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SEPTEMBER 2022

FY21 EMERGENT PIPELINE REPAIR
RED HILL

PIPELINE STRESS ANALYSIS AND STRUCTURAL EVALUATION REPORT - RED HILL LOWER ACCESS TUNNEL

Red Hill Bulk Fuel Storage Facility, Hawaii (RHL)

APTIM Federal Services

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14. ABSTRACT

This pipe stress analysis evaluated the pipelines according to ASME B31.3, Process Piping and AISC 360-16, Structural Pipe Supports. The purpose of this analysis was to evaluate the areas of concern identified by an independent assessment of the lower access tunnel piping system. The results would provide numerical data and a basis for repair recommendations for safe defueling of the Red Hill facility.

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FY21 EMERGENT PIPELINE REPAIR RED HILL
RED HILL UNDERGROUND FUEL STORAGE COMPLEX, JBPHH, HI

PIPELINE STRESS ANALYSIS AND STRUCTURAL EVALUATION REPORT – RED HILL LOWER ACCESS TUNNEL

September 2022

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EXECUTIVE SUMMARY

(b) (3) (A) is a subconsultant to APTIM Federal Services. APTIM is under contract to Naval Facilities Engineering and Expeditionary Warfare Center (NAVFAC EWC), Contract N39430-20-D-2225, Task Order (TO) N3943021F4207 to perform emergent repairs at Red Hill Underground Fuel Storage Complex, Joint Base Pearl Harbor-Hickam (JBPHH), Hawaii. This pipe stress analysis evaluated the pipelines according to ASME B31.3, Process Piping and AISC 360-16, Structural Pipe Supports. The purpose of this analysis was to evaluate the areas of concern identified by an independent assessment of the lower access tunnel piping system. The results would provide numerical data and a basis for repair recommendations for safe defueling of the Red Hill facility.

Approach

The Pipe Stress Analysis considered the effects of gravity, sustained pressure, and seismic loads on the three major pipelines and tank laterals in the lower access tunnel. The objective was to identify conditions of high stress and determine if the piping system would be safe for defueling under intended operating conditions. Two pressure cases were considered in the stress analysis: an operating case of 85 psi to drain the tanks (based on the tank head pressure of a full tank), and a maximum allowable operating pressure (MAOP) of 285 psi for a Class 150 piping system. The piping system was modeled from 3D scans of the existing facility and updated to reflect ongoing repairs and modifications to the piping. Pipe support loads generated by the stress analysis at operating pressure conditions were then used to evaluate the potential failure of selected supports, PS-46 through PS-48 and PS-78 through PS-92.

Findings and Recommendations

The results of the stress analysis revealed that piping stresses can exceed code allowable limits at various locations along the three major pipelines. With a pressure load case of 85 psi, the system is code compliant in hoop stress but fails in sustained stress and occasional seismic stress unless some modifications are made. With a pressure load case of 285 psi (a full Class 150 MAOP), the system fails code requirements in the hoop, sustained, and occasional seismic stress. The effects of pressure surges on piping stress and support loads were not evaluated because they cannot be mitigated by structural or piping modifications and must be prevented by operational procedures.

The repairs recommended herein will allow the system to operate within code-allowable stress limits at operating pressures up to 85 psi, which will be sufficient to gravity-drain the tanks. Operating the piping systems at pressures above 85 psi is not recommended. Recommended repairs include shimming existing supports that do not contact the pipe, adding two vertical supports (one on the -inch pipeline tee at Tanks 1 and 2 and one on the -inch pipeline tee at Tanks 11 and 12), and adding guides to existing vertical supports adjacent to the tank lateral piping and on select tank lateral piping. With these modifications, the system can be brought into code compliance for operations at 85 psi.

Minor deficiencies were identified in a total of 13 of the 18 pipe supports evaluated. In most cases, the failure mode was determined to be either the shear breakout of the anchor rods from the concrete piers or compression overloading of the diagonal bracing. These supports only require modifications in select areas and can be upgraded without replacement or movement of existing members. The repairs consist primarily of providing additional bracing of the pipe support columns. Additionally, two supports will require an added column and base plate positioned underneath the -inch diameter pipe.

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APPENDIX

RED HILL PIPELINE LOWER ACCESS TUNNEL
STRESS ANALYSIS AND STRUCTURAL EVALUATION REPORT

1.0 INTRODUCTION

(b) (3) (A) is a subconsultant to APTIM Federal Services. APTIM is under contract to Naval Facilities Engineering and Expeditionary Warfare Center (NAVFAC EWC), Contract N39430-20-D-2225, Task Order (TO) N3943021F4207 to perform emergent repairs at Red Hill Underground Fuel Storage Complex, Joint Base Pearl Harbor-Hickam (JBPHH), Hawaii.

The Scope of Work (SOW) for TO F4207 was originally outlined in the 6-part RFP X018 dated 8 June 2021. This SOW was awarded on 14 July 2021. The purpose of this project is to repair fuel piping and transfer pipelines at and between the Red Hill Bulk Fuel Storage Facility tank farm and Joint Base Harbor Hickam. Repairs in the base award include providing temporary piping in the cross tunnels of out-of-service tanks to provide lateral support to the tunnel piping and repairing piping and supports in the lower access tunnel. Modification 001 to add hydrostatic testing and pipe stand repair was issued on 4 March 2022. The SOW for Modification 002 was issued on 26 April 2022. Notice to Proceed was issued on 20 May 2022. Modification 002 SOW includes pipe stress analysis, pipe support structural analysis, development of a concept to relieve low-pressure conditions in JP-5 and F-24 pipelines and a concept to defuel F-76 utilizing (b -inch F-24 or (b -inch JP-5 pipelines. This document only addresses the Modification 002 SOW related to pipe stress analysis and pipe support structural analysis. The relief of low-pressure conditions and F-76 defuel was submitted in June 2022 under a separate cover.

Objective

The pipe stress analysis was performed on the fuel piping system from the bulkhead beyond pipe support 106 (PS-106) to the top of the lower access tunnel (PS-1). The analysis will identify conditions of high stress and determine whether the piping system and pipe couplings are safe for defueling under intended operating conditions. Intended operating conditions for defueling exclude consideration of fuel thermal effects. Fuel in the Red Hill facility is at a constant temperature in the tanks and piping because they are buried or in tunnels and do not see any thermal gain from the sun. It is not intended that new fuel would be received, therefore no low-temperature fuel from colder locations would be introduced to the piping system. As fuel receipts will not be considered, no evaluation of pumping scenarios will be included, only tank pressure head, maximum allowable operating pressures, and seismic loads will be considered. The effects of pressure surges on piping stress and support loads were not evaluated. Pressure surges can create damaging impulses that cannot be mitigated by structural or piping modifications and must be prevented by operational procedures or mitigated by pressure control and relief systems. Specific pipe supports (PS-46 to PS-48 and PS-79 to PS-92) were evaluated for seismic load adequacy.

Existing Facility

The Red Hill complex consists of 20 mined fuel tanks that were completed construction circa 1942. The Red Hill tanks are the primary bulk storage tanks for the three major products handled at Pearl Harbor (F-24, JP-5, and F-76). Three main transfer lines in the lower access tunnel carry fuel to and from Red Hill (a (b -inch F-76 line, an (b -inch JP-5 line, and a (b -inch F-24 line). The fuel lines are approximately (miles in length and are located in a tunnel from the Red Hill Tank Gallery to the Underground Pumphouse, Facility 59 (UGPH59). Tanks 1-16 have two common fill and issue lines that branch off the three main transfer lines. Tanks 17-20 have one common fill and issue line connected only to the (b -inch JP-5 line.

Only the piping in the tank area, from the bulkhead beyond PS-106 to the top of the lower access tunnel (PS-1) was evaluated under this project. The (-mile pipeline to UGPH59 was not identified as a concern and was not assessed.

At the time of this report, Tanks 1 and 19 have been out of service and drained of fuel for several years. Tanks 13-14 and 17-18 are empty and under construction for clean, inspect, and repair (CIR) contracts. Repairs included modifying piping in the lower access tunnel. These repairs have been included in the stress analysis. Tanks 2 through 12, 15, 16, and 20 are presently filled with product.

Site Investigation

Site investigations for Modification 002 started on 16 May 2022 and were completed in mid-July 2022. The pipe in the lower access tunnel and all overhead supports were scanned using a 3D scanner. In addition to referencing existing design drawings and other documents, (b) conducted numerous walkdowns to document any conditions which would impact this analysis. The design basis for modeling the system considered the current ongoing work as completed construction, necessary for resuming operations and defueling the facility.

2.0 STRESS ANALYSIS ENGINEERING ASSESSMENT

This stress analysis calculation was prepared to evaluate the existing conditions of the Red Hill lower access tunnel piping. The objective was to evaluate the piping under the effects of gravity, sustained pressure, and seismic loads. It also evaluated loads at select pipe support to facilitate the structural evaluation. See Section 3.0 Pipe Support Structural Analysis for further discussion.

Calculation Method and Analysis

The pipe stress calculations were performed using BENTLEY® AutoPIPE (CONNECT Edition, Version 12.08), Static and Dynamic Analysis software. The program is a finite element analysis-based engineering application used for the calculation of piping stresses, deflections, and forces under static loading conditions.

A three-dimensional (3D) computer model was created based on the current configuration of the piping which was documented through 3D scans. At the time of this report, Tanks 13-14 and 17-18 were empty and under construction. Modeling for these areas was based on the CIR tank modification drawings. Piping in the tunnels was also modeled according to the ongoing FY21 Emergent Pipeline Repair drawings for Tanks 1, 18-20, and the tee at Tank 5. This ongoing work was assumed to be complete for the purpose of this analysis. An overview of the piping configuration and geometry is shown in Figure 1. The limits of the model were bounded between the end of the tunnel, near Tanks 19 and 20, and an anchoring bulkhead near PS-106. Tank lateral piping connected to each of the tanks was modeled as anchors at the tank wall.

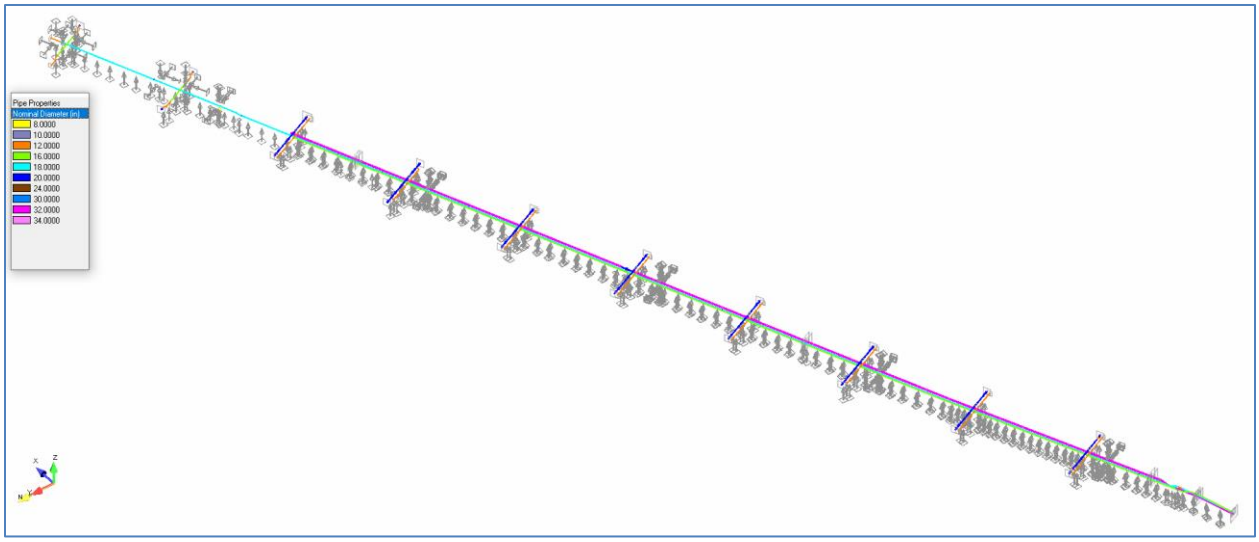

Figure 1: Lower Access Tunnel Pipeline Model Overview

Load Cases

The following load cases were applied to the model (see Appendix B for input report):

- **Gravity (G)** loads of the pipe and contents, except those tanks "empty" or out of service, up to the spec blind.
- **Pressure (P1, P2)** loads P1 for an operating case of 85 psi and P2 for maximum allowable operating pressure (MAOP) of 285 psi, Class 150 flange rating.
- **Temperature (T1, T2)** loads modeled as an average tunnel temperature of 65°F.
- **Static seismic (E1, E2, E3)** loads from UFC 3-301-01 for Pearl Harbor, HI as calculated from ASCE 7-10. E1 modeled acceleration in the north, east, and vertical directions. E2 modeled acceleration in the east and vertical directions, and E3 modeled acceleration in the north and vertical directions.

Assumptions

For a full summary of model inputs, see Appendix B. The following assumptions were made in creating the model:

- All piping greater than (b inch nominal pipe size is either standard wall thickness or Schedule 10. This was spot-checked with ultrasonic measurements during the field site investigation.
- The system is mostly constructed as ANSI Class 150, with a nominal MAOP of 285 psi. A few select valves and flanges are ANSI Class 300.
- The temperature of piping and fuel remains constant year-round. No new fuel (of a different temperature) is added to the system.
- Pipe supports modeled as vertical supports. Guide supports were modeled at wall penetrations and some new pipe supports at Tanks 17-20.
- Branch connections are a mixture of forged tees and unreinforced stub-on connections (with a higher stress intensification factor (SIF)).

- Dresser couplings (Style 38) in tank laterals of the even-numbered tanks were modeled as expansion joints with a spring stiffness of zero. The couplings are fit with Type 440 joint harnesses modeled as tie-rod supports, and welded lugs on the pipe modeled as rigid beams.
- Butt welded bell and socket piping ends were approximated with back-to-back non-standard reducers.

Summary of Findings

The load cases were applied to the model and stress combinations were evaluated per ASME B31.3, Process Piping.

- Hoop stress is circumferential stress due to internal pressure (P1, P2).
- Sustained stress is gravity (G) + pressure, internal (P1, P2).
- Occasional stress is determined by applicable combinations, in this case, sustained (G + P1, P2) + earthquake, seismic (E1, E2, E3). As the Red Hill piping is in tunnels, no wind or snow loads were applied. And there was no potential for thermal differential.

The results are presented as a ratio between calculated stress and allowable stress values. Any ratio over 1.00 is not allowed. **Analysis of the B31.3 code combinations revealed that in some locations, the piping stresses were not within the allowable range.** Figures shown below represent only the operating case of P1 (85 psi). Over-stressed areas, any ratio over 1.00, show as red.

Hoop Stress

The maximum allowable hoop stress is 20 kips per square inch (ksi). For operating pressure, P1, the maximum calculated stress ratio is 0.44. This occurred in the (b -inch pipeline near PS-101, at the mitered bends approaching the double block and bleed (DB&B) valve (see Figure 2). In the operating pressure case, P1, all hoop stress ratios were within code allowable limits. For Class 150 MAOP, P2, the maximum calculated stress ratio is 1.47. This occurred near PS-101 in the (b -inch pipeline at a mitered bend. All three pipelines in this area with mitered bends exceeded code allowable limits. All other points in the model were within code allowable limits for hoop stress in the P2 case.

Maximum Hoop Stress Results		
Load Case	**P1**	**P2**
Stress Ratio	0.44	**1.47**

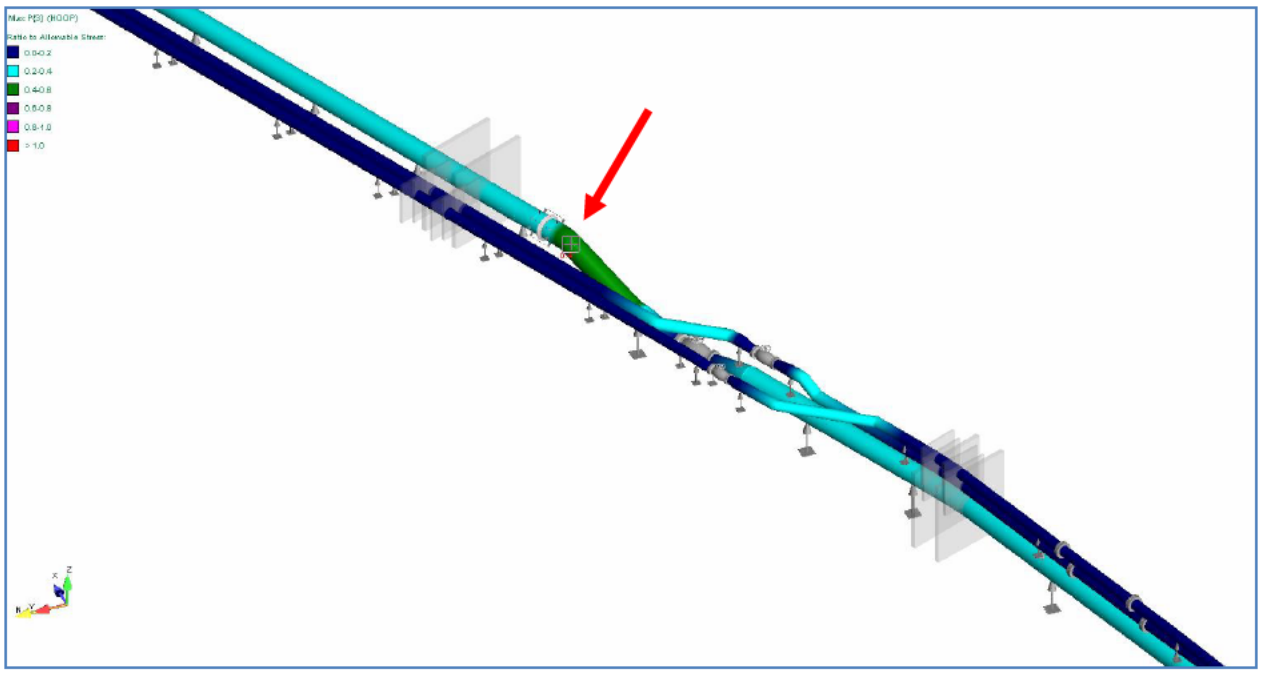

Figure 2: Maximum Hoop Code Stress of P1 load case (end of tunnel piping)

Sustained Stress

Sustained stress, the effects of gravity combined with pressure, has a maximum allowable stress of 20 ksi. In the operating case, P1, the maximum calculated stress ratio is 1.06. This is located at the Tank 1 and 2 (b -inch tee to the(b) -inch lateral (see Figure 3). For the operating pressure P1, all other pipeline stresses were within code allowable limits. In the Class 150 MAOP case, P2, the maximum calculated stress ratio was also at Tank 1 and 2 (b -inch tee to (b -inch lateral. All other points in the model were within code allowable limits for the Class 150 MAOP case.

Maximum Sustained Stress Results		
Load Case	**P1**	**P2**
Stress Ratio	**1.06**	**1.07**

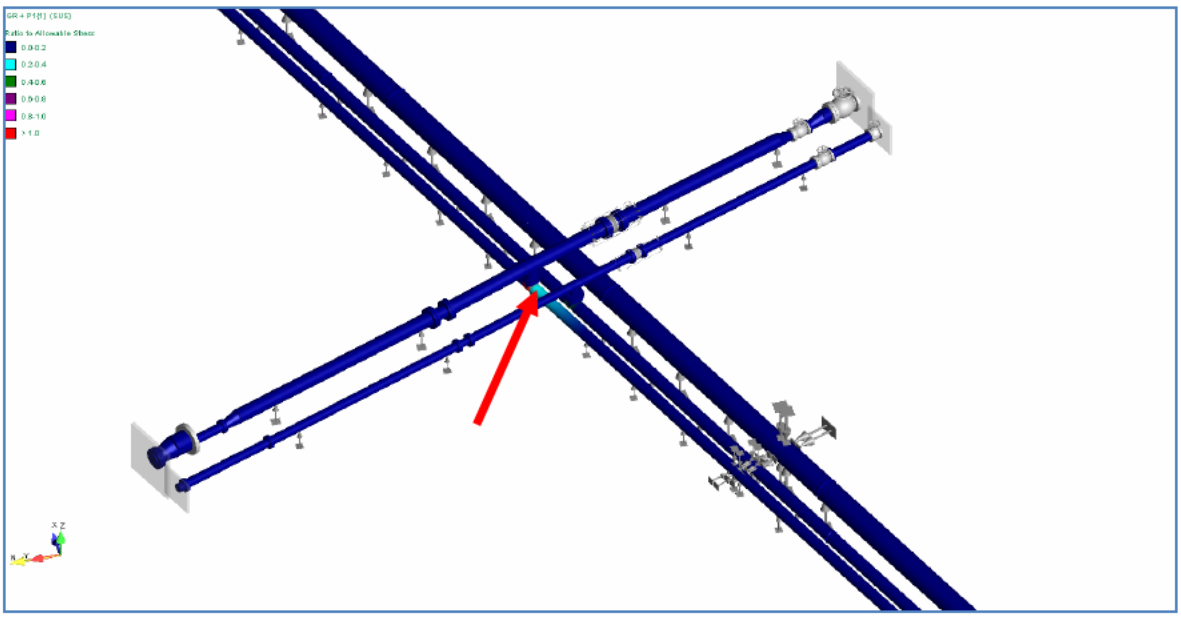

Figure 3: Maximum Sustained Code Stress of P1 load case (Tank 1 on the left, Tank 2 on the right)

Occasional Stress (Seismic)

Occasional stress, in this scenario a design level seismic event, has a maximum allowable stress of 26.6 ksi. In the operating case (P1) of sustained plus seismic loads, the maximum calculated stress ratio is 5.32. This occurred at the tee near Tank 1 and 2 of the (b -inch pipeline to the (b -inch lateral (see Figure 4). Pipeline stresses at most all the tees between tank laterals and tunnel pipelines exceeded code allowable limits. Tees at Tanks 17-20, the (b -inch tee of Tanks 5, 6, 15, and 16 and all other piping in the model were within code allowable limits of the occasional seismic load. In the Class 150 MAOP case, P2 + E2, the maximum calculated stress ratio was 5.30, also at Tank 1 and 2, 16-inch tee to 20-inch lateral.

Maximum Occasional Stress Results		
Load Case	**P1+E3**	**P2+E2**
Stress Ratio	**5.32**	**5.30**

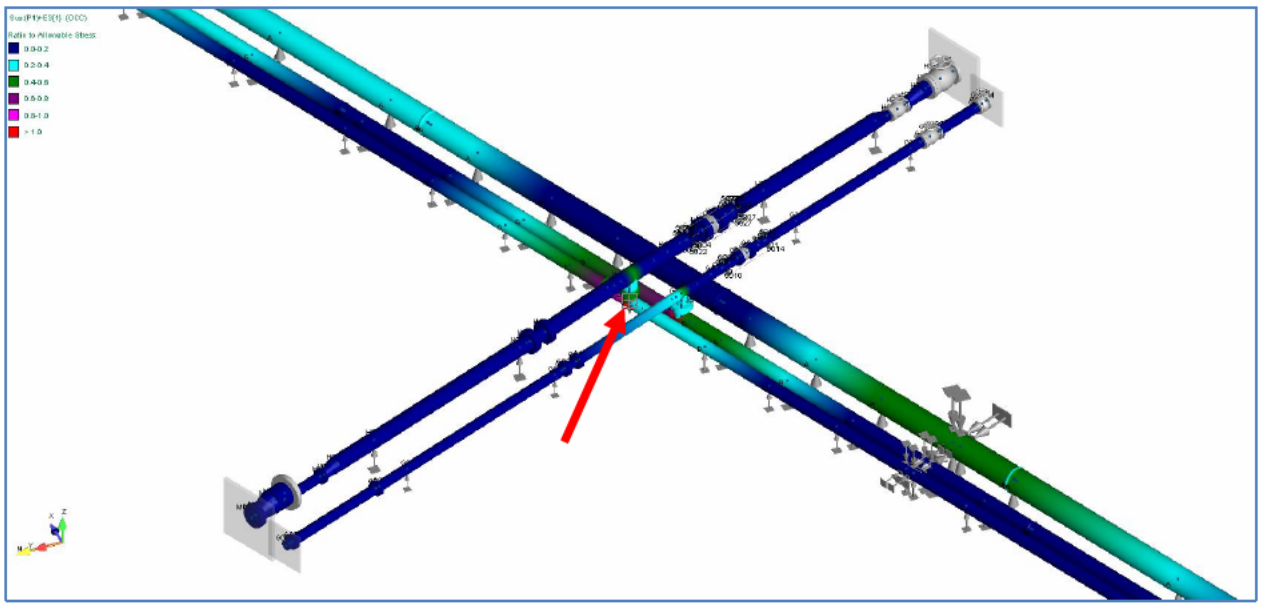

Figure 4: Maximum Occasional Code Stress Ratio of P1 load case (Tank 1 on the left, Tank 2 on the right)

For more reporting on the piping stress and loads, see the result screenshots included in Appendix A and a model output summary of maximum stresses in Appendix C.

Recommendations

To bring the lower access tunnel piping system into compliance with allowable code stress limits, modifications will need to be made to the existing piping system. **The recommended modifications will allow the system to operate at pressures up to 85 psi, which will be sufficient to gravity-drain the tanks.** The recommended changes will not be sufficient to maintain compliance with code stress limits at pressures above 85 psi, therefore operating the piping systems at pressures above 85 psi is not recommended.

At a full Class 150 rating (285 psi MAOP), the three pipelines failed in hoop stress at the mitered bends near PS-101. It is recommended that the facility adopt a new maximum allowable operating pressure of 193 psi just to maintain a code-compliant hoop stress ratio in all three of the pipelines. An intended operating pressure of 85 psi (gravity draining the existing tanks) is well within this pressure limit.

Mandatory Repairs

Mandatory repairs listed below are required for bringing the system into code compliance with a maximum intended operating pressure of 85 psi. The recommendations included are of a preliminary nature and have not been verified through structural design but focus on mitigating issues of piping stress.

1. At seven pipe support locations, there is no contact between the pipe and the vertical support. It is recommended to provide shims to bring the support in contact with the pipe.

	Pipe Support
(b -inch Pipeline	PS-46, PS-47, PS-73, PS-74
(b -inch Pipeline	PS-11, PS-13, PS-16

2. In the case of sustained stress (P1), a vertical support must be added below the tee at the (b -inch pipeline to the (b -inch lateral at the Tanks 1 and 2 corridors (see red highlight in Figure 5). Adding a vertical support under the (b -inch tee reduces the code stress to 0.11 The new maximum code stress in sustained loading is 0.49 at the (b -inch tee near Tanks 15 and 16.

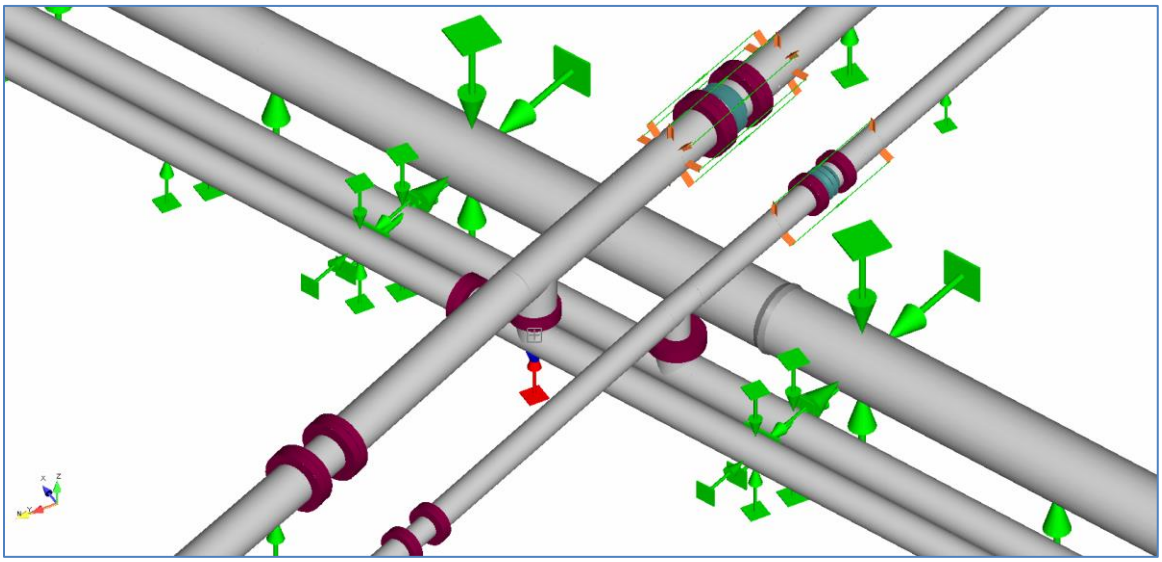

Figure 5: Vertical Support on the 16-inch pipeline at Tanks 1 and 2

To address the issues present in a design-level seismic event, a number of modifications must be made to the piping.

3. Add tight guide supports (zero gaps) to the vertical supports adjacent to the tank laterals at each corridor (see red highlights in Figure 6).

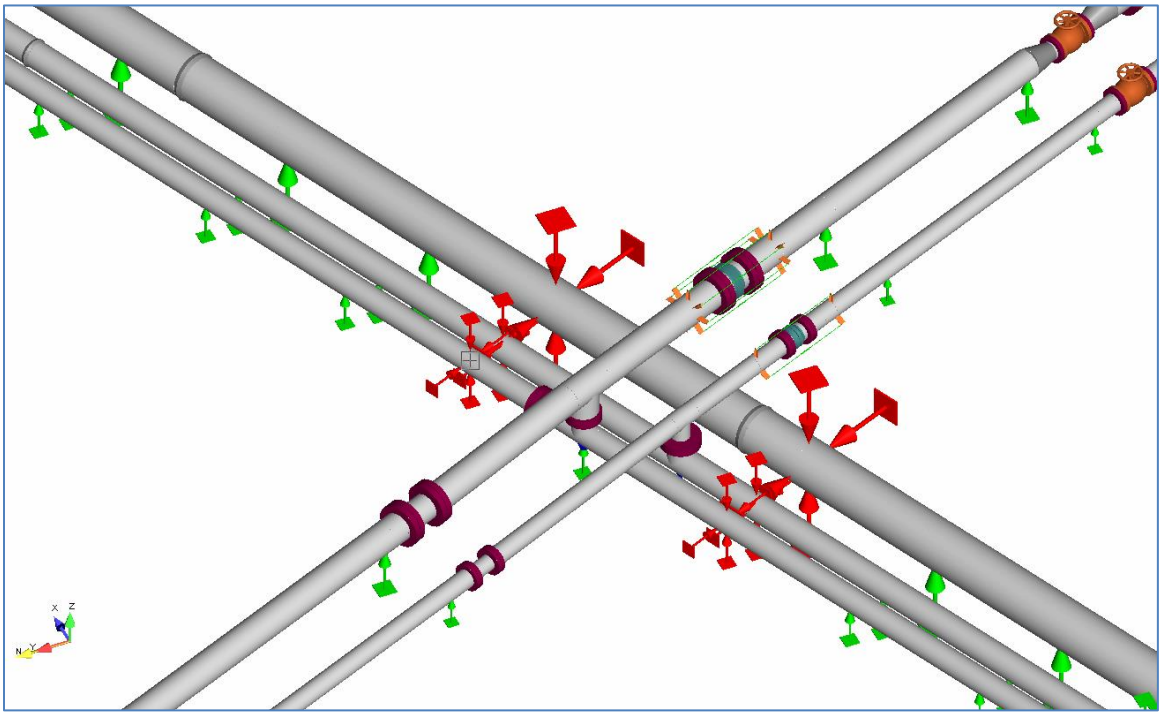

Figure 6: Guide Supports PS-92, PS-93 adjacent to Tank Laterals

4. Add tight guide supports at each first pipe support of the tank laterals at Tanks 3-8, 11-12, and 15-16 (see red highlights in Figure 7).

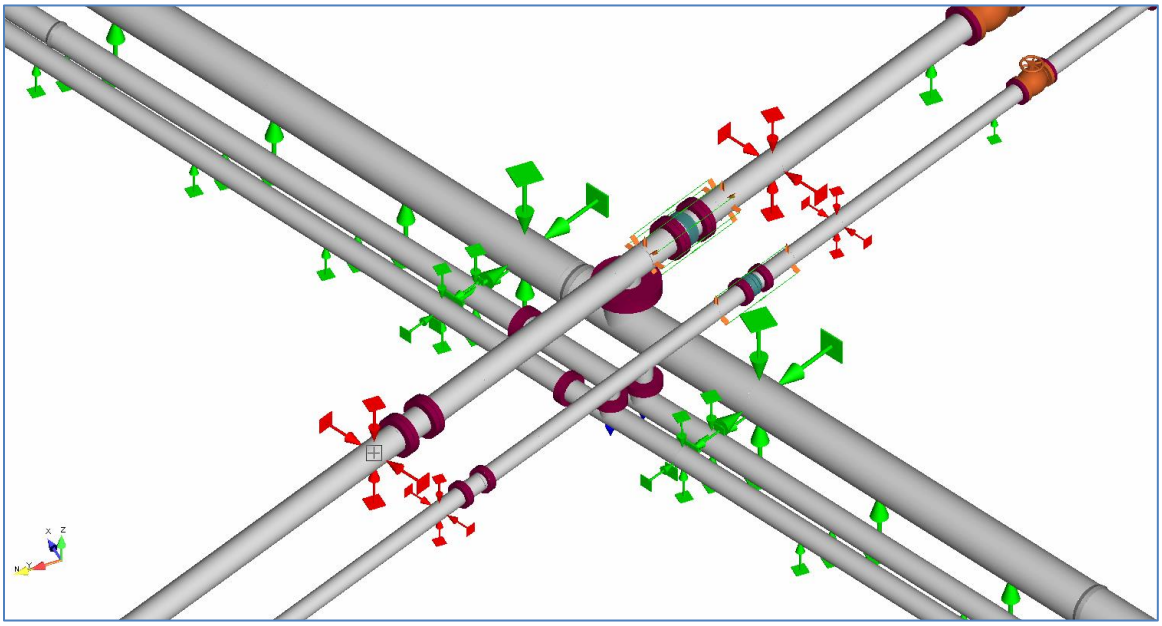

Figure 7: Guide Supports at tank laterals PS-1 of Tank 3 and Tank 4

5. Add a tight guide support to PS-47 on the (b -inch pipeline (see red highlight in Figure 8). This reduces code stress due to seismic to 1.00.

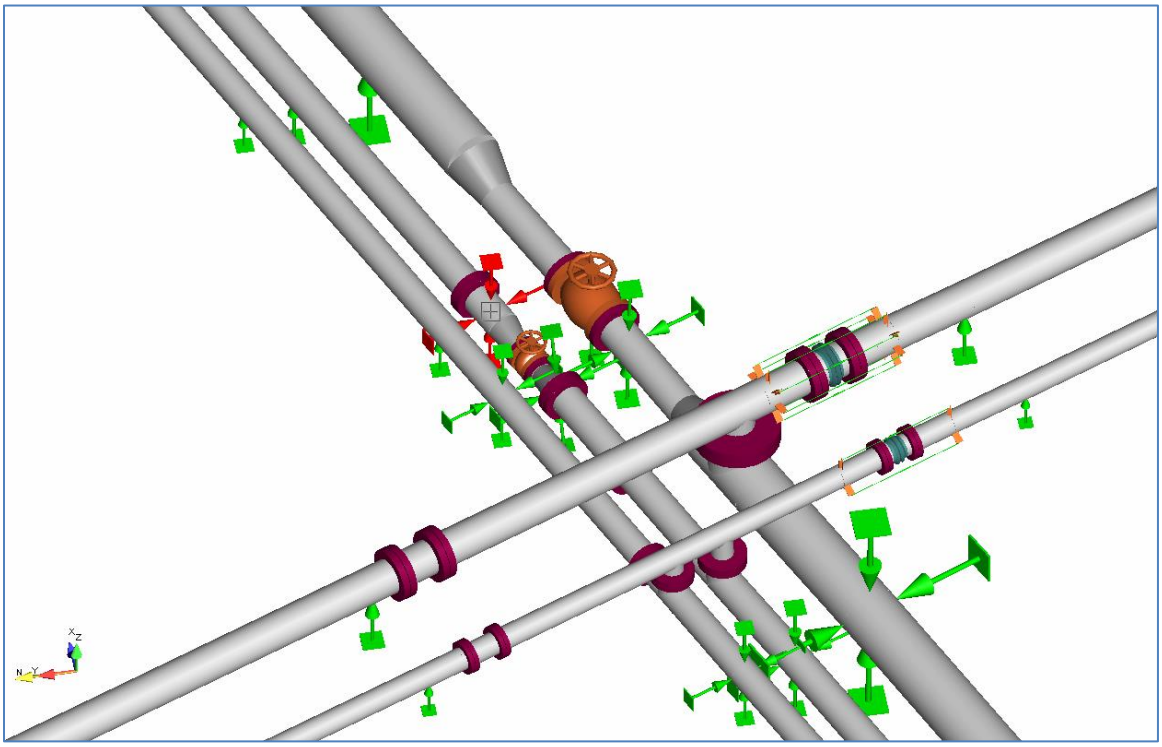

Figure 8: Guide Support at PS-47

6. To further reduce code stress, add a vertical support under the (b -inch to (b -inch tee at Tanks 11 and 12 (see red highlight in Figure 9). This reduces code stresses due to seismic to 0.95.

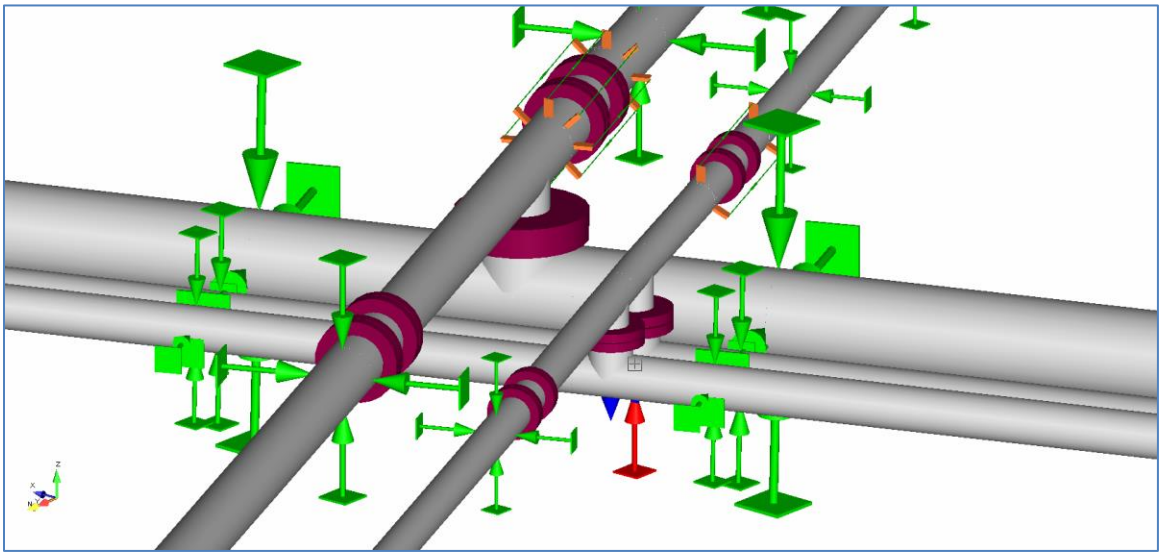

Figure 9: Vertical Support on the 18-inch pipeline at Tanks 11 and 12

For a summary report of the piping stress and loads with the proposed preliminary repairs, see the result screenshots included in Appendix A and a model output summary of maximum stresses in Appendix D.

Alternative Repairs

It is understood that dresser couplings are used in the tank laterals on the even tanks due to the potential for receiving cold fuel into the system. Since the facility will not be resupplied with fuel, the dresser couplings could be removed from the system.

7. Alternative to providing a vertical support (recommendation 6) under the (b -inch to (b -inch tee at Tank 11 and 12, removing the dresser couplings of Tank 12 reduces the occasional code stress to 0.91. This code stress considers recommendations 1-5 in addition to recommendation 7.

As determined by this analysis, the existing system of piping at Red Hill is not within allowable limits of ASME B31.3 for sustained stress and occasional stress. Following subsequent design and repair, the system could be brought into code compliance for operating pressures up to 85 psi. Though the hoop stress at PS-101 is within code limits up to 193 psi, it is recommended that the facility not exceed the design case of defueling the facility with a maximum tank head pressure of 85 psi.

3.0 PIPE SUPPORT STRUCTURAL ANALYSIS

The SOW included an evaluation of 18 pipe supports within the Red Hill lower access tunnel. These pipe supports have been designated as PS-78 through PS-92 and PS-46 through PS-48. The evaluation included the combined effects of the gravity, pressure, and seismic loads that were generated as outputs from the main pipe stress analysis. The results were based on an operating pressure of 85 psi. The structural calculations were performed using RISA 3D to analyze the support structures and Hilti PROFIS to analyze the anchor rod connections.

Pipe Support Description

As-built drawings of the supports were available for review. A site visit was performed to verify dimensions and member sizes. In general, the pipe supports were constructed as H-shaped frames using wide flange (W-section) steel sections. For PS-78 through PS-92, the horizontal beam was supported by a steel column on one side while the other end was embedded in the gunite lining of the tunnel wall. For PS-46 through PS-48, the horizontal beam was supported by a steel column at each end. PS-46 was embedded in the gunite lining as well, and PS-48 had a central column, totaling three columns for this pipe support. The bracing on the column side (in the direction of the pipe) was mixed; some supports had angle bracing on both sides, some had angle bracing on one side, and some were unsupported by any longitudinal bracing. All bracing was constructed from structural steel angles (L2-1/2 x 2-1/2 x 1/4 in most cases). Figure 10 shows a typical pipe support braced on both sides with diagonal angle bracing. The baseplates were a mix of 10-inch and 12-inch square plates, 3/4 thick, and attached to the concrete foundation with two anchor rods. The anchor rods are oriented in the longitudinal direction of the pipe. This allows for the support to be modeled as a fixed base with one rod in tension and the other in compression. However, in the transverse direction, the support is considered pinned. Although the as-built construction of the foundations could not be verified for each column base, some historical drawings have shown that the foundations are 12-inch square concrete pedestals.

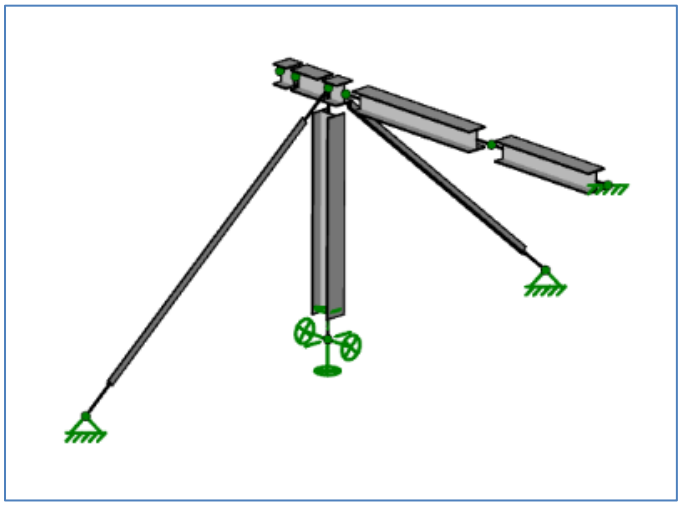

Figure 10: Typical Dual-Braced Pipe Support

Rather than create 18 models to address the minor differences in construction, simplifications were made to reduce the number of representative models to six. Model PS-80 represented PS-80, PS-81, PS-83, PS-84, PS-86, PS-88, PS-89, PS-90 and PS-92. Model PS-91 represented PS-79, PS-82, PS-85, PS-87 and PS-91. PS-46, PS-47, PS-48, and PS-78 were each modeled due to uniqueness in either geometry or loads.

Calculation Method and Analysis

Resultant loads from the pipe stress analysis were generated for each local direction of the pipe run – longitudinal to the pipe, transverse to the pipe, and vertical. There were five total load combinations provided – gravity load, pressure load at 85 psi, and three seismic load cases. As part of the structural analysis, pressure loading was interpreted as a dead load and combined with gravity. This resultant dead load combination was paired with the worst seismic load case in each direction. Out of the groupings listed in the pipe support description, the worst combinations from this process were identified and applied to the associated representative pipe support modeled in RISA 3D. Utilization ratios from AISC 360-16 Chapter H were generated for each member to determine which portions of the pipe supports are prone to failure. These ratios combine shear and moment utilization to create a realistic metric to assess failure. A ratio equal to or in excess of 1.0 indicates that the member experiences failure in one or more failure modes and must be modified before the support can be loaded.

From the RISA analysis, loads and moments were calculated at the baseplate of each representative support. The baseplates and anchorage were modeled in Hilti PROFIS based on site data and the RISA output. An assumption has been made to neglect the specific requirements of ACI 318-14 Chapter 17 *Anchoring to Concrete*. Substantial code changes have been made with respect to the behavior of concrete anchors since the construction of Red Hill. The specific code requirements for the failure of a ductile element over the failure of a brittle element have been set aside. The failure assessment has been limited to whether or not a pipe support would sustain the applied loads without failure of any element. Combined, these models were used to identify existing deficiencies in the pipe supports.

Summary of Findings

The analysis of the pipe support models under consideration revealed minor deficiencies in select areas. Generally, the W-section frames themselves pose no concerns, but the baseplates and bracing of certain pipe supports warrant modification to adequately resist the design loading. For the wire models below, the numbers represent the utilization ratios mentioned above.

Deficiency 1: It was found that for all pipes that only have bracing on one side (See Figure 11), this brace will pass within 5% of failure under design loading. Since seismic loads are variable, this is not ideal as any deviations above the design seismic event will likely result in the buckling or tensile yielding of these elements. If this were to happen, although the frames would adequately handle the new loads without failure, the base anchorage would fail and result in overturning of these pipe supports.

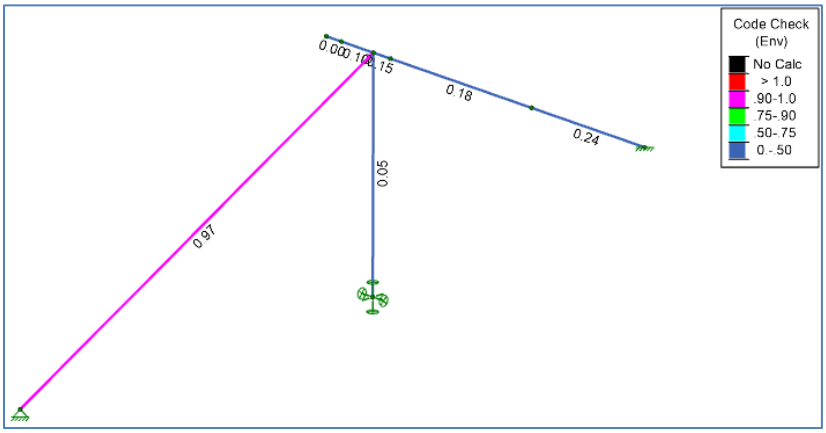

Figure 11: Supports Braced on One Side

Deficiency 2: There are two supports that are entirely unbraced. It was determined that, although there are no concerns with the members that the frame is comprised of, the lack of longitudinal bracing overloads the baseplate anchorage of these supports. The anchors and pier-style foundation underneath the supports will not be able to adequately resist the design load if the support were modeled as a cantilevered column. PS-78 is unbraced on the column side but embedded in the gunite wall on the other side, and PS-48 is unbraced on both sides of the support beam. Figure 12 and Figure 13 show PS-78 and PS-48 in their current conditions, respectively.

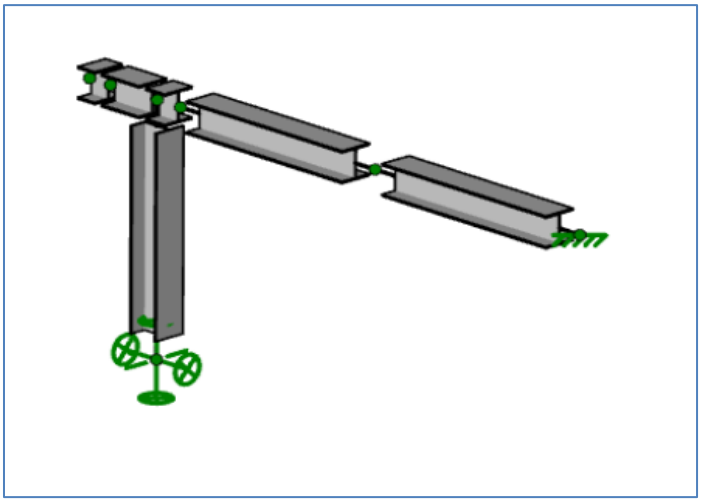

Figure 12: Existing PS-78

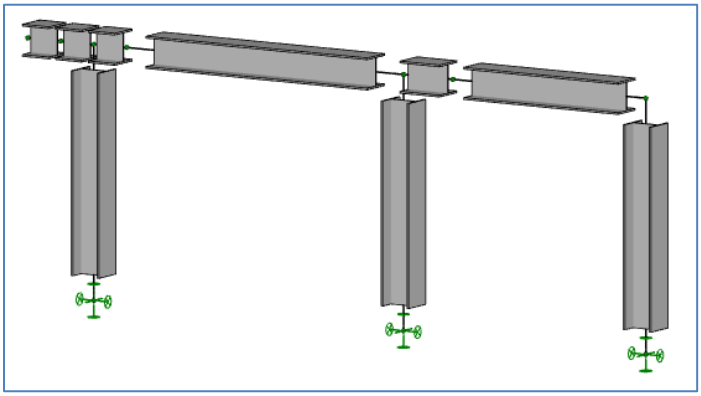

Figure 13: Existing PS-48

Deficiency 3: There are two concerns with PS-47 (See Figure 14). First, the support was severed in the middle of the beam to allow for the installation of a double block and bleed valve. This valve has been seated on a standalone support. This standalone support, from now on referred to as PS-47a, is comprised of a 6-inch standard vertical pipe stanchion. The stanchion is welded to a baseplate that is anchored by 4 anchor rods. Under design loading, PS-47a will fail at the anchor attachment between the baseplate and foundation. Modeling the support as a cantilever column applies a significant bending moment on the base. Second, the smaller portion of PS-47, (the side further from the wall), is laterally unsupported and requires some form of bracing to withstand any transverse loading conditions. The portion that is closer to the wall is supported via a W-section horizontal brace connecting it to PS-48. None of the pipes under consideration bear on top of this section. The application of any incident loads to this portion is outside the scope of this report.

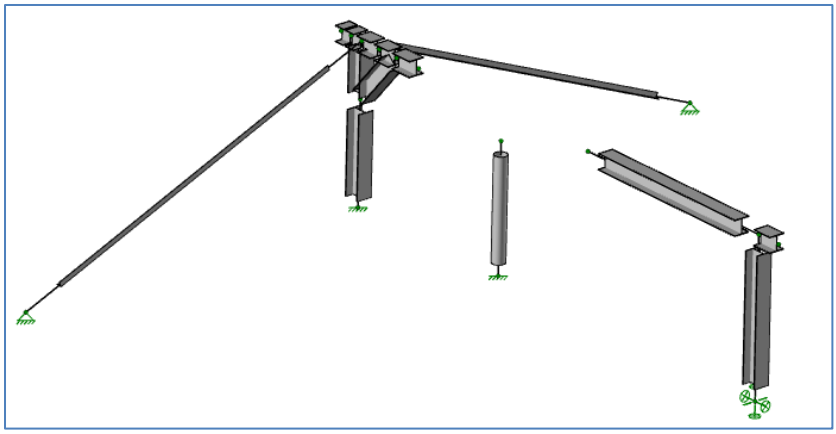

Figure 14: Existing PS-47

Deficiency 4: It was found that the anchorage of the baseplates is overloaded for the columns of PS-46. Although this support is fixed to the gunite wall and braced on either side of the outside column, PS-46 has a vertical downward load of over 10,000 pounds applied in the center of the beam. This load is significantly higher than any of the other vertical loads present from the pipe stress analysis. As the beam deflects downward in the center, it induces outward rotation at the tops of the columns, which causes them to bow outward from the center of the beam. This mechanism transfers shear forces to the baseplates as if they were unbraced, except the shear forces are perpendicular to the pipe instead of parallel to the pipe. This pipe support received much larger gravity loads than the rest of the supports, which is why failure in this way is unique to PS-46. The model of PS-46 in its current condition can be seen below (Figure 15).

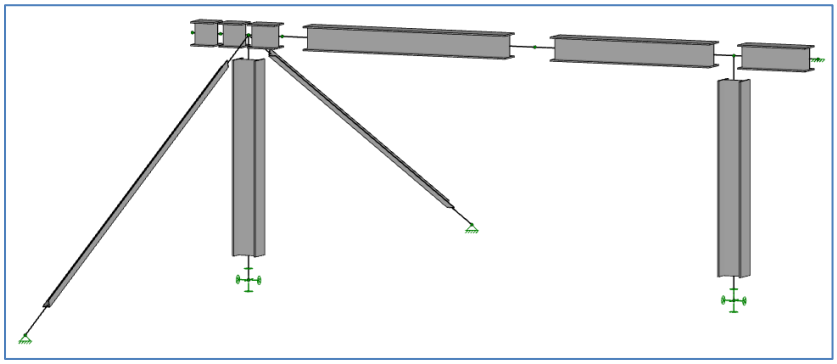

Figure 15: Existing PS-46

Recommendations

It is recommended to modify the pipe supports such that they will be able to adequately transfer the design loads from the pipe run to the foundation without failure. The recommendations are limited only to those 18 supports within the scope of study.

To address Deficiency 1, it is recommended to augment the existing braces where only one side of the support has been braced. Increasing the available strength of the braces would be the least intrusive method of increasing strength and reducing the utilization ratio. The simplest approach would be to stitch weld additional L2 x 2 x 1/4 angles to the inside of the existing L3 x 2-1/2 x 1/4 angles. Alternatively, additional bracing could be installed. However, this may not be feasible at all locations due to constraints

such as geometry, cross tunnels, and other physical objects. This recommendation is applicable to PS-80, PS-81, PS-83, PS-84, PS-86, PS-88, PS-89, PS-90, and PS-92.

Deficiency 2 is specific to PS-48 and PS-78 which are unbraced in the longitudinal direction. For both supports, it is recommended to provide bracing on at least one side to reduce the loads applied to the column baseplates. An L3 x 2-1/2 x 7/16 can be added from the top of PS-48 to the base of PS-47 and from the top of PS-78 to the base of PS-79. Using this larger size of angle will mitigate the concerns in Deficiency 1 without requiring nested angles or further alteration. It is also recommended to add a column on PS-78 under the 32-inch pipe and to provide a fixed connection between the beam of PS-48 and the gunite wall, either by welded baseplate or concrete embedment and tie-in. Altogether, these modifications will address the baseplate anchorage issues at PS-48 and PS-78. The modifications have been shown below in Figure 16 and Figure 17.

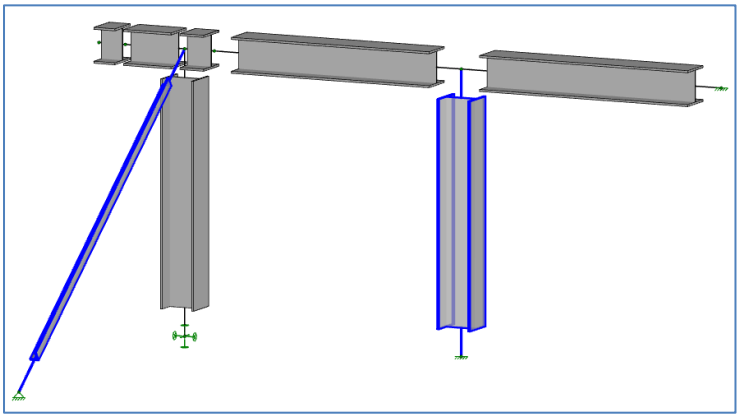

Figure 16: Modified PS-78

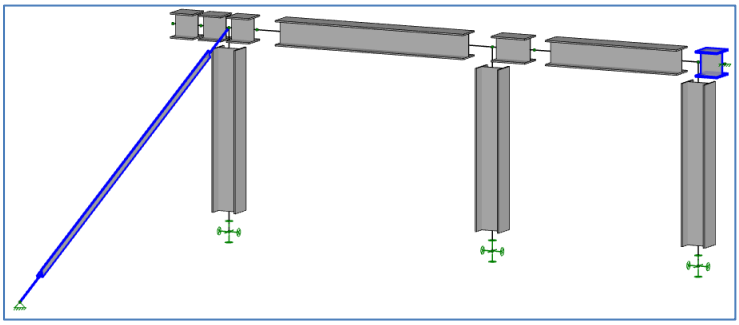

Figure 17: Modified PS-48

For Deficiency 3, the instabilities of PS-47 are considered in multiple parts. To address the baseplate anchor rod failure in PS-47a, it is recommended to add one L3 x 2-1/2 x 7/16 braces in each direction (lateral and longitudinal). This will minimize the bending moment applied to the baseplate and is the least intrusive repair. For the portion of this deficiency that pertains to PS-47, it is recommended to add one L3 x 2-1/2 x 7/16 diagonal braces in the transverse direction for stability. The brace could be attached at the base of the existing W-section knee brace and would only protrude less than 5 ft out from the vertical column. These recommendations are illustrated in Figure 18.

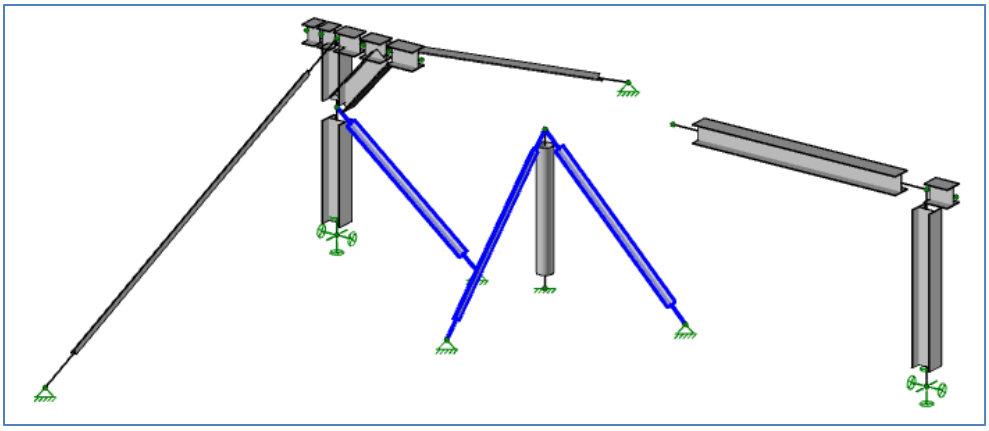

Figure 18: Modified PS-47 and PS-47a

Deficiency 4 can be addressed by adding an additional column to PS-46 under the (b -inch pipe. Properly sized, the column will support a large portion of the loading from the (b -inch pipe before it is shared by the other two columns. This will reduce the baseplate shear loading of the existing columns to acceptable levels. Figure 19 shows the modification of PS-46 to address this deficiency.

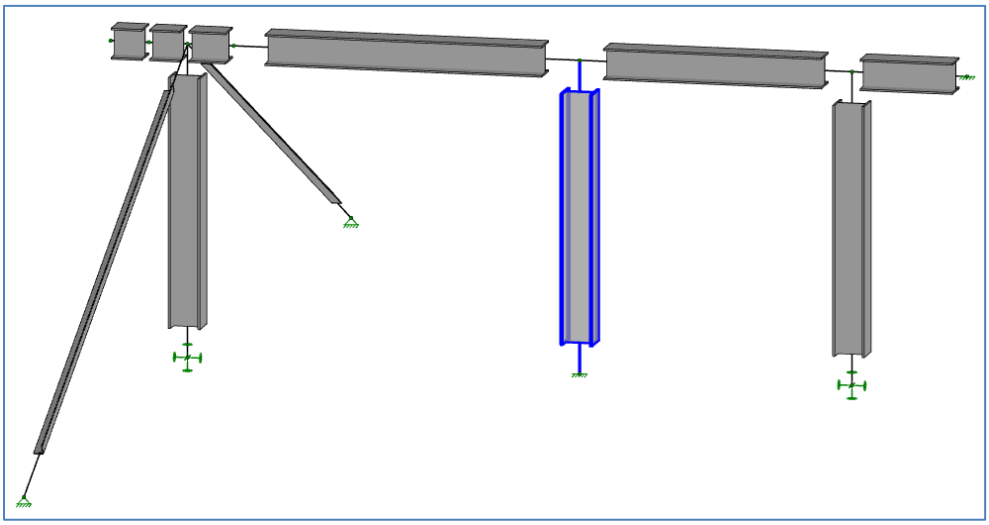

Figure 19: Modified PS-46

ACRONYMS AND ABBREVIATIONS

3D	Three-dimensional
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
CIR	Clean, Inspect, Repair
DB&B	Double Block and Bleed
E1, E2, E3	Earthquake 1, Earthquake 2, Earthquake 3
EEI	Enterprise Engineering, Inc.
JBPHH	Joint Base Pearl Harbor-Hickam
ksi	kilopounds per square inch
MAOP	Maximum Allowable Operating Pressure
NAVFAC EXWC	Naval Facilities Engineering and Expeditionary Warfare Center
NDE	Non-Destructive Examination
P1, P2	Pressure 1, Pressure 2
POL	Petroleum, Oil, and Lubricants
PS	Pipe Support
psi	Pounds per square inch
SIF	Stress Intensification Factor
SOW	Scope of Work
TO	Task Order
UFGS	Universal Facilities Guide Specifications

CODES AND REFERENCES

Industry Codes and Standards

- ASME B31.3, 2018 – Process Piping
- ASME Section VIII, Div 1 – Boiler and Pressure Vessel Code

Client Criteria and Specifications

- UFC 3-301-01, February 2022 – Structural Engineering
- UFC 3-460-01, January 2022 – Design Petroleum Fuel Facilities

APPENDIX A
STRESS ANALYSIS MODEL SCREENSHOTS

CALCULATION METHOD: AUTOPIPE MODELING

The Red Hill lower access tunnel piping configuration and geometry (see Figure 1 below) were modeled according to 3D scans of the piping, CIR tank modification drawings for Tanks 13-14 and 17-18, and FY21 Emergent Pipeline Repair drawings for Tanks 1, 18-20, and the tee at Tank 5. The limits of the model were bounded between the end of the tunnel, near Tanks 19 and 20, and an anchoring bulkhead near PS-106. Tank lateral piping connected to each of the tanks was modeled as anchors at the tank walls.

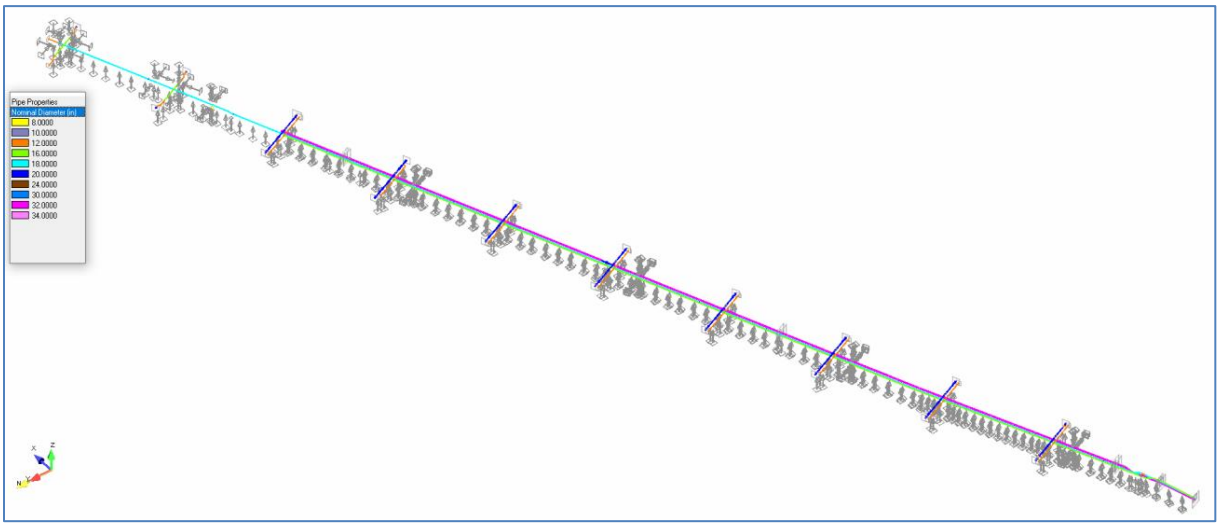

Figure 1: Lower Access Tunnel Piping Configuration. Tank 19 and 20 on the left, Tank 1 and 2 on the right.

In the lower access tunnel, there are three main transfer lines that carry fuel to and from Red Hill: a (b -inch F-76 line, an (b -inch JP-5 line, and a (b -inch F-24 line. The (b -inch pipeline connects Tanks 3-16, terminating at Tanks 15 and 16. The (b -inch pipeline connects Tanks 1-20, and the (b -inch pipeline connects Tanks 1-16, terminating at Tanks 15 and 16. A small piping segment at an (-inch tee was modeled and terminated at a bulkhead anchor.

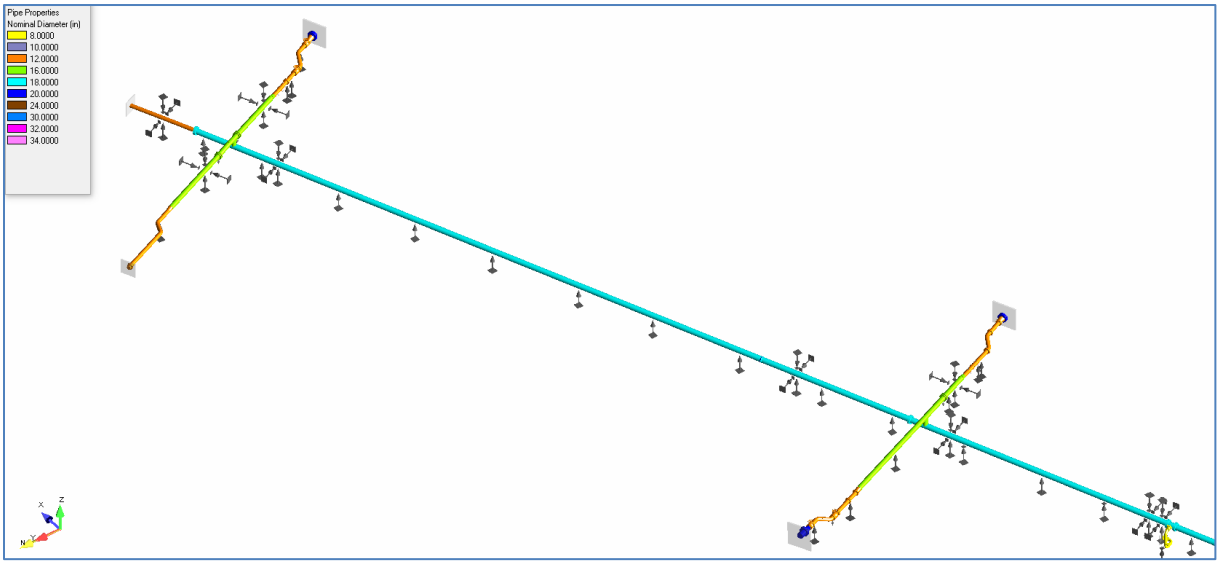

Figure 2: Tank 17-20 Piping Configuration

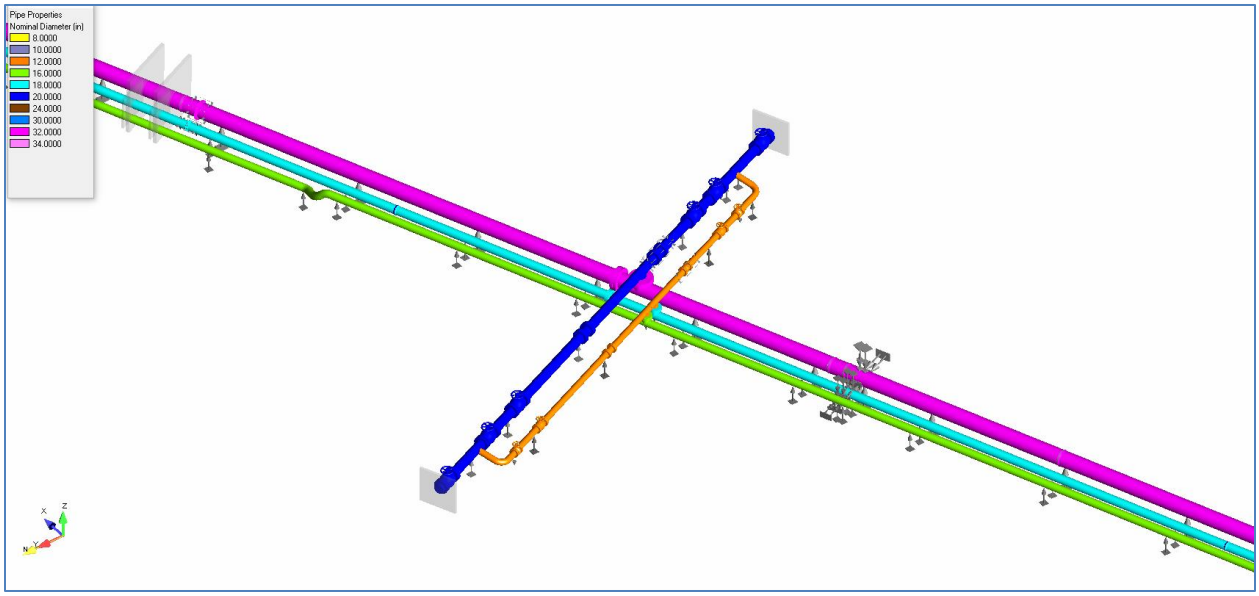

Figure 3: Tank 5 and 6 Sample Piping Configuration

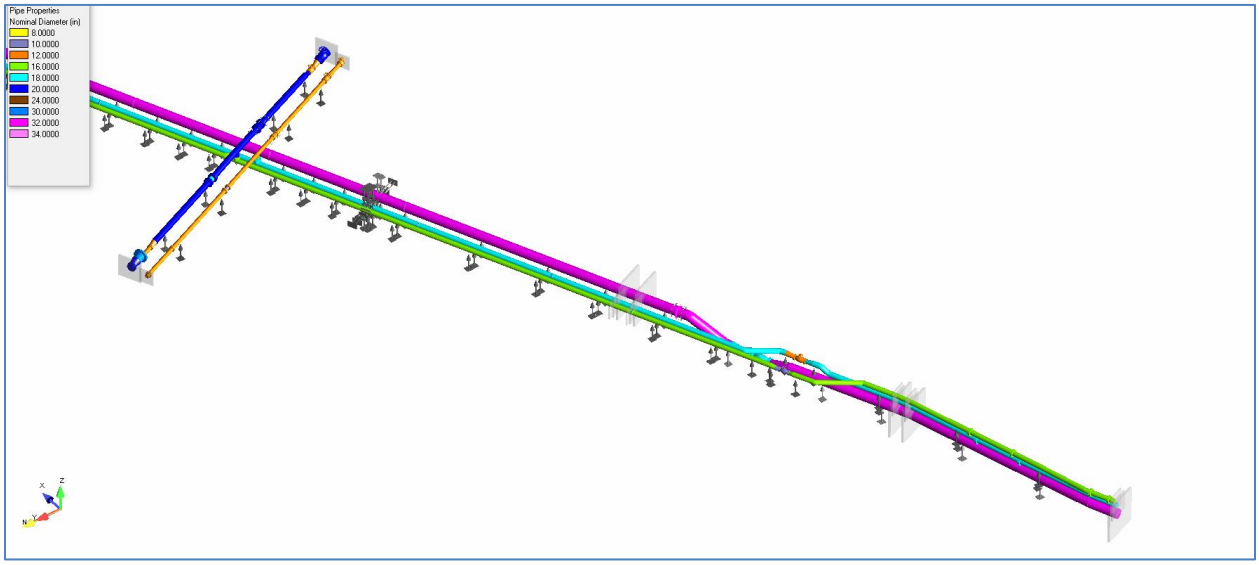

Figure 4: Tank 1 and 2 and Model Boundary Piping Configuration

AUTOPIPE RESULTS

Piping Stress

Stresses were calculated for ASME B31.3 code cases. The results are given as a ratio between calculated stress and allowable stress values. Any ratio over 1.00 exceeds allowable. Results shown in the figures below are due to piping load cases considering just an operating condition of defueling the facility. The operating pressure is due to the tank head, a pressure of 85 psi (P1).

Hoop Stress

The maximum allowable hoop stress is 20,000 psi or 20 ksi. The maximum calculated stress ratio is 0.44. This occurred in the (b -inch piping near PS-101 in the operating pressure (P1) case. The high stress concentration is due to mitered bends at this location.

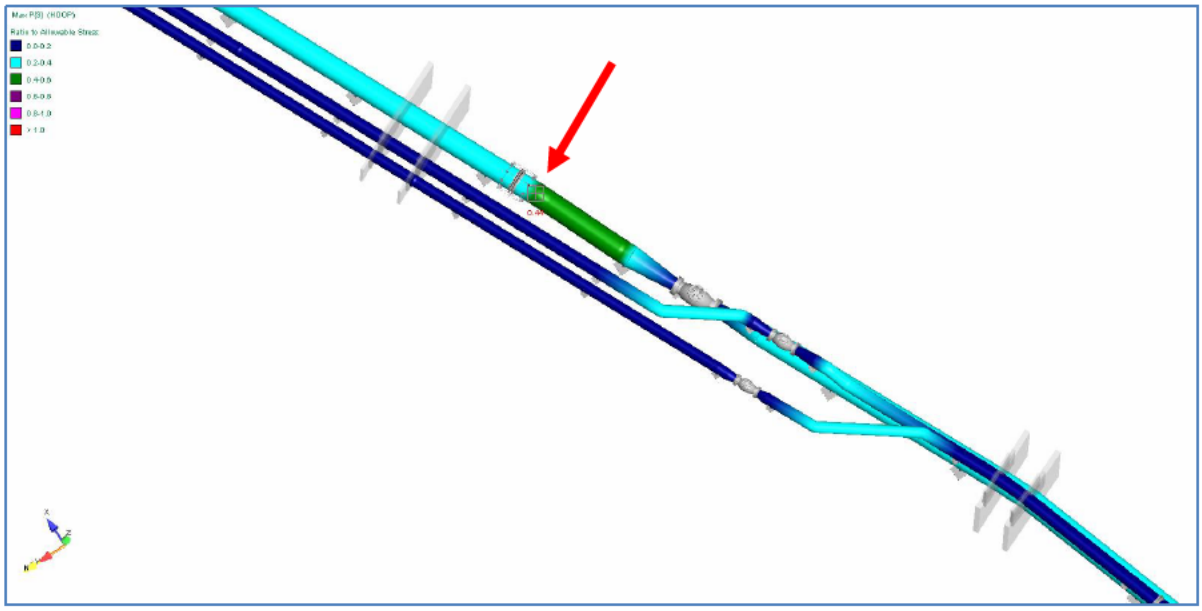

Figure 5: Hoop Stress

Sustained Stress

The maximum allowable sustained stress is 20 ksi. The maximum calculated stress ratio is 1.06. This occurs at the corridor of Tanks 1 and 2 on the (b -inch pipeline tee to the (b -inch lateral. This condition occurred while evaluating the effects of gravity combined with operating pressure (P1).

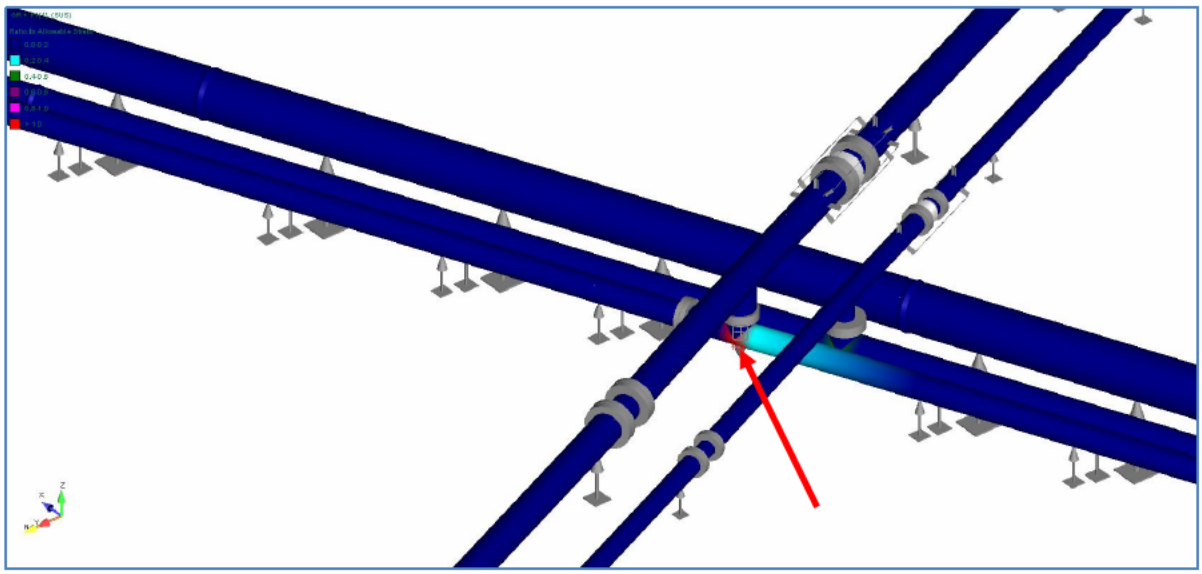

Figure 6: Sustained Stress

Occasional Stress (Seismic)

The maximum allowable occasional stress is 26.6 ksi. The maximum calculated stress ratio is 5.32. This occurs at the corridor of Tank 1 and 2 on the (b -inch pipeline tee to the (b -inch lateral. This condition occurred while evaluating the effects of the occasional load of seismic (E3) added to the sustained case.

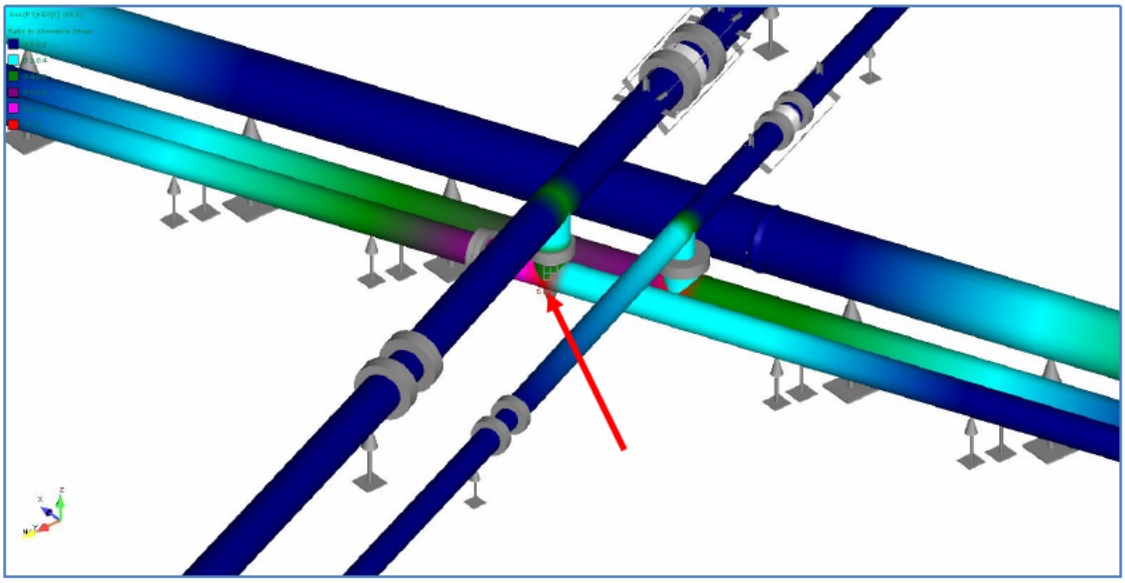

Figure 7: Maximum Occasional Seismic Stress

AutoPIPE Recommendations

To bring the lower access tunnel piping system into compliance with allowable code stress limits, modifications will need to be made to the existing piping system. The recommended modifications will allow the system to operate at pressures up to 85 psi, which will be sufficient to gravity-drain the tanks. The recommended changes will not be sufficient to maintain compliance with code stress limits at pressures above 85 psi, therefore operating the piping systems at pressures above 85 psi is not recommended. See Appendix D, Proposed Repairs Stress Analysis Summary, for the output report.

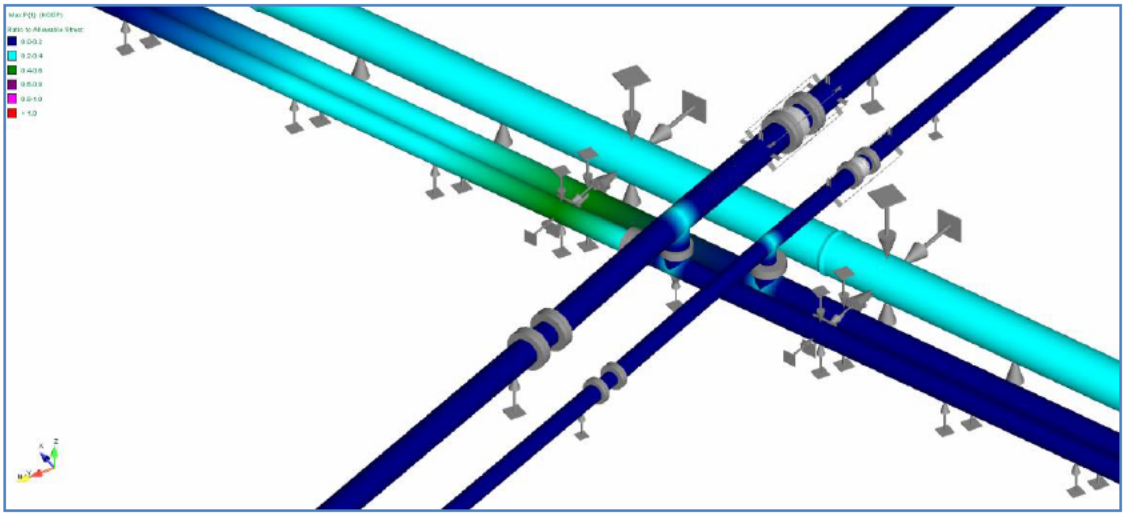

Figure 8: Tank 1 and 2 Maximum Stress Code Ratios to Allowable Stress

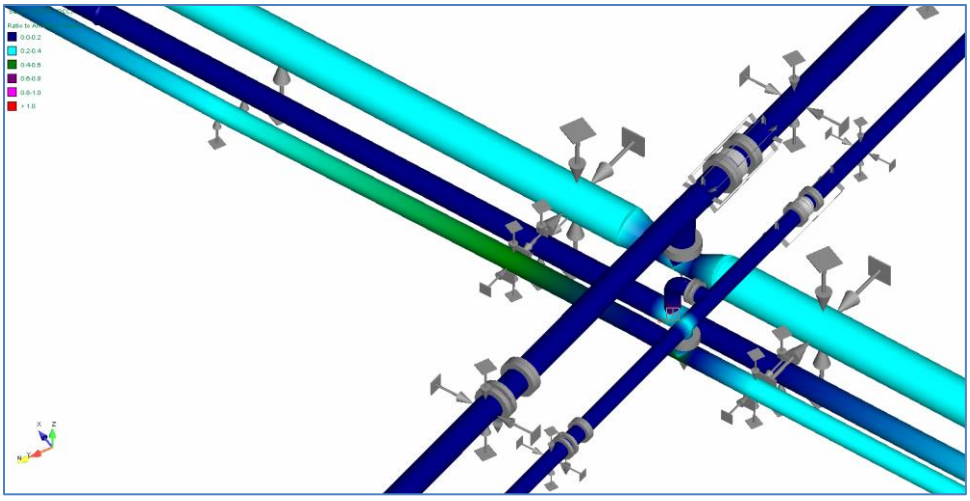

Figure 9: Tank 5 and 6 Maximum Stress Code Ratios to Allowable Stress

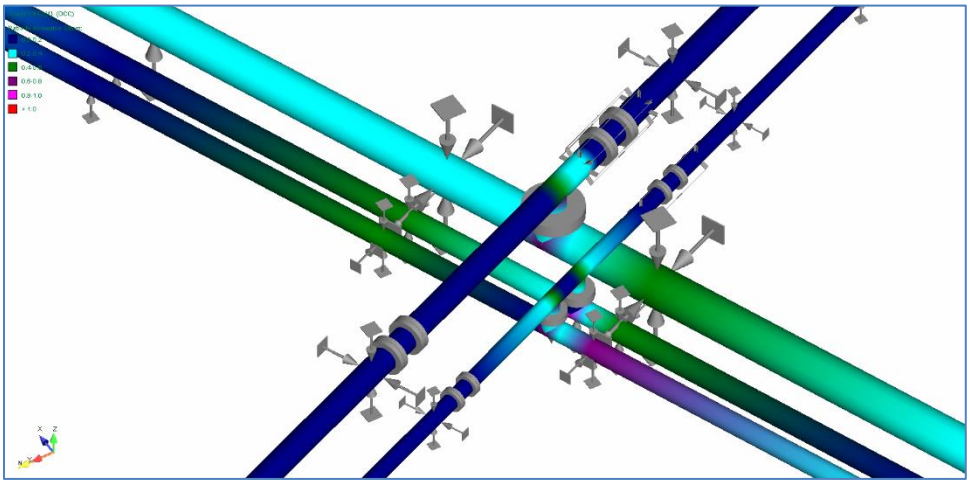

Figure 10: Tank 11 and 12 Maximum Code Stress Ratios to Allowable Stress

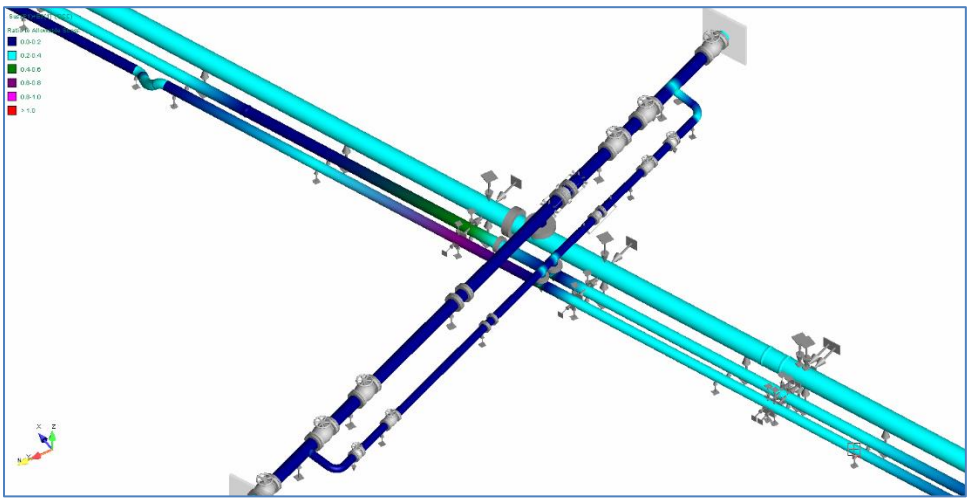

Figure 11: Tank 13 and 14 Maximum Code Stress Ratios to Allowable Stress

APPENDIX B
AUTOPIPE INPUT DATA AND REPORT

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Pipe Stress Analysis and Design Program

Version: 12.08.01.010

Edition: AutoPIPE Standard

Version: 12.08.01.010

Edition: AutoPIPE Standard

Developed and Maintained by

BENTLEY SYSTEMS, INCORPORATED
1065 N. PACIFIC CENTER DRIVE, SUITE 450
ANAHEIM, CA 92806

****
**
** AUTOPIPE SYSTEM INFORMATION **
**
****

SYSTEM NAME : Red Hill

PROJECT ID : EMERGENT REPAIR PIPING
9845

PREPARED BY : _____
MRO

CHECKED BY : _____
JFK

1ST APPROVER : _____

2ND APPROVER : _____

PIPING CODE : ASME B31.3

YEAR : 2018

VERTICAL AXIS : Z

AMBIENT TEMPERATURE : 65.0 deg F

COMPONENT LIBRARY : AUTOPIPE

MATERIAL LIBRARY : B313-18

MODEL REVISION NUMBER : 173

SYSTEM NAME : Red Hill

PROJECT ID : EMERGENT REPAIR PIPING
9845

PREPARED BY : _____
MRO

CHECKED BY : _____
JFK

1ST APPROVER : _____

2ND APPROVER : _____

PIPING CODE : ASME B31.3

YEAR : 2018

VERTICAL AXIS : Z

AMBIENT TEMPERATURE : 65.0 deg F

COMPONENT LIBRARY : AUTOPIPE

MATERIAL LIBRARY : B313-18

MODEL REVISION NUMBER : 173

T A B L E O F C O N T E N T S

P I P E D A T A L I S T I N G

Pipe ID/ Material CladMaterial ---Line Class---	Nom/ Sch	O.D. inch	-----Thickness(inch)----- W.Th. Clad	Corr	Mill	Insu	Ling	Spec Grav/ InsMt	InsuDen/ LingDen/ CladDen lb/cu.ft	Weight(lb/ft) Pipe/ Cont	Ling/ Insu/ Clad	Total	E/ W/ f	Composition/ Steel Group/ Tcr(deg F)
Tag No. : <None>														
(b)			0.375	0	0.05	0	0	0.80	0.000	127	0	392	1.00	Carbon Steel
A53-B	STD								0.000	266	0		Auto	Carbon
CS150			0						0.000		0		1.00	650.000
Tag No. : 18.0IN;A53-B;SCH 10														
(b)			0.250	0	0.03	0	0	0.80	0.000	47.34	0	131	1.00	Carbon Steel
A53-B	10								0.000	83.38	0		1.00	Carbon
CS150			0						0.000		0		1.00	650.000
Tag No. : <None>														
(b)			0.375	0	0.05	0	0	0.80	0.000	62.51	0	126	1.00	Carbon Steel
A53-B	STD								0.000	63.32	0		Auto	Carbon
CS150			0						0.000		0		1.00	650.000
Tag No. : <None>														
(b)			0.375	0	0.05	0	0	0.80	0.000	78.51	0	179	1.00	Carbon Steel
A53-B	STD								0.000	101	0		Auto	Carbon
CS150			0						0.000		0		1.00	650.000
Tag No. : <None>														
(b)			0.375	0	0.05	0	0	0.80	0.000	49.51	0	88.71	1.00	Carbon Steel
A53-B	STD								0.000	39.21	0		Auto	Carbon
CS150			0						0.000		0		1.00	650.000
Tag No. : 10.0IN;A53-B;SSTD;														
(b)			0.365	0	0.05	0	0	0.80	0.000	40.44	0	67.77	1.00	Carbon Steel
A53-B	STD								0.000	27.34	0		1.00	Carbon
CS150			0						0.000		0		1.00	650.000
Tag No. : <None>														
(b)			0.375	0	0.05	0	0	0.80	0.000	94.51	0	242	1.00	Carbon Steel
A53-B	STD								0.000	147	0		Auto	Carbon
CS150			0						0.000		0		1.00	650.000

P I P E D A T A L I S T I N G

Pipe ID/ Material CladMaterial ---Line Class---	Nom/ Sch	O.D. inch	Thickness(inch) W.Th.	Corr	Mill	Insu	Ling	Spec Grav/ InsMt	InsuDen/ LingDen/ CladDen lb/cu.ft	Weight(lb/ft) Pipe/ Cont	Ling/ Insu/ Clad	Total	E/ W/ f	Composition/ Steel Group/ Tcr(deg F)
Tag No. : <None>														
(b)		0.375	0	0.05	0	0	0.80		0.000	135	0	436	1.00	Carbon Steel
A53-B	STD								0.000	301	0		2.00	Carbon
CS150		0							0.000		0		1.00	650.000
Tag No. : <None>														
(b)		0.375	0	0.05	0	0	0.80		0.000	54.51	0	102	1.00	Carbon Steel
A53-B	STD								0.000	47.80	0		Auto	Carbon
CS150		0							0.000		0		1.00	650.000
Tag No. : STRUCTURAL, EMPTY														
(b) (3)		0.365	0	0.05	0	0	0		0.000	40.44	0	40.44	1.00	Carbon Steel
A53-B	STD								0.000	0	0		1.00	Carbon
CS150		0							0.000		0		1.00	650.000
Tag No. : 30.0IN;A53-B;SSTD;														
(b)		0.375	0	0.05	0	0	0.80		0.000	119	0	351	1.00	Carbon Steel
A53-B	STD								0.000	233	0		1.00	Carbon
CS150		0							0.000		0		1.00	650.000
Tag No. : STRUCTURAL, EMPTY														
(b) (3)		0.375	0	0.05	0	0	0		0.000	70.51	0	70.51	1.00	Carbon Steel
A53-B	STD								0.000	0	0		1.00	Carbon
CS150		0							0.000		0		1.00	650.000
Tag No. : STRUCTURAL, EMPTY														
(b) (3)		0.375	0	0.05	0	0	0		0.000	49.51	0	49.51	1.00	Carbon Steel
A53-B	STD								0.000	0	0		1.00	Carbon
CS150		0							0.000		0		1.00	650.000
Tag No. : STRUCTURAL, EMPTY														
(b) (3)		0.375	0	0.05	0	0	0		0.000	78.51	0	78.51	1.00	Carbon Steel
A53-B	STD								0.000	0	0		1.00	Carbon
CS150		0							0.000		0		1.00	650.000
Tag No. : STRUCTURAL, EMPTY														

P I P E D A T A L I S T I N G

Pipe ID/ Material CladMaterial ---Line Class---	Nom/ Sch	O.D. inch	Thickness(inch) W.Th. Clad	Corr	Mill	Insu	Ling	Spec Grav/ InsMt	InsuDen/ LingDen/ CladDen lb/cu.ft	Weight(lb/ft) Pipe/ Cont	Ling/ Insu/ Clad	Total	E/ W/ f	Composition/ Steel Group/ Tcr(deg F)
			0.375	0	0.05	0	0	0	0.000	119	0	119	1.00	Carbon Steel
(b) (3) A53-B	STD								0.000	0	0		1.00	Carbon
			0						0.000		0		1.00	650.000
CS150														
Tag No. : 8.0IN;A53-B;SSTD;														
			0.322	0	0.04	0	0	0.80	0.000	28.52	0	45.87	1.00	Carbon Steel
(b) A53-B	STD								0.000	17.34	0		1.00	Carbon
			0						0.000		0		1.00	650.000
CS150														
Tag No. : 20.0IN;A53-B;SCH 10														
			0.250	0	0.03	0	0	0.80	0.000	52.67	0	156	1.00	Carbon Steel
(b) A53-B	10								0.000	104	0		1.00	Carbon
			0						0.000		0		1.00	650.000
CS150														
Tag No. : 16.0IN;A53-B;SCH 10														
			0.250	0	0.03	0	0	0.80	0.000	42.01	0	107	1.00	Carbon Steel
(b) A53-B	10								0.000	65.41	0		1.00	Carbon
			0						0.000		0		1.00	650.000
CS150														
Tag No. : STRUCTURAL, EMPTY														
			0.375	0	0.05	0	0	0	0.000	62.51	0	62.51	1.00	Carbon Steel
(b) (3) A53-B	STD								0.000	0	0		1.00	Carbon
			0						0.000		0		1.00	650.000
CS150														

```
               M A T E R I A L   D A T A   L I S T I N G

  Material            Density  Pois. Temper.      Modulus E6 psi       Expans.  Composition
    Name     Pipe ID  lb/cu.ft Ratio deg F    Axial     Hoop    Shear   in/100ft
------------ -------- -------- ----- ------- -------- -------- -------- -------- -------------------
 A53-B     (b) (3) (B)   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel

 A53-B                   489.0  0.30    65.0   29.427   29.427   11.318          Carbon Steel
```

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         M A T E R I A L   A L L O W A B L E   D A T A   L I S T I N G

  Material             Temper. Allow.   Yield    Ultimate Weld Reduction Factor
    Name      Pipe ID  deg F   psi      psi                         W
-----------            ------- -------- -------- -------- ---------------------
 A53-B      (b) (3) (B)   65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000

 A53-B                    65.0  20000.0  35000.0  60000.0        1.000
                          65.0  20000.0  35000.0                 1.000
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OPERATING TEMPERATURE AND PRESSURE DATA
STRESSES IN psi

POINT NAME	CASE	PRESS. psi	TEMPER deg F	EXPAN. in/100ft	MODULUS E6 psi	ALLOW STRESS	YIELD STRESS
*** SEGMENT A, LINE # (b) Pipeline							
A00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
A228	Same as previous point.						
*** SEGMENT B, LINE # (b) Pipeline							
B00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
B287	Same as previous point.						
*** SEGMENT D, LINE # (b) Pipeline							
D00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
D180	Same as previous point.						
*** SEGMENT E, LINE # Tank 1/2 (b) tee							
D40	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
H15	Same as previous point.						
*** SEGMENT G, LINE # Tank 1/2 (b) lateral							
G00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
G36	Same as previous point.						
*** SEGMENT H, LINE # Tank 1/2 (b) lateral							
H00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
H37	Same as previous point.						
*** SEGMENT M, LINE # Tank 1 OOS access							
M00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
H00	Same as previous point.						
*** SEGMENT BA, LINE # Tank 7/8 (b) tee							
B123	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
BF19	Same as previous point.						
*** SEGMENT BD, LINE # Tank 7/8 (b) tee							
D106	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
BF22	Same as previous point.						
*** SEGMENT BF, LINE # Tank 7/8 (b) lateral							
BF00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
BF37	Same as previous point.						
*** SEGMENT BG, LINE # Tank 5/6 (b) lateral							
BG00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
BG51	Same as previous point.						
*** SEGMENT BH, LINE # Tank 5/6 (b) tee							
D79	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
BI23	Same as previous point.						
*** SEGMENT BI, LINE # Tank 5/6 (b) lateral							
BI00	T1	85.00	65.00	0.000	29.427	20000	35000

OPERATING TEMPERATURE AND PRESSURE DATA
STRESSES IN psi

POINT NAME	CASE	PRESS. psi	TEMPER deg F	EXPAN. in/100ft	MODULUS E6 psi	ALLOW STRESS	YIELD STRESS
	T2	285	65.00	0.000	29.427	20000	35000
BG45	Same as previous point.						
*** SEGMENT BM, LINE # Tank 3/4 (b) tee							
B72	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
BP21	Same as previous point.						
*** SEGMENT BO, LINE # Tank 5/6 (b) tee							
B99	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
BI20	Same as previous point.						
*** SEGMENT BP, LINE # Tank 3/4 (b) lateral							
BP00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
BP43	Same as previous point.						
*** SEGMENT BQ, LINE # Tank 3/4 (b) lateral							
BQ00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
BQ40	Same as previous point.						
*** SEGMENT BW, LINE # Tank 7/8 (b) lateral							
BW00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
BW36	Same as previous point.						
*** SEGMENT EP, LINE # Tank 11/12 (b) tee							
B177	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FD22	Same as previous point.						
*** SEGMENT EQ, LINE # Tank 13/14 (b) tee							
B194	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FG25	Same as previous point.						
*** SEGMENT ER, LINE # Tank 15/16 (b) tee							
B219	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FI17	Same as previous point.						
*** SEGMENT EY, LINE # Tank 11/12 (b) tee							
D137	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FD25	Same as previous point.						
*** SEGMENT EZ, LINE # Tank 13/14 (b) tee							
D151	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FG28	Same as previous point.						
*** SEGMENT FA, LINE # Tank 15/16 (b) lateral							
FA00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FA36	Same as previous point.						
*** SEGMENT FB, LINE # Tank 9/10 (b) lateral							
FB00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FB42	Same as previous point.						
*** SEGMENT FC, LINE # Tank 15/16 (b) tee							

OPERATING TEMPERATURE AND PRESSURE DATA
STRESSES IN psi

POINT NAME	CASE	PRESS. psi	TEMPER deg F	EXPAN. in/100ft	MODULUS E6 psi	ALLOW STRESS	YIELD STRESS
D177	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FI14	Same as previous point.						
*** SEGMENT FD, LINE # Tank 11/12 (b) lateral							
FD00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FD43	Same as previous point.						
*** SEGMENT FE, LINE # Tank 9/10 (b) tee							
D121	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FB25	Same as previous point.						
*** SEGMENT FF, LINE # Tank 9/10 (b) tee							
B148	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FB22	Same as previous point.						
*** SEGMENT FG, LINE # Tank 13/14 (b) lateral							
FH07	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FH50	Same as previous point.						
*** SEGMENT FH, LINE # Tank 13/14 (b) lateral							
FH00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FH57	Same as previous point.						
*** SEGMENT FI, LINE # Tank 15/16 (b) lateral							
FI00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FI39	Same as previous point.						
*** SEGMENT FR, LINE # Tank 9/10 (b) lateral							
FR00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FR40	Same as previous point.						
*** SEGMENT FW, LINE # Tank 11/12 (b) lateral							
FW00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FW42	Same as previous point.						
*** SEGMENT GG, LINE # Tank 17/18 (b) lateral							
GG00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
GG55	Same as previous point.						
*** SEGMENT GH, LINE # Tank 19/20 (b) lateral							
GH00	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
GH49	Same as previous point.						
*** SEGMENT GJ, LINE # Tank 19/20 (b) tee							
GH15	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
B280	Same as previous point.						
*** SEGMENT GO, LINE # Tank 1/2 (b) tee							
B42	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
G15	Same as previous point.						

OPERATING TEMPERATURE AND PRESSURE DATA
STRESSES IN psi

POINT NAME	CASE	PRESS. psi	TEMPER deg F	EXPAN. in/100ft	MODULUS E6 psi	ALLOW STRESS	YIELD STRESS
*** SEGMENT GS, LINE # Tank 3/4 (b) tee							
A66	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
BQ22	Same as previous point.						
*** SEGMENT GX, LINE # Tank 5/6 (b) tee							
BG25	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
A98	Same as previous point.						
*** SEGMENT HF, LINE # Tank 7/8 (b) tee							
BW15	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
A124	Same as previous point.						
*** SEGMENT HI, LINE # Tank 9/10 (b) tee							
A148	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FR22	Same as previous point.						
*** SEGMENT HJ, LINE # Tank 11/12 (b) tee							
A169	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FW22	Same as previous point.						
*** SEGMENT HK, LINE # Tank 13/14 (b) tee							
A193	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FH30	Same as previous point.						
*** SEGMENT HL, LINE # Tank 15/16 (b) tee							
A225	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
FA22	Same as previous point.						
*** SEGMENT IF, LINE # Tank 17/18 (b) tee							
B260	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
GG23	Same as previous point.						
*** SEGMENT IG, LINE # Tank 3/4 (b) tee							
D59	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
BP24	Same as previous point.						
*** SEGMENT IH, LINE # (tee							
B251	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
IH10	Same as previous point.						
*** SEGMENT II, LINE # (BF							
IH04	T1	85.00	65.00	0.000	29.427	20000	35000
	T2	285	65.00	0.000	29.427	20000	35000
II01	Same as previous point.						

u User-defined value
* Non-code material for allowable stress;
Non-standard material for expansion and modulus

L O A D C A S E D E S C R I P T I O N

Load Case	Load Case Name	Description
GR	Gravity	Gravity Case
T1	Thermal 1	65 deg F
T2	Thermal 2	65 deg F
E1	Earth 1	X = 0.216, Y = 0.216, Z = 0.043
E2	Earth 2	X = 0.216, Y = 0, Z = 0.043
E3	Earth 3	X = 0, Y = 0.216, Z = 0.043
P1	Press 1	85 psi
P2	Press 2	285 psi

L O A D S S U M M A R Y D A T A L I S T I N G

EARTHQUAKE LOAD CASES :

Number of load cases : 3

Load case 1 - E1

Seismic Code : ASCE 2016

Site Class	:	C: Very Dense Soil and Soft Rock
Zip Code	:	
Latitude	:	0.0000
Longitude	:	0.0000
Mapped Spectral Response (Ss)	:	0.5640
Maximum Considered Earthquake (Fa)	:	1.2744
Importance Factor (Ip)	:	1.5000
Attachment Height (z)	:	12.0000 ft
Roof Height (h)	:	12.0000 ft
Component Response (Rp)	:	12.0
Amplification Factor (ap)	:	2.5
Multiplication Factor (f)	:	1.0000

Vertical Factor : 0.2000

X-Resultant = 0.216 Y-Resultant = 0.216 Z-Resultant = 0.043

Load case 2 - E2

Seismic Code : User-defined

X-Resultant = 0.216 Y-Resultant = 0.000 Z-Resultant = 0.043

Load case 3 - E3

Seismic Code : User-defined

X-Resultant = 0.000 Y-Resultant = 0.216 Z-Resultant = 0.043

S E G M E N T D A T A L I S T I N G

Segment Name	First Node	Last Node	Line Number	Apply Wind	Apply Bowing	Apply Buoyancy
A	A00	A228	(b) Pipeline	No	No	No
B	B00	B287	(b) Pipeline	No	No	No
D	D00	D180	(b) Pipeline	No	No	No
E	D40	H15	Tank 1/2 (h) tee	No	No	No
G	G00	G36	Tank 1/2 (h) lateral	No	No	No
H	H00	H37	Tank 1/2 (b) lateral	No	No	No
M	M00	H00	Tank 1 OOS access	No	No	No
BA	B123	BF19	Tank 7/8 (h) tee	No	No	No
BD	D106	BF22	Tank 7/8 (h) tee	No	No	No
BF	BF00	BF37	Tank 7/8 (h) lateral	No	No	No
BG	BG00	BG51	Tank 5/6 (h) lateral	No	No	No
BH	D79	BI23	Tank 5/6 (b) tee	No	No	No
BI	BI00	BG45	Tank 5/6 (b) lateral	No	No	No
BM	B72	BP21	Tank 3/4 (b) tee	No	No	No
BO	B99	BI20	Tank 5/6 (b) tee	No	No	No
BP	BP00	BP43	Tank 3/4 (h) lateral	No	No	No
BQ	BQ00	BQ40	Tank 3/4 (h) lateral	No	No	No
BW	BW00	BW36	Tank 7/8 (h) lateral	No	No	No
EP	B177	FD22	Tank 11/12 (b) tee	No	No	No
EQ	B194	FG25	Tank 13/14 (b) tee	No	No	No
ER	B219	FI17	Tank 15/16 (b) tee	No	No	No
EY	D137	FD25	Tank 11/12 (b) tee	No	No	No
EZ	D151	FG28	Tank 13/14 (h) tee	No	No	No
FA	FA00	FA36	Tank 15/16 (h) lateral	No	No	No
FB	FB00	FB42	Tank 9/10 (b) lateral	No	No	No
FC	D177	FI14	Tank 15/16 (b) tee	No	No	No
FD	FD00	FD43	Tank 11/12 (b) lateral	No	No	No
FE	D121	FB25	Tank 9/10 (b) tee	No	No	No
FF	B148	FB22	Tank 9/10 (h) tee	No	No	No
FG	FH07	FH50	Tank 13/14 (h) lateral	No	No	No
FH	FH00	FH57	Tank 13/14 (b) lateral	No	No	No
FI	FI00	FI39	Tank 15/16 (b) lateral	No	No	No
FR	FR00	FR40	Tank 9/10 (b) lateral	No	No	No
FW	FW00	FW42	Tank 11/12 (b) lateral	No	No	No
GG	GG00	GG55	Tank 17/18 (h) lateral	No	No	No
GH	GH00	GH49	Tank 19/20 (h) lateral	No	No	No
GJ	GH15	B280	Tank 19/20 (b) tee	No	No	No
GO	B42	G15	Tank 1/2 (h) tee	No	No	No
GS	A66	BQ22	Tank 3/4 (b) tee	No	No	No
GX	BG25	A98	Tank 5/6 (b) tee	No	No	No
HF	BW15	A124	Tank 7/8 (h) tee	No	No	No
HI	A148	FR22	Tank 9/10 (h) tee	No	No	No
HJ	A169	FW22	Tank 11/12 (b) tee	No	No	No
HK	A193	FH30	Tank 13/14 (b) tee	No	No	No
HL	A225	FA22	Tank 15/16 (b) tee	No	No	No
IF	B260	GG23	Tank 17/18 (b) tee	No	No	No
IG	D59	BP24	Tank 3/4 (b) tee	No	No	No
IH	B251	IH10	(tee	No	No	No
II	IH04	II01	(BF	No	No	No

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	K1-Fowd	K2-Bckd	K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf)	Ld.Var /Pend. /Ultim	Aut	Size /Rod	Figure Length (in) /Brkawy for
Tag No.: PS-106									Attachment ID: <None>								
A02	V-stop	A02 1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				
Tag No.: PS-105									Attachment ID: <None>								
A03	V-stop	A03 1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				
Tag No.: PS-104									Attachment ID: <None>								
A06	V-stop	A06 1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				
Tag No.: PS-103									Attachment ID: <None>								
A07	V-stop	A07 1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				
Tag No.: 18" DB&B SUPPORT									Attachment ID: <None>								
A09	V-stop	A09 1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				
Tag No.: 18" DB&B SUPPORT									Attachment ID: <None>								
A10	V-stop	A10 1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				
Tag No.: PS-101									Attachment ID: <None>								
A12 N	V-stop	A12 N1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				
Tag No.: PS-100									Attachment ID: <None>								
A18	V-stop	A18 1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				
Tag No.: PS-099									Attachment ID: <None>								
A21	V-stop	A21 1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				
Tag No.: PS-098									Attachment ID: <None>								
A22	V-stop	A22 1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				
Tag No.: PS-097									Attachment ID: <None>								
A23	V-stop	A23 1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				
Tag No.: PS-096									Attachment ID: <None>								
A26	V-stop	A26 1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				
Tag No.: WALL PENETRATION									Attachment ID: DOOR 2								
A27	Guide-V	A27 1	Ground	0.000	Rigid				0.000	0.031	0.30		Weightless				
	Guide-H	A27 1	Ground	0.000	Rigid				0.031	0.031	0.30		Weightless				
Tag No.: WALL PENETRATION									Attachment ID: DOOR 2								
A28	Guide-V	A28 1	Ground	0.000	Rigid				0.000	0.031	0.30		Weightless				
	Guide-H	A28 1	Ground	0.000	Rigid				0.031	0.031	0.30		Weightless				
Tag No.: PS-095									Attachment ID: <None>								
A29	V-stop	A29 1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				
Tag No.: PS-094									Attachment ID: <None>								
A30	V-stop	A30 1	Ground	0.000	Rigid				0.000	100.000	0.30		Weightless				

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	Comp.Wt (lb) K1-Fowd	Comp.Wt (lb) K2-Bckd	Comp.Wt (lb) K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
Tag No.: PS-093									Attachment ID: <None>							
A31	V-stop	A31	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-092									Attachment ID: <None>							
A35	V-stop	A35	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-091									Attachment ID: <None>							
A36	V-stop	A36	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-090									Attachment ID: <None>							
A37	V-stop	A37	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-089									Attachment ID: <None>							
A41	V-stop	A41	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-088									Attachment ID: <None>							
A42	V-stop	A42	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-087									Attachment ID: <None>							
A43	V-stop	A43	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-086									Attachment ID: <None>							
A47	V-stop	A47	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-085									Attachment ID: <None>							
A48	V-stop	A48	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-084									Attachment ID: <None>							
A52	V-stop	A52	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-083									Attachment ID: <None>							
A53	V-stop	A53	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-082									Attachment ID: <None>							
A54	V-stop	A54	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-081									Attachment ID: <None>							
A58	V-stop	A58	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-080									Attachment ID: <None>							
A62	V-stop	A62	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-079									Attachment ID: <None>							
A63	V-stop	A63	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-078									Attachment ID: <None>							
A64	V-stop	A64	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-077									Attachment ID: <None>							

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	Comp.Wt (lb) K1-Fowd	Stiff. K2-Bckd	Stiff. K2-Fowd	Gap 1 K1-Ph-B	Gap 1 K1-Ph-F	Gap 2	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
A72	V-stop	A72 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: PS-076								Attachment ID: <None>								
A73	V-stop	A73 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: PS-075								Attachment ID: <None>								
A74	V-stop	A74 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: PS-074								Attachment ID: <None>								
A76	V-stop	A76 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: PS-073								Attachment ID: <None>								
A80	V-stop	A80 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: PS-072								Attachment ID: <None>								
A81	V-stop	A81 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: PS-071								Attachment ID: <None>								
A85	V-stop	A85 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: PS-070								Attachment ID: <None>								
A87	V-stop	A87 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: PS-069								Attachment ID: <None>								
A88	V-stop	A88 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: WALL PENETRATION								Attachment ID: DOOR 3								
A89	Guide-V	A89 1	Ground	0.000	Rigid			0.000	0.031	0.30	Weightless					
	Guide-H	A89 1	Ground	0.000	Rigid			0.031	0.031	0.30	Weightless					
Tag No.: WALL PENETRATION								Attachment ID: DOOR 3								
A90	Guide-V	A90 1	Ground	0.000	Rigid			0.000	0.031	0.30	Weightless					
	Guide-H	A90 1	Ground	0.000	Rigid			0.031	0.031	0.30	Weightless					
Tag No.: PS-068								Attachment ID: <None>								
A94	V-stop	A94 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: PS-067								Attachment ID: <None>								
A95	V-stop	A95 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: PS-066								Attachment ID: <None>								
A102	V-stop	A102 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: PS-065								Attachment ID: <None>								
A103	V-stop	A103 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: PS-064								Attachment ID: <None>								
A107	V-stop	A107 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless					
Tag No.: PS-063								Attachment ID: <None>								

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID /Dir	Conn.to Comp.Wt (lb) K1-Bckd	K1-Fowd	K2-Bckd	K2-Fowd	Stiff. K1-Ph-B	K1-Ph-F	Gap 1	Gap 2	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
A108	V-stop	A108 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: PS-062							Attachment ID: <None>									
A114	V-stop	A114 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: PS-061							Attachment ID: <None>									
A115	V-stop	A115 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: PS-060							Attachment ID: <None>									
A116	V-stop	A116 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: PS-059							Attachment ID: <None>									
A121	V-stop	A121 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: PS-058							Attachment ID: <None>									
A122	V-stop	A122 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: PS-057							Attachment ID: <None>									
A127	V-stop	A127 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: PS-056							Attachment ID: <None>									
A128	V-stop	A128 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: PS-055							Attachment ID: <None>									
A132	V-stop	A132 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: PS-054							Attachment ID: <None>									
A133	V-stop	A133 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: PS-053							Attachment ID: <None>									
A137	V-stop	A137 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: PS-052							Attachment ID: <None>									
A138	V-stop	A138 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: PS-051							Attachment ID: <None>									
A139	V-stop	A139 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: WALL PENETRATION							Attachment ID: DOOR 4									
A140	Guide-V	A140 1	Ground	0.000	Rigid		0.000	0.031	0.30	Weightless						
	Guide-H	A140 1	Ground	0.000	Rigid		0.031	0.031	0.30	Weightless						
Tag No.: WALL PENETRATION							Attachment ID: DOOR 4									
A141	Guide-V	A141 1	Ground	0.000	Rigid		0.000	0.031	0.30	Weightless						
	Guide-H	A141 1	Ground	0.000	Rigid		0.031	0.031	0.30	Weightless						
Tag No.: PS-050							Attachment ID: <None>									
A145	V-stop	A145 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless						
Tag No.: PS-049							Attachment ID: <None>									

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID /Dir	Conn.to K1-Bckd	Comp.Wt (lb) K1-Fowd	Stiff. K2-Bckd	K2-Fowd	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
A146	V-stop	A146 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-048						Attachment ID: <None>								
A151	V-stop	A151 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-47 DB&B VALVE						Attachment ID: DB&B VALVE SUPPORT								
A152M	V-stop	A152M1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-046						Attachment ID: <None>								
A157	V-stop	A157 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-045						Attachment ID: <None>								
A158	V-stop	A158 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-044						Attachment ID: <None>								
A162	V-stop	A162 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-043						Attachment ID: <None>								
A163	V-stop	A163 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-042						Attachment ID: <None>								
A164	V-stop	A164 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-041						Attachment ID: <None>								
A165	V-stop	A165 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-040						Attachment ID: <None>								
A166	V-stop	A166 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-039						Attachment ID: <None>								
A167	V-stop	A167 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-038						Attachment ID: <None>								
A171	V-stop	A171 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-037						Attachment ID: <None>								
A172	V-stop	A172 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-036						Attachment ID: <None>								
A173	V-stop	A173 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-035						Attachment ID: <None>								
A174	V-stop	A174 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-034						Attachment ID: <None>								
A175	V-stop	A175 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-033						Attachment ID: <None>								
A176	V-stop	A176 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	Comp.Wt (lb) K1-Fowd	Comp.Wt (lb) K2-Bckd	Comp.Wt (lb) K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
Tag No.: PS-032									Attachment ID: <None>							
A180	V-stop	A180 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: WALL PENETRATION									Attachment ID: DOOR 5							
A181	Guide-V	A181 1	Ground			0.000	Rigid		0.000	0.031	0.30	Weightless				
	Guide-H	A181 1	Ground			0.000	Rigid		0.031	0.031	0.30	Weightless				
Tag No.: WALL PENETRATION									Attachment ID: DOOR 5							
A182	Guide-V	A182 1	Ground			0.000	Rigid		0.000	0.031	0.30	Weightless				
	Guide-H	A182 1	Ground			0.000	Rigid		0.031	0.031	0.30	Weightless				
Tag No.: PS-031									Attachment ID: <None>							
A190	V-stop	A190 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-030									Attachment ID: <None>							
A191	V-stop	A191 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-029									Attachment ID: <None>							
A198	V-stop	A198 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-028									Attachment ID: <None>							
A199	V-stop	A199 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-027									Attachment ID: <None>							
A200	V-stop	A200 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-026									Attachment ID: <None>							
A201	V-stop	A201 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-025									Attachment ID: <None>							
A213	V-stop	A213 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-024									Attachment ID: <None>							
A214	V-stop	A214 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-023									Attachment ID: <None>							
A215	V-stop	A215 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-022									Attachment ID: <None>							
A222	V-stop	A222 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-021									Attachment ID: <None>							
A223	V-stop	A223 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-106									Attachment ID: <None>							
B02	V-stop	B02 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-105									Attachment ID: <None>							
B08	V-stop	B08 1	Ground			0.000	Rigid		0.000	100.000	0.30	Weightless				

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	Comp.Wt (lb) K1-Fowd	Comp.Wt (lb) K2-Bckd	Comp.Wt (lb) K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
Tag No.: PS-104									Attachment ID: <None>							
B11	V-stop	B11 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-103									Attachment ID: <None>							
B14	V-stop	B14 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-102									Attachment ID: <None>							
B18	V-stop	B18 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-101									Attachment ID: <None>							
B21	V-stop	B21 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-100									Attachment ID: <None>							
B22	V-stop	B22 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-099									Attachment ID: <None>							
B25	V-stop	B25 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-098									Attachment ID: <None>							
B30	V-stop	B30 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-097									Attachment ID: <None>							
B31	V-stop	B31 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-096									Attachment ID: <None>							
B35	V-stop	B35 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				
Tag No.: WALL PENETRATION									Attachment ID: DOOR 2							
B36	Guide-V	B36 1	Ground					0.000 Rigid	0.000	0.031	0.30	Weightless				
	Guide-H	B36 1	Ground					0.000 Rigid	0.031	0.031	0.30	Weightless				
Tag No.: WALL PENETRATION									Attachment ID: DOOR 2							
B37	Guide-V	B37 1	Ground					0.000 Rigid	0.000	0.031	0.30	Weightless				
	Guide-H	B37 1	Ground					0.000 Rigid	0.031	0.031	0.30	Weightless				
Tag No.: PS-095									Attachment ID: <None>							
B38	V-stop	B38 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-094									Attachment ID: <None>							
B39	V-stop	B39 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-093									Attachment ID: <None>							
B40	V-stop	B40 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-092									Attachment ID: <None>							
B44	V-stop	B44 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-091									Attachment ID: <None>							
B45	V-stop	B45 1	Ground					0.000 Rigid	0.000	100.000	0.30	Weightless				

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	Comp.Wt (lb) K1-Fowd	Comp.Wt (lb) K2-Bckd	Comp.Wt (lb) K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
Tag No.: PS-090									Attachment ID: <None>							
B46	V-stop	B46	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-089									Attachment ID: <None>							
B47	V-stop	B47	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-088									Attachment ID: <None>							
B51	V-stop	B51	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-087									Attachment ID: <None>							
B52	V-stop	B52	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-086									Attachment ID: <None>							
B56	V-stop	B56	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-085									Attachment ID: <None>							
B57	V-stop	B57	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-084									Attachment ID: <None>							
B58	V-stop	B58	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-083									Attachment ID: <None>							
B62	V-stop	B62	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-082									Attachment ID: <None>							
B63	V-stop	B63	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-081									Attachment ID: <None>							
B64	V-stop	B64	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-080									Attachment ID: <None>							
B68	V-stop	B68	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-079									Attachment ID: <None>							
B69	V-stop	B69	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-078									Attachment ID: <None>							
B70	V-stop	B70	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-077									Attachment ID: <None>							
B75	V-stop	B75	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-076									Attachment ID: <None>							
B76	V-stop	B76	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-075									Attachment ID: <None>							
B78	V-stop	B78	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-074									Attachment ID: <None>							
B80	V-stop	B80	1 Ground	0.000	0.000	0.000	0.000	Rigid	0.000	100.000	0.30	Weightless				

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	K1-Fowd	K2-Bckd	K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf)	Ld.Var /Pend. /Ultim	Aut	Size /Rod	Figure Length (in) /Brkawy for
Tag No.: PS-073									Attachment ID: <None>								
B85	V-stop	B85	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				
Tag No.: PS-072									Attachment ID: <None>								
B86	V-stop	B86	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				
Tag No.: PS-071									Attachment ID: <None>								
B88	V-stop	B88	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				
Tag No.: PS-070									Attachment ID: <None>								
B92	V-stop	B92	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				
Tag No.: PS-069									Attachment ID: <None>								
B93	V-stop	B93	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				
Tag No.: WALL PENETRATION									Attachment ID: DOOR 3								
B94	Guide-V	B94	1 Ground	0.000				Rigid	0.000	0.031	0.30		Weightless				
	Guide-H	B94	1 Ground	0.000				Rigid	0.031	0.031	0.30		Weightless				
Tag No.: WALL PENETRATION									Attachment ID: DOOR 3								
B95	Guide-V	B95	1 Ground	0.000				Rigid	0.000	0.031	0.30		Weightless				
	Guide-H	B95	1 Ground	0.000				Rigid	0.031	0.031	0.30		Weightless				
Tag No.: PS-068									Attachment ID: <None>								
B96	V-stop	B96	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				
Tag No.: PS-067									Attachment ID: <None>								
B97	V-stop	B97	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				
Tag No.: PS-066									Attachment ID: <None>								
B102	V-stop	B102	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				
Tag No.: PS-065									Attachment ID: <None>								
B103	V-stop	B103	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				
Tag No.: PS-064									Attachment ID: <None>								
B107	V-stop	B107	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				
Tag No.: PS-063									Attachment ID: <None>								
B108	V-stop	B108	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				
Tag No.: PS-062									Attachment ID: <None>								
B114	V-stop	B114	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				
Tag No.: PS-061									Attachment ID: <None>								
B118	V-stop	B118	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				
Tag No.: PS-060									Attachment ID: <None>								
B119	V-stop	B119	1 Ground	0.000				Rigid	0.000	100.000	0.30		Weightless				

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID /Dir	Conn.to Comp.Wt (lb) K1-Bckd	K1-Fowd	K2-Bckd	K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf)	Ld.Var /Pend. /Ultim	Aut	Size /Rod	Figure Length (in) /Brkawy for
Tag No.: PS-059								Attachment ID: <None>								
B120	V-stop	B120 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless
Tag No.: PS-058								Attachment ID: <None>								
B121	V-stop	B121 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless
Tag No.: PS-057								Attachment ID: <None>								
B126	V-stop	B126 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless
Tag No.: PS-056								Attachment ID: <None>								
B127	V-stop	B127 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless
Tag No.: PS-055								Attachment ID: <None>								
B131	V-stop	B131 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless
Tag No.: PS-054								Attachment ID: <None>								
B132	V-stop	B132 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless
Tag No.: PS-053								Attachment ID: <None>								
B137	V-stop	B137 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless
Tag No.: PS-052								Attachment ID: <None>								
B141	V-stop	B141 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless
Tag No.: PS-051								Attachment ID: <None>								
B142	V-stop	B142 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless
Tag No.: WALL PENETRATION								Attachment ID: DOOR 4								
B143	Guide-V	B143 1	Ground		0.000	Rigid		0.000	0.031	0.30						Weightless
	Guide-H	B143 1	Ground		0.000	Rigid		0.031	0.031	0.30						Weightless
Tag No.: WALL PENETRATION								Attachment ID: DOOR 4								
B144	Guide-V	B144 1	Ground		0.000	Rigid		0.000	0.031	0.30						Weightless
	Guide-H	B144 1	Ground		0.000	Rigid		0.031	0.031	0.30						Weightless
Tag No.: PS-050								Attachment ID: <None>								
B145	V-stop	B145 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless
Tag No.: PS-049								Attachment ID: <None>								
B146	V-stop	B146 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless
Tag No.: PS-048								Attachment ID: <None>								
B155	V-stop	B155 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless
Tag No.: PS-047								Attachment ID: <None>								
B161	V-stop	B161 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless
Tag No.: PS-046								Attachment ID: <None>								
B165	V-stop	B165 1	Ground		0.000	Rigid		0.000	100.000	0.30						Weightless

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	K1-Fowd	K2-Bckd	K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf)	Ld.Var /Pend. /Ultim	Aut	Size /Rod	Figure Length (in) /Brkawy for
Tag No.: PS-045									Attachment ID: <None>								
B169	V-stop	B169 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: PS-044									Attachment ID: <None>								
B170	V-stop	B170 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: PS-043									Attachment ID: <None>								
B171	V-stop	B171 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: PS-042									Attachment ID: <None>								
B172	V-stop	B172 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: PS-041									Attachment ID: <None>								
B173	V-stop	B173 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: PS-040									Attachment ID: <None>								
B174	V-stop	B174 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: PS-039									Attachment ID: <None>								
B175	V-stop	B175 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: PS-038									Attachment ID: <None>								
B179	V-stop	B179 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: PS-037									Attachment ID: <None>								
B180	V-stop	B180 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: PS-036									Attachment ID: <None>								
B181	V-stop	B181 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: PS-035									Attachment ID: <None>								
B182	V-stop	B182 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: PS-034									Attachment ID: <None>								
B186	V-stop	B186 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: PS-033									Attachment ID: <None>								
B187	V-stop	B187 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: PS-032									Attachment ID: <None>								
B188	V-stop	B188 1	Ground	0.000	Rigid				0.000	100.000	0.30						Weightless
Tag No.: WALL PENETRATION									Attachment ID: DOOR 5								
B189	Guide-V	B189 1	Ground	0.000	Rigid				0.000	0.031	0.30						Weightless
	Guide-H	B189 1	Ground	0.000	Rigid				0.031	0.031	0.30						Weightless
Tag No.: WALL PENETRATION									Attachment ID: DOOR 5								
B190	Guide-V	B190 1	Ground	0.000	Rigid				0.000	0.031	0.30						Weightless
	Guide-H	B190 1	Ground	0.000	Rigid				0.031	0.031	0.30						Weightless

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	K1-Fowd	K2-Bckd	K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf)	Ld.Var /Pend. /Ultim	Aut	Size /Rod	Figure Length (in) /Brkawy for
Tag No.: PS-031									Attachment ID: <None>								
B191	V-stop	B191	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-030									Attachment ID: <None>								
B192	V-stop	B192	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-029									Attachment ID: <None>								
B197	V-stop	B197	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-028									Attachment ID: <None>								
B198	V-stop	B198	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-027									Attachment ID: <None>								
B202	V-stop	B202	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-026									Attachment ID: <None>								
B203	V-stop	B203	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-025									Attachment ID: <None>								
B210	V-stop	B210	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-024									Attachment ID: <None>								
B214	V-stop	B214	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-023									Attachment ID: <None>								
B215	V-stop	B215	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-022									Attachment ID: <None>								
B216	V-stop	B216	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-021									Attachment ID: <None>								
B217	V-stop	B217	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-020									Attachment ID: <None>								
B229	V-stop	B229	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-019									Attachment ID: <None>								
B233	V-stop	B233	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-018									Attachment ID: <None>								
B234	V-stop	B234	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-017									Attachment ID: <None>								
B235	V-stop	B235	1 Ground					0.000 Rigid	0.000	100.000	0.30						Weightless
Tag No.: PS-016									Attachment ID: <None>								
B239	V-stop	B239	1 Ground					0.000 Rigid	0.250	100.000	0.30						Weightless
Tag No.: PS-015									Attachment ID: ASSUMED								

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	Comp.Wt (lb) K1-Fowd	Comp.Wt (lb) K2-Bckd	Comp.Wt (lb) K2-Fowd	Stiff. K1-Ph-B	Stiff. K1-Ph-F	Gap 1	Gap 2	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
B247	V-stop	B247 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless						
Tag No.: PS-014								Attachment ID: ASSUMED									
B248	V-stop	B248 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless						
Tag No.: WALL PENETRATION								Attachment ID: DOOR C									
B253	Guide-V	B253 1	Ground	0.000	Rigid			0.000	0.031	0.30	Weightless						
	Guide-H	B253 1	Ground	0.000	Rigid			0.031	0.031	0.30	Weightless						
Tag No.: WALL PENETRATION								Attachment ID: DOOR C									
B254	Guide-V	B254 1	Ground	0.000	Rigid			0.000	0.031	0.30	Weightless						
	Guide-H	B254 1	Ground	0.000	Rigid			0.031	0.031	0.30	Weightless						
Tag No.: PS-013								Attachment ID: <None>									
B255	V-stop	B255 1	Ground	0.000	Rigid			1.625	100.000	0.30	Weightless						
Tag No.: PS-012								Attachment ID: <None>									
B256	V-stop	B256 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless						
Tag No.: PS-011								Attachment ID: <None>									
B257	V-stop	B257 1	Ground	0.000	Rigid			1.188	100.000	0.30	Weightless						
Tag No.: WALL PENETRATION								Attachment ID: DOOR 17/18									
B258	Guide-V	B258 1	Ground	0.000	Rigid			0.000	0.031	0.30	Weightless						
	Guide-H	B258 1	Ground	0.000	Rigid			0.031	0.031	0.30	Weightless						
Tag No.: PS-010								Attachment ID: <None>									
B265	V-stop	B265 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless						
Tag No.: PS-009								Attachment ID: <None>									
B266	V-stop	B266 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless						
Tag No.: WALL PENETRATION								Attachment ID: DOOR 17/18 (2)									
B267	Guide-V	B267 1	Ground	0.000	Rigid			0.000	0.031	0.30	Weightless						
	Guide-H	B267 1	Ground	0.000	Rigid			0.031	0.031	0.30	Weightless						
Tag No.: PS-008								Attachment ID: <None>									
B271	V-stop	B271 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless						
Tag No.: PS-007								Attachment ID: <None>									
B272	V-stop	B272 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless						
Tag No.: PS-006								Attachment ID: <None>									
B273	V-stop	B273 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless						
Tag No.: PS-005								Attachment ID: <None>									
B274	V-stop	B274 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless						
Tag No.: PS-004								Attachment ID: <None>									
B275	V-stop	B275 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless						

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID /Dir	Conn.to K1-Bckd (lb)	Comp.Wt K1-Fowd (lb)	Stiff. K2-Bckd (lb)	K2-Fowd	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
Tag No.: PS-003							Attachment ID: <None>							
B276	V-stop	B276 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: WALL PENETRATION							Attachment ID: DOOR 19/20							
B277	Guide-V	B277 1	Ground	0.000	Rigid		0.000	0.031	0.30	Weightless				
	Guide-H	B277 1	Ground	0.000	Rigid		0.031	0.031	0.30	Weightless				
Tag No.: PS-002							Attachment ID: <None>							
B278	V-stop	B278 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-001							Attachment ID: <None>							
B282	V-stop	B282 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-000							Attachment ID: U BOLT							
B286	Guide-V	B286 1	Ground	0.000	Rigid		0.000	0.125	0.25	Weightless				
	Guide-H	B286 1	Ground	0.000	Rigid		0.125	0.125	0.25	Weightless				
Tag No.: PS-106							Attachment ID: <None>							
D04	V-stop	D04 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-105							Attachment ID: <None>							
D11	V-stop	D11 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-104							Attachment ID: <None>							
D14	V-stop	D14 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-103							Attachment ID: <None>							
D17	V-stop	D17 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-102							Attachment ID: <None>							
D22	V-stop	D22 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-101							Attachment ID: <None>							
D23	V-stop	D23 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-100							Attachment ID: <None>							
D24	V-stop	D24 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-099							Attachment ID: <None>							
D30	V-stop	D30 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-098							Attachment ID: <None>							
D31	V-stop	D31 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-097							Attachment ID: <None>							
D32	V-stop	D32 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: PS-096							Attachment ID: <None>							
D33	V-stop	D33 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless				

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	Comp.Wt (lb) K1-Fowd	Comp.Wt (lb) K2-Bckd	Comp.Wt (lb) K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
Tag No.: WALL PENETRATION									Attachment ID: DOOR 2							
D34	Guide-V	D34	1 Ground				0.000	Rigid	0.000	0.031	0.30	Weightless				
	Guide-H	D34	1 Ground				0.000	Rigid	0.031	0.031	0.30	Weightless				
Tag No.: WALL PENETRATION									Attachment ID: DOOR 2							
D35	Guide-V	D35	1 Ground				0.000	Rigid	0.000	0.031	0.30	Weightless				
	Guide-H	D35	1 Ground				0.000	Rigid	0.031	0.031	0.30	Weightless				
Tag No.: PS-095									Attachment ID: <None>							
D36	V-stop	D36	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-094									Attachment ID: <None>							
D37	V-stop	D37	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-093									Attachment ID: <None>							
D38	V-stop	D38	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-092									Attachment ID: <None>							
D43	V-stop	D43	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-091									Attachment ID: <None>							
D44	V-stop	D44	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-090									Attachment ID: <None>							
D45	V-stop	D45	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-089									Attachment ID: <None>							
D46	V-stop	D46	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-088									Attachment ID: <None>							
D47	V-stop	D47	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-087									Attachment ID: <None>							
D48	V-stop	D48	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-086									Attachment ID: <None>							
D49	V-stop	D49	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-085									Attachment ID: <None>							
D50	V-stop	D50	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-084									Attachment ID: <None>							
D51	V-stop	D51	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-083									Attachment ID: <None>							
D52	V-stop	D52	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				
Tag No.: PS-082									Attachment ID: <None>							
D53	V-stop	D53	1 Ground				0.000	Rigid	0.000	100.000	0.30	Weightless				

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	Comp.Wt (lb) K1-Fowd	Comp.Wt (lb) K2-Bckd	Comp.Wt (lb) K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
Tag No.: PS-081									Attachment ID: <None>							
D54	V-stop	D54	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-080									Attachment ID: <None>							
D55	V-stop	D55	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-079									Attachment ID: <None>							
D56	V-stop	D56	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-078									Attachment ID: <None>							
D57	V-stop	D57	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-077									Attachment ID: <None>							
D62	V-stop	D62	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-076									Attachment ID: <None>							
D63	V-stop	D63	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-075									Attachment ID: <None>							
D64	V-stop	D64	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-074									Attachment ID: <None>							
D65	V-stop	D65	1 Ground					0.000 Rigid	1.750	100.000	0.30		Weightless			
Tag No.: PS-073									Attachment ID: 1/2 TWIST SADDLE							
D67	V-stop	D67	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-072									Attachment ID: <None>							
D68	V-stop	D68	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-071									Attachment ID: <None>							
D70	V-stop	D70	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-070									Attachment ID: <None>							
D71	V-stop	D71	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-069									Attachment ID: <None>							
D73	V-stop	D73	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: WALL PENETRATION									Attachment ID: DOOR 3							
D74	Guide-V	D74	1 Ground					0.000 Rigid	0.000	0.031	0.30		Weightless			
	Guide-H	D74	1 Ground					0.000 Rigid	0.031	0.031	0.30		Weightless			
Tag No.: WALL PENETRATION									Attachment ID: DOOR 3							
D75	Guide-V	D75	1 Ground					0.000 Rigid	0.000	0.031	0.30		Weightless			
	Guide-H	D75	1 Ground					0.000 Rigid	0.031	0.031	0.30		Weightless			
Tag No.: PS-068									Attachment ID: <None>							
D76	V-stop	D76	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	Comp.Wt (lb) K1-Fowd	Comp.Wt (lb) K2-Bckd	Comp.Wt (lb) K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
Tag No.: PS-067												Attachment ID: <None>				
D77	V-stop	D77	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-066												Attachment ID: <None>				
D82	V-stop	D82	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-065												Attachment ID: <None>				
D84	V-stop	D84	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-064												Attachment ID: <None>				
D85	V-stop	D85	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-063												Attachment ID: <None>				
D87	V-stop	D87	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-UNDER BULKHEAD												Attachment ID: BETWEEN TANKS 5/6 & 7/8				
D94	V-stop	D94	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-062												Attachment ID: <None>				
D95	V-stop	D95	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-061												Attachment ID: <None>				
D101	V-stop	D101	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-060												Attachment ID: <None>				
D102	V-stop	D102	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-059												Attachment ID: <None>				
D103	V-stop	D103	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-058												Attachment ID: <None>				
D104	V-stop	D104	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-057												Attachment ID: <None>				
D109	V-stop	D109	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-056												Attachment ID: <None>				
D110	V-stop	D110	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-055												Attachment ID: <None>				
D111	V-stop	D111	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-054												Attachment ID: <None>				
D112	V-stop	D112	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-053												Attachment ID: <None>				
D113	V-stop	D113	1 Ground					0.000 Rigid	0.000	100.000	0.30		Weightless			
Tag No.: PS-052												Attachment ID: <None>				

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	Comp.Wt (lb) K1-Fowd	Stiff. K2-Bckd	Stiff. K2-Fowd	Gap 1 K1-Ph-B	Gap 1 K1-Ph-F	Gap 2	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
D114	V-stop	D114 1	Ground			0.000	Rigid	0.000	100.000		0.30	Weightless				
Tag No.: PS-051								Attachment ID: <None>								
D115	V-stop	D115 1	Ground			0.000	Rigid	0.000	100.000		0.30	Weightless				
Tag No.: WALL PENETRATION								Attachment ID: DOOR 4								
D116	Guide-V	D116 1	Ground			0.000	Rigid	0.000	0.031		0.30	Weightless				
	Guide-H	D116 1	Ground			0.000	Rigid	0.031	0.031		0.30	Weightless				
Tag No.: WALL PENETRATION								Attachment ID: DOOR 4								
D117	Guide-V	D117 1	Ground			0.000	Rigid	0.000	0.031		0.30	Weightless				
	Guide-H	D117 1	Ground			0.000	Rigid	0.031	0.031		0.30	Weightless				
Tag No.: PS-050								Attachment ID: <None>								
D118	V-stop	D118 1	Ground			0.000	Rigid	0.000	100.000		0.30	Weightless				
Tag No.: PS-049								Attachment ID: <None>								
D119	V-stop	D119 1	Ground			0.000	Rigid	0.000	100.000		0.30	Weightless				
Tag No.: PS-048								Attachment ID: <None>								
D126	V-stop	D126 1	Ground			0.000	Rigid	0.000	100.000		0.30	Weightless				
Tag No.: PS-047								Attachment ID: <None>								
D127	V-stop	D127 1	Ground			0.000	Rigid	1.750	100.000		0.30	Weightless				
Tag No.: PS-046								Attachment ID: <None>								
D128	V-stop	D128 1	Ground			0.000	Rigid	1.500	100.000		0.30	Weightless				
Tag No.: PS-045								Attachment ID: <None>								
D129	V-stop	D129 1	Ground			0.000	Rigid	0.000	100.000		0.30	Weightless				
Tag No.: PS-044								Attachment ID: <None>								
D130	V-stop	D130 1	Ground			0.000	Rigid	0.000	100.000		0.30	Weightless				
Tag No.: PS-043								Attachment ID: <None>								
D131	V-stop	D131 1	Ground			0.000	Rigid	0.000	100.000		0.30	Weightless				
Tag No.: PS-042								Attachment ID: <None>								
D132	V-stop	D132 1	Ground			0.000	Rigid	0.000	100.000		0.30	Weightless				
Tag No.: PS-041								Attachment ID: <None>								
D133	V-stop	D133 1	Ground			0.000	Rigid	0.000	100.000		0.30	Weightless				
Tag No.: PS-040								Attachment ID: <None>								
D134	V-stop	D134 1	Ground			0.000	Rigid	0.000	100.000		0.30	Weightless				
Tag No.: PS-039								Attachment ID: <None>								
D135	V-stop	D135 1	Ground			0.000	Rigid	0.000	100.000		0.30	Weightless				
Tag No.: PS-038								Attachment ID: <None>								

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID /Dir	Conn.to Comp.Wt (lb) K1-Bckd	K1-Fowd	K2-Bckd	K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
D139	V-stop	D139 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-037							Attachment ID: <None>								
D140	V-stop	D140 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-036							Attachment ID: <None>								
D141	V-stop	D141 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-035							Attachment ID: <None>								
D142	V-stop	D142 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-034							Attachment ID: <None>								
D143	V-stop	D143 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-033							Attachment ID: <None>								
D144	V-stop	D144 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-032							Attachment ID: <None>								
D145	V-stop	D145 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: WALL PENETRATION							Attachment ID: DOOR 5								
D146	Guide-V	D146 1	Ground	0.000	Rigid		0.000	0.031	0.30	Weightless					
	Guide-H	D146 1	Ground	0.000	Rigid		0.031	0.031	0.30	Weightless					
Tag No.: WALL PENETRATION							Attachment ID: DOOR 5								
D147	Guide-V	D147 1	Ground	0.000	Rigid		0.000	0.031	0.30	Weightless					
	Guide-H	D147 1	Ground	0.000	Rigid		0.031	0.031	0.30	Weightless					
Tag No.: PS-031							Attachment ID: <None>								
D148	V-stop	D148 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-030							Attachment ID: <None>								
D149	V-stop	D149 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-029							Attachment ID: <None>								
D153	V-stop	D153 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-028							Attachment ID: <None>								
D154	V-stop	D154 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-027							Attachment ID: <None>								
D155	V-stop	D155 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-UNDER BULKHEAD							Attachment ID: BETWEEN TANKS 13/14 & 15/16								
D162	V-stop	D162 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-026							Attachment ID: <None>								
D163	V-stop	D163 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-025							Attachment ID: <None>								

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID /Dir	Conn.to Comp.Wt (lb) K1-Bckd	K1-Fowd	K2-Bckd	K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
D164	V-stop	D164 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-UNDER BULKHEAD							Attachment ID: BETWEEN TANKS 13/14 & 15/16								
D165N	V-stop	D165N1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-024							Attachment ID: <None>								
D172	V-stop	D172 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-023							Attachment ID: <None>								
D173	V-stop	D173 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-022							Attachment ID: <None>								
D174	V-stop	D174 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: PS-021							Attachment ID: <None>								
D175	V-stop	D175 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 1 PS-2							Attachment ID: <None>								
G06	V-stop	G06 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 1 PS-1							Attachment ID: <None>								
G07	V-stop	G07 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 2 PS-1							Attachment ID: <None>								
G28	V-stop	G28 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 2 PS-2							Attachment ID: <None>								
G29	V-stop	G29 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 1 PS-2							Attachment ID: <None>								
H07	V-stop	H07 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 1 PS-1							Attachment ID: <None>								
H08	V-stop	H08 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 2 PS-1							Attachment ID: <None>								
H28	V-stop	H28 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 2 PS-2							Attachment ID: <None>								
H29	V-stop	H29 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 8 PS-2							Attachment ID: <None>								
BF06	V-stop	BF06 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 8 PS-1							Attachment ID: <None>								
BF07	V-stop	BF07 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 7 PS-1							Attachment ID: <None>								
BF24	V-stop	BF24 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	Stiff. K1-Fowd	Comp.Wt (lb) K2-Bckd	Stiff. K2-Fowd	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
Tag No.: TANK 7 PS-2								Attachment ID: <None>							
BF30	V-stop	BF30 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 6 PS-2								Attachment ID: <None>							
BG09	V-stop	BG09 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 6 PS-1								Attachment ID: <None>							
BG11	V-stop	BG11 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 5 PS-1								Attachment ID: <None>							
BG35	V-stop	BG35 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 5 PS-2								Attachment ID: <None>							
BG40	V-stop	BG40 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 5 PS-3								Attachment ID: <None>							
BG47	V-stop	BG47 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 6 PS-2								Attachment ID: <None>							
BI07	V-stop	BI07 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 6 PS-1								Attachment ID: <None>							
BI08	V-stop	BI08 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 5 PS-1								Attachment ID: <None>							
BI32	V-stop	BI32 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 5 PS-2								Attachment ID: <None>							
BI37	V-stop	BI37 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 4 PS-2								Attachment ID: <None>							
BP08	V-stop	BP08 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 4 PS-1								Attachment ID: <None>							
BP09	V-stop	BP09 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 3 PS-1								Attachment ID: <None>							
BP33	V-stop	BP33 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 3 PS-2								Attachment ID: <None>							
BP34	V-stop	BP34 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 4 PS-2								Attachment ID: <None>							
BQ08	V-stop	BQ08 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 4 PS-1								Attachment ID: <None>							
BQ10	V-stop	BQ10 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 3 PS-1								Attachment ID: <None>							
BQ31	V-stop	BQ31 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb)	Stiff.	Gap 1	Gap 2	Fric. Fact.	GapSet /#hgr	Preload (lbf)	Ld.Var /Pend. /Ultim	Aut	Size /Rod	Figure Length (in) /Brkaway for
		K1-Bckd	K1-Fowd	K2-Bckd	K2-Fowd	K1-Ph-B	K1-Ph-F							
Tag No.: TANK 3 PS-2						Attachment ID: <None>								
BQ32	V-stop	BQ32 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 7 PS-2						Attachment ID: <None>								
BW08	V-stop	BW08 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 7 PS-1						Attachment ID: <None>								
BW09	V-stop	BW09 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 8 PS-1						Attachment ID: <None>								
BW26	V-stop	BW26 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 8 PS-2						Attachment ID: <None>								
BW27	V-stop	BW27 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 16 PS-2						Attachment ID: <None>								
FA09	V-stop	FA09 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 16 PS-1						Attachment ID: <None>								
FA10	V-stop	FA10 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 15 PS-1						Attachment ID: <None>								
FA26	V-stop	FA26 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 15 PS-2						Attachment ID: <None>								
FA27	V-stop	FA27 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 10 PS-2						Attachment ID: <None>								
FB09	V-stop	FB09 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 10 PS-1						Attachment ID: <None>								
FB10	V-stop	FB10 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 9 PS-1						Attachment ID: <None>								
FB33	V-stop	FB33 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 9 PS-2						Attachment ID: <None>								
FB34	V-stop	FB34 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 12 PS-2						Attachment ID: <None>								
FD09	V-stop	FD09 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 12 PS-1						Attachment ID: <None>								
FD10	V-stop	FD10 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 11 PS-1						Attachment ID: <None>								
FD33	V-stop	FD33 1	Ground	0.000	Rigid	0.000	100.000	0.30	Weightless					
Tag No.: TANK 11 PS-2						Attachment ID: <None>								

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID /Dir	Conn.to Comp.Wt (lb) K1-Bckd	K1-Fowd	K2-Bckd	K2-Fowd	Stiff. K1-Ph-B	Gap 1 K1-Ph-F	Gap 2	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
FD34	V-stop	FD34 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 14 PS-2							Attachment ID: <None>								
FG03	V-stop	FG03 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 14 PS-1							Attachment ID: <None>								
FG13	V-stop	FG13 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 13 PS-1							Attachment ID: <None>								
FG36	V-stop	FG36 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 13 PS-2							Attachment ID: <None>								
FG40	V-stop	FG40 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 14 PS-3							Attachment ID: ADJUSTABLE								
FH05	V-stop	FH05 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 14 PS-2							Attachment ID: <None>								
FH09	V-stop	FH09 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 14 PS-1							Attachment ID: <None>								
FH18	V-stop	FH18 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 13 PS-1							Attachment ID: <None>								
FH38	V-stop	FH38 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 13 PS-2							Attachment ID: <None>								
FH43	V-stop	FH43 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 13 PS-3							Attachment ID: ADUSTABLE								
FH52	V-stop	FH52 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 15 PS-2							Attachment ID: <None>								
FI09	V-stop	FI09 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 15 PS-1							Attachment ID: <None>								
FI12	V-stop	FI12 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 16 PS-1							Attachment ID: <None>								
FI29	V-stop	FI29 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 16 PS-2							Attachment ID: <None>								
FI30	V-stop	FI30 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 10 PS-2							Attachment ID: <None>								
FR09	V-stop	FR09 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					
Tag No.: TANK 10 PS-1							Attachment ID: <None>								
FR10	V-stop	FR10 1	Ground	0.000	Rigid		0.000	100.000	0.30	Weightless					

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	Stiff. K1-Fowd	Comp.Wt (lb) K2-Bckd	Stiff. K2-Fowd	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
Tag No.: TANK 9 PS-1								Attachment ID: <None>							
FR30	V-stop	FR30 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 9 PS-2								Attachment ID: <None>							
FR31	V-stop	FR31 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 12 PS-2								Attachment ID: <None>							
FW09	V-stop	FW09 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 12 PS-1								Attachment ID: <None>							
FW10	V-stop	FW10 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 11 PS-1								Attachment ID: <None>							
FW31	V-stop	FW31 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 11 PS-2								Attachment ID: <None>							
FW32	V-stop	FW32 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 17 PS-3								Attachment ID: ADJUSTABLE							
GG08	V-stop	GG08 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 17 PS-2								Attachment ID: <None>							
GG16	V-stop	GG16 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 17 PS-1								Attachment ID: <None>							
GG21	V-stop	GG21 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 18 PS-1								Attachment ID: ADJUSTABLE							
GG29	V-stop	GG29 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 18 PS-2								Attachment ID: U BOLT							
GG30	Guide-V	GG30 1	Ground	0.000	Rigid			0.000	0.125	0.25	Weightless				
	Guide-H	GG30 1	Ground	0.000	Rigid			0.125	0.125	0.25	Weightless				
Tag No.: TANK 18 PS-3								Attachment ID: ADJUSTABLE							
GG41	V-stop	GG41 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 18 PS-4								Attachment ID: <None>							
GG42	V-stop	GG42 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 19 PS-2								Attachment ID: <None>							
GH05	V-stop	GH05 1	Ground	0.000	Rigid			0.000	100.000	0.30	Weightless				
Tag No.: TANK 19 PS-1								Attachment ID: U BOLT							
GH08	Guide-V	GH08 1	Ground	0.000	Rigid			0.000	0.125	0.25	Weightless				
	Guide-H	GH08 1	Ground	0.000	Rigid			0.125	0.125	0.25	Weightless				
Tag No.: TANK 20 PS-1								Attachment ID: U BOLT							
GH20	Guide-V	GH20 1	Ground	0.000	Rigid			0.000	0.125	0.25	Weightless				
	Guide-H	GH20 1	Ground	0.000	Rigid			0.125	0.125	0.25	Weightless				

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID /Dir	Conn.to K1-Bckd	Comp.Wt (lb) K1-Fowd	Comp.Wt (lb) K2-Bckd	Comp.Wt (lb) K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
Tag No.: TANK 20 PS-2								Attachment ID: PS-20-A							
GH32	V-stop	GH32 1	Ground		0.000	Rigid		0.000	100.000	0.25	Weightless				
Tag No.: TANK 20 PS-3								Attachment ID: <None>							
GH33	V-stop	GH33 1	Ground		0.000	Rigid		0.000	100.000	0.30	Weightless				
Tag No.: TANK 20 PS-4								Attachment ID: PS-20-B							
GH42	V-stop	GH42 1	Ground		0.000	Rigid		0.000	100.000	0.25	Weightless				
Tag No.: BASE ELBOW SUPPORT								Attachment ID: <None>							
IH05N	V-stop	IH05N1	Ground		0.000	Rigid		0.500	100.000	0.30	Weightless				
Tag No.: TANK 2 - (b)		DC STUD						Attachment ID: TIE-ROD							
5003N	Tie/link	5003 1	5006		0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 2 - (b)		DC STUD						Attachment ID: TIE-ROD							
5004N	Tie/link	5004 1	5007		0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 2 - (b)		DC STUD						Attachment ID: TIE-ROD							
5005N	Tie/link	5005 1	5008		0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 2 - (b)		DC STUD						Attachment ID: TIE-ROD							
5009N	Tie/link	5009 1	5013		0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 2 - (b)		DC STUD						Attachment ID: TIE-ROD							
5010N	Tie/link	5010 1	5014		0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 2 - (b)		DC STUD						Attachment ID: TIE-ROD							
5015N	Tie/link	5015 1	5016		0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 2 - (b)		DC STUD						Attachment ID: TIE-ROD							
5017N	Tie/link	5017 1	5020		0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 2 - (b)		DC STUD						Attachment ID: TIE-ROD							
5021N	Tie/link	5021 1	5026		0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 2 - (b)		DC STUD						Attachment ID: TIE-ROD							
5022N	Tie/link	5022 1	5027		0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 2 - (b)		DC STUD						Attachment ID: TIE-ROD							
5023N	Tie/link	5023 1	5028		0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 2 - (b)		DC STUD						Attachment ID: TIE-ROD							
5024N	Tie/link	5024 1	5029		0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 4 - (b)		DC STUD						Attachment ID: TIE-ROD							
5031N	Tie/link	5031 1	5035		0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 4 - (		" DC STUD						Attachment ID: TIE-ROD							

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb)		Stiff.	Gap 1	Gap 2	Fric. Fact.	GapSet /#hgr	Preload (lbf)	Ld.Var /Pend. /Ultim	Size /Aut	Figure /Rod Length (in) /Brkawy for
		K1-Bckd	K1-Fowd	K2-Bckd	K2-Fowd		K1-Ph-B	K1-Ph-F						
5032N	Tie/link	5032 1	5036	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 4 - (b)		DC STUD				Attachment ID: TIE-ROD								
5033N	Tie/link	5033 1	5037	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 4 - (b)		DC STUD				Attachment ID: TIE-ROD								
5038N	Tie/link	5038 1	5040	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 4 - (b)		DC STUD				Attachment ID: TIE-ROD								
5041N	Tie/link	5041 1	5045	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 4 - ("		DC STUD				Attachment ID: TIE-ROD								
5042N	Tie/link	5042 1	5046	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 4 - (b)		DC STUD				Attachment ID: TIE-ROD								
5043N	Tie/link	5043 1	5047	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 4 - (b)		DC STUD				Attachment ID: TIE-ROD								
5049N	Tie/link	5049 1	5052	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 4 - (b)		DC STUD				Attachment ID: TIE-ROD								
5050N	Tie/link	5050 1	5053	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 4 - (b)		DC STUD				Attachment ID: TIE-ROD								
5054N	Tie/link	5054 1	5055	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 6 - (b)		DC STUD				Attachment ID: TIE-ROD								
5057N	Tie/link	5057 1	5060	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 6 - (b)		DC STUD				Attachment ID: TIE-ROD								
5058N	Tie/link	5058 1	5061	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 6 - (b)		DC STUD				Attachment ID: TIE-ROD								
5064N	Tie/link	5064 1	5068	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 6 - (b)		DC STUD				Attachment ID: TIE-ROD								
5065N	Tie/link	5065 1	5069	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 6 - (b)		DC STUD				Attachment ID: TIE-ROD								
5066N	Tie/link	5066 1	5070	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 6 - (b)		DC STUD				Attachment ID: TIE-ROD								
5071N	Tie/link	5071 1	5073	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 6 - (b)		DC STUD				Attachment ID: TIE-ROD								
5074N	Tie/link	5074 1	5078	0.000	Rigid		0.000	0.000	0.00					
Tag No.: TANK 6 - (b)		DC STUD				Attachment ID: TIE-ROD								
5075N	Tie/link	5075 1	5079	0.000	Rigid		0.000	0.000	0.00					

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID /Dir	Conn.to K1-Bckd	Conn.to K1-Fowd	Comp.Wt (lb) K2-Bckd	Stiff. K2-Fowd	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
Tag No.: TANK 6 - (b)	DC STUD						Attachment ID: TIE-ROD							
5076N Tie/link 5076 1		5080			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 8 - (b)	DC STUD						Attachment ID: TIE-ROD							
5082N Tie/link 5082 1		5086			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 8 - (b)	DC STUD						Attachment ID: TIE-ROD							
5083N Tie/link 5083 1		5087			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 8 - (b)	DC STUD						Attachment ID: TIE-ROD							
5084N Tie/link 5084 1		5088			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 8 - (b)	DC STUD						Attachment ID: TIE-ROD							
5089N Tie/link 5089 1		5091			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 8 - (b)	DC STUD						Attachment ID: TIE-ROD							
5092N Tie/link 5092 1		5096			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 8 - (b)	DC STUD						Attachment ID: TIE-ROD							
5093N Tie/link 5093 1		5097			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 10 - (b)	DC STUD						Attachment ID: TIE-ROD							
5099N Tie/link 5099 1		5103			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 10 - (b)	DC STUD						Attachment ID: TIE-ROD							
5100N Tie/link 5100 1		5104			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 10 - (b)	DC STUD						Attachment ID: TIE-ROD							
5101N Tie/link 5101 1		5105			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 10 - (b)	DC STUD						Attachment ID: TIE-ROD							
5106N Tie/link 5106 1		5108			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 10 - (b)	DC STUD						Attachment ID: TIE-ROD							
5109N Tie/link 5109 1		5113			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 10 - (b)	DC STUD						Attachment ID: TIE-ROD							
5110N Tie/link 5110 1		5114			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 12 - (b)	DC STUD						Attachment ID: TIE-ROD							
5134N Tie/link 5134 1		5138			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 12 - (b)	DC STUD						Attachment ID: TIE-ROD							
5135N Tie/link 5135 1		5139			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 12 - (b)	DC STUD						Attachment ID: TIE-ROD							
5136N Tie/link 5136 1		5140			0.000	Rigid	0.000	0.000	0.00					
Tag No.: TANK 12 - (b)	DC STUD						Attachment ID: TIE-ROD							
5141N Tie/link 5141 1		5143			0.000	Rigid	0.000	0.000	0.00					

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID /Dir	Conn.to K1-Bckd	Comp.Wt (lb) K1-Fowd	K2-Bckd	K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf)	Ld.Var /Pend. /Ultim	Aut	Size /Rod	Figure Length (in) /Brkawy for
Tag No.: TANK 12 - 5144N Tie/link 5144 1	(b)	DC STUD 5148		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 12 - 5145N Tie/link 5145 1	(b)	DC STUD 5149		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 12 - 5146N Tie/link 5146 1	(b)	DC STUD 5150		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 12 - 5147N Tie/link 5147 1	(b)	DC STUD 5151		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 14 - 5153N Tie/link 5153 1	(b)	DC STUD 5157		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 14 - 5154N Tie/link 5154 1	(b)	DC STUD 5158		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 14 - 5155N Tie/link 5155 1	(b)	DC STUD 5159		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 14 - 5160N Tie/link 5160 1	(b)	DC STUD 5162		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 14 - 5163N Tie/link 5163 1	(b)	DC STUD 5167		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 14 - 5164N Tie/link 5164 1	(b)	DC STUD 5168		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 14 - 5165N Tie/link 5165 1	(b)	DC STUD 5169		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 14 - 5166N Tie/link 5166 1	(b)	DC STUD 5170		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 16 - 5172N Tie/link 5172 1	(b)	DC STUD 5176		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 16 - 5173N Tie/link 5173 1	(b)	DC STUD 5177		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 16 - 5174N Tie/link 5174 1	(b)	DC STUD 5178		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 16 - 5179N Tie/link 5179 1	(b)	DC STUD 5181		0.000			Rigid	0.000	0.000	0.00						Attachment ID: TIE-ROD
Tag No.: TANK 16 -	(b)	DC STUD														Attachment ID: TIE-ROD

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID	Conn.to /Dir	Comp.Wt (lb) K1-Bckd	Stiff. K1-Fowd	Stiff. K2-Bckd	Stiff. K2-Fowd	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf)	Ld.Var /Pend. /Ultim	Size /Aut	Figure /Rod Length (in) /Brkawy for
5182N	Tie/link	5182 1	5186	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 16 - (b)							Attachment ID: TIE-ROD								
5183N	Tie/link	5183 1	5187	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 16 - (b)							Attachment ID: TIE-ROD								
5184N	Tie/link	5184 1	5188	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 16 - (b)							Attachment ID: TIE-ROD								
5185N	Tie/link	5185 1	5189	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 8 - (b)							Attachment ID: TIE-ROD								
5201N	Tie/link	5201 1	5204	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 8 - (b)							Attachment ID: TIE-ROD								
5202N	Tie/link	5202 1	5205	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 8 - (b)							Attachment ID: TIE-ROD								
5206N	Tie/link	5206 1	5207	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 10 - (b)							Attachment ID: TIE-ROD								
5209N	Tie/link	5209 1	5212	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 10 - (b)							Attachment ID: TIE-ROD								
5210N	Tie/link	5210 1	5213	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 10 - (b)							Attachment ID: TIE-ROD								
5214N	Tie/link	5214 1	5215	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 12 - (b)							Attachment ID: TIE-ROD								
5217N	Tie/link	5217 1	5220	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 12 - (b)							Attachment ID: TIE-ROD								
5218N	Tie/link	5218 1	5221	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 12 - (b)							Attachment ID: TIE-ROD								
5222N	Tie/link	5222 1	5223	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 14 - (b)							Attachment ID: TIE-ROD								
5225N	Tie/link	5225 1	5228	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 14 - ("							Attachment ID: TIE-ROD								
5226N	Tie/link	5226 1	5229	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 14 - (b)							Attachment ID: TIE-ROD								
5230N	Tie/link	5230 1	5231	0.000	Rigid			0.000	0.000	0.00					
Tag No.: TANK 16 - (b)							Attachment ID: TIE-ROD								
5233N	Tie/link	5233 1	5236	0.000	Rigid			0.000	0.000	0.00					

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID /Dir	Conn.to K1-Bckd	Comp.Wt (lb) K1-Fowd	K2-Bckd	K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf)	Ld.Var /Pend. /Ultim	Size /Aut	Figure /Rod Length (in) /Brkawy for
Tag No.: TANK 16 - (b)		DC STUD						Attachment ID: TIE-ROD							
5234N Tie/link 5234 1		5237	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 16 - (b)		DC STUD						Attachment ID: TIE-ROD							
5238N Tie/link 5238 1		5239	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 20 - (b)		DC STUD						Attachment ID: TIE-ROD							
5261N Tie/link 5261 1		5266	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 20 - (b)		DC STUD						Attachment ID: TIE-ROD							
5263N Tie/link 5263 1		5259	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 20 - (b)		DC STUD						Attachment ID: TIE-ROD							
5264N Tie/link 5264 1		5260	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 18 - (b)		DC STUD						Attachment ID: TIE-ROD							
5270N Tie/link 5270 1		5275	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 18 - (b)		DC STUD						Attachment ID: TIE-ROD							
5272N Tie/link 5272 1		5268	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 18 - (b)		DC STUD						Attachment ID: TIE-ROD							
5273N Tie/link 5273 1		5269	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 8 - (b)		DC STUD						Attachment ID: TIE-ROD							
5277N Tie/link 5277 1		5094	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 10 - (b)		DC STUD						Attachment ID: TIE-ROD							
5279N Tie/link 5279 1		5111	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 4 - (b)		DC STUD						Attachment ID: TIE-ROD							
5281N Tie/link 5281 1		5044	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 6 - (b)		DC STUD						Attachment ID: TIE-ROD							
5283N Tie/link 5283 1		5077	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 8 - (b)		DC STUD						Attachment ID: TIE-ROD							
5285N Tie/link 5285 1		5095	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 10 - (b)		DC STUD						Attachment ID: TIE-ROD							
5287N Tie/link 5287 1		5112	0.000	Rigid				0.000	0.000	0.00					
Tag No.: TANK 6 - (b)		DC STUD						Attachment ID: TIE-ROD							
5289N Tie/link 5289 1		5062	0.000	Rigid				0.000	0.000	0.00					
Tag No.: (b)		DC STUD						Attachment ID: TIE-ROD							
6011N Tie/link 6011 1		5323	0.000	Rigid				0.000	0.000	0.00					
Tag No.: (b)		DC STUD						Attachment ID: TIE-ROD							
6013N Tie/link 6013 1		5311	0.000	Rigid				0.000	0.000	0.00					

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID /Dir	Conn.to Comp.Wt (lb) K1-Bckd	K1-Fowd	K2-Bckd	K2-Fowd	Stiff.	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf)	Ld.Var /Pend. /Ultim	Aut	Size /Rod	Figure Length (in) /Brkawy for
Tag No.: (b)	DC STUD							Attachment ID: TIE-ROD								
6017N	Tielink	6017 1	5319		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD							Attachment ID: TIE-ROD								
6015N	Tielink	6015 1	5315		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD							Attachment ID: TIE-ROD								
6012N	Tielink	6012 1	5321		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD							Attachment ID: TIE-ROD								
6014N	Tielink	6014 1	5317		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD							Attachment ID: TIE-ROD								
6016N	Tielink	6016 1	5313		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD							Attachment ID: TIE-ROD								
6018N	Tielink	6018 1	5325		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD							Attachment ID: TIE-ROD								
6001N	Tielink	6001 1	6005		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD							Attachment ID: TIE-ROD								
6003N	Tielink	6003 1	6006		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD							Attachment ID: TIE-ROD								
6004N	Tielink	6004 1	5335		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD							Attachment ID: TIE-ROD								
6002N	Tielink	6002 1	5337		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD (PS-100)							Attachment ID: TIE-ROD								
5339N	Tielink	5339 1	5354		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD (PS-100)							Attachment ID: TIE-ROD								
5340N	Tielink	5340 1	5348		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD (PS-100)							Attachment ID: TIE-ROD								
5341N	Tielink	5341 1	5352		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD (PS-100)							Attachment ID: TIE-ROD								
5342N	Tielink	5342 1	5350		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD (PS-100)							Attachment ID: TIE-ROD								
5343N	Tielink	5343 1	5353		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD (PS-100)							Attachment ID: TIE-ROD								
5344N	Tielink	5344 1	5351		0.000	Rigid		0.000	0.000	0.00						
Tag No.: (b)	DC STUD (PS-100)							Attachment ID: TIE-ROD								

S U P P O R T D A T A L I S T I N G

Point Name	Support Type	Support ID /Dir	Conn.to Comp.Wt (lb) K1-Bckd	Stiff. K1-Fowd	K2-Bckd	K2-Fowd	Gap 1 K1-Ph-B	Gap 2 K1-Ph-F	Fric. Fact.	GapSet /#hgr	Preload (lbf) /Ultim	Ld.Var /Pend.	Size /Aut	Figure /Rod Length (in) /Brkawy for
5345N	Tie/link	5345 1 5349	0.000	Rigid			0.000	0.000	0.00					
Tag No.: (b) DC STUD (PS-100) Attachment ID: TIE-ROD														
5346N	Tie/link	5346 1 5355	0.000	Rigid			0.000	0.000	0.00					

Spring Manufacturer:
NOTE 1: No soil supports present in the system.
Gap 1 : V-stop,Guide-V=down, Linestop,Incline,Tie/link=backward, Guide-H=Left, Rotation=Anticlockwise
Gap 2 : V-stop,Guide-V=Up , Linestop,Incline,Tie/link=forward , Guide-H=Right, Rotation=Clockwise
Stiffness units for rotation support: ft-lb/deg, all others: lb/in
Gap units for rotation support: deg , all others: inch
Breakaway force units for ultimate force gap support: lbf
K1-Ph-B and K1-Ph-F units for ultimate force gap support: inch
K1-Bckd, K1-Fowd, K2-Bckd and K2-Fowd are stiffness values for ultimate force gap support

ANCHOR DATA LISTING

	Translational Stiffness			Rotational Stiffness			Release Hanger		
Point Name	KTX lb/in	KTY lb/in	KTZ lb/in	KRX ft-lb/deg	KRY ft-lb/deg	KRZ ft-lb/deg	X XX	Y YY	Z ZZ
A00	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
A04	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
A05	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
A19	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
A20	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
A112	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
A113	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
A211	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
A212	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
B00	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
B09	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
B10	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
B23	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			

ANCHOR DATA LISTING

	Translational Stiffness			Rotational Stiffness			Release Hanger		
Point Name	KTX lb/in	KTY lb/in	KTZ lb/in	KRX ft-lb/deg	KRY ft-lb/deg	KRZ ft-lb/deg	X XX	Y YY	Z ZZ
B24	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
B112	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
B113	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
B208	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
B209	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
B287	Tag No.: TUNNEL WALL			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
D00	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
D12	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
D13	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
D28	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
D29	Tag No.: BULKHEAD			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
G00	Tag No.: TANK 1 - OOS			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			

ANCHOR DATA LISTING

	Translational Stiffness			Rotational Stiffness			Release Hanger		
Point Name	KTX lb/in	KTY lb/in	KTZ lb/in	KRX ft-lb/deg	KRY ft-lb/deg	KRZ ft-lb/deg	X XX	Y YY	Z ZZ
G36	Tag No.: TANK 2			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
H37	Tag No.: TANK 2			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
M00	Tag No.: TANK 1 - OOS			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
BF00	Tag No.: TANK 8			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
BF37	Tag No.: TANK 7			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
BG00	Tag No.: TANK 6			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
BG51	Tag No.: TANK 5			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
BI00	Tag No.: TANK 6			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
BP00	Tag No.: TANK 4			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
BP43	Tag No.: TANK 3			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
BQ00	Tag No.: TANK 4			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
BQ40	Tag No.: TANK 3			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
BW00	Tag No.: TANK 7			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			

ANCHOR DATA LISTING

	Translational Stiffness			Rotational Stiffness			Release Hanger		
Point Name	KTX lb/in	KTY lb/in	KTZ lb/in	KRX ft-lb/deg	KRY ft-lb/deg	KRZ ft-lb/deg	X XX	Y YY	Z ZZ
BW36	Tag No.: TANK 8			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
FA00	Tag No.: TANK 16			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
FA36	Tag No.: TANK 15			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
FB00	Tag No.: TANK 10			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
FB42	Tag No.: TANK 9			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
FD00	Tag No.: TANK 12			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
FD43	Tag No.: TANK 11			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
FH00	Tag No.: TANK 14 - EMPTY			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
FH57	Tag No.: TANK 13 - EMPTY			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
FI00	Tag No.: TANK 15			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
FI39	Tag No.: TANK 16			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
FR00	Tag No.: TANK 10			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			

ANCHOR DATA LISTING

Point Name	Translational Stiffness KTX lb/in	KTY lb/in	KTZ lb/in	Rotational Stiffness KRX ft-lb/deg	KRY ft-lb/deg	KRZ ft-lb/deg	Release Hanger X XX	Y YY	Z ZZ
FR40	Tag No.: TANK 9			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
FW00	Tag No.: TANK 12			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
FW42	Tag No.: TANK 11			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
GG00	Tag No.: TANK 17 - EMPTY			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
GG55	Tag No.: TANK 18 - EMPTY			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
GH00	Tag No.: TANK 19 - OOS			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
GH49	Tag No.: TANK 20			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			
IH10	Tag No.: GROUND			Connected to: Ground					
	RIGID	RIGID	RIGID	RIGID	RIGID	RIGID			

T E E D A T A L I S T I N G

Point Name	Point Seg-Type	Pipe OD (in)	Pipe Thk. (in)	Material	Tee Type	**Crotch Radius (in)	*Crotch Thick (in)	SIF in	SIF out
A66	A-Header	(b) (3)	0.375	A53-B	Unreinfo			8.43	10.90
	GS-Branch	(B)	0.375	A53-B					
A98	A-Header		0.375	A53-B	Welding			3.05	3.73
	GX-Branch		0.375	A53-B					
A124	A-Header		0.375	A53-B	Unreinfo			8.43	10.90
	HF-Branch		0.375	A53-B					
A148	A-Header		0.375	A53-B	Unreinfo			8.43	10.90
	HI-Branch		0.375	A53-B					
A169	A-Header		0.375	A53-B	Unreinfo			8.43	10.90
	HJ-Branch		0.375	A53-B					
A193	A-Header		0.375	A53-B	Unreinfo			8.43	10.90
	HK-Branch		0.375	A53-B					
A225	A-Header		0.375	A53-B	Unreinfo			8.43	10.90
	HL-Branch		0.375	A53-B					
B42	B-Header		0.250	A53-B	Unreinfo			7.54	9.72
	GO-Branch		0.250	A53-B					
B72	B-Header		0.250	A53-B	Unreinfo			7.54	9.72
	BM-Branch		0.250	A53-B					
B99	B-Header		0.250	A53-B	Fitting			4.39	4.39
	BO-Branch		0.375	A53-B					
B123	B-Header		0.250	A53-B	Unreinfo			7.54	9.72
	BA-Branch		0.250	A53-B					
B148	B-Header		0.250	A53-B	Unreinfo			7.54	9.72
	FF-Branch		0.250	A53-B					
B177	B-Header		0.250	A53-B	Unreinfo			7.54	9.72
	EP-Branch		0.250	A53-B					
B194	B-Header		0.250	A53-B	Unreinfo			7.54	9.72
	EQ-Branch		0.250	A53-B					
B219	B-Header		0.250	A53-B	Unreinfo			7.54	9.72
	ER-Branch		0.250	A53-B					
B251	B-Header		0.250	A53-B	Welding			3.68	4.57
	IH-Branch		0.322	A53-B					
B260	B-Header		0.250	A53-B	Welding			3.68	4.57
	IF-Branch		0.375	A53-B					
B280	B-Header		0.250	A53-B	Welding			3.68	4.57

T E E D A T A L I S T I N G

Point Name	Point Seg-Type	Pipe OD (in)	Pipe Thk. (in)	Material	Tee Type	**Crotch Radius (in)	*Crotch Thick (in)	SIF in	SIF out
	GJ-Branch	(b) (3) (B)	0.250	A53-B					
D40	D-Header		0.250	A53-B	Unreinfo			6.98	8.98
	E-Branch		0.250	A53-B					
D59	D-Header		0.375	A53-B	Unreinfo			5.36	6.81
	IG-Branch		0.375	A53-B					
D79	D-Header		0.250	A53-B	Unreinfo			6.98	8.98
	BH-Branch		0.250	A53-B					
D106	D-Header		0.375	A53-B	Unreinfo			5.36	6.81
	BD-Branch		0.375	A53-B					
D121	D-Header		0.375	A53-B	Unreinfo			5.36	6.81
	FE-Branch		0.375	A53-B					
D137	D-Header		0.250	A53-B	Unreinfo			6.98	8.98
	EY-Branch		0.250	A53-B					
D151	D-Header		0.250	A53-B	Unreinfo			6.98	8.98
	EZ-Branch		0.250	A53-B					
D177	D-Header		0.250	A53-B	Unreinfo			6.98	8.98
	FC-Branch		0.250	A53-B					
H15	H-Header		0.375	A53-B	Welding			3.05	3.73
	E-Branch		0.375	A53-B					
G15	G-Header		0.375	A53-B	Welding			2.31	2.74
	GO-Branch		0.375	A53-B					
BF19	BF-Header		0.375	A53-B	Welding			2.31	2.74
	BA-Branch		0.375	A53-B					
BF22	BF-Header		0.375	A53-B	Welding			2.31	2.74
	BD-Branch		0.375	A53-B					
BG25	BG-Header		0.375	A53-B	Welding			3.05	3.73
	GX-Branch		0.375	A53-B					
BG45	BG-Header		0.375	A53-B	Welding			3.05	3.73
	BI-Branch		0.375	A53-B					
BI23	BI-Header		0.375	A53-B	Welding			2.31	2.74
	BH-Branch		0.375	A53-B					
BI20	BI-Header		0.375	A53-B	Welding			2.31	2.74
	BO-Branch		0.375	A53-B					
BP21	BP-Header		0.375	A53-B	Welding			2.31	2.74
	BM-Branch		0.375	A53-B					

T E E D A T A L I S T I N G

Point Name	Point Seg-Type	Pipe OD (in)	Pipe Thk. (in)	Material	Tee Type	**Crotch Radius (in)	*Crotch Thick (in)	SIF in	SIF out
BP24	BP-Header	(b) (3)	0.375	A53-B	Welding			2.31	2.74
	IG-Branch	(B)	0.375	A53-B					
BQ22	BQ-Header		0.375	A53-B	Welding			3.05	3.73
	GS-Branch		0.375	A53-B					
BW15	BW-Header		0.375	A53-B	Welding			3.05	3.73
	HF-Branch		0.375	A53-B					
FD22	FD-Header		0.375	A53-B	Welding			2.31	2.74
	EP-Branch		0.375	A53-B					
FG25	FG-Header		0.375	A53-B	Welding			2.31	2.74
	EQ-Branch		0.375	A53-B					
FI17	FI-Header		0.375	A53-B	Welding			2.31	2.74
	ER-Branch		0.375	A53-B					
FD25	FD-Header		0.375	A53-B	Welding			2.31	2.74
	EY-Branch		0.375	A53-B					
FG28	FG-Header		0.375	A53-B	Welding			2.31	2.74
	EZ-Branch		0.375	A53-B					
FA22	FA-Header		0.375	A53-B	Welding			3.05	3.73
	HL-Branch		0.375	A53-B					
FB22	FB-Header		0.375	A53-B	Welding			2.31	2.74
	FF-Branch		0.375	A53-B					
FB25	FB-Header		0.375	A53-B	Welding			2.31	2.74
	FE-Branch		0.375	A53-B					
FI14	FI-Header		0.375	A53-B	Welding			2.31	2.74
	FC-Branch		0.375	A53-B					
FH07	FH-Header		0.375	A53-B	Welding			3.05	3.73
	FG-Branch		0.375	A53-B					
FH50	FH-Header		0.375	A53-B	Welding			3.05	3.73
	FG-Branch		0.375	A53-B					
FH30	FH-Header		0.375	A53-B	Welding			3.05	3.73
	HK-Branch		0.375	A53-B					
FR22	FR-Header		0.375	A53-B	Welding			3.05	3.73
	HI-Branch		0.375	A53-B					
FW22	FW-Header		0.375	A53-B	Welding			3.05	3.73
	HJ-Branch		0.375	A53-B					

T E E D A T A L I S T I N G

Point Name	Point Seg-Type	Pipe OD (in)	Pipe Thk. (in)	Material	Tee Type	**Crotch Radius (in)	*Crotch Thick (in)	SIF in	SIF out
GG23	GG-Header	(b) (3)	0.375	A53-B	Welding			2.65	3.21
	IF-Branch	(B)	0.375	A53-B					
GH15	GH-Header		0.375	A53-B	Welding			2.65	3.21
	GJ-Branch		0.375	A53-B					
IH04	IH-Header		0.322	A53-B	Welding			2.00	2.33
	II-Branch		0.322	A53-B					

* = Pad thickness for reinforced tee.
**= Fillet radius for Raised tee or discontinuity dist. for Thickened tee.

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE SO, 300 LB, RF, ASME B16.5, A											
A09	1	SLIP-ON		300	258.00	129.00	SW	1.30			Yes
Tag No. : FLANGE SO, 300 LB, RF, ASME B16.5, A											
A10	1	SLIP-ON		300	258.00	129.00	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.47,											
A126	1	SLIP-ON		150	410.00	205.00	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.47,											
A126	2	SLIP-ON		150	410.00	205.00	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
A152	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
A153	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.47,											
A196	1	WELDNECK		150	505.00	252.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.47,											
A196	2	WELDNECK		150	505.00	252.50	WN	1.00			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.47,											
A228	1	SLIP-ON		150	410.00	205.00	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF											
A228	2	BLIND		150	1237.00	618.50	USER	1.00			No
Tag No. : FLANGE WN, 300 LB, RF, ASME B16.5, A											
B04	1	WELDNECK		300	306.00	153.00	WN	1.00			Yes
Tag No. : FLANGE WN, 300 LB, RF, ASME B16.5, A											
B04	2	WELDNECK		300	306.00	153.00	WN	1.00			Yes
Tag No. : FLANGE WN, 300 LB, RF, ASME B16.5, A											
B06	1	WELDNECK		300	306.00	153.00	WN	1.00			Yes
Tag No. : FLANGE WN, 300 LB, RF, ASME B16.5, A											
B06	2	WELDNECK		300	306.00	153.00	WN	1.00			Yes
Tag No. : FLANGE SO, 300 LB, RF, ASME B16.5, A											
B15	1	SLIP-ON		300	117.00	58.50	SW	1.30			Yes
Tag No. : FLANGE SO, 300 LB, RF, ASME B16.5, A											
B16	1	SLIP-ON		300	117.00	58.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
B74	1	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
B74	2	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
B125	1	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
B125	2	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B151	1	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B151	2	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B154	1	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B154	2	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B157	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B158	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B163	1	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B163	2	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.47,											
B196	1	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.47,											
B196	2	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B222	1	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B222	2	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B231	1	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B231	2	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
B250	1	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
B250	2	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
B252	1	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
B252	2	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B263	1	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B263	2	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
B284	1	BLIND		150	217.00	108.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
B284	2	WELDNECK		150	165.00	82.50	WN	1.00			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
D01	1	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
D01	2	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
D02	1	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
D02	2	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE WN, 300 LB, RF, ASME B16.5, A											
D06	1	WELDNECK		300	249.00	124.50	WN	1.00			Yes
Tag No. : FLANGE WN, 300 LB, RF, ASME B16.5, A											
D06	2	WELDNECK		300	249.00	124.50	WN	1.00			Yes
Tag No. : FLANGE WN, 300 LB, RF, ASME B16.5, A											
D09	1	WELDNECK		300	249.00	124.50	WN	1.00			Yes
Tag No. : FLANGE WN, 300 LB, RF, ASME B16.5, A											
D09	2	WELDNECK		300	249.00	124.50	WN	1.00			Yes
Tag No. : FLANGE SO, 300 LB, RF, ASME B16.5, A											
D19	1	SLIP-ON		300	78.00	39.00	SW	1.30			Yes
Tag No. : FLANGE SO, 300 LB, RF, ASME B16.5, A											
D20	1	SLIP-ON		300	78.00	39.00	SW	1.30			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
D42	1	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
D42	2	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
D61	1	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
D61	2	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
D108	1	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
D108	2	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
D124	1	WELDNECK		150	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
D124	2	WELDNECK		150	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
D180	1	WELDNECK		150	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
D180	2	BLIND		150	187.00	93.50	USER	1.00			No
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
E02	1	BLIND		150	187.00	93.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
E04	1	SLIP-ON		150	141.00	70.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
G02	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
G02	2	BLIND		150	105.00	52.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
G04	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
G04	2	BLIND		150	105.00	52.50	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
G09	1	BLIND		150	105.00	52.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
G09	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
G12	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
G12	2	BLIND		150	105.00	52.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
G21	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
G21	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
G24	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
G24	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
G31	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
G32	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
G35	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
H02	1	SLIP-ON		150	64.00	32.00	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
H04	1	SLIP-ON		150	64.00	32.00	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
H04	2	BLIND		150	105.00	52.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
H10	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
H10	2	BLIND		150	276.00	138.00	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
H13	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
H13	2	BLIND		150	276.00	138.00	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
H21	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
H21	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
H24	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
H24	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
H31	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
H32	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
H36	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
M02	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
M02	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : 34" DIA, 1" THK PLATE											
H00	1	BLIND		NS	258.00	0.00	USER	1.00			No
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
BA02	1	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
BA03	1	BLIND		150	217.00	108.50	SW	1.30			Yes
Tag No. : FLANGE, SO, 150 LB, RF, ASME B16.5											
BD01	1	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
BD03	1	BLIND		150	187.00	93.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF01	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF02	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF04	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF05	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF11	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF11	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF14	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF14	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF25	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF25	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF28	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF28	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF32	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF33	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF35	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BF36	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG02	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG03	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG06	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG07	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG15	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG15	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG18	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG18	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG28	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG28	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG31	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG33	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG37	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG38	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG42	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG43	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG49	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BG50	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE, SO, 150 LB, RF, ASME B16.5											
BH02	1	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
BH04	1	BLIND		150	187.00	93.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI01	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI02	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI05	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI06	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI12	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI12	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI15	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI15	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI26	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI26	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI29	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI31	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI34	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI35	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI39	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BI40	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5											
BM02	1	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
BM04	1	BLIND		150	217.00	108.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BO04	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BO05	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP01	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP02	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP05	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP06	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP13	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP13	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP16	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP16	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP28	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP28	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP31	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP31	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP37	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP38	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP41	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BP42	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ01	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ02	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ05	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ06	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ14	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ14	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ17	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ17	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ26	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ26	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ29	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ29	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ35	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ36	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BQ39	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW02	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW03	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW06	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW07	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW11	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW11	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW12	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW12	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW19	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW19	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW22	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW22	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW29	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW30	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW33	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
BW34	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
EP01	1	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
EP03	1	BLIND		150	217.00	108.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
EQ01	1	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
EQ03	1	BLIND		150	217.00	108.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
ER01	1	SLIP-ON		150	112.00	56.00	SW	1.30			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
ER03	1	BLIND		150	217.00	108.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
EY01	1	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
EY03	1	BLIND		150	187.00	93.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
EZ01	1	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
EZ03	1	BLIND		150	187.00	93.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FA02	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FA03	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FA06	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FA07	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FA14	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FA14	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FA17	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FA17	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FA24	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FA24	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FA25	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FA25	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FA29	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FA30	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FA33	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FA34	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB02	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB03	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB06	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB07	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB14	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB14	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB17	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB17	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB28	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB28	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB31	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB31	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB36	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB37	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB40	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FB41	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
FC01	1	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
FC04	1	BLIND		150	187.00	93.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FD02	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FD03	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FD06	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FD07	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FD14	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FD14	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FD17	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FD17	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FD28	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FD28	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FD31	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FD31	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FD36	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FD37	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FD40	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FD41	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FE03	1	WELDNECK		150	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
FE03	2	BLIND		150	187.00	93.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
FF01	1	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
FF02	1	BLIND		150	217.00	108.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG05	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG08	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG11	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG12	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG17	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG17	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG20	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG20	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG31	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG31	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG34	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG34	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG38	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG39	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG42	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FG44	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH01	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH02	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH10	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH13	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH16	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH17	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH22	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH22	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH25	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH25	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH33	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH33	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH36	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH36	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH40	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH41	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH45	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH48	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH54	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FH55	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI02	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI03	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI06	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI07	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI10	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI10	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI11	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI11	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI22	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI22	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI25	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI25	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI32	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI33	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI36	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FI37	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FR02	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FR03	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FR06	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FR07	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FR14	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FR14	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FR17	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FR17	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FR25	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FR25	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FR28	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FR28	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FR33	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FR34	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FR37	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FR38	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW02	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FW03	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW06	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW07	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW14	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW14	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW17	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW17	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW25	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW25	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, FF, ASME B16.5, A											
FW28	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW28	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW34	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW35	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW38	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
FW40	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG02	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG02	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG05	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG06	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG12	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG13	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG15	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG15	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG18	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG18	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG26	1	WELDNECK		150	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG28	1	WELDNECK		150	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG44	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG44	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG48	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
GG48	2	BLIND		150	105.00	52.50	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
GG50	1	BLIND		150	150.00	75.00	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG50	2	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GG53	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
GG53	2	SLIP-ON		150	141.00	70.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GH02	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
GH02	2	SLIP-ON		150	64.00	32.00	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GH09	1	WELDNECK		150	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GH11	1	WELDNECK		150	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GH16	1	WELDNECK		150	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GH18	1	WELDNECK		150	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE WN, 300 LB, RF, ASME B16.5, A											
GH31	1	WELDNECK		300	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE WN, 300 LB, RF, ASME B16.5, A											
GH31	2	WELDNECK		300	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE WN, 300 LB, RF, ASME B16.5, A											
GH35	1	WELDNECK		300	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE WN, 300 LB, RF, ASME B16.5, A											
GH36	1	WELDNECK		300	142.00	71.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GH43	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GH44	1	WELDNECK		150	88.00	44.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GH47	1	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
GH47	2	WELDNECK		150	197.00	98.50	WN	1.00			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
GO01	1	SLIP-ON		150	112.00	56.00	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
GO03	1	BLIND		150	217.00	108.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.47,											
GS01	1	SLIP-ON		150	410.00	205.00	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
GS03	1	BLIND		1501	237.00	618.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
GX03	1	SLIP-ON		150	141.00	70.50	SW	1.30			Yes

F L A N G E D A T A L I S T I N G

Point Name	FLG No.	Type	Dnom (in)	Rating	Flange Weight (lb)	Bolt Weight (lb)	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)	ANSI Check
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
GX03	2	SLIP-ON		150	141.00	70.50	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
HF02	1	BLIND		150	1237.00	618.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.47,											
HF04	1	SLIP-ON		150	410.00	205.00	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.47,											
HI01	1	SLIP-ON		150	410.00	205.00	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
HI02	1	BLIND		150	1237.00	618.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.47,											
HJ01	1	SLIP-ON		150	410.00	205.00	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
HJ03	1	BLIND		150	1237.00	618.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.47,											
HK01	1	SLIP-ON		150	410.00	205.00	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
HK03	1	BLIND		150	1237.00	618.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.47,											
HL01	1	SLIP-ON		150	410.00	205.00	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
HL03	1	BLIND		150	1237.00	618.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
IG02	1	SLIP-ON		150	101.00	50.50	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
IG04	1	BLIND		150	217.00	108.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
IH01	1	SLIP-ON		150	27.00	13.50	SW	1.30			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
IH02	1	SLIP-ON		150	27.00	13.50	SW	1.30			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
IH07	1	WELDNECK		150	40.00	20.00	WN	1.00			Yes
Tag No. : FLANGE WN, 150 LB, RF, ASME B16.5, A											
IH08	1	WELDNECK		150	40.00	20.00	WN	1.00			Yes
Tag No. : FLANGE SO, 150 LB, RF, ASME B16.5, A											
II01	1	SLIP-ON		150	27.00	13.50	SW	1.30			Yes
Tag No. : FLANGE BLIND, 150 LB, RF, ASME B16.5											
II01	2	BLIND		150	48.00	24.00	USER	1.00			No

A N S I F L A N G E C H E C K D A T A L I S T I N G

Point Name	FLG No.	Flange Data Series	Flange Data Material	Flange Data Group	Gasket Data Material	Gasket Data Di(in)	Gasket Data Width(in)
A09	1		A105	1.1	NS	(b) (3) (B)	2.750
A10	1		A105	1.1	NS		2.750
A126	1	A	A105	1.1	NS		0.000
A126	2	A	A105	1.1	NS		0.000
A152	1		A105	1.1	NS		1.940
A153	1		A105	1.1	NS		1.940
A196	1	A	A105	1.1	NS		0.000
A196	2	A	A105	1.1	NS		0.000
A228	1	A	A105	1.1	NS		0.000
B04	1		A105	1.1	NS		2.750
B04	2		A105	1.1	NS		2.750
B06	1		A105	1.1	NS		2.750
B06	2		A105	1.1	NS		2.750
B15	1		A105	1.1	NS		1.935
B16	1		A105	1.1	NS		1.935
B74	1		A105	1.1	NS		1.810
B74	2		A105	1.1	NS		1.810
B125	1		A105	1.1	NS		1.810
B125	2		A105	1.1	NS		1.810
B151	1		A105	1.1	NS		1.810
B151	2		A105	1.1	NS		1.810
B154	1		A105	1.1	NS		1.810
B154	2		A105	1.1	NS		1.810
B157	1		A105	1.1	NS		1.690
B158	1		A105	1.1	NS		1.690
B163	1		A105	1.1	NS		1.810
B163	2		A105	1.1	NS		1.810
B196	1		A105	1.1	NS		1.810
B196	2		A105	1.1	NS		1.810
B222	1		A105	1.1	NS		1.810
B222	2		A105	1.1	NS		1.810
B231	1		A105	1.1	NS		1.810
B231	2		A105	1.1	NS		1.810
B250	1		A105	1.1	NS		1.810
B250	2		A105	1.1	NS		1.810
B252	1		A105	1.1	NS		1.810
B252	2		A105	1.1	NS		1.810
B263	1		A105	1.1	NS		1.810
B263	2		A105	1.1	NS		1.810
B284	1		A105	1.1	NS		1.810
B284	2		A105	1.1	NS		1.810
D01	1		A105	1.1	NS		2.125
D01	2		A105	1.1	NS		2.125
D02	1		A105	1.1	NS		2.125
D02	2		A105	1.1	NS		2.125
D06	1		A105	1.1	NS		2.625
D06	2		A105	1.1	NS		2.625
D09	1		A105	1.1	NS		2.625
D09	2		A105	1.1	NS		2.625
D19	1		A105	1.1	NS		1.750
D20	1		A105	1.1	NS		1.750
D42	1		A105	1.1	NS		2.125

A N S I F L A N G E C H E C K D A T A L I S T I N G

Point Name	FLG No.	Flange Data Series	Flange Data Material	Flange Data Group	Gasket Data Material	Gasket Data Di(in)	Gasket Data Width(in)
D42	2		A105	1.1	NS	(b) (3) (B)	2.125
D61	1		A105	1.1	NS		2.125
D61	2		A105	1.1	NS		2.125
D108	1		A105	1.1	NS		2.125
D108	2		A105	1.1	NS		2.125
D124	1		A105	1.1	NS		2.125
D124	2		A105	1.1	NS		2.125
D180	1		A105	1.1	NS		2.125
E02	1		A105	1.1	NS		2.125
E04	1		A105	1.1	NS		2.125
G02	1		A105	1.1	NS		1.690
G02	2		A105	1.1	NS		1.690
G04	1		A105	1.1	NS		1.690
G04	2		A105	1.1	NS		1.690
G09	1		A105	1.1	NS		1.690
G09	2		A105	1.1	NS		1.690
G12	1		A105	1.1	NS		1.690
G12	2		A105	1.1	NS		1.690
G21	1		A105	1.1	NS		1.690
G21	2		A105	1.1	NS		1.690
G24	1		A105	1.1	NS		1.690
G24	2		A105	1.1	NS		1.690
G31	1		A105	1.1	NS		1.690
G32	1		A105	1.1	NS		1.690
G35	1		A105	1.1	NS		1.690
H02	1		A105	1.1	NS		1.690
H04	1		A105	1.1	NS		1.690
H04	2		A105	1.1	NS		1.690
H10	1		A105	1.1	NS		1.940
H10	2		A105	1.1	NS		1.940
H13	1		A105	1.1	NS		1.940
H13	2		A105	1.1	NS		1.940
H21	1		A105	1.1	NS		1.940
H21	2		A105	1.1	NS		1.940
H24	1		A105	1.1	NS		1.940
H24	2		A105	1.1	NS		1.940
H31	1		A105	1.1	NS		1.690
H32	1		A105	1.1	NS		1.690
H36	1		A105	1.1	NS		1.940
M02	1		A105	1.1	NS		1.940
M02	2		A105	1.1	NS		1.940
BA02	1		A105	1.1	NS		1.810
BA03	1		A105	1.1	NS		1.810
BD01	1		A105	1.1	NS		2.125
BD03	1		A105	1.1	NS		2.125
BF01	1		A105	1.1	NS		1.690
BF02	1		A105	1.1	NS		1.690
BF04	1		A105	1.1	NS		1.690
BF05	1		A105	1.1	NS		1.690
BF11	1		A105	1.1	NS		1.690
BF11	2		A105	1.1	NS		1.690
BF14	1		A105	1.1	NS		1.690

A N S I F L A N G E C H E C K D A T A L I S T I N G

Point Name	FLG No.	Flange Data Series	Flange Data Material	Flange Data Group	Gasket Data Material	Gasket Data Di(in)	Gasket Data Width(in)
BF14	2		A105	1.1	NS	(b) (3)	1.690
BF25	1		A105	1.1	NS	(B)	1.690
BF25	2		A105	1.1	NS		1.690
BF28	1		A105	1.1	NS		1.690
BF28	2		A105	1.1	NS		1.690
BF32	1		A105	1.1	NS		1.690
BF33	1		A105	1.1	NS		1.690
BF35	1		A105	1.1	NS		1.690
BF36	1		A105	1.1	NS		1.690
BG02	1		A105	1.1	NS		1.940
BG03	1		A105	1.1	NS		1.940
BG06	1		A105	1.1	NS		1.940
BG07	1		A105	1.1	NS		1.940
BG15	1		A105	1.1	NS		1.940
BG15	2		A105	1.1	NS		1.940
BG18	1		A105	1.1	NS		1.940
BG18	2		A105	1.1	NS		1.940
BG28	1		A105	1.1	NS		1.940
BG28	2		A105	1.1	NS		1.940
BG31	1		A105	1.1	NS		1.940
BG33	1		A105	1.1	NS		1.940
BG37	1		A105	1.1	NS		1.940
BG38	1		A105	1.1	NS		1.940
BG42	1		A105	1.1	NS		1.940
BG43	1		A105	1.1	NS		1.940
BG49	1		A105	1.1	NS		1.940
BG50	1		A105	1.1	NS		1.940
BH02	1		A105	1.1	NS		2.125
BH04	1		A105	1.1	NS		2.125
BI01	1		A105	1.1	NS		1.690
BI02	1		A105	1.1	NS		1.690
BI05	1		A105	1.1	NS		1.690
BI06	1		A105	1.1	NS		1.690
BI12	1		A105	1.1	NS		1.690
BI12	2		A105	1.1	NS		1.690
BI15	1		A105	1.1	NS		1.690
BI15	2		A105	1.1	NS		1.690
BI26	1		A105	1.1	NS		1.690
BI26	2		A105	1.1	NS		1.690
BI29	1		A105	1.1	NS		1.690
BI31	1		A105	1.1	NS		1.690
BI34	1		A105	1.1	NS		1.690
BI35	1		A105	1.1	NS		1.690
BI39	1		A105	1.1	NS		1.690
BI40	1		A105	1.1	NS		1.690
BM02	1		A105	1.1	NS		1.810
BM04	1		A105	1.1	NS		1.810
BO04	1		A105	1.1	NS		1.690
BO05	1		A105	1.1	NS		1.690
BP01	1		A105	1.1	NS		1.690
BP02	1		A105	1.1	NS		1.690
BP05	1		A105	1.1	NS		1.690

A N S I F L A N G E C H E C K D A T A L I S T I N G

Point Name	FLG No.	Flange Data Series	Flange Data Material	Flange Data Group	Gasket Data Material	Gasket Data Di(in)	Gasket Data Width(in)
BP06	1		A105	1.1	NS	(b) (3) (B)	1.690
BP13	1		A105	1.1	NS		1.690
BP13	2		A105	1.1	NS		1.690
BP16	1		A105	1.1	NS		1.690
BP16	2		A105	1.1	NS		1.690
BP28	1		A105	1.1	NS		1.690
BP28	2		A105	1.1	NS		1.690
BP31	1		A105	1.1	NS		1.690
BP31	2		A105	1.1	NS		1.690
BP37	1		A105	1.1	NS		1.690
BP38	1		A105	1.1	NS		1.690
BP41	1		A105	1.1	NS		1.690
BP42	1		A105	1.1	NS		1.690
BQ01	1		A105	1.1	NS		1.940
BQ02	1		A105	1.1	NS		1.940
BQ05	1		A105	1.1	NS		1.940
BQ06	1		A105	1.1	NS		1.940
BQ14	1		A105	1.1	NS		1.940
BQ14	2		A105	1.1	NS		1.940
BQ17	1		A105	1.1	NS		1.940
BQ17	2		A105	1.1	NS		1.940
BQ26	1		A105	1.1	NS		1.940
BQ26	2		A105	1.1	NS		1.940
BQ29	1		A105	1.1	NS		1.940
BQ29	2		A105	1.1	NS		1.940
BQ35	1		A105	1.1	NS		1.940
BQ36	1		A105	1.1	NS		1.940
BQ39	1		A105	1.1	NS		1.940
BW02	1		A105	1.1	NS		1.940
BW03	1		A105	1.1	NS		1.940
BW06	1		A105	1.1	NS		1.940
BW07	1		A105	1.1	NS		1.940
BW11	1		A105	1.1	NS		1.940
BW11	2		A105	1.1	NS		1.940
BW12	1		A105	1.1	NS		1.940
BW12	2		A105	1.1	NS		1.940
BW19	1		A105	1.1	NS		1.940
BW19	2		A105	1.1	NS		1.940
BW22	1		A105	1.1	NS		1.940
BW22	2		A105	1.1	NS		1.940
BW29	1		A105	1.1	NS		1.940
BW30	1		A105	1.1	NS		1.940
BW33	1		A105	1.1	NS		1.940
BW34	1		A105	1.1	NS		1.940
EP01	1		A105	1.1	NS		1.810
EP03	1		A105	1.1	NS		1.810
EQ01	1		A105	1.1	NS		1.810
EQ03	1		A105	1.1	NS		1.810
ER01	1		A105	1.1	NS		1.810
ER03	1		A105	1.1	NS		1.810
EY01	1		A105	1.1	NS		2.125
EY03	1		A105	1.1	NS		2.125

A N S I F L A N G E C H E C K D A T A L I S T I N G

Point Name	FLG No.	Flange Data Series	Flange Data Material	Flange Data Group	Gasket Data Material	Gasket Data Di(in)	Gasket Data Width(in)
EZ01	1		A105	1.1	NS	(b) (3) (B)	2.125
EZ03	1		A105	1.1	NS		2.125
FA02	1		A105	1.1	NS		1.940
FA03	1		A105	1.1	NS		1.940
FA06	1		A105	1.1	NS		1.940
FA07	1		A105	1.1	NS		1.940
FA14	1		A105	1.1	NS		1.940
FA14	2		A105	1.1	NS		1.940
FA17	1		A105	1.1	NS		1.940
FA17	2		A105	1.1	NS		1.940
FA24	1		A105	1.1	NS		1.940
FA24	2		A105	1.1	NS		1.940
FA25	1		A105	1.1	NS		1.940
FA25	2		A105	1.1	NS		1.940
FA29	1		A105	1.1	NS		1.940
FA30	1		A105	1.1	NS		1.940
FA33	1		A105	1.1	NS		1.940
FA34	1		A105	1.1	NS		1.940
FB02	1		A105	1.1	NS		1.690
FB03	1		A105	1.1	NS		1.690
FB06	1		A105	1.1	NS		1.690
FB07	1		A105	1.1	NS		1.690
FB14	1		A105	1.1	NS		1.690
FB14	2		A105	1.1	NS		1.690
FB17	1		A105	1.1	NS		1.690
FB17	2		A105	1.1	NS		1.690
FB28	1		A105	1.1	NS		1.690
FB28	2		A105	1.1	NS		1.690
FB31	1		A105	1.1	NS		1.690
FB31	2		A105	1.1	NS		1.690
FB36	1		A105	1.1	NS		1.690
FB37	1		A105	1.1	NS		1.690
FB40	1		A105	1.1	NS		1.690
FB41	1		A105	1.1	NS		1.690
FC01	1		A105	1.1	NS		2.125
FC04	1		A105	1.1	NS		2.125
FD02	1		A105	1.1	NS		1.690
FD03	1		A105	1.1	NS		1.690
FD06	1		A105	1.1	NS		1.690
FD07	1		A105	1.1	NS		1.690
FD14	1		A105	1.1	NS		1.690
FD14	2		A105	1.1	NS		1.690
FD17	1		A105	1.1	NS		1.690
FD17	2		A105	1.1	NS		1.690
FD28	1		A105	1.1	NS		1.690
FD28	2		A105	1.1	NS		1.690
FD31	1		A105	1.1	NS		1.690
FD31	2		A105	1.1	NS		1.690
FD36	1		A105	1.1	NS		1.690
FD37	1		A105	1.1	NS		1.690
FD40	1		A105	1.1	NS		1.690
FD41	1		A105	1.1	NS		1.690

A N S I F L A N G E C H E C K D A T A L I S T I N G

Point Name	FLG No.	Flange Data Series	Flange Data Material	Flange Data Group	Gasket Data Material	Gasket Data Di(in)	Gasket Data Width(in)
FE03	1		A105	1.1	NS	(b) (3) (B)	2.125
FE03	2		A105	1.1	NS		2.125
FF01	1		A105	1.1	NS		1.810
FF02	1		A105	1.1	NS		1.810
FG05	1		A105	1.1	NS		1.690
FG08	1		A105	1.1	NS		1.690
FG11	1		A105	1.1	NS		1.690
FG12	1		A105	1.1	NS		1.690
FG17	1		A105	1.1	NS		1.690
FG17	2		A105	1.1	NS		1.690
FG20	1		A105	1.1	NS		1.690
FG20	2		A105	1.1	NS		1.690
FG31	1		A105	1.1	NS		1.690
FG31	2		A105	1.1	NS		1.690
FG34	1		A105	1.1	NS		1.690
FG34	2		A105	1.1	NS		1.690
FG38	1		A105	1.1	NS		1.690
FG39	1		A105	1.1	NS		1.690
FG42	1		A105	1.1	NS		1.690
FG44	1		A105	1.1	NS		1.690
FH01	1		A105	1.1	NS		1.940
FH02	1		A105	1.1	NS		1.940
FH10	1		A105	1.1	NS		1.940
FH13	1		A105	1.1	NS		1.940
FH16	1		A105	1.1	NS		1.940
FH17	1		A105	1.1	NS		1.940
FH22	1		A105	1.1	NS		1.940
FH22	2		A105	1.1	NS		1.940
FH25	1		A105	1.1	NS		1.940
FH25	2		A105	1.1	NS		1.940
FH33	1		A105	1.1	NS		1.940
FH33	2		A105	1.1	NS		1.940
FH36	1		A105	1.1	NS		1.940
FH36	2		A105	1.1	NS		1.940
FH40	1		A105	1.1	NS		1.940
FH41	1		A105	1.1	NS		1.940
FH45	1		A105	1.1	NS		1.940
FH48	1		A105	1.1	NS		1.940
FH54	1		A105	1.1	NS		1.940
FH55	1		A105	1.1	NS		1.940
FI02	1		A105	1.1	NS		1.690
FI03	1		A105	1.1	NS		1.690
FI06	1		A105	1.1	NS		1.690
FI07	1		A105	1.1	NS		1.690
FI10	1		A105	1.1	NS		1.690
FI10	2		A105	1.1	NS		1.690
FI11	1		A105	1.1	NS		1.690
FI11	2		A105	1.1	NS		1.690
FI22	1		A105	1.1	NS		1.690
FI22	2		A105	1.1	NS		1.690
FI25	1		A105	1.1	NS		1.690
FI25	2		A105	1.1	NS		1.690

A N S I F L A N G E C H E C K D A T A L I S T I N G

Point Name	FLG No.	Flange Data Series	Flange Data Material	Flange Data Group	Gasket Data Material	Gasket Data Di(in)	Gasket Data Width(in)
FI32	1		A105	1.1	NS		1.690
FI33	1		A105	1.1	NS		1.690
FI36	1		A105	1.1	NS		1.690
FI37	1		A105	1.1	NS		1.690
FR02	1		A105	1.1	NS		1.940
FR03	1		A105	1.1	NS		1.940
FR06	1		A105	1.1	NS		1.940
FR07	1		A105	1.1	NS		1.940
FR14	1		A105	1.1	NS		1.940
FR14	2		A105	1.1	NS		1.940
FR17	1		A105	1.1	NS		1.940
FR17	2		A105	1.1	NS		1.940
FR25	1		A105	1.1	NS		1.940
FR25	2		A105	1.1	NS		1.940
FR28	1		A105	1.1	NS		1.940
FR28	2		A105	1.1	NS		1.940
FR33	1		A105	1.1	NS		1.940
FR34	1		A105	1.1	NS		1.940
FR37	1		A105	1.1	NS		1.940
FR38	1		A105	1.1	NS		1.940
FW02	1		A105	1.1	NS		1.940
FW03	1		A105	1.1	NS		1.940
FW06	1		A105	1.1	NS		1.940
FW07	1		A105	1.1	NS		1.940
FW14	1		A105	1.1	NS		1.940
FW14	2		A105	1.1	NS		1.940
FW17	1		A105	1.1	NS		1.940
FW17	2		A105	1.1	NS		1.940
FW25	1		A105	1.1	NS		1.940
FW25	2		A105	1.1	NS		1.940
FW28	1		A105	1.1	NS		1.940
FW28	2		A105	1.1	NS		1.940
FW34	1		A105	1.1	NS		1.940
FW35	1		A105	1.1	NS		1.940
FW38	1		A105	1.1	NS		1.940
FW40	1		A105	1.1	NS		1.940
GG02	1		A105	1.1	NS		1.940
GG02	2		A105	1.1	NS		1.940
GG05	1		A105	1.1	NS		1.690
GG06	1		A105	1.1	NS		1.690
GG12	1		A105	1.1	NS		1.690
GG13	1		A105	1.1	NS		1.690
GG15	1		A105	1.1	NS		1.690
GG15	2		A105	1.1	NS		1.690
GG18	1		A105	1.1	NS		1.690
GG18	2		A105	1.1	NS		1.690
GG26	1		A105	1.1	NS		2.125
GG28	1		A105	1.1	NS		2.125
GG44	1		A105	1.1	NS		1.690
GG44	2		A105	1.1	NS		1.690
GG48	1		A105	1.1	NS		1.690
GG48	2		A105	1.1	NS		1.690

A N S I F L A N G E C H E C K D A T A L I S T I N G

Point Name	FLG No.	Flange Data Series	Flange Data Material	Flange Data Group	Gasket Data Material	Gasket Data Di(in)	Gasket Data Width(in)
GG50	1		A105	1.1	NS		1.690
GG50	2		A105	1.1	NS		1.690
GG53	1		A105	1.1	NS		1.940
GG53	2		A105	1.1	NS		1.940
GH02	1		A105	1.1	NS		1.690
GH02	2		A105	1.1	NS		1.690
GH09	1		A105	1.1	NS		2.125
GH11	1		A105	1.1	NS		2.125
GH16	1		A105	1.1	NS		2.125
GH18	1		A105	1.1	NS		2.125
GH31	1		A105	1.1	NS		1.935
GH31	2		A105	1.1	NS		1.935
GH35	1		A105	1.1	NS		1.935
GH36	1		A105	1.1	NS		1.935
GH43	1		A105	1.1	NS		1.690
GH44	1		A105	1.1	NS		1.690
GH47	1		A105	1.1	NS		1.940
GH47	2		A105	1.1	NS		1.940
GO01	1		A105	1.1	NS		1.810
GO03	1		A105	1.1	NS		1.810
GS01	1	A	A105	1.1	NS		0.000
GS03	1	A	A105	1.1	NS		0.000
GX03	1		A105	1.1	NS		1.940
GX03	2		A105	1.1	NS		1.940
HF02	1	A	A105	1.1	NS		0.000
HF04	1	A	A105	1.1	NS		0.000
HI01	1	A	A105	1.1	NS		0.000
HI02	1	A	A105	1.1	NS		0.000
HJ01	1	A	A105	1.1	NS		0.000
HJ03	1	A	A105	1.1	NS		0.000
HK01	1	A	A105	1.1	NS		0.000
HK03	1	A	A105	1.1	NS		0.000
HL01	1	A	A105	1.1	NS		0.000
HL03	1	A	A105	1.1	NS		0.000
IG02	1		A105	1.1	NS		2.125
IG04	1		A105	1.1	NS		2.125
IH01	1		A105	1.1	NS		5.190
IH02	1		A105	1.1	NS		5.190
IH07	1		A105	1.1	NS		5.190
IH08	1		A105	1.1	NS		5.190
II01	1		A105	1.1	NS		5.190

V A L V E D A T A L I S T I N G

Point Name	Type	Dnom (in)	Length (ft)	Valve Weight (lb)	Auto	Symbol	Actuator Weight (lb)	DX (ft)	DY (ft)	DZ (ft)	SAF	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)
Tag No. : PLUG VALVE, FULL BORE, 300 LB, RF,															
A09	CATALOG	(		6400	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
A152	CATALOG	(		3326	Yes	No					0.00	WN	1.00		
Tag No. : PLUG VALVE, FULL BORE, 300 LB, RF,															
B15	CATALOG	(		2500	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
B157	CATALOG	(		790	Yes	No					0.00	WN	1.00		
Tag No. : PLUG VALVE, FULL BORE, 300 LB, RF,															
D19	CATALOG	(		1800	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
G31	CATALOG	(		1289	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
G35	CATALOG	(		790	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
H31	CATALOG	(		1289	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
H36	CATALOG	(		3326	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
BF01	CATALOG	(		790	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
BF04	CATALOG	(		1289	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
BF32	CATALOG	(		1289	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
BF35	CATALOG	(		790	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
BG02	CATALOG	(		3326	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
BG06	CATALOG	(		4000	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
BG37	CATALOG	(		4000	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
BG42	CATALOG	(		3326	Yes	No					0.00	WN	1.00		

V A L V E D A T A L I S T I N G

Point Name	Type	Dnom (in)	Length (ft)	Valve Weight (lb)	Auto	Symbol	Actuator Weight (lb)	DX (ft)	DY (ft)	DZ (ft)	SAF	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)
Tag No. : DB&B VALVE															
BG49	CATALOG	(		3326	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
BI01	CATALOG	(		790	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
BI05	CATALOG	(		1289	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
BI34	CATALOG	(		1289	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
BI39	CATALOG	(		790	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
BP01	CATALOG	(		790	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
BP05	CATALOG	(		1289	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
BP37	CATALOG	(		1289	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
BP41	CATALOG	(		790	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
BQ01	CATALOG	(		3326	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
BQ05	CATALOG	(		4000	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
BQ35	CATALOG	(		4000	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
BQ39	CATALOG	(		3326	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
BW02	CATALOG	(		3326	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
BW06	CATALOG	(		4000	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
BW29	CATALOG	(		4000	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
BW33	CATALOG	(		3326	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															

V A L V E D A T A L I S T I N G

Point Name	Type	Dnom (in)	Length (ft)	Valve Weight (lb)	Auto	Symbol	Actuator Weight (lb)	DX (ft)	DY (ft)	DZ (ft)	SAF	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)
FA02	CATALOG	(	(b)	3326	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FA06	CATALOG	(	(b)	4000	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FA29	CATALOG	(	(b)	4000	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FA33	CATALOG	(	(b)	3326	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FB02	CATALOG	(	(b)	790	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FB06	CATALOG	(	(b)	1289	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FB36	CATALOG	(	(b)	1289	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FB40	CATALOG	(	(b)	790	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FD02	CATALOG	(	(b)	790	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FD06	CATALOG	(	(b)	1289	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FD36	CATALOG	(	(b)	1289	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FD40	CATALOG	(	(b)	790	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FG07	CATALOG	(	(b)	790	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FG11	CATALOG	(	(b)	1289	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FG38	CATALOG	(	(b)	1289	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FG42	CATALOG	(	(b)	790	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FH01	CATALOG	(	(b)	3326	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FH12	CATALOG	(	(b)	3326	Yes	No					0.00	WN	1.00		

V A L V E D A T A L I S T I N G

Point Name	Type	Dnom (in)	Length (ft)	Valve Weight (lb)	Auto	Symbol	Actuator Weight (lb)	DX (ft)	DY (ft)	DZ (ft)	SAF	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)
Tag No. : BALL VALVE															
FH16	CATALOG	(	(b)	4000	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FH40	CATALOG	(	(b)	4000	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FH45	CATALOG	(	(b)	3326	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FH54	CATALOG	(	(b)	3326	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FI02	CATALOG	(	(b)	790	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FI06	CATALOG	(	(b)	1289	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FI32	CATALOG	(	(b)	1289	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FI36	CATALOG	(	(b)	790	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FR02	CATALOG	(	(b)	3326	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FR06	CATALOG	(	(b)	4000	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FR33	CATALOG	(	(b)	4000	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FR37	CATALOG	(	(b)	3326	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FW02	CATALOG	(	(b)	3326	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FW06	CATALOG	(	(b)	4000	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE															
FW34	CATALOG	(	(b)	4000	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
FW38	CATALOG	(	(b)	3326	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
GG05	CATALOG	(	(b)	790	Yes	No					0.00	WN	1.00		

V A L V E D A T A L I S T I N G

Point Name	Type	Dnom (in)	Length (ft)	Valve Weight (lb)	Auto	Symbol	Actuator Weight (lb)	DX (ft)	DY (ft)	DZ (ft)	SAF	Joint Type	SIF	Size /Avg. (in)	Type /Max. (in)
Tag No. : BALL VALVE															
GG12	CATALOG	(	(b)	1289	Yes	No					0.00	WN	1.00		
Tag No. : BALL VALVE, LONG PATTERN, 300 LB, R															
GH35	CATALOG	(	(b)	1444	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
GH43	CATALOG	(	(b)	790	Yes	No					0.00	WN	1.00		
Tag No. : DB&B VALVE															
IH01	CATALOG	(	(b)	405	Yes	No					0.00	WN	1.00		
Tag No. : GATE VALVE															
IH07	CATALOG	(	(b)	260	Yes	No					4.50	WN	1.00		

C A T A L O G V A L V E D A T A L I S T I N G

Point Name : A09
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : A152
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : B15
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : B157
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : D19
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : G31
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : G35
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

C A T A L O G V A L V E D A T A L I S T I N G

Point Name : H31
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : H36
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : BF01
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : BF04
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : BF32
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : BF35
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : BG02
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

C A T A L O G V A L V E D A T A L I S T I N G

Point Name : BG06
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : BG37
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : BG42
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : BG49
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : BI01
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : BI05
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : BI34
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

C A T A L O G V A L V E D A T A L I S T I N G

Point Name : BI39
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : BP01
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : BP05
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : BP37
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : BP41
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : BQ01
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : BQ05
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

C A T A L O G V A L V E D A T A L I S T I N G

Point Name : BQ35
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : BQ39
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : BW02
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : BW06
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : BW29
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : BW33
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FA02
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

C A T A L O G V A L V E D A T A L I S T I N G

Point Name : FA06
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FA29
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FA33
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FB02
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FB06
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FB36
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FB40
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

C A T A L O G V A L V E D A T A L I S T I N G

Point Name : FD02
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FD06
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FD36
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FD40
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FG07
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FG11
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FG38
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

C A T A L O G V A L V E D A T A L I S T I N G

Point Name : FG42
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FH01
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FH12
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FH16
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FH40
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FH45
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FH54
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

C A T A L O G V A L V E D A T A L I S T I N G

Point Name : FI02
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FI06
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FI32
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FI36
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FR02
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FR06
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FR33
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

C A T A L O G V A L V E D A T A L I S T I N G

Point Name : FR37
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FW02
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : FW06
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FW34
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

Point Name : FW38
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : GG05
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : GG12
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 150

C A T A L O G V A L V E D A T A L I S T I N G

Point Name : GH35
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Ball Valves
Type : Ball Valve Side Entry
Main End : FL
Rating : 300

Point Name : GH43
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : IH01
Manufacturer: AutoPIPE Generic
Standard : NS
Sub Category: NS
Type : NS
Main End : NS
Rating : NS

Point Name : IH07
Manufacturer: AutoPIPE Generic
Standard : ANSI/ASME
Sub Category: Gate Valves
Type : Gate Valves
Main End : BW
Rating : 150

ADDITIONAL WEIGHT DATA LISTING

Point Name	Added Weight lb	DX ft	DY ft	DZ ft
B196	100.00			
E03	127.00	1.77		
BA03	139.00	-0.81	-1.92	
BD02	127.00	-1.80	-0.76	
BG32	188.00			
BH03	127.00	1.77		
BI30	62.00	-1.50		
BM03	139.00			
BO05	62.00			1.58
EP02	139.00	-1.38	-0.58	
EQ02	139.00			
ER02	139.00			
EY03	127.00			
EZ02	127.00			
FC03	127.00		-1.77	
FE03	127.00			
FF01	139.00	-1.92	-0.81	
FG06	62.00			
FG44	62.00			
FH11	188.00			
FH47	188.00			
GG12	62.00			
GG27	127.00			
GH10	127.00			
GH17	127.00	1.75	0.74	
GO02	139.00			
GS02	555.00			
GX03	188.00			
HF03	555.00	3.00		
HI02	555.00			
HJ02	555.00			
HK02	555.00			
HL02	555.00	-3.00		
IG03	127.00	-1.50		

Structural Load Data Tool For UFC 3-301-01

United States – Hawaii

BASE / CITY
Camp H.M. Smith
Fort Shafter
Hickam AFB
Lualualei
MCBH Kaneohe Bay
Pearl Harbor

Latitude / Longitude

21.3518051, -157.97621000000004

WIND SPEED (MPH)					WIND SPEED (KM/H)				
RISK CATEGORY					RISK CATEGORY				
I	II	III	IV	V	I	II	III	IV	V
115	130	145	145	176	185	209	233	233	283

SNOW LOADING			
GROUND SNOW (PSF)	FROST PENETRATION (IN)	GROUND SNOW (KPA)	FROST PENETRATION (MM)
0	0	0	0

SEISMIC DATA (SITE CLASS C)				
PGA (%G)	S_S (%G)	S_1 (%G)	S_{MS} (%G)	S_{M1} (%G)
26	56.4	16.1	71.9	24.1

(b) (3) (B)

98

40
NO
FA
TE
FA

(b) (3) (B)

(b) (3) (B)

(b) (3) (B)

1 . 2 . 3 . 4 . 5

(b) (3) (B)

(b) (3) (B)

(b) (3) (B)

(b) (3) (B)

(b) (3) (B)

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APPENDIX C
AUTOPIPE EXISTING FACILITY STRESS SUMMARY

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Pipe Stress Analysis and Design Program

Version: 12.08.01.010

Edition: AutoPIPE Standard

Version: 12.08.01.010

Edition: AutoPIPE Standard

Developed and Maintained by

BENTLEY SYSTEMS, INCORPORATED
1065 N. PACIFIC CENTER DRIVE, SUITE 450
ANAHEIM, CA 92806

****
** **
** AUTOPIPE SYSTEM INFORMATION **
** **
****

SYSTEM NAME : Red Hill

PROJECT ID : EMERGENT REPAIR PIPING
9845

PREPARED BY : _____
MRO

CHECKED BY : _____
JFK

1ST APPROVER : _____

2ND APPROVER : _____

PIPING CODE : ASME B31.3

YEAR : 2018

VERTICAL AXIS : Z

AMBIENT TEMPERATURE : 65.0 deg F

COMPONENT LIBRARY : AUTOPIPE

MATERIAL LIBRARY : B313-18

MODEL REVISION NUMBER : 173

SYSTEM NAME : Red Hill

PROJECT ID : EMERGENT REPAIR PIPING
9845

PREPARED BY : _____
MRO

CHECKED BY : _____
JFK

1ST APPROVER : _____

2ND APPROVER : _____

PIPING CODE : ASME B31.3

YEAR : 2018

VERTICAL AXIS : Z

AMBIENT TEMPERATURE : 65.0 deg F

COMPONENT LIBRARY : AUTOPIPE

MATERIAL LIBRARY : B313-18

MODEL REVISION NUMBER : 173

T A B L E O F C O N T E N T S

R E S U L T S U M M A R Y

Maximum displacements (in)

Maximum X :	0.168	Point : 5172	Load Comb.: GT2P2E1{2}
Maximum Y :	0.222	Point : B240	Load Comb.: GT2P2{1}
Maximum Z :	-0.228	Point : D128	Load Comb.: GT1P1{1}
Max. total:	0.244	Point : 5185	Load Comb.: GT2P2E1{2}

Maximum rotations (deg)

Maximum X :	-0.145	Point : D159F	Load Comb.: Pressure 2{1}
Maximum Y :	-0.087	Point : D99	Load Comb.: GT2P2{2}
Maximum Z :	-0.186	Point : B243	Load Comb.: GT2P2{2}
Max. total:	0.210	Point : B243	Load Comb.: GT2P2{2}

Maximum restraint forces (lb)

Maximum X :	-80769	Point : A00	Load Comb.: GT2P2{2}
Maximum Y :	35253	Point : BG51	Load Comb.: GT2P2E1{2}
Maximum Z :	-24338	Point : A223	Load Comb.: Gravity{2}
Max. total:	84969	Point : A00	Load Comb.: GT2P2{2}

Maximum restraint moments (ft-lb)

Maximum X :	23446	Point : FA36	Load Comb.: GT2P2{2}
Maximum Y :	17160	Point : A00	Load Comb.: Gravity{2}
Maximum Z :	40117	Point : A00	Load Comb.: GT2P2E1{2}
Max. total:	42744	Point : A00	Load Comb.: GT2P2E1{2}

Maximum pipe forces (lb)

Maximum X :	218745	Point : A17	Load Comb.: GT2P2E1{2}
Maximum Y :	20126	Point : A96	Load Comb.: GT2P2E1{2}
Maximum Z :	27946	Point : H00	Load Comb.: GT2P2E1{2}
Max. total:	218748	Point : A206	Load Comb.: GT2P2E1{2}

Maximum pipe moments (ft-lb)

Maximum X :	7967	Point : EQ04	Load Comb.: GT2P2E1{2}
Maximum Y :	-40123	Point : A00	Load Comb.: GT2P2E1{2}
Maximum Z :	125351	Point : A223	Load Comb.: GT1P1{1}
Max. total:	125952	Point : A223	Load Comb.: GE1{2}

R E S U L T S U M M A R Y

Maximum sustained stress

Point : D40
Stress psi : 21426
Allowable psi : 20000
Ratio : 1.07
Load combination : GR + P2{1}

Maximum sustained stress

Point : D40
Stress psi : 21426
Allowable psi : 20000
Ratio : 1.07
Load combination : GR + P2{1}

Maximum occasional stress

Point : D40
Stress psi : 141524
Allowable psi : 26600
Ratio : 5.32
Load combination : Sus.(P1)+E3{1}

Maximum occasional stress

Point : D40
Stress psi : 141524
Allowable psi : 26600
Ratio : 5.32
Load combination : Sus.(P1)+E3{1}

Maximum hoop stress

Point : A13 N
Stress psi : 29438
Allowable psi : 20000
Ratio : 1.47
Load combination : Max P{1}

Maximum hoop stress

Point : A13 N
Stress psi : 29438
Allowable psi : 20000
Ratio : 1.47
Load combination : Max P{1}

Maximum sustained stress ratio

Point : D40

R E S U L T S U M M A R Y

Stress psi : 21426
Allowable psi : 20000
Ratio : 1.07
Load combination : GR + P2{1}

Maximum sustained stress ratio

Point : D40
Stress psi : 21426
Allowable psi : 20000
Ratio : 1.07
Load combination : GR + P2{1}

Maximum occasional stress ratio

Point : D40
Stress psi : 141524
Allowable psi : 26600
Ratio : 5.32
Load combination : Sus.(P1)+E3{1}

Maximum occasional stress ratio

Point : D40
Stress psi : 141524
Allowable psi : 26600
Ratio : 5.32
Load combination : Sus.(P1)+E3{1}

Maximum hoop stress ratio

Point : A13 N
Stress psi : 29438
Allowable psi : 20000
Ratio : 1.47
Load combination : Max P{1}

Maximum hoop stress ratio

Point : A13 N
Stress psi : 29438
Allowable psi : 20000
Ratio : 1.47
Load combination : Max P{1}

* * * The system does not satisfy ASME B31.3 (2018) code requirements * * *
* * * for the selected options * * *

AutoPIPE Output Data Available Upon Request

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APPENDIX D
AUTOPIPE PROPOSED REPAIRS STRESS SUMMARY

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Pipe Stress Analysis and Design Program

Version: 12.08.01.010

Edition: AutoPIPE Standard

Version: 12.08.01.010

Edition: AutoPIPE Standard

Developed and Maintained by

BENTLEY SYSTEMS, INCORPORATED
1065 N. PACIFIC CENTER DRIVE, SUITE 450
ANAHEIM, CA 92806

****
** **
** AUTOPIPE SYSTEM INFORMATION **
** **
****

SYSTEM NAME : Red Hill

PROJECT ID : EMERGENT REPAIR PIPING - PROPOSED
9845

PREPARED BY : _____
RJJ

CHECKED BY : _____
MRO

1ST APPROVER : _____

2ND APPROVER : _____

PIPING CODE : ASME B31.3

YEAR : 2018

VERTICAL AXIS : Z

AMBIENT TEMPERATURE : 65.0 deg F

COMPONENT LIBRARY : AUTOPIPE

MATERIAL LIBRARY : B313-18

MODEL REVISION NUMBER : 19

SYSTEM NAME : Red Hill

PROJECT ID : EMERGENT REPAIR PIPING - PROPOSED
9845

PREPARED BY : _____
RJJ

CHECKED BY : _____
MRO

1ST APPROVER : _____

2ND APPROVER : _____

PIPING CODE : ASME B31.3

YEAR : 2018

VERTICAL AXIS : Z

AMBIENT TEMPERATURE : 65.0 deg F

COMPONENT LIBRARY : AUTOPIPE

MATERIAL LIBRARY : B313-18

MODEL REVISION NUMBER : 19

T A B L E O F C O N T E N T S

R E S U L T S U M M A R Y

Maximum displacements (in)

Maximum X :	0.100	Point : 5172	Load Comb.: GT1P1{2}
Maximum Y :	0.089	Point : 5339	Load Comb.: GE3{2}
Maximum Z :	-0.223	Point : A228	Load Comb.: GE1{2}
Max. total:	0.224	Point : A228	Load Comb.: GE1{2}

Maximum rotations (deg)

Maximum X :	-0.083	Point : D98	Load Comb.: GE3{2}
Maximum Y :	0.085	Point : A228	Load Comb.: GE1{2}
Maximum Z :	-0.030	Point : B242	Load Comb.: GT1P1{2}
Max. total:	0.087	Point : D98	Load Comb.: GE3{2}

Maximum restraint forces (lb)

Maximum X :	-24156	Point : A00	Load Comb.: GT1P1{2}
Maximum Y :	-9815	Point : FA00	Load Comb.: GT1P1{2}
Maximum Z :	-24334	Point : A223	Load Comb.: Gravity{2}
Max. total:	25807	Point : A00	Load Comb.: GT1P1{2}

Maximum restraint moments (ft-lb)

Maximum X :	23173	Point : FA36	Load Comb.: GT1P1{2}
Maximum Y :	17160	Point : A00	Load Comb.: Gravity{2}
Maximum Z :	11440	Point : A00	Load Comb.: GT1P1{2}
Max. total:	27534	Point : FA36	Load Comb.: GE1{2}

Maximum pipe forces (lb)

Maximum X :	65204	Point : A203	Load Comb.: GT1P1{2}
Maximum Y :	13861	Point : A223	Load Comb.: Gravity{2}
Maximum Z :	8015	Point : H00	Load Comb.: Pressure 1{2}
Max. total:	65214	Point : A203	Load Comb.: GT1P1{2}

Maximum pipe moments (ft-lb)

Maximum X :	6862	Point : A11	Load Comb.: GE3{2}
Maximum Y :	-17768	Point : A223	Load Comb.: GE3{2}
Maximum Z :	124764	Point : A223	Load Comb.: GE1{2}
Max. total:	125487	Point : A223	Load Comb.: GE1{2}

R E S U L T S U M M A R Y

Maximum sustained stress

Point : A223
Stress psi : 6820
Allowable psi : 20000
Ratio : 0.34
Load combination : GR + Max P{1}

Maximum sustained stress

Point : A223
Stress psi : 6820
Allowable psi : 20000
Ratio : 0.34
Load combination : GR + Max P{1}

Maximum displacement stress

Point : D92 F
Stress psi : 0
Allowable psi : 30000
Ratio : 0.00
Load combination : Max Range

Maximum displacement stress

Point : D92 F
Stress psi : 0
Allowable psi : 30000
Ratio : 0.00
Load combination : Max Range

Maximum occasional stress

Point : B177
Stress psi : 22728
Allowable psi : 26600
Ratio : 0.85
Load combination : Sus.(P1)+E3{1}

Maximum occasional stress

Point : B177
Stress psi : 22728
Allowable psi : 26600
Ratio : 0.85
Load combination : Sus.(P1)+E3{1}

Maximum hoop stress

Point : A13 N
Stress psi : 8780
Allowable psi : 20000
Ratio : 0.44
Load combination : Max P{1}

Maximum hoop stress

Point : A13 N
Stress psi : 8780
Allowable psi : 20000
Ratio : 0.44
Load combination : Max P{1}

Maximum sustained stress ratio

Point : A223
Stress psi : 6820
Allowable psi : 20000
Ratio : 0.34
Load combination : GR + Max P{1}

Maximum sustained stress ratio

Point : A223
Stress psi : 6820
Allowable psi : 20000
Ratio : 0.34
Load combination : GR + Max P{1}

Maximum displacement stress ratio

Point : D92 F
Stress psi : 0
Allowable psi : 30000
Ratio : 0.00
Load combination : Max Range

Maximum displacement stress ratio

Point		: D92 F
Stress	psi	: 0
Allowable	psi	: 30000
Ratio		: 0.00
Load combination		: Max Range

Maximum occasional stress ratio

Point		: B177
Stress	psi	: 22728
Allowable	psi	: 26600
Ratio		: 0.85
Load combination		: Sus.(P1)+E3{1}

Maximum occasional stress ratio

Point		: B177
Stress	psi	: 22728
Allowable	psi	: 26600
Ratio		: 0.85
Load combination		: Sus.(P1)+E3{1}

Maximum hoop stress ratio

Point		: A13 N
Stress	psi	: 8780
Allowable	psi	: 20000
Ratio		: 0.44
Load combination		: Max P{1}

Maximum hoop stress ratio

Point		: A13 N
Stress	psi	: 8780
Allowable	psi	: 20000
Ratio		: 0.44
Load combination		: Max P{1}

* * * The system satisfies ASME B31.3 (2018) code requirements * * *
* * * for the selected options * * *

AutoPIPE Output Data Available Upon Request

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APPENDIX E
PIPE SUPPORT SCREENSHOTS

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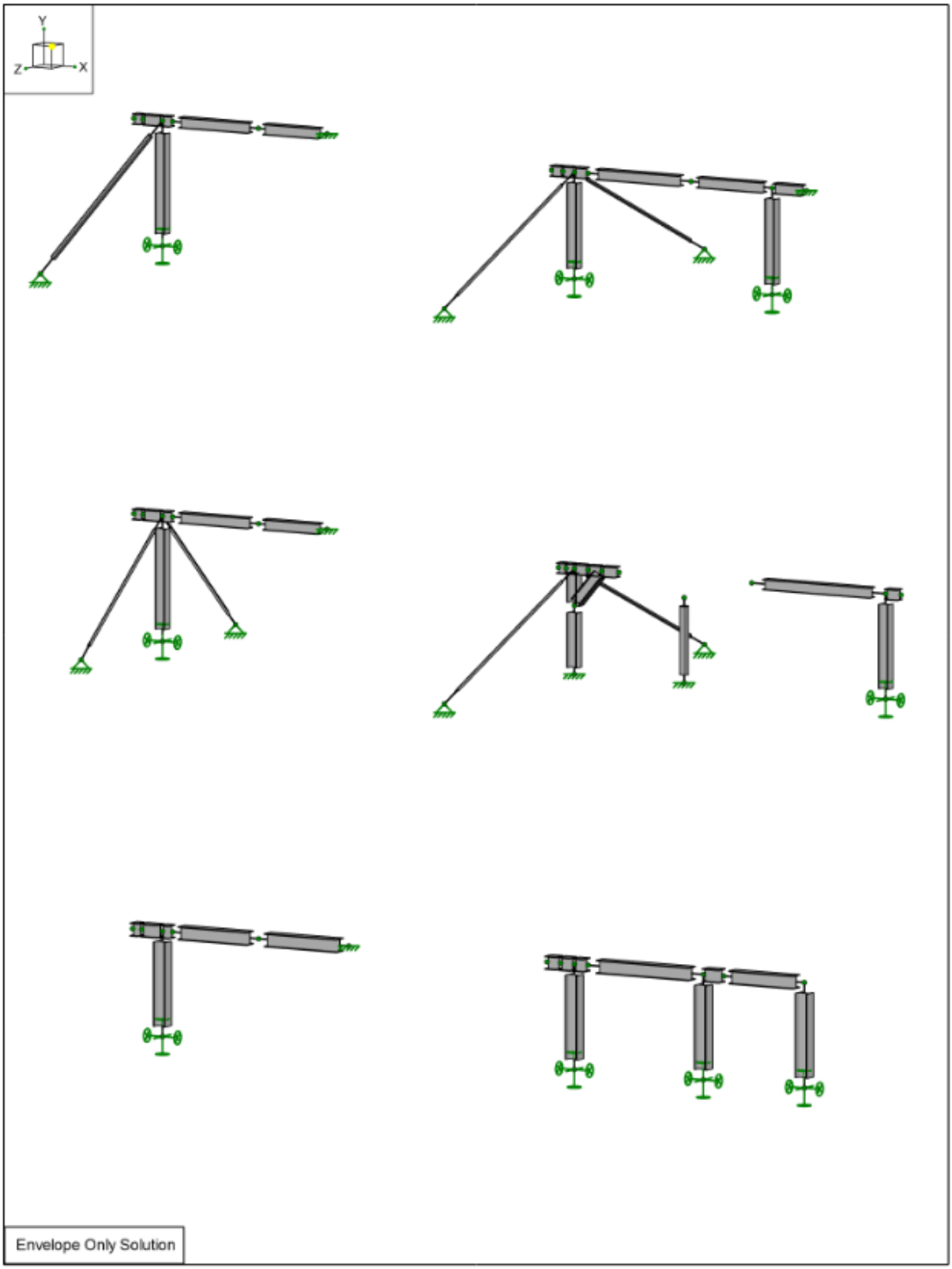

Figure 1: Existing Pipe Support Models

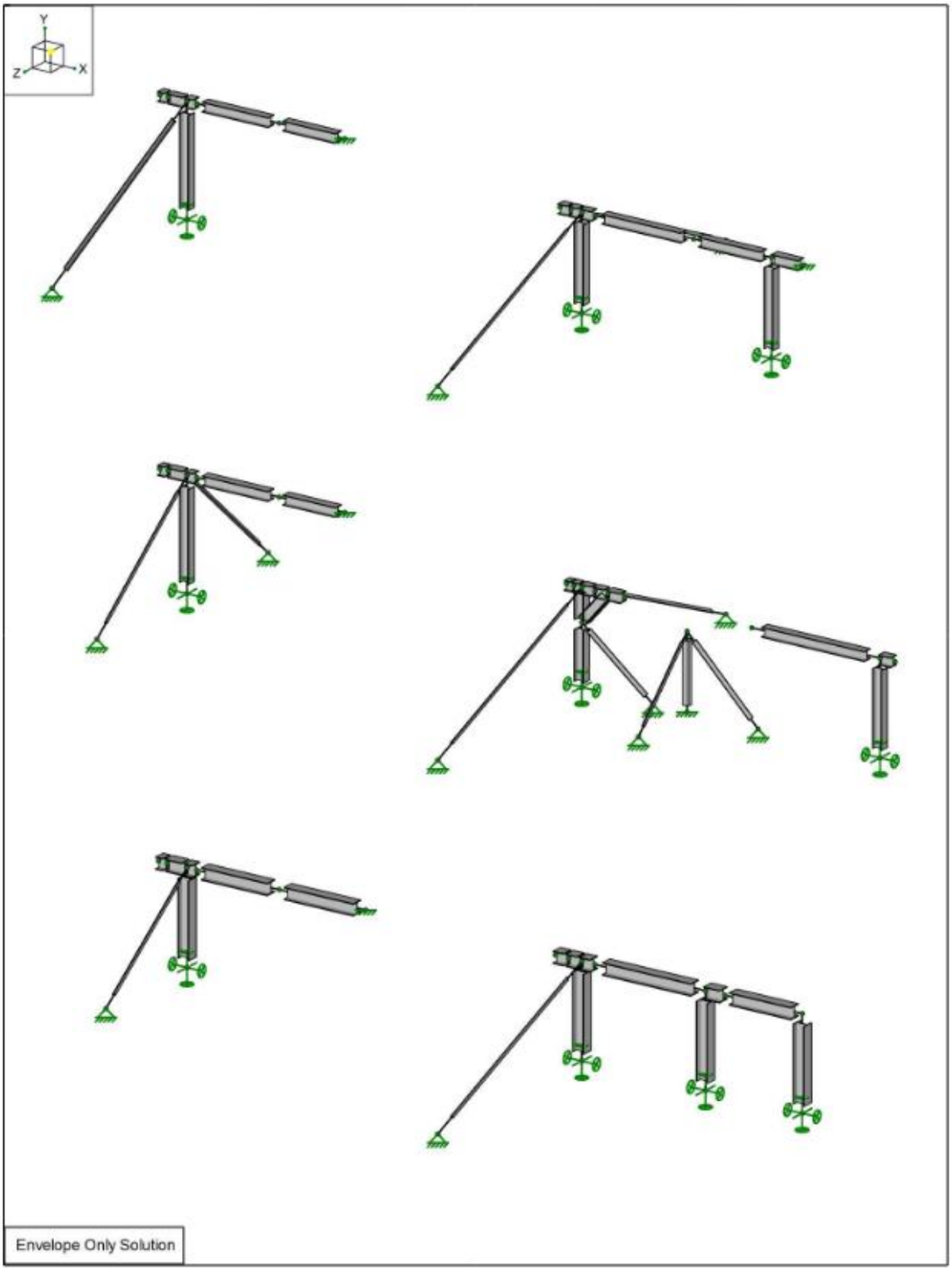

Figure 2: Modified Pipe Support Models

APPENDIX F
MAPPED SPECTRAL RESPONSE FOR OCCASIONAL STRESS

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MAPPED SPECTRAL RESPONSE

Mapped spectral response value (S_s) corresponds to the latitude/longitude of the facility location. Structural load data according to UFC 3-301-01 provides a conversative value of S_s for the design of a facility. To determine a break point at which the calculated occasional stresses remained at or below the allowable occasional stresses (resulting in a stress ratio less than or equal to 1.00), an iterative calculation was run. The existing model was modified to include the proposed vertical support between Tank 1 and 2 (recommendation 2). Multiple seismic cases were set up with decreasing S_s (starting at S_s=0.5640).

The break point at which the calculated occasional stresses remained at or below the allowable occasional stresses corresponds to an S_s value of 0.11

Mapped Spectral Response for Occasional Stress							
Case	**Seismic Code**	**Vertical Factor**	**X (g)**	**Y (g)**	**Z (g)**	**S_s**	**Max Code Ratio**
E1	ASCE 2016	0.2	0.2156	0.2156	0.0431	0.564	3.32
E2	ASCE 2016	0.2	0.1950	0.1950	0.0390	0.5	3.02
E3	ASCE 2016	0.2	0.1755	0.1755	0.0351	0.45	2.74
E4	ASCE 2016	0.2	0.1560	0.1560	0.0312	0.40	2.46
E5	ASCE 2016	0.2	0.1365	0.1365	0.0273	0.35	2.18
E6	ASCE 2016	0.2	0.1170	0.1170	0.0234	0.30	1.9
E7	ASCE 2016	0.2	0.0975	0.0975	0.0195	0.25	1.64
E8	ASCE 2016	0.2	0.0780	0.0780	0.0156	0.20	1.4
E9	ASCE 2016	0.2	0.0585	0.0585	0.0117	0.15	1.17
E10	ASCE 2016	0.2	0.0546	0.0546	0.0109	0.14	1.12
E11	ASCE 2016	0.2	0.0507	0.0507	0.0101	0.13	1.07
E12	ASCE 2016	0.2	0.0468	0.0468	0.0094	0.12	1.03
E13	ASCE 2016	0.2	0.0429	0.0429	0.0086	0.11	0.98
E14	ASCE 2016	0.2	0.0390	0.0390	0.0078	0.10	0.93

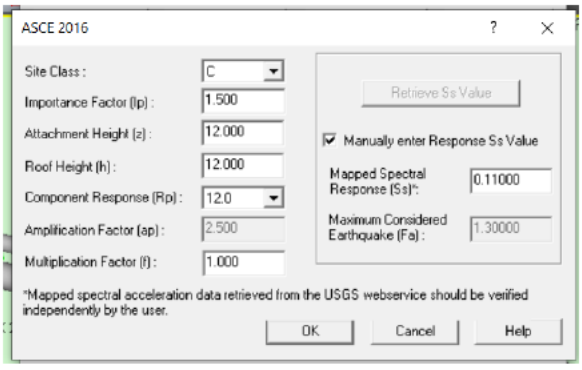

Figure 1 AutoPIPE Static Earthquake Inputs

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