## CEMENT: SURFACE

Stage Tool Depth: N/A

**Lead:**

| | | | |
|---|---|---|---|
| Top MD of Segment: | 0 | Btm MD of Segment: | 1285.47 |
| Cmt Type: | C | Cmt Additives: | 4% Bentonite + 1% CaCl2 |
| Quantity (sks): | 650 | | |
| Yield (cu/ft/sk): | 1.73 | Volume (cu/ft): | 1124.5 |
| Density (lbs/gal): | 13.5 | Percent OH Excess: | 25% |

**Tail:**

| | | | |
|---|---|---|---|
| Top MD of Segment: | 1285.47 | Btm MD of Segment: | 1700 |
| Cmt Type: | C | Cmt Additives: | 1% CaCl2 |
| Quantity (sks): | 300 | | |
| Yield (cu/ft/sk): | 1.33 | Volume (cu/ft): | 399 |
| Density (lbs/gal): | 14.8 | Percent OH Excess: | 25% |

## CEMENT: INTERMEDIATE

Single Stage

**Lead:**

| | | | |
|---|---|---|---|
| Top MD of Segment: | 0 | Btm MD of Segment: | 5144.38 |
| Cmt Type: | C | Cmt Additives: | 5% NaCl + 6% Bentonite + 2 lb/sk Kolseal + 0.125 lb/sk Celloflake + 0.4% Retarder |
| Quantity (sks): | 1043 | | |
| Yield (cu/ft/sk): | 1.885 | Volume (cu/ft): | 1966.06 |
| Density (lbs/gal): | 12.9 | Percent OH Excess: | 25% |

**Tail:**

| | | | |
|---|---|---|---|
| Top MD of Segment: | 5144.38 | Btm MD of Segment: | 5780 |
| Cmt Type: | C | Cmt Additives: | 0.2% Retarder |
| Quantity (sks): | 200 | | |
| Yield (cu/ft/sk): | 1.34 | Volume (cu/ft): | 268 |
| Density (lbs/gal): | 14.8 | Percent OH Excess: | 25% |

****CONTINGENCY 2 Stage Cement Job**

*** DVT depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.**

***If lost circulation is encountered, Apache may 2-stage Interm csg. A DVT may be used in the 7" csg & ECP may be placed below DVT.**

1st Stage

**Lead:**

| | | | |
|---|---|---|---|
| Top MD of Segment: | 3500 | Btm MD of Segment: | 5144.38 |
| Cmt Type: | C | Cmt Additives: | 5% NaCl + 6% Bentonite + 2 lb/sk Kolseal + 0.125 lb/sk Celloflake + 0.4% Retarder |
| Quantity (sks): | 345 | | |
| Yield (cu/ft/sk): | 1.885 | Volume (cu/ft): | 650.33 |
| Density (lbs/gal): | 12.9 | Percent OH Excess: | 25% |

**Tail:**

| | | | |
|---|---|---|---|
| Top MD of Segment: | 5144.38 | Btm MD of Segment: | 5780 |
| Cmt Type: | C | Cmt Additives: | 0.3% Retarder |
| Quantity (sks): | 200 | | |
| Yield (cu/ft/sk): | 1.34 | Volume (cu/ft): | 268 |
| Density (lbs/gal): | 14.8 | Percent OH Excess: | 25% |

Stage Tool / ECP Depth: ± 3500'

2nd Stage

**Lead:**

Top MD of Segment: 0 | Btm MD of Segment: 2815.44

Cmt Type: C | Cmt Additives: 5% NaCl + 6% Bentonite

Quantity (sks): 565
Yield (cu/ft/sk): 1.868 | Volume (cu/ft): 1055.42
Density (lbs/gal): 12.9 | Percent OH Excess: 25%

**Tail:**

Top MD of Segment: 2815.44 | Btm MD of Segment: 3500

Cmt Type: C | Cmt Additives: 0.3% Retarder

Quantity (sks): 200
Yield (cu/ft/sk): 1.34 | Volume (cu/ft): 268
Density (lbs/gal): 14.8 | Percent OH Excess: 25%

**CEMENT: PRODUCTION**

Single Stage

**Lead:**

Top MD of Segment: 3000 | Btm MD of Segment: 10461.18

Cmt Type: H | Cmt Additives: 10% gel + 5% Salt

Quantity (sks): 925
Yield (cu/ft/sk): 2.32 | Volume (cu/ft): 1221
Density (lbs/gal): 11.9 | Percent OH Excess: 20%

**Tail:**

Top MD of Segment: 10461.18 | Btm MD of Segment: 15667.23

Cmt Type: TXI Lite  Cmt Additives: 0.3% Fluid Loss + 0.2% Retarder

Quantity (sks): 1103
Yield (cu/ft/sk): 1.44 Volume (cu/ft): 1588.32
Density (lbs/gal): 12.8 Percent OH Excess: 20%

**CONTINGENCY 2 Stage Cement Job

* DV tool depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

*If lost circulation is encountered, Apache may 2-stage Interm csg. A DVT may be used in the 7" csg & ECP may be placed below DVT.

1st Stage

**Lead:**

Top MD of Segment: 5830  Btm MD of Segment: 10461.18

Cmt Type: H  Cmt Additives: 10% gel + 5% Salt

Quantity (sks): 606
Yield (cu/ft/sk): 2.32 Volume (cu/ft): 1405.92
Density (lbs/gal): 11.9 Percent OH Excess: 20%

**Tail:**

Top MD of Segment: 10461.18  Btm MD of Segment: 15667.23

Cmt Type: TXI Lite  Cmt Additives: 0.3% Fluid Loss + 0.2% Retarder

Quantity (sks): 1103
Yield (cu/ft/sk): 1.44 Volume (cu/ft): 1588.32
Density (lbs/gal): 12.8 Percent OH Excess: 20%

Stage Tool / ECP Depth: ± 5830'

2nd Stage

**Lead:**

| | | | |
|---|---|---|---|
| Top MD of Segment: | 3000 | Btm MD of Segment: | 4810.33 |
| Cmt Type: | H | Cmt Additives: | 10% gel + 5% Salt |
| Quantity (sks): | 204 | | |
| Yield (cu/ft/sk): | 2.32 | Volume (cu/ft): | 473.28 |
| Density (lbs/gal): | 11.9 | Percent OH Excess: | 20% |

**Tail:**

| | | | |
|---|---|---|---|
| Top MD of Segment: | 4810.33 | Btm MD of Segment: | 5830 |
| Cmt Type: | C | Cmt Additives: | 0.3% Retarder |
| Quantity (sks): | 200 | | |
| Yield (cu/ft/sk): | 1.34 | Volume (cu/ft): | 268 |
| Density (lbs/gal): | 14.8 | Percent OH Excess: | 20% |

## BLACK & TAN 27 FEDERAL COM 302H

**String:** SURFACE

Hole Size: 17.5

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Top Setting Depth (MD): | 0 | Top Setting Depth (TVD): | 0 | Btm setting depth (MD): | 1700 | Btm setting depth (TVD): | 1700 |
| Size: | 13-3/8" | Grade: | J-55 | Weight (lbs/ft): | 54.5 | Joint (Butt,FJ, LTC,STC, SLH, N/A, Other): | Buttress |

Condition (New/Used): New  Standard (API/Non-API): API

Tapered String (Y/N)?: N
If yes, need spec attachment

**Safety Factors**

Collapse Design Safety Factor: 2.15  Burst Design Safety Factor: 1.82

Body Tensile Design Safety Factor type?: Dry/Buoyant: Buoyant
Body Tensile Design Safety Factor: 3.79

Joint Tensile Design Safety Factor type?: Dry/Buoyant: Buoyant
Joint Tensile Design Safety Factor: 4.04

**String:** INTERMEDIATE

Hole Size: 12.25

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Top Setting Depth (MD): | 0 | Top Setting Depth (TVD): | 0 | Btm setting depth (MD): | 900 | Btm setting depth (TVD): | 900 |
| Size: | 9-5/8" | Grade: | J-55 | Weight (lbs/ft): | 40 | Joint (Butt,FJ, LTC,STC, SLH, N/A, Other): | Buttress |

Condition (New/Used): New  Standard (API/Non-API): API

Tapered String (Y/N)?: N
If yes, need spec attachment

**Safety Factors**

Collapse Design Safety Factor: 5.37  Burst Design Safety Factor: 1.7

Body Tensile Design Safety Factor type?: Dry/Buoyant  Buoyant
Body Tensile Design Safety Factor: 1.96

Joint Tensile Design Safety Factor type?: Dry/Buoyant  Buoyant
Joint Tensile Design Safety Factor: 2.24

| Top Setting Depth (MD): | 900 | Top Setting Depth (TVD): | 900 | Btm setting depth (MD): | 5780 | Btm setting depth (TVD): | 5780 |
|---|---|---|---|---|---|---|---|
| Size: | 9-5/8" | Grade: | J-55 | Weight (lbs/ft): | 40 | Joint (Butt,FJ, LTC,STC, SLH, N/A, Other): | LTC |

Condition (New/Used): New  Standard (API/Non-API): API

Tapered String (Y/N)?: N
If yes, need spec attachment

**Safety Factors**

Collapse Design Safety Factor: 1.54  Burst Design Safety Factor: 1.87

Body Tensile Design Safety Factor type?: Dry/Buoyant  Buoyant
Body Tensile Design Safety Factor: 2.15

Joint Tensile Design Safety Factor type?: Dry/Buoyant  Buoyant
Joint Tensile Design Safety Factor: 1.8

**String:** **PRODUCTION**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Hole Size: | 8.75 | | | | | | |
| Top Setting Depth (MD): | 0 | Top Setting Depth (TVD): | 0 | Btm setting depth (MD): | 15667.23 | Btm setting depth (TVD): | 10950 |
| Size: | 5-1/2" | Grade: | P-110 | Weight (lbs/ft): | 17 | Joint (Butt,FJ, LTC,STC, SLH, N/A, Other): | Buttress |

Condition (New/Used): New  Standard (API/Non-API): API

**Safety Factors**

Collapse Design Safety Factor: 1.36  Burst Design Safety Factor: 1.33

Body Tensile Design Safety Factor type?: Dry/Buoyant  Buoyant
Body Tensile Design Safety Factor: 2.04

Joint Tensile Design Safety Factor type?: Dry/Buoyant  Buoyant
Joint Tensile Design Safety Factor: 2.13

Tapered String (Y/N)?: N
If yes, need spec attachment

| QUALITY CONTROL INSPECTION AND TEST CERTIFICATE | | | | | CERT. N°: | 373 | |
|---|---|---|---|---|---|---|---|
| PURCHASER: | ContiTech Oil & Marine Corp. | | | | P.O. N°: | 4500398355 | |
| CONTITECH RUBBER order N°: | 538079 | | HOSE TYPE: | 3" ID | Choke and Kill Hose | | |
| HOSE SERIAL N°: | 67090 | | NOMINAL / ACTUAL LENGTH: | | 10,67 m / 10,73 m | | |
| W.P. 68,9 MPa | 10000 psi | | T.P. 103,4 MPa | 15000 psi | Duration: | 60 | min. |

Pressure test with water at ambient temperature

See attachment. ( 1 page )

↑ 10 mm = 10 Min.

→ 10 mm = 25 MPa

| COUPLINGS Type | Serial N° | Quality | Heat N° |
|---|---|---|---|
| 3" coupling with | 1252 8901 | AISI 4130 | A0709N A1126U |
| 4 1/16" 10K API b.w. Flange end | | AISI 4130 | 035285 |

**NOT DESIGNED FOR WELL TESTING** **API Spec 16 C**

**Temperature rate:"B"**

All metal parts are flawless

**WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.**

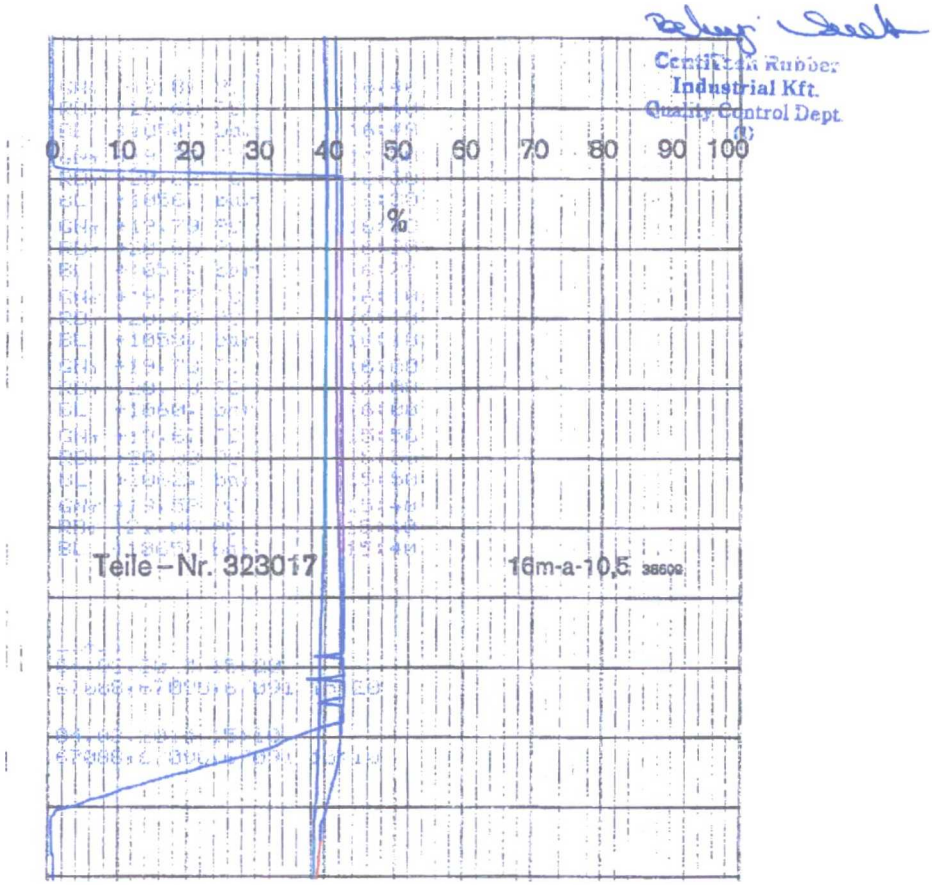
STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

COUNTRY OF ORIGIN HUNGARY/EU

| Date: | Inspector | Quality Control |
|---|---|---|
| 05. March 2014. | | ContiTech Rubber Industrial Kft. Quality Control Dept. |

*ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE* *No: 371, 373, 374*





Continental CONTITECH

## Hose Data Sheet

| | |
|---|---|
| CRI Order No. | 538079 |
| Customer | ContiTech Oil & Marine Corp. |
| Customer Order No | 4500398355 |
| Item No. | 1 |
| Hose Type | Flexible Hose |
| **Standard** | **API SPEC 16 C** |
| Inside dia in inches | 3 |
| Length | 35 ft |
| Type of coupling one end | FLANGE 4.1/16" 10K API SPEC 6A TYPE 6BX FLANGE C/W BX155 R.GR.SOUR |
| Type of coupling other end | FLANGE 4.1/16" 10K API SPEC 6A TYPE 6BX FLANGE C/W BX155 R.GR.SOUR |
| H2S service NACE MR0175 | Yes |
| Working Pressure | 10 000 psi |
| Design Pressure | 10 000 psi |
| Test Pressure | 15 000 psi |
| Safety Factor | 2,25 |
| Marking | USUAL PHOENIX |
| Cover | NOT FIRE RESISTANT |
| Outside protection | St.steel outer wrap |
| Internal stripwound tube | No |
| Lining | OIL + GAS RESISTANT SOUR |
| Safety clamp | No |
| Lifting collar | No |
| Element C | No |
| Safety chain | No |
| Safety wire rope | No |
| Max.design temperature [°C] | 100 |
| Min.design temperature [°C] | -20 |
| Min. Bend Radius operating [m] | 0,90 |
| Min. Bend Radius storage [m] | 0,90 |
| Electrical continuity | The Hose is electrically continuous |
| Type of packing | WOODEN CRATE ISPM-15 |

Black and Tan 27 Federal COM 302H Intermediate Casing Design Assumptions

## Pore Pressure

| Vertical Depth (ft) | Pore Pressure/EMW | | Permeable Zones |
|---|---|---|---|
| Depth (ft) | (psi) | (ppg) | Zones |
| 20 | 0 | 0 | No |
| 1700 | 748 | 8.47 | No |
| 3900 | 1621 | 8 | No |
| 5800 | 2552 | 8.47 | No |
| 8586 | 3970 | 8.9 | No |
| 11352 | 5661 | 9.6 | No |

## Fracture Pressure

| Vertical Depth (ft) | Fracture Pressure/EMW | |
|---|---|---|
| Depth (ft) | (psi) | (ppg) |
| 20 | 9 | 9 |
| 1700 | 1189 | 13.46 |
| 3900 | 2026 | 10 |
| 5800 | 4055 | 13.46 |
| 8586 | 6004 | 13.46 |
| 11352 | 8551 | 14.5 |

## Temperature Gradient

Ambient Temperature is 80° F

Temperature gradient of 0.75°/100' TVD

## Analysis Options

- Single External Pressure Profile
- Temperature Deration
- Buckling

# Intermediate Casing Loads

## Burst Loads

### Internal Profile

Drilling Loads

- Gas Kick Profile
  - Influx at 15,667.2' MD
  - 30 Bbl Kick Volume
  - 0.5 ppg Kick Intensity
  - Maximum Mud Weight of 9.5 ppg
  - Kick gas gravity of 0.7 ppg
  - No margin of error on frac gradient
  - 5" DP
  - 650' of 6.5" Drill Collars
- Lost Returns with Water
  - No margin of error on frac gradient
  - Mud/Water Interface at 5780'
  - Mud weight with losses at 9.5 ppg
- Pressure Test
  - 1500 psi casing pressure test with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 2300 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water

### External Profile

- Mud and Cement Mix-Water
  - TOC at surface
  - Mud weight is 10.2 ppg
  - Cement Mix-Water Density is 8.33 ppg

## Collapse Loads

### Internal Profile

Drilling Loads

- Partial Evacuation
  - 50% evacuation. Top of mud level at 2890'.
  - Mud Weight is 10.2 ppg
- Lost Returns with Mud Drop

    - Losses occurring at 5800' MD
    - Pore Pressure at 8.33 ppg
    - Current Mud Weight at 9.5 ppg
    - Mud level drops to 714.3'
- Cementing
    - Lead Slurry Density at 12.9 ppg
    - Tail Slurry Density at 14.8 ppg
    - Tail Slurry Length of 500'
    - TOC at surface
    - Mud Weight at shoe 10.2 ppg
    - Displacement fluid density at 8.33 ppg

### External Profile

- Fluid Gradients w/ Pore Pressure
    - Fluid Gradient Above TOC is 10.2 ppg
    - Fluid Gradient Below TOC is 10.2 ppg

## Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 2300 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

# Black and Tan 27 Federal COM 302H Surface Casing Design Assumptions

## Pore Pressure

| Vertical Depth (ft) | Pore Pressure/EMW | | Permeable Zones |
|---|---|---|---|
| Depth (ft) | (psi) | (ppg) | Zones |
| 20 | 0 | 0 | No |
| 1700 | 748 | 8.47 | No |
| 3900 | 1621 | 8 | No |
| 5800 | 2552 | 8.47 | No |
| 8586 | 3970 | 8.9 | No |
| 11352 | 5661 | 9.6 | No |

## Fracture Pressure

| Vertical Depth (ft) | Fracture Pressure/EMW | |
|---|---|---|
| Depth (ft) | (psi) | (ppg) |
| 20 | 9 | 9 |
| 1700 | 1189 | 13.46 |
| 3900 | 2026 | 10 |
| 5800 | 4055 | 13.46 |
| 8586 | 6004 | 13.46 |
| 11352 | 8551 | 14.5 |

## Temperature Gradient

Ambient Temperature is 80° F

Temperature gradient of 0.75°/100' TVD

## Analysis Options

- Single External Pressure Profile
- Temperature Deration
- Buckling

# Surface Casing Loads

## Burst Loads

### Internal Profile

Drilling Loads

- Fracture @ Shoe w/ Gas Gradient Above
  - No margin of error on frac gradient
  - Using a 0.7 ppg gas gradient
- Lost Returns with Water
  - No margin of error on frac gradient
  - Mud/Water Interface at 1700'
  - Mud weight with losses at 10.2 ppg
- Pressure Test
  - 1500 psi casing pressure test with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 1200 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water

### External Profile

- Mud and Cement Mix-Water
  - TOC at surface
  - Mud weight is 8.6 ppg
  - Cement Mix-Water Density is 8.33 ppg

## Collapse Loads

### Internal Profile

Drilling Loads

- Partial Evacuation
  - 50% evacuation. Top of mud level at 850'.
  - Mud Weight is 8.6 ppg
- Lost Returns with Mud Drop
  - Losses occurring at 4000'
  - Pore Pressure at 8.00 ppg
  - Current Mud Weight at 10.2 ppg
  - Mud level drops to 863'
- Cementing
  - Lead slurry of 13.5 ppg with TOC at surface

- Tail slurry slurry at 14.8 ppg with length of 500'
- Mud weight at shoe 8.6 ppg
- Displacement fluid density at 8.33 ppg

### External Profile

- Fluid Gradients w/ Pore Pressure
  - Fluid Gradient Above TOC is 8.6 ppg
  - Fluid Gradient Below TOC is 8.6 ppg

## Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 1200 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

# Black and Tan 27 Federal COM 302H Production Casing Design Assumptions

## Pore Pressure

| Vertical Depth (ft) | Pore Pressure/EMW | | Permeable Zones |
|---|---|---|---|
| Depth (ft) | (psi) | (ppg) | Zones |
| 20 | 0 | 0 | No |
| 1700 | 748 | 8.47 | No |
| 3900 | 1621 | 8 | No |
| 5800 | 2552 | 8.47 | No |
| 8586 | 3970 | 8.9 | No |
| 11352 | 5661 | 9.6 | No |

## Fracture Pressure

| Vertical Depth (ft) | Fracture Pressure/EMW | |
|---|---|---|
| Depth (ft) | (psi) | (ppg) |
| 20 | 9 | 9 |
| 1700 | 1189 | 13.46 |
| 3900 | 2026 | 10 |
| 5800 | 4055 | 13.46 |
| 8586 | 6004 | 13.46 |
| 11352 | 8551 | 14.5 |

## Temperature Gradient

Ambient Temperature is 80° F

Temperature gradient of 0.75°/100' TVD

## Analysis Options

- Single External Pressure Profile
- Temperature Deration
- Buckling

# Production Casing Loads

## Burst Loads

### Internal Profile

Drilling Loads

- Pressure Test
  - 8000 psi with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 3800 psi put on casing when bumping the plug with 8.33 ppg displacement

Production Loads

- Tubing Leak
  - Packer Fluid Density at 8.6 ppg
  - Packer Depth of 10411.2'
  - Perf Depth at 15667.2' MD
  - Gas/Oil Gradient 0.35 psi/ft
  - Reservoir pressure at 5119 psi
- Injection Down Casing
  - Injection pressure of 8000 psi
  - Injection density of 9.4 ppg

### External Profile

- Fluid Gradients w/ Pore Pressure
  - 9.5 ppg mud weight above TOC
  - 8.33 ppg below TOC
  - Pore pressure applied in the openhole

## Collapse Loads

### Internal Profile

Drilling Loads

- Cementing
  - Mud weight at shoe is 9.5 ppg
  - TOC at surface
  - Lead Slurry Density is 11.9 ppg
  - Tail Slurry Density is 12.8 ppg
  - Tail Slurry Length at 5706.1'.
  - Displacement fluid density is 8.33 ppg

Production Loads

- Full Evacuation
- Above/Below Packer
    - Reservoir pressure at 4850 psi
    - Density Above Packer at 8.6 ppg
    - Density Below Packer at 6.0 ppg
    - Assuming a fluid drop above the packer

## External Profile

- Fluid Gradients w/ Pore Pressure
    - Fluid Gradient Above TOC is 9.5 ppg
    - Fluid Gradient Below TOC is 9.5 ppg

## Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 3800 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

Black and Tan 27 Federal COM 302H Intermediate Casing Design Assumptions

## Pore Pressure

| Vertical Depth (ft) | Pore Pressure/EMW | | Permeable Zones |
|---|---|---|---|
| Depth (ft) | (psi) | (ppg) | Zones |
| 20 | 0 | 0 | No |
| 1700 | 748 | 8.47 | No |
| 3900 | 1621 | 8 | No |
| 5800 | 2552 | 8.47 | No |
| 8586 | 3970 | 8.9 | No |
| 11352 | 5661 | 9.6 | No |

## Fracture Pressure

| Vertical Depth (ft) | Fracture Pressure/EMW | |
|---|---|---|
| Depth (ft) | (psi) | (ppg) |
| 20 | 9 | 9 |
| 1700 | 1189 | 13.46 |
| 3900 | 2026 | 10 |
| 5800 | 4055 | 13.46 |
| 8586 | 6004 | 13.46 |
| 11352 | 8551 | 14.5 |

## Temperature Gradient

Ambient Temperature is 80° F

Temperature gradient of 0.75°/100' TVD

## Analysis Options

- Single External Pressure Profile
- Temperature Deration
- Buckling

# Intermediate Casing Loads

## Burst Loads

### Internal Profile

Drilling Loads

- Gas Kick Profile
  - Influx at 15,667.2' MD
  - 30 Bbl Kick Volume
  - 0.5 ppg Kick Intensity
  - Maximum Mud Weight of 9.5 ppg
  - Kick gas gravity of 0.7 ppg
  - No margin of error on frac gradient
  - 5" DP
  - 650' of 6.5" Drill Collars
- Lost Returns with Water
  - No margin of error on frac gradient
  - Mud/Water Interface at 5780'
  - Mud weight with losses at 9.5 ppg
- Pressure Test
  - 1500 psi casing pressure test with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 2300 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water

### External Profile

- Mud and Cement Mix-Water
  - TOC at surface
  - Mud weight is 10.2 ppg
  - Cement Mix-Water Density is 8.33 ppg

## Collapse Loads

### Internal Profile

Drilling Loads

- Partial Evacuation
  - 50% evacuation. Top of mud level at 2890'.
  - Mud Weight is 10.2 ppg
- Lost Returns with Mud Drop

    - Losses occurring at 5800' MD
    - Pore Pressure at 8.33 ppg
    - Current Mud Weight at 9.5 ppg
    - Mud level drops to 714.3'
- Cementing
    - Lead Slurry Density at 12.9 ppg
    - Tail Slurry Density at 14.8 ppg
    - Tail Slurry Length of 500'
    - TOC at surface
    - Mud Weight at shoe 10.2 ppg
    - Displacement fluid density at 8.33 ppg

### External Profile

- Fluid Gradients w/ Pore Pressure
    - Fluid Gradient Above TOC is 10.2 ppg
    - Fluid Gradient Below TOC is 10.2 ppg

## Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 2300 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

## APACHE BOP AND CHOKE MANIFOLD SCHEMATIC

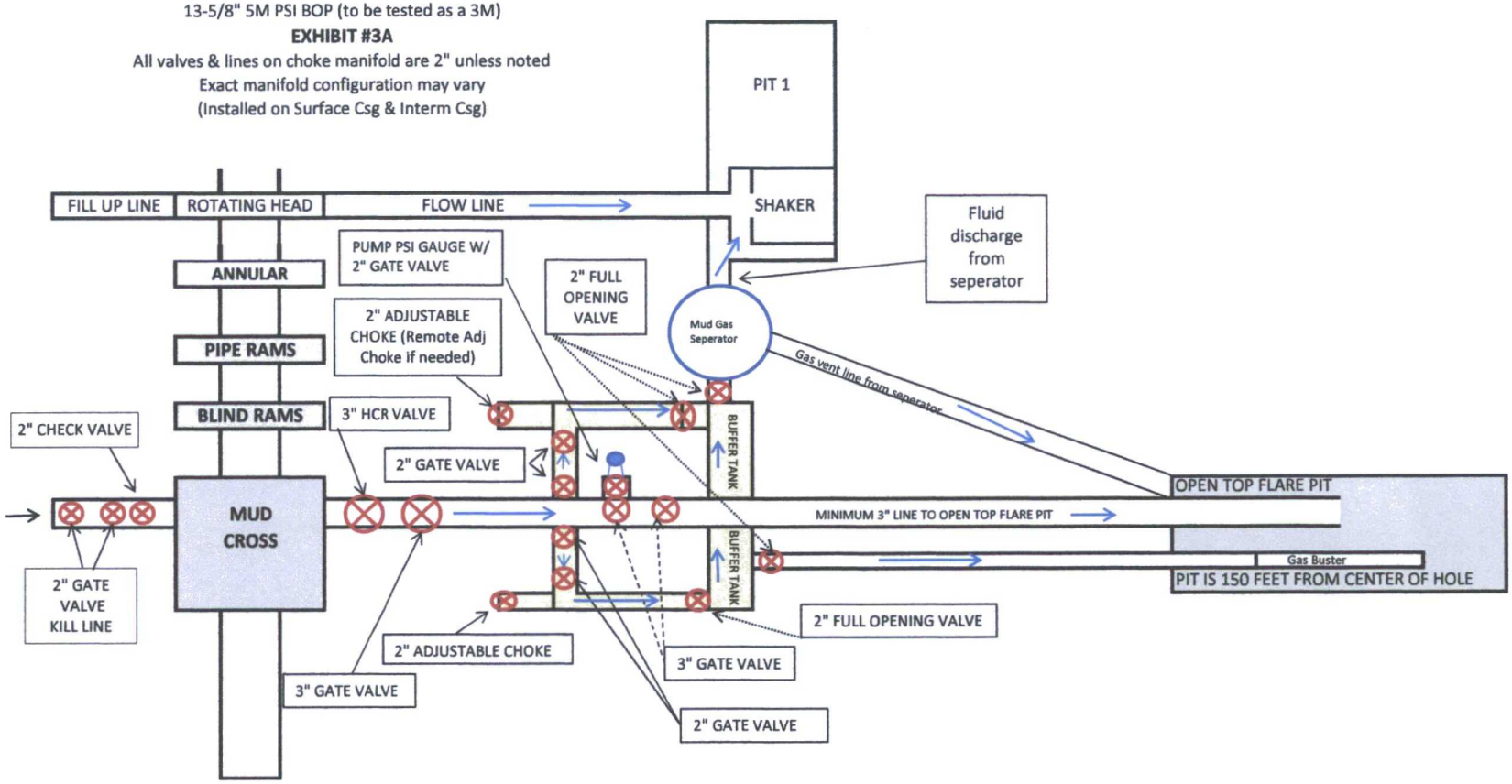
13-5/8" 5M PSI BOP (to be tested as a 3M)

**EXHIBIT #3A**

All valves & lines on choke manifold are 2" unless noted

Exact manifold configuration may vary

(Installed on Surface Csg & Interm Csg)




*** If H2S is encountered in quantities greater than 100ppm, Apache will shut in well & install a remote operated choke ***

## APACHE BOP AND CHOKE MANIFOLD SCHEMATIC

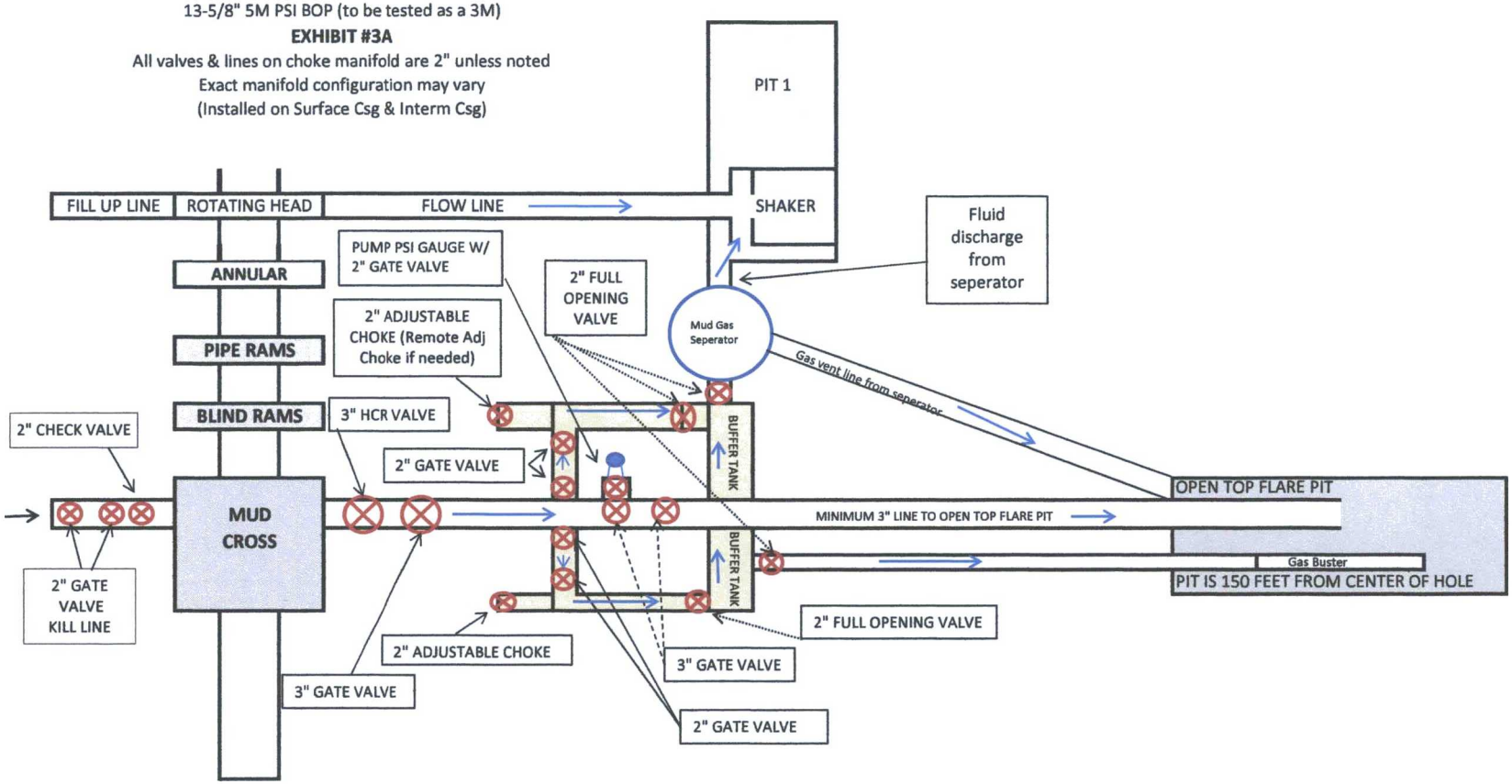
13-5/8" 5M PSI BOP (to be tested as a 3M)

**EXHIBIT #3A**

All valves & lines on choke manifold are 2" unless noted

Exact manifold configuration may vary

(Installed on Surface Csg & Interm Csg)




*** If H2S is encountered in quantities greater than 100ppm, Apache will shut in well & install a remote operated choke ***