## 1. FORMATION TOPS

The estimated tops of important geologic markers are as follows:

| FORMATION | SUB-SEA TVD | KBTVD | MD |
|---|---|---|---|
| Rustler | | 800 | |
| Castile | | 3480 | |
| Lamar | | 4900 | |
| Bell Canyon | | 4930 | |
| Cherry Canyon | | 5970 | |
| Brushy Canyon | | 7620 | |
| Bone Spring Limestone | | 9090 | |
| Upr. Avalon | | 9120 | |
| Top Bone Spring 1 | | 10040 | |
| Top Bone Spring 2 | | 10700 | |
| Top Bone Spring 3 | | 11740 | |
| Wolfcamp | | 12140 | |
| Wolfcamp A1 | | 12193 | |
| | | | |
| | | | |
| Lateral TD (Wolfcamp A1) | | 12,213 | 22300 |

## 2. ESTIMATED DEPTH OF WATER, OIL, GAS & OTHER MINERAL BEARING FORMATIONS

The estimated depths at which the top and bottom of the anticipated water, oil, gas, or other mineral bearing formations are expected to be encountered are as follows:

| Substance | Formation | Depth |
|---|---|---|
| Deepest Expected Base of Fresh Water | | 700 |
| Water | Rustler | 800 |
| Water | Bell Canyon | 4930 |
| Water | Cherry Canyon | 5970 |
| Oil/Gas | Brushy Canyon | 7620 |
| Oil/Gas | Bone Spring Limestone | 9090 |
| Oil/Gas | Upr. Avalon | 9120 |
| Oil/Gas | Top Bone Spring 1 | 10040 |
| Oil/Gas | Top Bone Spring 2 | 10700 |
| Oil/Gas | Top Bone Spring 3 | 11740 |
| Oil/Gas | Wolfcamp | 12140 |
| Oil/Gas | Wolfcamp A1 | 12193 |
| Oil/Gas | | |

All shows of fresh water and minerals will be reported and protected.

## 3. BOP EQUIPMENT

Will have a minimum of a 10000 psi rig stack (see proposed schematic) for drill out below surface (Wolfcamp is not exposed until drillout of the intermediate casing). Could possibly utilize the 5000 psi rig stack (see proposed schematic) for drill out below surface casing due to the availabity of 10 M annular. (Wolfcamp is not exposed until drillout of the intermediate casing) Stack will be tested as specified in the attached testing requirements. Batch drilling of the surface, intermediate, and production will take place. A full BOP test will be performed unless approval from BLM is received otherwise. Flex choke hose will be used for all wells on the pad (see attached specs) BOP test will be conducted by a third party.

Chevron requests a variance to use a FMC UH2 Multibowl wellhead, which will be run through the rig foor on surface casing. BOPE will be nippled up and tested after cementing surface casing. Subsequent tests will be performed as needed, not to exceed 30 days. The field report from FMC and BOP test information will be provided in a subsequent report at the end of the well. Please see the attached wellhead schematic. An installation manual has been placed on file with the BLM office and remains unchanged from previous submittal.

4. **CASING PROGRAM**

a. The proposed casing program will be as follows:

| Purpose | From | To | Hole Size | Csg Size | Weight | Grade | Thread | Condition |
|---|---|---|---|---|---|---|---|---|
| Surface | 0' | 800' | 17-1/2" | 13-3/8" | 55 # | J55 | STC | New |
| Intermediate | 0' | 11,500' | 12-1/4" | 9-5/8" | 43.5# | HCK-L80 | LTC | New |
| Production | 0' | 22,300' | 8-1/2" | 5-1/2" | 20.0 # | P-110-ICY | TXP BTC | New |

b. Casing design subject to revision based on geologic conditions encountered.

c. *****A "Worst Case" casing design for wells in a particular area is used below to calculate the Casing Safety Factors. If for any reason the casing design for a particular well requires setting casing deeper than the following "worst case" design, then the Casing Safety Factors will be recalcuated & sent to the BLM prior to drilling.**

d. **Chevron will fill casing at a minimum of every 20 jts (840') while running for intermediate and production casing in order to maintain collapse SF.**

**SF Calculations based on the following "Worst Case" casing design:**

**Surface Casing:** 850'
**Intermediate Casing:** 11,200' TVD
**Production Casing:** 23,000' MD/12,750' TVD (10,300' VS @ 90 deg inc)

| Casing String | Min SF Burst | Min SF Collapse | Min SF Tension | Min SF Tri-Axial |
|---|---|---|---|---|
| Surface | 1.36 | 3.12 | 3.17 | 1.70 |
| Intermediate | 1.12 | 1.44 | 1.93 | 1.37 |
| Production | 1.11 | 1.23 | 1.97 | 1.37 |

Min SF is the smallest of a group of safety factors that include the following considerations:

| | Surf | Int | Prod |
|---|---|---|---|
| **Burst Design** | | | |
| Pressure Test- Surface, Int, Prod Csg<br>P external: Water<br>P internal: Test psi + next section heaviest mud in csg | X | X | X |
| Displace to Gas- Surf Csg<br>P external: Water<br>P internal: Dry Gas from Next Csg Point | X | | |
| Frac at Shoe, Gas to Surf- Int Csg<br>P external: Water<br>P internal: Dry Gas, 16 ppg Frac Gradient | | X | |
| Stimulation (Frac) Pressures- Prod Csg<br>P external: Water<br>P internal: Max inj pressure w/ heaviest injected fluid | | | X |
| Tubing leak- Prod Csg (packer at KOP)<br>P external: Water<br>P internal: Leak just below surf, 8.7 ppg packer fluid | | | X |
| **Collapse Design** | | | |
| Full Evacuation<br>P external: Water gradient in cement, mud above TOC<br>P internal: none | X | X | X |
| Cementing- Surf, Int, Prod Csg<br>P external: Wet cement<br>P internal: water | X | X | X |
| **Tension Design** | | | |
| 100k lb overpull | X | X | X |

5. **CEMENTING PROGRAM**

| Slurry | Type | Top | Bottom | Weight | Yield | %Excess | Sacks | Water |
|---|---|---|---|---|---|---|---|---|
| Surface | | | | (ppg) | (sx/cu ft) | Open Hole | | gal/sk |
| Tail | Class C | 0' | 800' | 14.8 | 1.33 | 50 | 650 | 6.57 |
| Intermediate | | | | | | | | |
| Stage 2 Lead | Class C | 0' | 4570 | 11.9 | 2.39 | 100 | 1070 | 13.46 |
| Stage 2 Tail | Class C | 4570 | 4870 | 14.8 | 1.33 | 25 | 89 | 6.35 |
| Stage 1 Lead | 50:50 Poz Class C | 4,870' | 10,650' | 11.9 | 2.21 | 25 | 1024 | 12.18 |
| Stage 1 Tail | Class H | 10,650' | 11,150' | 15.6 | 1.22 | 25 | 184 | 5.37 |
| Production | | | | | | | | |
| Tail | Acid Soluble | 10,350' | 22,300' | 15.6 | 1.2 | 10 | 2500 | 5.05 |

1. Final cement volumes will be determined by caliper.
2. Surface casing shall have at least one centralizer installed on each of the bottom three joints starting with the shoe joint.
3. Production casing will have one horizontal type centralizer on every joint for the first 1000' from TD, then every other joint to EOB, and then every third joint to KOP. Bowspring type centralizers will be run from KOP to intermediate casing.

## 6. MUD PROGRAM

| From | To | Type | Weight | F. Vis | Filtrate |
|---|---|---|---|---|---|
| 0' | 800' | Spud Mud | 8.3 - 8.7 | 32 - 34 | NC - NC |
| 800' | 11,150' | Oil Based Mud | 8.7-9.2 | 28 - 30 | 25-30 |
| 11,150' | 12,300' | Oil Based Mud | 9.5-13.5 | 70 - 75 | 25 - 30 |
| 12,300' | 22,300' | Oil Based Mud | 9.5-13.5 | 70 - 75 | 25 - 30 |

A closed system will by utilized consisting of above ground steel tanks. All wastes accumulated during drilling operations will be contained in a portable trash cage and removed from location and deposited in an approved sanitary landfill. Sanitary wastes will be contained in a chemical porta-toilet and then hauled to an approved sanitary landfill.

All fluids and cuttings will be disposed of in accordance with New Mexico Oil Conservation Division rules and regulations.

A mud test shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

Visual mud monitoring equipment shall be in place to detect volume changes indicating loss or gain of circulating fluid volume. When abnormal pressures are anticipated -- a pit volume totalizer (PVT), stroke counter, and flow sensor will be used to detect volume changes indicating loss or gain of circulating fluid volume.

A weighting agent and lost circulating material (LCM) will be onsite to mitigate pressure or lost circulation as hole conditions dictate.

## 7. TESTING, LOGGING, AND CORING

The anticipated type and amount of testing, logging, and coring are as follows:

a. Drill stem tests are not planned.
b. The logging program will be as follows:

| TYPE | Logs | Interval | Timing | Vendor |
|---|---|---|---|---|
| Mudlogs | 2 man mudlog | Int Csg to TD | Drillout of Int Csg | TBD |
| LWD | MWD Gamma | Int. and Prod. Hole | While Drilling | TBD |

c. Conventional whole core samples are not planned.
d. A Directional Survey will be run.

## 8. ABNORMAL PRESSURES AND HYDROGEN SULFIDE

a. No abnormal pressures or temperatures are expected. Estimated BHP at intermediate TD is: 5750 psi
No abnormal pressures or temperatures are expected. Estimated BHP at production TD is: 8650 psi

b. Hydrogen sulfide gas is not anticipated. An H2S Contingency plan is attached with this APD in the event that H2S is encountered

Tenaris

Wed Jun 17 2015

# Casing and Tubing Performance Dat

## PIPE BODY DATA

### GEOMETRY

| | | | | | |
|---|---|---|---|---|---|
| Outside Diameter | **9.625 in** | Wall Thickness | **0.435 in** | API Drift Diameter | **8.599 in** |
| Nominal Weight | **43.50 lbs/ft** | Nominal ID | **8.755 in** | Alternative Drift Diameter | **8.625 in** |
| Plain End Weight | **42.73 lbs/ft** | Nominal cross section | **12.559 in** | | |

### PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Steel Grade | **L80** | Minimum Yield | **80,000 psi** | Minimum Ultimate | **95,000 psi** |
| Tension Yield | **1,005,000 in** | Internal Pressure Yield | **6,330 psi** | Collapse Pressure | **3,810 psi** |
| Available Seamless | **Yes** | Available Welded | **No** | | |

## CONNECTION DATA

**TYPE: LTC**

### GEOMETRY

| | | | | | |
|---|---|---|---|---|---|
| Coupling Reg OD | **10.625 in** | Threads per in | **8** | Thread turns make up | **3.5** |

### PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Steel Grade | **L80** | Coupling Min Yield | **80,000 psi** | Coupling Min Ultimate | **95,000 psi** |
| Joint Strength | **813,000 lbs** | | | Internal Pressure Resistance | **6,330 psi** |

For the latest performance data, always visit our website: www.tenaris.com

January 18 2016

Tenaris

**Connection**: TenarisXP® BTC
**Casing/Tubing**: CAS
**Coupling Option**: REGULAR

**Size**: 5.500 in.
**Wall**: 0.361 in.
**Weight**: 20.00 lbs/ft
**Grade**: P110-ICY
**Min. Wall Thickness**: 87.5 %

## PIPE BODY DATA

### GEOMETRY

| | | | | | |
|---|---|---|---|---|---|
| Nominal OD | **5.500** in. | Nominal Weight | **20.00** lbs/ft | Standard Drift Diameter | **4.653** in. |
| Nominal ID | **4.778** in. | Wall Thickness | **0.361** in. | Special Drift Diameter | **N/A** |
| Plain End Weight | **19.83** lbs/ft | | | | |

### PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Body Yield Strength | **729** x 1000 lbs | Internal Yield | **14360** psi | SMYS | **125000** psi |
| Collapse | **12100** psi | | | | |

## TENARISXP® BTC CONNECTION DATA

### GEOMETRY

| | | | | | |
|---|---|---|---|---|---|
| Connection OD | **6.100** in. | Coupling Length | **9.450** in. | Connection ID | **4.766** in. |
| Critical Section Area | **5.828** sq. in. | Threads per in. | **5.00** | Make-Up Loss | **4.204** in. |

### PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Tension Efficiency | **100** % | Joint Yield Strength | **729** x 1000 lbs | Internal Pressure Capacity[1] | **14360** psi |
| Structural Compression Efficiency | **100** % | Structural Compression Strength | **729** x 1000 lbs | Structural Bending[2] | **104** °/100 ft |
| External Pressure Capacity | **12100** psi | | | | |

### ESTIMATED MAKE UP TORQUES[3]

| | | | | | |
|---|---|---|---|---|---|
| Minimum | **11540** ft-lbs | Optimum | **12820** ft-lbs | Maximum | **14100** ft-lbs |

### OPERATIONAL LIMIT TORQUES

| | | | | | |
|---|---|---|---|---|---|
| Operating Torque | **22700** ft-lbs | Yield Torque | **25250** ft-lbs | | |

### BLANKING DIMENSIONS

Blanking Dimensions

**(1)** Internal Pressure Capacity related to structural resistance only. Internal pressure leak resistance as per section 10.3 API 5C3 / ISO 10400 - 2007.

**(2)** Structural rating, pure bending to yield (i.e no other loads applied)

**(3)** Torque values calculated for API Modified thread compounds with Friction Factor=1. For other thread compounds please contact us at licensees@oilfield.tenaris.com. Torque values may be further reviewed.

For additional information, please contact us at contact-tenarishydril@tenaris.com

# BLOWOUT PREVENTOR SCHEMATIC

## Minimum Requirements

**OPERATION** : Wolfcamp A/A2 Wells

**Minimum System Pressure Rating** : 10,000 psi

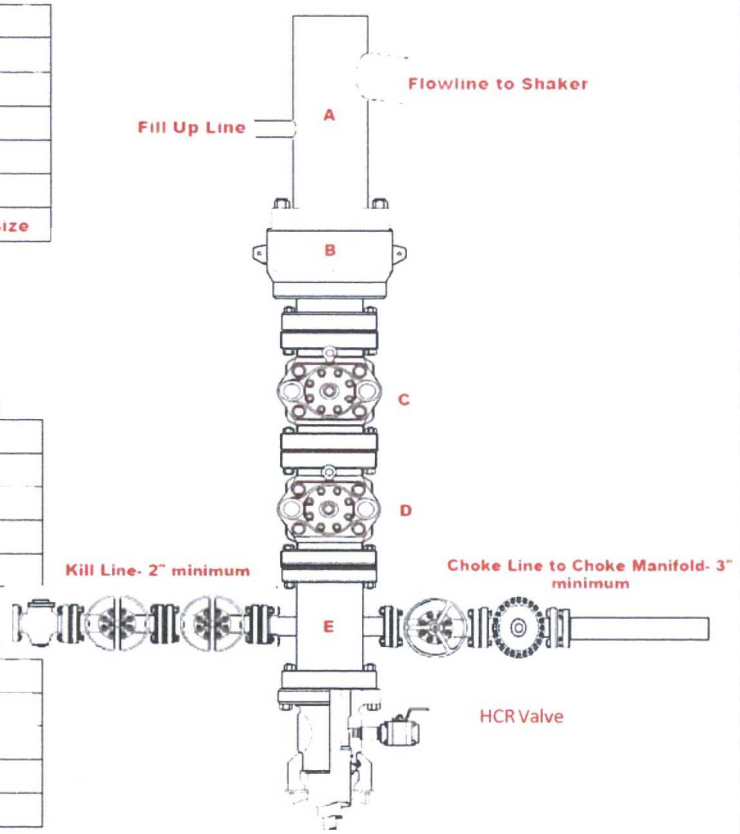
| | SIZE | PRESSURE | DESCRIPTION |
|---|---|---|---|
| A | | N/A | Bell Nipple |
| B | 13 5/8" | 10,000 psi | Annular |
| C | 13 5/8" | 10,000 psi | Pipe Ram |
| D | 13 5/8" | 10,000 psi | Blind Ram |
| E | 13 5/8" | 10,000 psi | Mud Cross |
| F | 13 5/8" | 10,000 psi | Pipe Ram |
| DSA | | As required for each hole size | |

### Kill Line

| SIZE | PRESSURE | DESCRIPTION |
|---|---|---|
| 2" | 10,000 psi | Gate Valve |
| 2" | 10,000 psi | Gate Valve |
| 2" | 10,000 psi | Check Valve |
| | | |
| | | |

### Choke Line

| SIZE | PRESSURE | DESCRIPTION |
|---|---|---|
| 3" | 10,000 psi | Gate Valve |
| 3" | 10,000 psi | HCR Valve |
| | | |
| | | |
| | | |




## Installation Checklist

**The following item must be verified and checked off prior to pressure testing of BOP equipment.**

- ☐ **The installed BOP equipment meets at least the minimum requirements (rating, type, size, configuration) as shown on this schematic. Components may be substituted for equivalent equipment rated to higher pressures. Additional components may be put into place as long as they meet or exceed the minimum pressure rating of the system.**
- ☐ **All valves on the kill line and choke line will be full opening and will allow straight though flow.**
- ☐ **The kill line and choke line will be straight unless turns use tee blocks or are targeted with running tess, and will be anchored to prevent whip and reduce vibration.**
- ☐ **Manual (hand wheels) or automatic locking devices will be installed on all ram preventers. Hand wheels will also be installed on all manual valves on the choke line and kill line.**
- ☐ **A valve will be installed in the closing line as close as possible to the annular preventer to act as a locking device. This valve will remain open unless accumulator is inoperative.**
- ☐ **Upper kelly cock valve with handle will be available on rig floor along with safety valve and subs to fit all drill string connections in use.**

**After Installation Checklist is complete, fill out the information below and email to Superintendent and Drilling Engineer**

**Wellname:** _____

**Representative:** _____

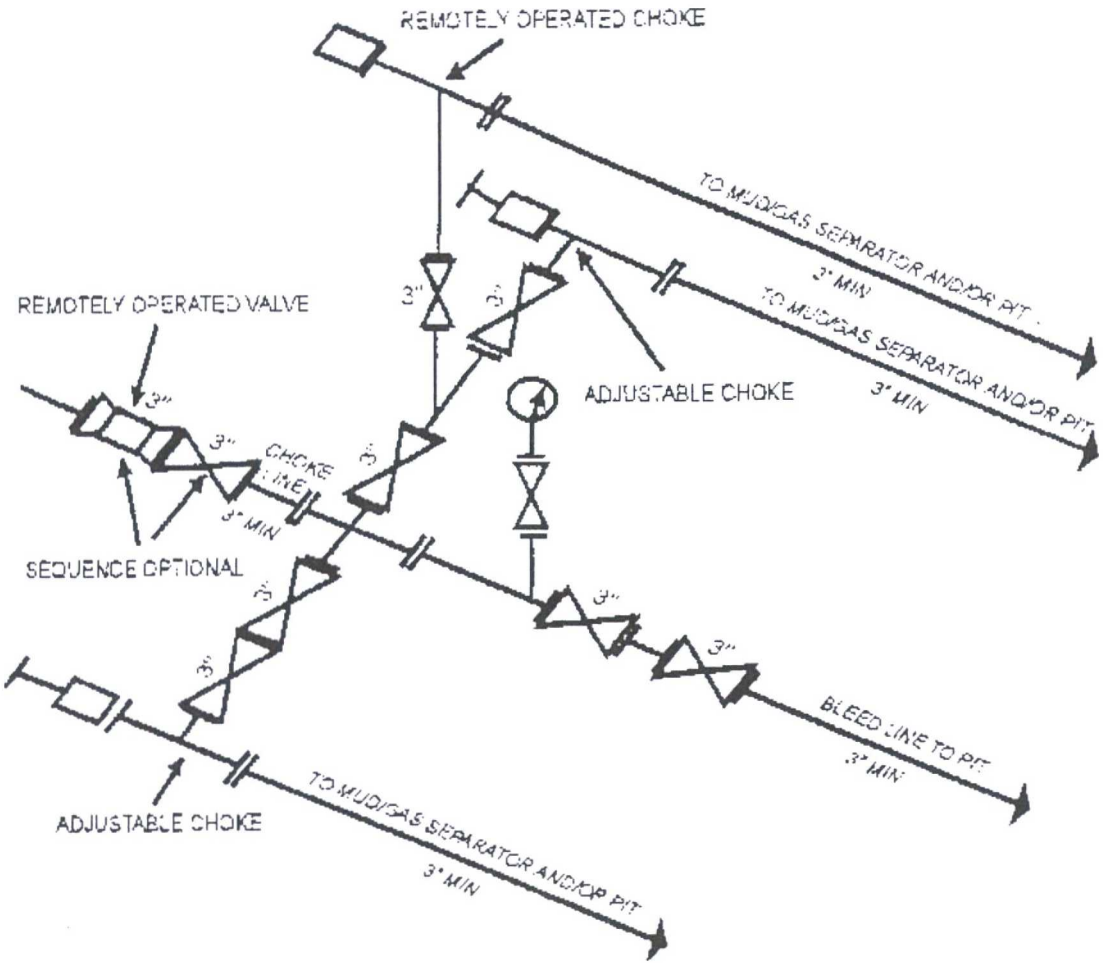
**Date:** _____

# 10M Choke Manifold SCHEMATIC

Minimum Requirements

**OPERATION:** Production and Open Hole Sections

**Minimum System Pressure Rating:** **10,000 PSI**




10M AND 15M CHOKE MANIFOLD EQUIPMENT - CONFIGURATION OF CHOKES MAY VARY

[53 FR 49661, Dec. 9, 1988 and 54 FR 39528, Sept. 27, 1989]

Diagram B

Continental

ContiTech

## Hose Data Sheet

| | |
|---|---|
| CRI Order No. | 538332 |
| Customer | ContiTech Oil & Marine Corp. |
| Customer Order No | 4500412631 CBC544771, CBC544769, CBC544767, CBC544763, CBC544768, CBC544745, CBC544744, CBC544746 |
| Item No. | 1 |
| Hose Type | Flexible Hose |
| **Standard** | **API SPEC 16 C** |
| Inside dia in inches | 3 |
| Length | 45 ft |
| Type of coupling one end | FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGE SOURC/W BX155 ST/ST INLAID R.GR. |
| Type of coupling other end | FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGE SOUR C/W BX155 ST/ST INLAID R.GR. |
| 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 | Yes |
| Lifting collar | Yes |
| Element C | Yes |
| Safety chain | Yes |
| 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 |

Continental

ContiTech

| CONTITECH RUBBER Industrial Kft. | No:QC-DB- 231/ 2014 |
|---|---|
| | Page: 10 / 119 |

| QUALITY CONTROL INSPECTION AND TEST CERTIFICATE | | | | | CERT. N°: | 594 | |
|---|---|---|---|---|---|---|---|
| PURCHASER: | ContiTech Oil & Marine Corp. | | | | P.O. N°: | 4500412631 | |
| CONTITECH ORDER N°: | 538332 | HOSE TYPE: | 3" | ID | Choke & Kill Hose | | |
| HOSE SERIAL N°: | 67349 | NOMINAL / ACTUAL LENGTH: | | | 13,72 m / 13,85 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 | 1435 | 1436 | AISI 4130 | A1258U |
| 4 1/16" 10K API Swivel Flange end | | | AISI 4130 | 034939 |
| Hub | | | AISI 4130 | A1045N |

**Not Designed For Well Testing** **API Spec 16 C**

**Tag No.: 66 – 1198** **Temperature rate:"B"**

All metal parts are flawless

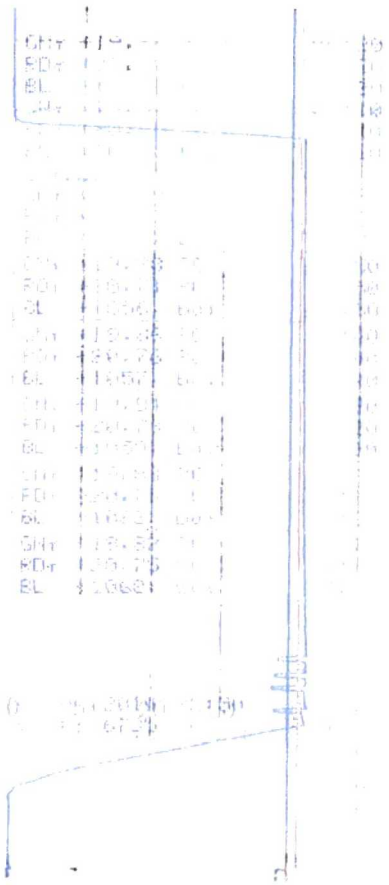
**WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.**

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.

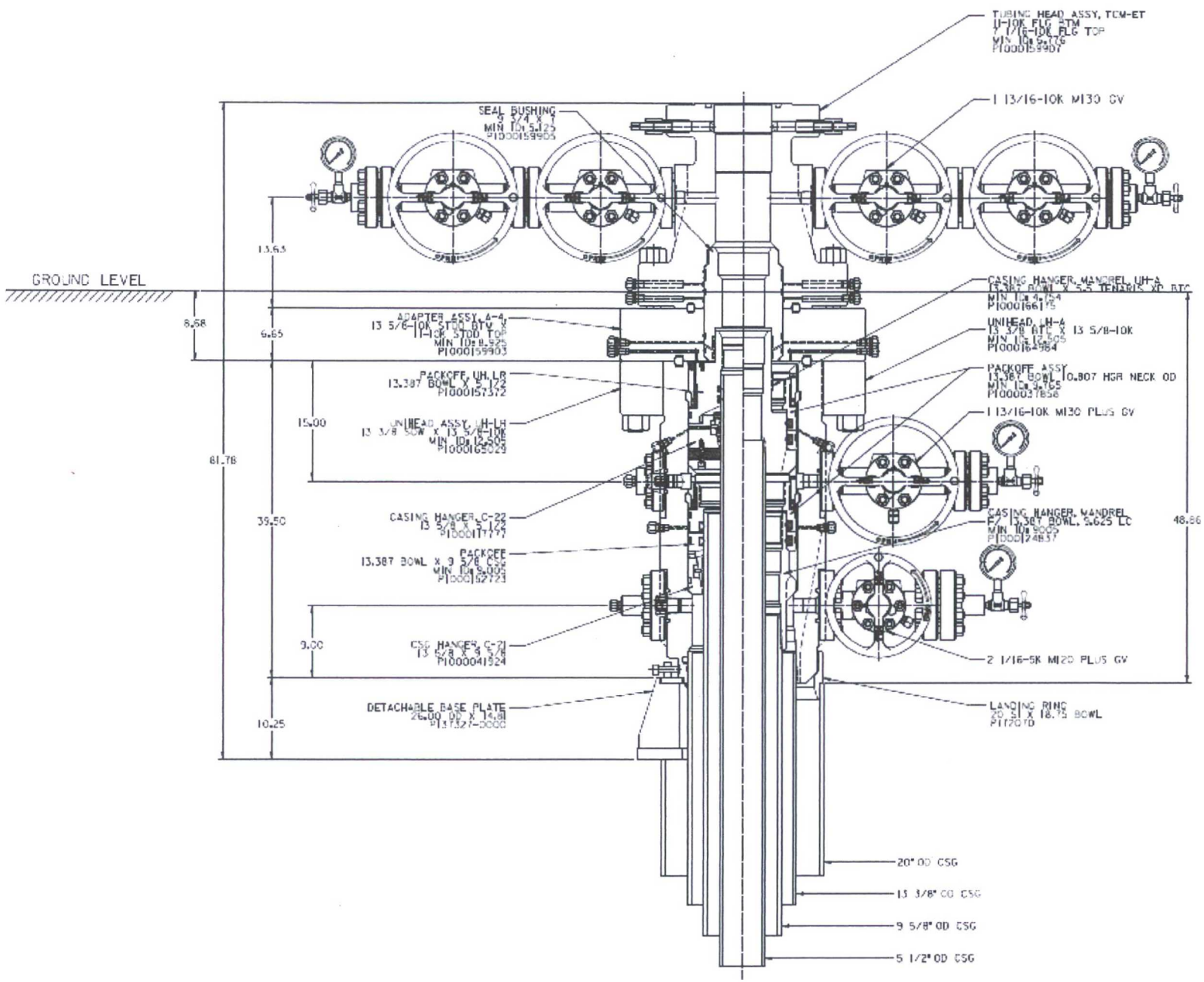
| Date: | Inspector | Quality Control |
|---|---|---|
| 03. April 2014. | | ContiTech Rubber Industrial Kft. Quality Control Dept. (1) |

*ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE* *No: 594, 596, 597*





CandTech Rubber
Industrial Kft.
Quality Control Dept.
(1)


TUBING HEAD ASSY, TCM-ET
U-10K FLG BTM
7 1/16-10K FLG TOP
MIN ID= 5.176
P1000159907
SEAL BUSHING
9 1/4 X
MIN ID= 5.125
P1000159905
1 13/16-10K MI30 GV
GROUND LEVEL
13.63
8.68
6.65
ADAPTER ASSY, A-4
13 5/8-10K STUD BTM X
11-10K STUD TOP
MIN ID= 8.525
P1000159903
CASING HANGER, MANDREL, UH-A
13.387 BOWL X 5.5 TENARIS XP BTC
MIN ID= 4.764
P1000166175
UNIHEAD, UH-A
13 3/8 BTC X 13 5/8-10K
MIN ID= 12.505
P1000164984
PACKOFF, UH, LR
13.387 BOWL X 9 1/2
P1000157372
PACKOFF ASSY
13.387 BOWL 10.807 HGR NECK OD
MIN ID= 4.765
P1000027856
15.00
UNIHEAD ASSY, UH-LH
13 3/8 SOW X 13 5/8-10K
MIN ID= 12.505
P1000165029
1 13/16-10K MI30 PLUS GV
81.78
CASING HANGER, C-22
13 5/8 X 9 1/2
P1000177177
39.50
CASING HANGER, MANDREL
F/ 13.387 BOWL, 5.625 LC
MIN ID= 5.005
P1000124857
48.86
PACKOFF
13.387 BOWL X 9 5/8 CSG
MIN ID= 8.005
P1000152723
9.00
CSG HANGER, C-21
13 5/8 X 9 5/8
P1000041924
2 1/16-5K MI20 PLUS GV
DETACHABLE BASE PLATE
26.00 OD X 14.81
P1173217-0000
10.25
LANDING RING
20.51 X 18.75 BOWL
P1172070
20" OD CSG
13 3/8" OD CSG
9 5/8" OD CSG
5 1/2" OD CSG