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	
Wolfcamp A2		12,523	
Lateral TD (Wolfcamp A2)		12,523	20000

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	Wolfcamp A2	12,523

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"	54.5 #	J55	STC	New
Intermediate	0'	11,500'	12-1/4"	9-5/8"	43.5#	HCK-L80	LTC	New
Liner	10,850'	12,300'	8-1/2"	7-5/8"	29.7 #	HCP-110	H513	New
Production (Taper String)	0'	12,500'	6-3/4"	5.5"	20#	P-110-ICY	TXP BTC	New
	12,500'	20,000'	6-3/4"	5"	18#	P-110 IC	TSH521	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
Liner	1.69	5.36	2.50	2.09
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	Liner	Prod
Burst Design				
Pressure Test- Surface, Int, Prod Csg P external: Water P internal: Test psi + next section heaviest mud in csg	X	X	X	X
Displace to Gas- Surf Csg P external: Water P internal: Dry Gas from Next Csg Point	X			
Frac at Shoe, Gas to Surf- Int Csg P external: Water P internal: Dry Gas, 16 ppg Frac Gradient		X	X	
Stimulation (Frac) Pressures- Prod Csg P external: Water P internal: Max inj pressure w/ heaviest injected fluid				X
Tubing leak- Prod Csg (packer at KOP) P external: Water P internal: Leak just below surf, 8.7 ppg packer fluid				X
Collapse Design				
Full Evacuation P external: Water gradient in cement, mud above TOC P internal: none	X	X	X	X
Cementing- Surf, Int, Prod Csg P external: Wet cement P internal: water	X	X	X	X
Tension Design				
100k lb overpull	X	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
Liner								
Tail	Class H	10,850'	12,300'	15.6	1.22	10	123	5.34
Production								
Tail	Acid Soluble	10,350'	20,000'	15.6	1.2	17	1000	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'	20,000'	Oil Based Mud	12.0-15.0	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: 9830 psi
b. Hydrogen sulfide gas is not anticipated. An H2S Contingency plan is attached with this APD in the event that H2S is encountered

BLOWOUT PREVENTOR SCHEMATIC

Minimum Requirements

OPERATION : Wolfcamp A/A2 Wells

Minimum System Pressure Rating : 10,000 psi

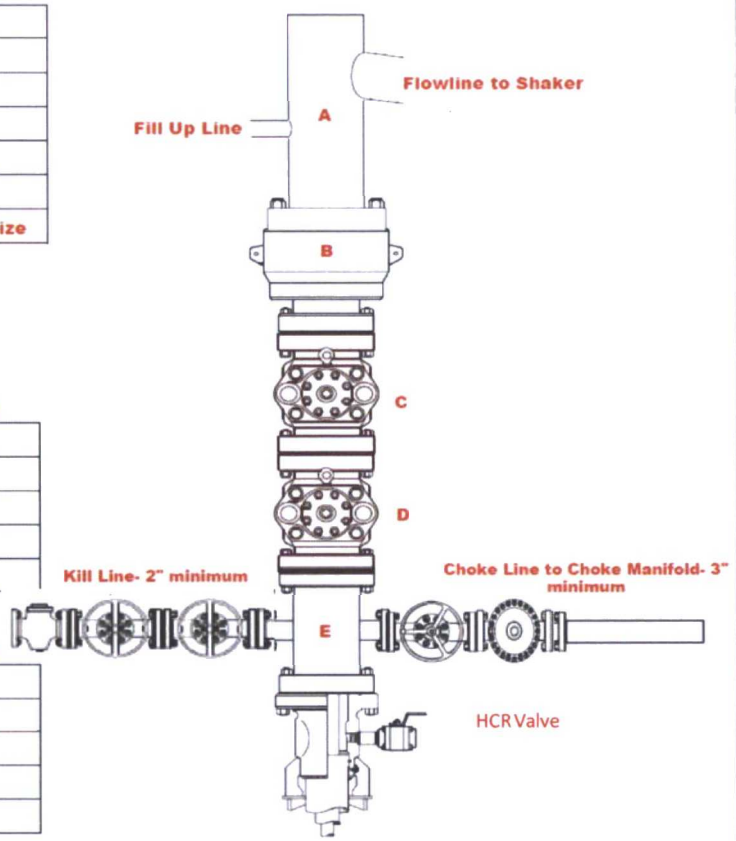
	SIZE	PRESSURE	DESCRIPTION
A		N/A	Bell Nipple
B	13 5/8"	10,000 psi	Annular
C	13 5/8"	10,000 psi	Pipe Ram
D	13 5/8"	10,000 psi	Blind Ram
E	13 5/8"	10,000 psi	Mud Cross
F	13 5/8"	10,000 psi	Pipe Ram
DSA		As required for each hole size	

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: _____

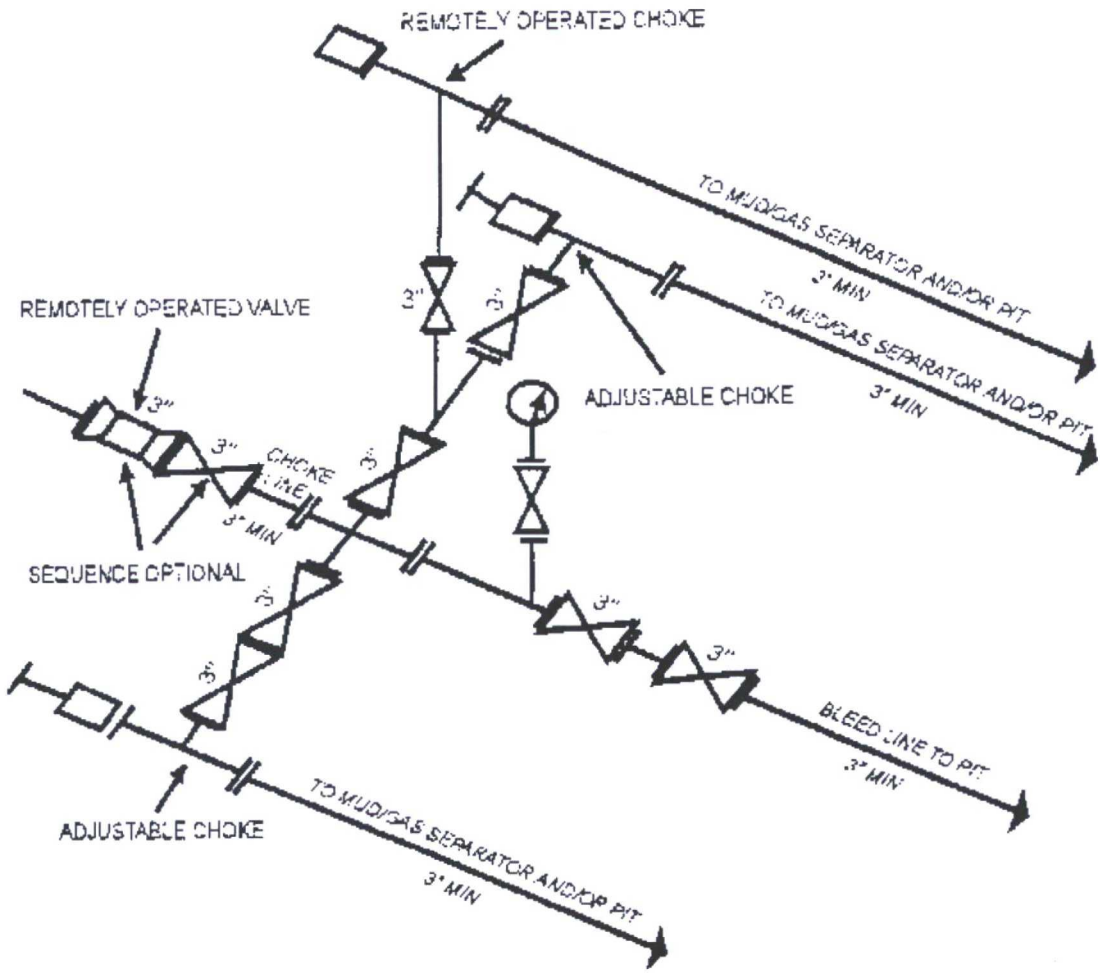
Date: _____

10M Choke Manifold SCHEMATIC

Minimum Requirements

OPERATION: Production and Open Hole Sections

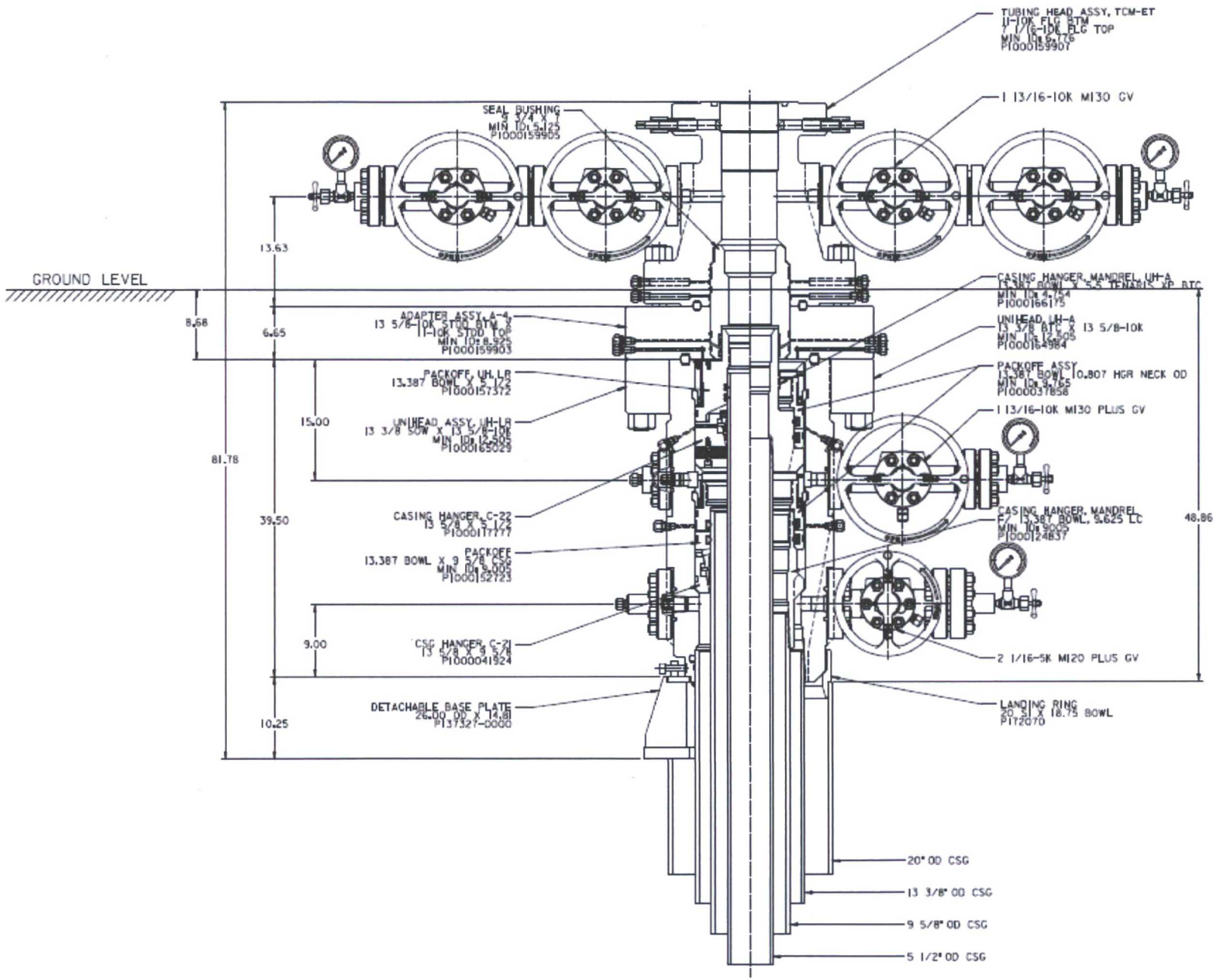
Minimum System Pressure Rating: **10,000 PSI**



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


TUBING HEAD ASSY, TCM-ET
11-10K FLG BTM
7 1/16-10K FLG TOP
MIN ID 6.176
P1000159907
SEAL BUSHING
9 3/4 X 7
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 4.754
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 5.172
P1000157372
PACKOFF ASSY
13.387 BOWL 10.807 HGR NECK OD
MIN ID 9.765
P1000037858
15.00
UNIHEAD ASSY, UH-LR
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 5.172
P1000117177
CASING HANGER MANDREL
C-7 13.387 BOWL, 5.625 LC
MIN ID 4.900
P1000124837
48.86
39.50
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
P137327-0000
10.25
LANDING RING
20 SI X 18.75 BOWL
P1T2070
20" OD CSG
13 3/8" OD CSG
9 5/8" OD CSG
5 1/2" OD CSG

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)

Continental

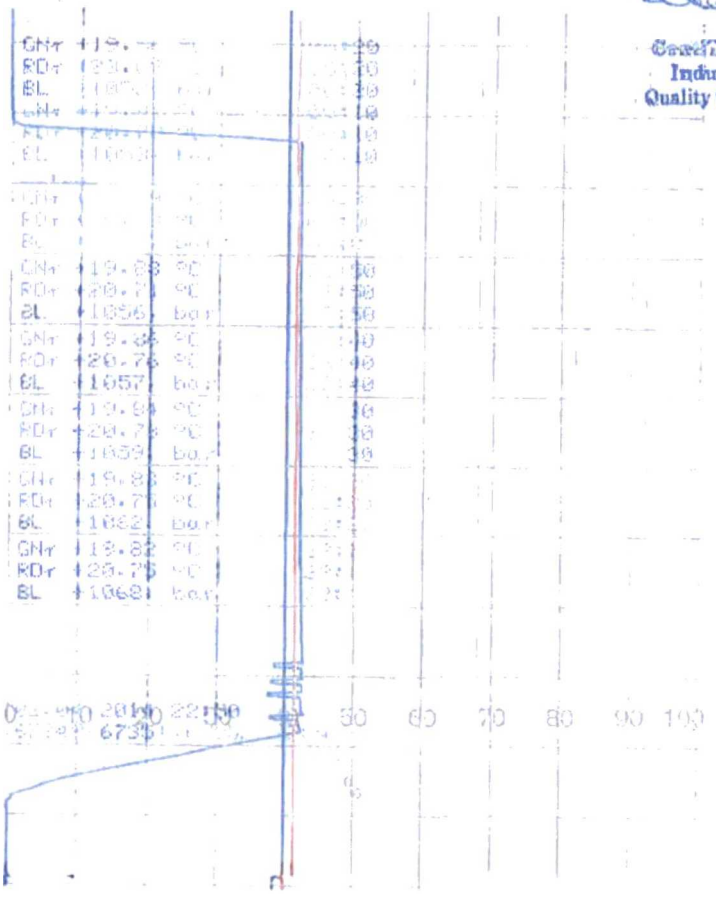
ContiTech

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

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

Page: 1 / 1



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

Wed Jun 17 2015

Tenaris

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

June 17 2015

TenarisHydril

Size: 7.625 in.
Wall: 0.375 in.
Weight: 29.70 lbs/ft
Grade: P110-IC
Min. Wall Thickness: 87.5 %

Connection: Wedge 513™
Casing/Tubing: CAS

PIPE BODY DATA

GEOMETRY

Nominal OD	**7.625** in.	Nominal Weight	**29.70** lbs/ft	Standard Drift Diameter	**6.750** in.
Nominal ID	**6.875** in.	Wall Thickness	**0.375** in.	Special Drift Diameter	**N/A**
Plain End Weight	**29.06** lbs/ft				

PERFORMANCE

Body Yield Strength	**940** x 1000 lbs	Internal Yield	**9470** psi	SMYS	**110000** psi
Collapse	**7150** psi				

WEDGE 513™ CONNECTION DATA

GEOMETRY

Connection OD	**7.625** in.	Connection ID	**6.800** in.	Make-Up Loss	**4.420** in.
Critical Section Area	**5.125** sq. in.	Threads per in.	**3.29**		

PERFORMANCE

Tension Efficiency	**60.0** %	Joint Yield Strength	**564** x 1000 lbs	Internal Pressure Capacity	**9470** psi
Compression Strength	**707** x 1000 lbs	Compression Efficiency	**75.2** %	Bending	**40** °/100 ft
External Pressure Capacity	**7150** psi				

MAKE-UP TORQUES

Minimum	**9000** ft-lbs	Optimum	**10800** ft-lbs	Maximum (*)	**15800** ft-lbs

OPERATIONAL LIMIT TORQUES

Operating Torque	**47000** ft-lbs	Yield Torque	**70000** ft-lbs		

BLANKING DIMENSIONS

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

January 18 2016

Tenaris

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

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

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

Tenaris

Data Sheet

TH DS-16.0370 11 ago 16
Rev 00

5" 18.00 ppf P110-ICY - TenarisXP® BTC (min wt 90%)
(USC Units)

PIPE BODY DATA					
GEOMETRY					
Nominal OD	5.000 in.	Nominal Weight	18.00 lbs/ft	Standard Drift Diameter	4.151 in.
Nominal ID	4.276 in.	Wall Thickness	0.362 in.	Special Drift Diameter	-
Plain End Weight	17.95 lbs/ft				
PERFORMANCE					
Body Yield Strength	659 x 1000 lbs	Internal Yield [4]	16290 psi	Collapse	14840 psi

CONNECTION DATA					
Regular OD	5.720 in.	Coupling Length	9.325 in.	Connection ID	4.264 in.
Critical Section Area	5.275 sq. in.	Threads per in.	5	Make-Up Loss	4.141 in.
PERFORMANCE					
Tension Efficiency	100.0 %	Joint Yield Strength	659 x 1000 lbs	Internal Pressure Capacity [1] [4]	16290 psi
Structural Compression Efficiency	100.0 %	Structural Compression Rating	659 x 1000 lbs	External Pressure Capacity	14840 psi
Structural Bending [2]	115°/100 ft				
MAKE-UP TORQUES [3]					
Minimum	11480 ft-lbs	Target	12750 ft-lbs	Maximum	14030 ft-lbs
Operating Torque	15800 ft-lbs	Yield Torque	17700 ft-lbs		

(1) Internal Yield pressure 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.

(4) Minimum wall thickness 90% of nominal

TenarisHydril

Data Sheet

TH DS-16.0372 23 August 2016
Rev 00

5.000" 18.00 lb/ft P110-ICY TenarisHydril Wedge 521®

PIPE BODY DATA					
GEOMETRY					
Nominal OD	5.000 in.	**Nominal Weight**	18.00 lbs/ft	**Standard Drift Diameter**	4.151 in.
Nominal ID	4.276 in.	**Wall Thickness**	0.362 in.	**Special Drift Diameter**	N/A
Plain End Weight	17.95 lbs/ft				
PERFORMANCE					
Body Yield Strength	659 x 1000 lbs	**Internal Yield[1]**	16290 psi	**Collapse**	14840 psi

CONNECTION DATA					
GEOMETRY					
Box OD (Turned)	5.359 in.	**Pin ID (Bored)**	4.226 in.	**Make-Up Loss**	3.62 in.
Critical Section Area	3.891 sq. in.	**Threads per in.**	3.36		
PERFORMANCE					
Tension Efficiency	73.8 %	**Joint Yield Strength**	486 x 1000 lbs	**Internal Yield[1]**	16290 psi
Compression Efficiency	88.7 %	**Compression Rating**	585 x 1000 lbs	**Collapse**	14840 psi
Bending	85°/100 ft				
MAKE-UP TORQUES					
Minimum	6100 ft-lbs	**Optimum**	7300 ft-lbs	**Maximum***	10700 ft-lbs
OPERATIONAL LIMIT TORQUES					
Operational	20000 ft-lbs			**Yield Torque**	30000 ft-lbs

*If you need to use torque values that are higher than the maximum indicated, please contact a local Tenaris technical sales representative

1. Internal Yield Rating is based on 90% RBW.

13 3/8	surface csg in a	17 1/2	inch hole.		Design Factors		SURFACE	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	54.50	J 55	ST&C	11.10	2.94	0.5	850	46,325
"B"							0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:	1,500	Tail Cmt	does	circ to sfc.		Totals:	850	46,325

Comparison of Proposed to Minimum Required Cement Volumes

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
17 1/2	0.6946	650	865	645	34	8.70	2966	3M	1.56

Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0.70, OK.

9 5/8	casing inside the	13 3/8	A Buoyant		Design Factors		INTERMEDIATE	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	43.50	L 80	LT&C	1.87	0.69	0.73	11,500	500,250
"B"							0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:						Totals:	11,500	500,250

The cement volume(s) are intended to achieve a top of 0 ft from surface or a 850 overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
12 1/4	0.3132	look ↘	0	3662		9.20	5920	10M	0.81
D V Tool(s):			4870				sum of sx	Σ CuFt	Σ%excess
t by stage % :		19	71				2367	5163	41

Class 'H' tail cmt yld > 1.20 MASP is within 10% of 5000psig,

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.55, b, c, d
<0.70 a Problem!! Alternative Collapse SF is expectable.

Tail cmt

7 5/8	Liner w/top @	#####			Design Factors		LINER	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	29.70	HCP 110	LT&C	2.63	0.83	0.97	1,450	43,065
"B"							0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:	1,262					Totals:	1,450	43,065
A would be:				13.10	0.83	if it were a vertical wellbore.		

No Pilot Hole Planned

MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC
12300	12300	12300	12115	90	12	12865

The cement volume(s) are intended to achieve a top of 3950 ft from surface or a 7550 overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
8 1/2	0.0770	123	150	838	-82	13.50	7032	10M	0.44

Class 'H' tail cmt yld > 1.20 MASP is within 10% of 5000psig, need exrta equip?

Burst Frac Gradient(s) for Segment(s): A, B, C, D = CURVE SAFETY FACTOR TOO CONSERVATIVE

Tail cmt

5 1/2	casing inside the	7 5/8			Design Factors		PRODUCTION	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	20.00	P 110	BUTT	2.91	1.28	1.47	12,100	242,000
"B"	18.00	P 110	BUTT	5.62	1.42	1.66	7,675	138,150
w/8.4#/g mud, 30min Sfc Csg Test psig:	2,662					Totals:	19,775	380,150
B egment Design Factors would be:				54.85	1.51	if it were a vertical wellbore.		

No Pilot Hole Planned

MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC
19775	12575	12575	12115	90	12	12865

The cement volume(s) are intended to achieve a top of 0 ft from surface or a 12300 overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
6 3/4	0.0835	1000	1200	1770	-32	15.00			0.70

Capitan Reef est top XXXX. MASP is within 10% of 5000psig, need exrta equip?

5.5" casing depth clearance is expectable