

Scanning
OCS G29094
SN 18309
new

In Reply To: MS 5232

March 2, 2012

Ms. Kemberlia K. Ducote
LLOG Exploration Offshore, L.L.C.
1001 Ochsner Boulevard
Suite 200
Covington, Louisiana 70433

Dear Ms. Ducote:

Reference is made to the following application that has been reviewed by this office:

Application Type: New Right-of-Way Pipeline
Application Date: May 26, 2011
Work Description: Create 200-foot wide Right-of-Way and install, operate, and maintain the following:

A 5.563-inch pipeline, 2.23 miles in length, to transport Bulk Oil from the Mississippi Canyon (MC) Block 199 Manifold through a 63ft jumper, then through a Plet. From the Plet the Bulk Oil will travel 991ft through a 5.563 inch pipeline to a touchdown point in (MC) Block 243. The Bulk Oil will then travel through a 5.563 inch, 3380ft in length cantenary Riser to the MC Block 243 A Platform.

Assigned Right-of-Way Number: OCS-G29094
Assigned Segment Number: 18309

Pursuant to 43 U.S.C. 1334(e) and 30 CFR 250.1000(d), your application is hereby approved.

Assigned MAOP (psi): 3705
MAOP Determination : Valves, Flanges, Hydrostatic Test Pressure

Please be reminded that, in accordance with 30 CFR 250.1008(a), you must notify the Regional Supervisor at least 48 hours prior to commencing the installation or relocation of a pipeline or conducting a pressure test on the pipeline. Commencement notification(s) should be faxed to (504) 736-2408. In accordance with 30 CFR 250.1008 (b), you are reminded to submit a report to the Regional Supervisor within 90 days after completion of any pipeline construction. Also

in accordance with a Letter to Lessees dated April 18, 1991, a copy of the as-built plat(s) must be submitted to the NOAA-National Ocean Service-OCS, Chief, Nautical Data Branch, N/CS26, 1315 East West Highway, Silver Spring, MD, 20910-3282.

Sincerely,

(org. sgd.) B. Hunter

Nick Wetzel
Regional Supervisor
Regional Field Operations

bcc: 1502-01 Segment No. 18309, ROW OCS-G29094 (MS 5232)
1502-01 ROW OCS-G29094 (Scanning) (MS 5033)
MS 5250 New Orleans District

BHunter:ttg:3/2/2012:Llog-18309

(6,29094)
BH

May 26, 2011

Mr. Michael Saucier
Regional Supervisor Field Operations
Bureau of Ocean Energy Management, Regulation, and Enforcement
1201 Elmwood Park Boulevard
New Orleans, Louisiana 70123-2394
MS 5232

Bureau Management Service
RECEIVED

MAY 27 2011

Office of Field Operations
Pipeline Section

RE: Application for Installation of One (1) 5.563" Right-of-Way Oil Bulk Oil Pipeline, one (1) O.D.5.563" Manifold Jumper, and one (1) 4.5" O.D. Well Flowline Jumper, from LLOG's Mississippi Canyon Block 199 Subsea Manifold, OCS-G 32301 to W&T Energy VI, LLC's Platform "A", Mississippi Canyon Block 243, OCS-G-19931 Gulf of Mexico, Offshore, Louisiana

Gentlemen:

Pursuant to the authority granted in 43 U.S.C. 1334 (e) and the regulations contained in Title 30 CFR Part 250, Subpart J and Title 49 CFR Part 195, LLOG Exploration Offshore, L.L.C., (LLOG), hereby submits this application, in quadruplicate, for the right-a-way two hundred feet (200') in width for the construction, maintenance and operation of one (1) 5.563" O.D. bulk oil pipeline, (1) O.D.5.563" Manifold Jumper and (1) 4.5" O.D. Well Jumper in the Mississippi Canyon Area, Gulf of Mexico. LLOG agrees that said right-of-ways, if approved, will be subject to the terms and conditions of said regulations and will be bound by the provisions of the OCS Lands Act, as amended.

The proposed ROW pipeline will be part of a dual pipeline system being installed to produce LLOG's subsea wells in Mississippi Canyon Area, Block 199, and is designated by LLOG as the **East Bulk Oil Pipeline**. The proposed East 5.563" O.D. bulk oil pipeline will originate from a pipeline end termination (PLET) located near LLOG's Subsea Well Nos. SS001 and SS002 in Mississippi Canyon Area, Block 199, OCS-G32301, then travel in a southerly direction for approximately 10,440.76 feet (1.98 statute miles) in Federal waters off the Louisiana Coast and terminate at the Mississippi Canyon Area, Block 243, Platform "A", OCS-G 19931, operated by W&T Energy IV, L.L.C. (MC 243 "A" Platform).

The proposed 5.563" O.D. x 63.47' long Manifold Flowline Jumper will originate at the Mississippi Canyon Area, Block 199 Subsea Manifold and terminate at the MC 199 West Pipeline PLET.

The proposed 4.5" O.D. x 53.62' long Well Flowline Jumper will originate at the existing MC 199 Subsea Well No. SS001 subsea tree and terminate at the MC 199 Subsea Manifold.

The pipeline installation contractor will install the proposed 5.563" O.D. pipeline by utilizing reeled pipe, "J" Lay methodology. No anchors will be deployed from the installation vessels. The seafloor in the area of the proposed route is relatively smooth. Water depths along the proposed route range from a minimum depth of 2460 feet at the MC 199 Subsea Manifold, slopes downward at an average rate of approximately 153 feet per mile to maximum of 2800 feet at MC 243 "A" platform.

If the above and attached information meets with your approval, please issue the necessary permit at your earliest convenience. Inquiries concerning this application should be directed to Mr. Pete Cruz of Pinnacle Engineering Company at petec@pinnacleengr.com, 713.784.1005, or Mr. Bruce Cooley in of LLOG Exploration Offshore, L.L.C. at bruceC@llog.com, 985.801.4300.

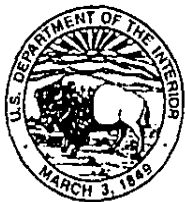
Sincerely,

LLOG Exploration Offshore, L.L.C.



Kemberlia Ducote
Secretary

EBR
Attachments



United States Department of the Interior

BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT

Gulf of Mexico OCS Region
1201 Elmwood Park Boulevard
New Orleans, LA 70123-2394

In Reply Refer To: MS 5232

February 24, 2012

Dr. Tassos Sachinis
DeepSea (UK) Ltd
Bradford House, 39a East Street.
Epsom, Surrey, KT17 1BL, UK

Dear Dr. Sachinis:

By the transmittal cover dated September 7, 2011, received by our office September 12, 2011, DeepSea (UK) Ltd, (Deep Sea), as the approved contracted certified verification agent (CVA) submitted an interim design phase report and by your transmittal cover dated January 31, 2012, received by our office February 1, 2012, Deep Sea submitted the final design phase report for the 5.563-inch OD SCR, which is associated with pending Right-of-way (ROW) Pipeline Segment No. (PSN) 18309 and Pipeline ROW OCS-G 29094, and LLOG's Mandy Project.

This riser will be installed on LLOG's Platform A, a mini tension leg production platform located in Mississippi Canyon Area, Block 243.

In accordance with 30 CFR 250.916(c)(4) and your recommendation, the BSEE hereby accepts the subject final design phase report.

Sincerely,

Angie D.
Gobert

Digitally signed by Angie D. Gobert
DN: cn=Angie D. Gobert,
o=Regional Field Operations,
BSEE, ou=Pipeline Section MS
5232,
email=angie.gobert@bsee.gov,
c=US
Date: 2012.02.26 19:20:43 -0600

For: Nick Wetzel
Regional Supervisor
Regional Field Operations

cc: Mr. Bruce Cooley
LLOG Exploration Offshore, L.L.C.
1001 Ochsner Blvd., Suite 200
Covington, Louisiana 70433

Hunter, Bradley

From: Gobert, Angie
Sent: Monday, February 27, 2012 7:25 AM
To: 'tsachinis@deepsea-eng.com'
Cc: 'Edie Ridgel'; 'Kumarasamy Varatha-Rajan'; Hunter, Bradley; 'bruceC@llog.com'
Subject: LLOG's ROW Pipeline Segment No. 18309 - Interim and Final Design Phase Report
Attachments: CVA_Design Final Report_LLOG_ROW PSN 18309_Mandy
Project_Acceptance_FINAL_2_24_2012_ADG.pdf

Dear Dr, Sachinis,

Please find attached the acceptance of the final design phase report for LLOG's Mandy Project regarding Right-of-way Pipeline Segment No. 1830 97' SCR.

Please ensure that the email contact of the individual responsible for confirming and submitting the final design report is included in the submittal.

Thank you for your cooperation.

Regards,
Angie D. Gobert
Senior Staff Petroleum Engineer
Pipeline Section - Regional Field Operations MS 5232
Bureau of Safety and Environmental Enforcement

(P) 504 736-2876
(F) 504 736-2208



United States Department of the Interior
BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
Gulf of Mexico OCS Region
1201 Elmwood Park Boulevard
New Orleans, LA 70123-2394

In Reply Refer To: MS 5232

November 4, 2011

Mr. Bruce Cooley
LLOG Exploration Offshore, L.L.C.
1001 Ochsner Blvd., Suite 200
Covington, Louisiana 70433

Dear Mr. Cooley:

Our office has reviewed your design, fabrication, and installation verification plans and the accompanying Certified Verification Agent (CVA) nomination dated June 23, 2011, received by our office June 24, 2011, amended by an email from Edie Ridgel dated November 2, 2011 to Angie D. Gobert. The aforementioned plans and CVA nomination has been submitted for one steel catenary riser (SCR) associated with the "Mandy" Project.

Specifically, LLOG proposes to install one 5.563-inch OD SCR which is associated with Right-of-way (ROW) Pipeline Segment No. (PSN) 18309 and Pipeline ROW OCS-G 29094. This riser will be installed on LLOG's Platform A, a mini tension leg production platform located in Mississippi Canyon Area, Block 243.

PSN 18309 is described as follows:

Segment No.	Size (inches)	Length (feet)	Service	Origin	Termination
18309	5	8,239	Bulk Oil	PLET	Platform A
				Mississippi Canyon Area	Mississippi Canyon Area
				Block 199	Block 243

Pursuant to 30 CFR 250.912, the subject verification plans are hereby approved. Additionally, pursuant to 30 CFR 250.914(a), the nomination of DeepSea US (Inc.) as the

CVA for the design, fabrication, and installation phase of the aforementioned riser is hereby approved.

Sincerely,

Angie D.
Gobert

Digitally signed by Angie D.
Gobert
DN: cn=Angie D. Gobert, o=Field
Operations, ou=Pipeline Section,
email=angie.gobert@boemre.gov,
c=US
Date: 2011.11.04 14:26:49 -0500

For: Nick Wetzel
Regional Supervisor
Regional Field Operations

cc: DeepSea (US) Inc.
10333 Richmond Avenue, Suite 600
Houston, Texas, 77042

Dan Jackson at djackson@deepsea-eng.com

Attachment F

CZM Certification

**COASTAL ZONE MANAGEMENT PROGRAM
CONSISTENCY CERTIFICATION**

FROM

Mississippi Canyon Block 199 PLET (OCS-G-32301)

TO

Mississippi Canyon Block 243 "A" Platform (OCS-G-19931)

1.98 miles Total Length

The proposed activities described in detail in this right-of-way pipeline application comply with the enforceable policies of Mississippi approved Coastal Management Program(s) and will be conducted in a manner consistent with such Program(s).

**Right-of-way Applicant
(Name and Address)**

LLOG Exploration Offshore, L.L.C.
1001 Ochsner Boulevard, Suite 200
Covington, Louisiana 70433

Certifying Official Signature



Kemberlia Ducote
Secretary

5-26-11

Date

May 26, 2011

Mr. Gregory DuCote
Coastal Resources Program Manager
Coastal Management Division
Department of Natural Resources
P.O. Box 44487
Baton Rouge, Louisiana 70804-4487

RE: **Application for Installation of One (1) 5.563" Right-of-Way Oil Bulk Oil Pipeline, one (1) 5.563" O.D. Manifold Jumper, and one (1) 4.5" O.D. Well Jumper, from LLOG's Mississippi Canyon Block 199 Subsea Manifold, OCS-G 32301 to W&T Energy VI, LLC's Platform "A", Mississippi Canyon Block 243, OCS-G-19931 Gulf of Mexico, Offshore, Louisiana**

Gentlemen:

In accordance with BOEMRE requirements (NTL No. 2007-G20) for a Right-of-Way pipeline that is adjacent to the State of Louisiana, we are enclosing (1) a complete copy of the pipeline application, (2) a consistency certification, and (3) all necessary data and information concerning the installation of the subject pipeline, and (4) a check in the amount of \$300.00 to cover the application fee.

In order to expedite the permit process, if the enclosed information is determined to be complete and the consistency review can begin, please indicate your consent by signing this letter in the space provided below and returning a signed copy to the attention of Bruce Cooley, LLOG Exploration Offshore, L.L.C., 1001 Ochsner Boulevard, Suite 200, Covington, Louisiana 70433.

Your cooperation in this matter is greatly appreciated.

Very truly yours,
LLOG EXPLORATION OFFSHORE, L.L.C.



Bruce Cooley
Vice President Facilities Engineering
Attachments

NOTIFICATION OF INFORMATION COMPLETENESS AND THAT REVIEW CAN COMMENCE.

THIS _____ DAY OF _____, 2011

By: _____

Title: _____

May 26, 2011

Mr. Mike Walker
Mississippi Coastal Program
Coastal Management Division
Department of Marine Resources
1141 Bayview Avenue,
Biloxi, MS 39530

RE: Application for Installation of One (1) 5.563" O.D. Right-of-Way Oil Bulk Oil Pipeline, one (1) O.D. 5.563" Manifold Jumper, and one (1) 4.5" O.D. Well Jumper, from LLOG's Mississippi Canyon Block 199 Subsea Manifold, OCS-G 32301 to W&T Energy VI, LLC's Platform "A", Mississippi Canyon Block 243, OCS-G-19931 Gulf of Mexico, Offshore, Louisiana

Gentlemen:

In accordance with MMS requirements (NTL No. 2007-G20) for a Right-of-Way pipeline that is adjacent to the State of Mississippi, we are enclosing (1) a complete copy of the pipeline application, (2) a consistency certification, and (3) all necessary data and information concerning the installation of the subject pipeline.

In order to expedite the permit process, if the enclosed information is determined to be complete and the consistency review can begin, please indicate your consent by signing this letter in the space provided below and returning a signed copy to the attention of Bruce Cooley, LLOG Exploration Offshore, L.L.C., 1001 Ochsner Boulevard, Suite 200, Covington, Louisiana 70433.

Your cooperation in this matter is greatly appreciated.

Very truly yours,
LLOG EXPLORATION OFFSHORE, L.L.C.



Bruce Cooley
Vice President Facilities Engineering
Attachments

NOTIFICATION OF INFORMATION COMPLETENESS AND THAT REVIEW CAN COMMENCE.

THIS _____ DAY OF _____, 2011

By: _____

Title: _____

Attachment J

WCD Calculation

LLOG EXPLORATION OFFSHORE, INC.
 MC 199 TO MC 243 "A" (EAST FLOWLINE)
 5" BULK OIL BI-DIRECTIONAL PIPELINE
 OIL SPILL CALCULATION SHEET
 WORST CASE DISCHARGE SCENARIO

A. DAILY FLOWRATES

GAS(mmscfd) 10
 OIL (bpd) 5000 = 0.05787 bbl/s

B. LEAK RESPONSE TIME

Leak detection time (s) 30
 Shutin response (s) 45
 Total response time 75 s = 0.020833 hours

C. DISCHARGE VOLUME DURING RESPONSE

VD1 = oil flow rate x total response time
 VD1 = 4.340278 bbls

D. LEAKAGE AFTER SHUT IN

Assume 33% of oil in pipeline leaks out.

Liquid holdup in pipeline: 223 bbls
 Volume discharge if 33% leaks =
 VD2= 66.9

TOTAL VOLUME SPILLED: VD1 + VD2 = 71.2 barrels

LLOG Exploration Offshore, L.L.C. can control, contain and clean up to the maximum extent practicable any discharged hydrocarbons that threaten coastal resources of Louisiana.

Attachment K
Designated Operators and State Agencies
Notification

The following Designated Oil and Gas Lease Operators, Right-of-Way Holders and Easement Holders have been furnished a copy of this application by Federal Express, Signature Requested. (Note: The status of blocks listed below is current as of May 26, 2011 per BOEMRE data search by LLOG)

MISSISSIPPI CANYON BLOCK 199

LLOG Exploration (Applicant) OCS-G-32301 Lease Holder

MISSISSIPPI CANYON BLOCK 243

W&T Energy VI, LLC OCS-G 19931 LeaseHolder/Operator
Nine Greenway Plaza, Suite 300
Houston, TX 77079
Attn: Ms. Jeanette Wilkins

STATE AGENCIES

Mr. Gregory DuCote, Coastal Resources Program Manager
Coastal Management Division
Department of Natural Resources
P.O. Box 44487
Baton Rouge, Louisiana 70804-4487

Mr. Mike Walker
Mississippi Coastal Program
Coastal Management Division
Department of Marine Resources
1141 Bayview Avenue,
Biloxi, MS 39530

May 26, 2011

Ms. Jeanette Wilkins
W&T Energy VI, LLC
Nine Greenway Plaza, Suite 300
Houston, TX 77079

RE: **Proposed SSTI**

Application for Installation of One (1) 5.563" O.D. Right-of-Way Oil Bulk Oil Pipeline, one (1) 5.563" O.D. Manifold Jumper, and one (1) 4.5" O.D. Well Jumper, from LLOG's Mississippi Canyon Block 199 Subsea Manifold, OCS-G 32301 to W&T Energy VI, LLC's Platform "A", Mississippi Canyon Block 243, OCS-G-19931 Gulf of Mexico, Offshore, Louisiana

Gentlemen:

This letter serves as notification that LLOG Exploration Offshore, L.L.C. (LLOG) is in the process of submitting an application to Bureau of Ocean Energy Management, Regulation, and Enforcement for the installation of the proposed one (1) 5.563" O.D. bulk oil pipeline, (1) 5.563" O.D. Manifold Jumper and (1) 4.5" O.D. Well Jumper in the Mississippi Canyon Area, Gulf of Mexico.

The pipeline installation will tie-in at your Platform "A" in Mississippi Canyon Area, Block 243, (OCS-G-19931).

In accordance with BOEMRE requirements, we are enclosing a complete copy of the subject application for your review.

In order to expedite the permit process, if the above information meets with your approval, please indicate your consent to this SSTI by signing this letter in the space provided below and returning a signed copy to the attention of Bruce Cooley, LLOG Exploration Offshore, L.L.C., 1001 Ochsner Boulevard, Suite 200, Covington, Louisiana 70433.

Your cooperation in this matter would be greatly appreciated.

Very truly yours,



Bruce Cooley
Vice President Facilities Engineering

CONSENT GRANTED THIS _____ DAY OF _____, 2011

By: _____

Title: _____

Attachment L

Nondiscrimination Employment Stipulation

**UNITED STATES
DEPARTMENT OF THE INTERIOR
Bureau of Ocean Energy Management, Regulation, and Enforcement**

NONDISCRIMINATION IN EMPLOYMENT (Form YN 3341-1)

As a condition precedent to the approval of the granting of the subject pipeline right-of-way, the grantee, LLOG Exploration Offshore, L.L.C. hereby agrees and consents to the following stipulation which is to be incorporated into the application for said right-of-way.

During the performance of this grant, the grantee agrees as follows:

During the performance under this grant, the grantee shall comply with paragraphs (1) through (7) of section 202 of Executive Order 11246, as amended (reprinted in 41 CFR 60-1.4(a)), which are for the purpose of preventing discrimination against persons on the basis of race, color, religion, sex or national origin. Paragraphs (1) through (7) of section 202 of Executive Order 11246, as amended, are incorporated in this grant by reference.



Kemberlia Ducote
Secretary

LLOG Exploration Offshore, .L.L.C.

5-26-11

Date



exploration

Mississippi Canyon 199
ROW Pipeline Information

Cathodic Protection 250.1007(a)(3)(i)	See Attachment E Design Information Sheets/Drawings <ul style="list-style-type: none"> - Pipeline - Jumpers - Manifold - Risers
External Pipeline Coating 250.1007(a)(3)(ii)	
Internal Protective Measures 250.1007(a)(3)(iii)	
Gravity of Empty Pipe 250.1007(a)(3)(iv)	
MSP 250.1007(a)(3)(v)	
MAOP and Calculations 250.1007(a)(3)(vi)	
Hydrostatic Test Pressure 250.1007(a)(3)(vii)	
Coastal Zone Management Program Requirements NTL 2007-G20	See Attachment F Coastal Zone Management Certification
MAOP of Receiving PL or Facility 250.1007(a)(3)(viii)	See Attachment D Safety Schematic Drawing (Drawing No. 901)
Proposed Construction Start Date Estimated Duration Overall Completion 250.1007(a)(3)(ix)	November 1, 2011 15 Days 30 Days
Type of Protection Crossing pipelines, Subsea Valves, Taps, and Manifold Assemblies 250.1007(a)(3)(x)	N/A
Additional Precautions 250.1007(a)(4.i-ii)	N/A
Hazard and Archaeological Survey & Reports 250.1007(a)(5) NTL 2005-G07. NTL 2008-G05. NTL 2009-G40	See Attachment G Archaeological, Engineering and Hazard Report prepared by C&C Technologies dated March 2011 A review of the hazard survey data indicated that there is no evidence of any geologic condition along the proposed route or in the survey area that would present a hazard or constraint to pipeline construction or operation.
Copies of Applications Submitted Plat Information on a CD with ASCII file 250.1007(b), NTL 2009-G15	An Original, three copies and a CD See Attachment H CD Enclosed

LLOG
exploration
Mississippi Canyon 199
ROW Pipeline Information

ROW Site for Proposed Pipeline 250.1007(a)(1)					
Description	Originate	Terminate	Direction	Distance (ft)	Distance (statute miles)
5.563 O.D. Bulk Oil	Pipeline End Termination in MC 199, OCS-G 32301	Hang off Location MC 243 "A", OCS-G 19931	Southerly	10,440.76	1.98
5.563" Manifold Jumper	Manifold in MC 199, OCS-G 32301	Pipeline End Termination in MC 199, OCS-G 32301	South Easterly	63.47	0.01
4.5" Well Jumper	Well No.SS-1 in MC 199, OCS-G 32301	Manifold in MC 199, OCS-G 32301	South Easterly	53.62	0.01

2. REQUIREMENT TO OBTAIN PIPELINE ROW GRANTS

Data Requirement	Required Data
Corporate Registration 250.1009(a)	LLOG Exploration Offshore, L.L.C. is a Louisiana Limited Liability Corporation
ROW Width 250.1009(b)	200'

3. REQUIREMENTS FOR PIPELINE ROW HOLDERS

Data Requirement	Required Data
Comply with Applicable laws and regulations 250.1010(a), 250.1010(b)	LLOG agrees that said right-of ways, if approved, will be subject to the terms and conditions of said regulations and will bound by the provisions of the OCS Lands Act, as amended. LLOG Exploration Offshore, L.L.C will be operator of the proposed ROW pipeline.
Comply with Archaeological Resources 250.1010(c)	LLOG will stop work and report any archaeological resources discovered within the ROW.



exploration

Mississippi Canyon 199
ROW Pipeline Information

4. APPLICATIONS FOR PIPELINE ROW GRANTS

Data Requirement	Required Data
Application Fee Rental Fee 250.1015(b)(3)(i-ii), 250.1000(b)	\$2,569.00 Payment per 250.125 1.98 miles = \$30.00 Payment per 250.1012 See Attachment I
Application Qualifications 250.1015(b)(3)(i-ii). 250.1011(a)(1)	Please refer to your New Orleans Miscellaneous File No. 2058 for a copy of a resolution approved by the Board of Directors authorizing the undersigned to sign for and on behalf of LLOG Exploration Offshore, L.L.C. LLOG Exploration Offshore, L.L.C., has an approved \$300,000 Right-of-Way Grant Bond on file with BOEMRE, covering installation of right-of-way pipelines in Federal Waters, Gulf of Mexico. Regional Oil Spill Response Plan All the proposed activities and facilities in the Exploration Plan/Development Operations Coordination Document will be covered by the last approved Oil Spill Response Plan (OSRP) submitted on 06/28/2008 and last approved modification to that Plan dated 01/06/2010. LLOG (MMS Operator No. 02058) submitted the Biennial Oil Spill Response Plan on 06/30/2010 (currently pending approval) with the last modification to that Plan filed on 03/16/2011 (currently pending approval). The last OSRP Certification was accepted by BOEMRE on 03/25/2011. See Attachment J WCD Calculations
Lease and Pipeline Crossing Notification 250.1015(c)	See Attachment K Designated Operators and State Agencies Notifications
Nondiscrimination in Employment 250.1015(d)	See Attachment L Nondiscrimination in Employment Stipulation



exploration

**Mississippi Canyon 199
ROW Pipeline Information**

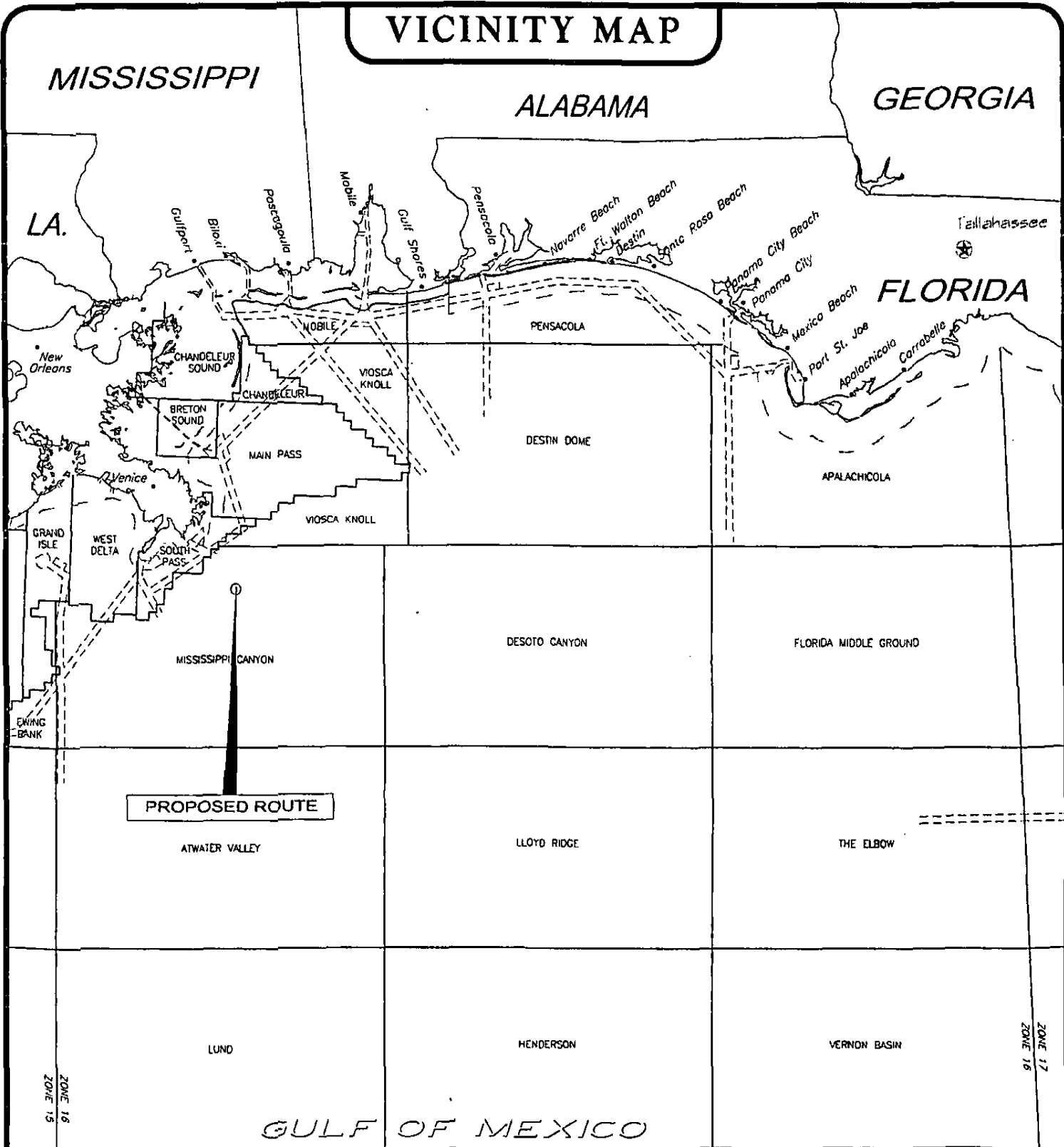
5. **GRANTING PIPELINE ROW**

Data Requirement	Required Data
Adjoin/Cross State Submerged Lands 250.1016(b)	Does not adjoin or subsequently cross state submerged lands.

Attachment A

Proposed East Oil Pipeline

VICINITY MAP



PROPOSED ROUTE



GEODETIC DATUM: NAD27
 ELLIPSOID: CLARKE 1866
 GRID UNITS: U.S. SURVEY FEET
 PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
 ZONE: 16N
 CENTRAL MERIDIAN: 87° 00' W
 FALSE EASTING: 1,640,416.87 ft. at C.M.
 FALSE NORTHING: 0.00 ft. at 00° 00' N

DATE: 05/20/2011 TIME: 14:05 FILENAME: Z:\110092\ACAD\PERMIT\PRM110092CVR.DWG



PROP. EAST 5.563" BULK OIL PIPELINE
Block 199 PLET to Block 243 "A" Platform
Mississippi Canyon Area

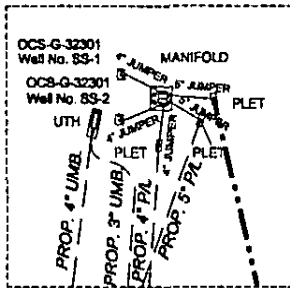
PREPARED BY:  **C&C Technologies**
 SURVEY SERVICES
 730 F. CHRISTE SAVOUCY ROAD, LAFAYETTE, LA (337) 251-0660

JOB No: 110092, 110367
 FILENAME: PRM110092CVR.DWG

REVISED: 05/09/2011
 05/20/2011

DATE: Mar. 23, 2011
SHEET 1 of 3

INSET



00+00.00'
PLET
X= 1,053,185.31'
Y= 10,445,314.47'
Lat= 28°46'12.993"N
Lon= 88°50'00.315"W

PROPOSED EAST 5.563" BULK OIL PIPELINE
TOTAL LENGTH = 10,440.76' = 1.98 statute miles

OCS-G-32301
Well No. 88-1, 88-2

PROP. WEST 6.563" BULK OIL P/L
PROPOSED 4" UMBILICAL
PROP. CENTRAL 3" UMBILICAL
PROP. CENTRAL 4" BULK OIL P/L

18309

513°53'07"E
6,824.87'

FLOW

MC199
OCS-G-32301
LLOG

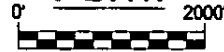
MATCH LINE

THE PROPOSED ROUTES ACCURATELY REPRESENTED.

RALPH A. COLEMAN
REGISTERED
PROFESSIONAL LAND SURVEYOR
LOUISIANA REGISTRATION No. 96870

FOR PERMITTING ONLY. STATIONING AND LENGTHS REFER TO HORIZONTAL DISTANCE(S) ONLY.

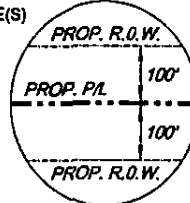
PLAN



SCALE IN US SURVEY FEET

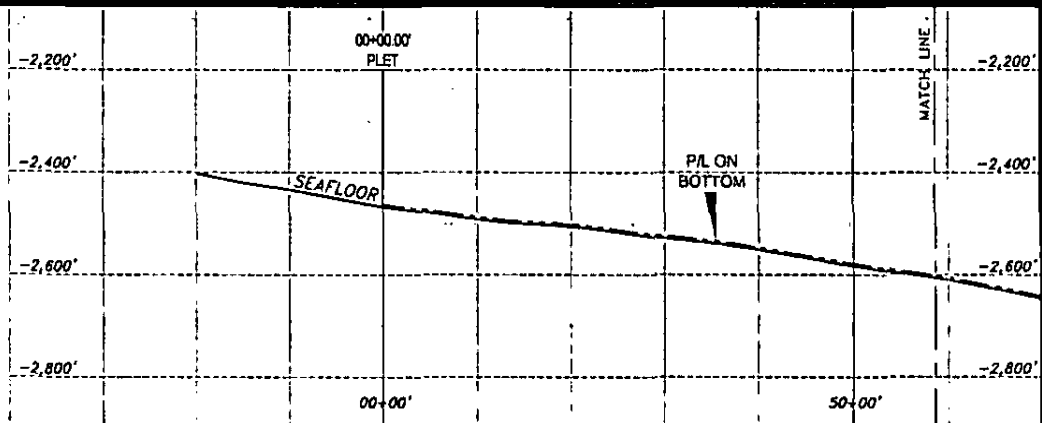
NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL



DESIGN CHARACTERISTICS OF THIS ROUTE ARE IN COMPLIANCE WITH APPLICABLE REGULATIONS.

AREA ENGINEER



PROFILE

HORIZONTAL SCALE: 0' to 2,000'
VERTICAL SCALE: 0' to 400'

DATE: 05/20/2011 TIME: 14:12 FILENAME: Z:\110092\ACAD\PERMIT\PRM110092_EAST.DWG

VERTICAL EXAGGERATION = 5



PROP. EAST 5.563" BULK OIL PIPELINE
Block 199 PLET to Block 243 "A" Platform
Mississippi Canyon Area

PREPARED BY: **C&C Technologies**
SURVEY SERVICES
730 E. KALISIE SALOON ROAD, LAFALETTE, LA (337) 251-0660

JOB No: 110092, 110367
FILENAME: PRM110092_EAST.DWG

REVISED: 05/09/2011
05/20/2011

DATE: Mar. 23, 2011

SHEET 2 of 3

MC199

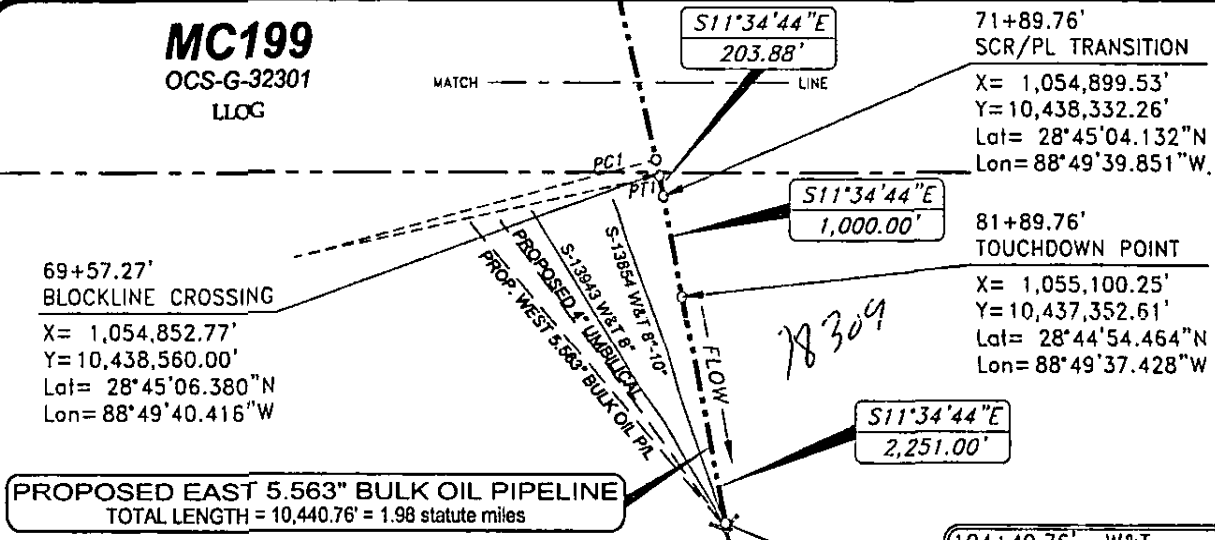
OCS-G-32301
LLOG

MC200

OCS-G-32302
NOBLE

MC244

OCS-G-32305
DEVON



PROPOSED EAST 5.563" BULK OIL PIPELINE
TOTAL LENGTH = 10,440.76' = 1.98 statute miles

CURVE 1 DATA	
PC1	68+24.87'
X=	1,054,823.13'
Y=	10,438,689.03'
Lat=	28°45'07.653"N
Lon=	88°49'40.771"W
PT1	69+85.88'
X=	1,054,858.61'
Y=	10,438,531.99'
Lat=	28°45'06.103"N
Lon=	88°49'40.345"W
PI1	
X=	1,054,842.45'
Y=	10,438,610.87'
R=	4,000.00'
T=	80.52'
Δ=	02°18'23"
L=	161.01'

MC243

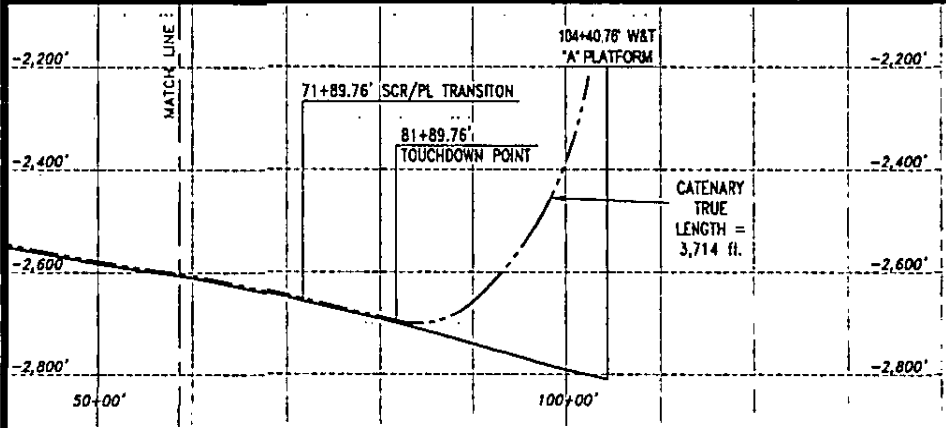
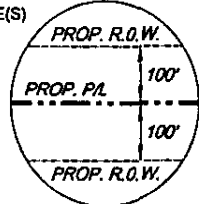
OCS-G-19931
W&T

FOR PERMITTING ONLY. STATIONING AND LENGTHS REFER TO HORIZONTAL DISTANCE(S) ONLY.

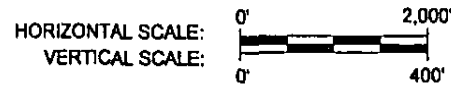
RIGHT-OF-WAY DETAIL



SCALE IN US SURVEY FEET
NADCON version 2.1 utilized for WGS84-NAD27 conversions.



PROFILE



VERTICAL EXAGGERATION = 5

DATE: 05/20/2011 TIME: 14:12 FILENAME: Z:\110092\ACAD\PERMIT\PRM110092_EAST.DWG



PROP. EAST 5.563" BULK OIL PIPELINE
Block 199 PLET to Block 243 "A" Platform
Mississippi Canyon Area

PREPARED BY:



C&C Technologies
SURVEY SERVICES
730 E. ALISTE SALOON ROAD, LAFAYETTE, LA (337) 251-0660

JOB No: 110092, 110367
FILENAME: PRM110092_EAST.DWG

REVISED: 05/09/2011
05/20/2011

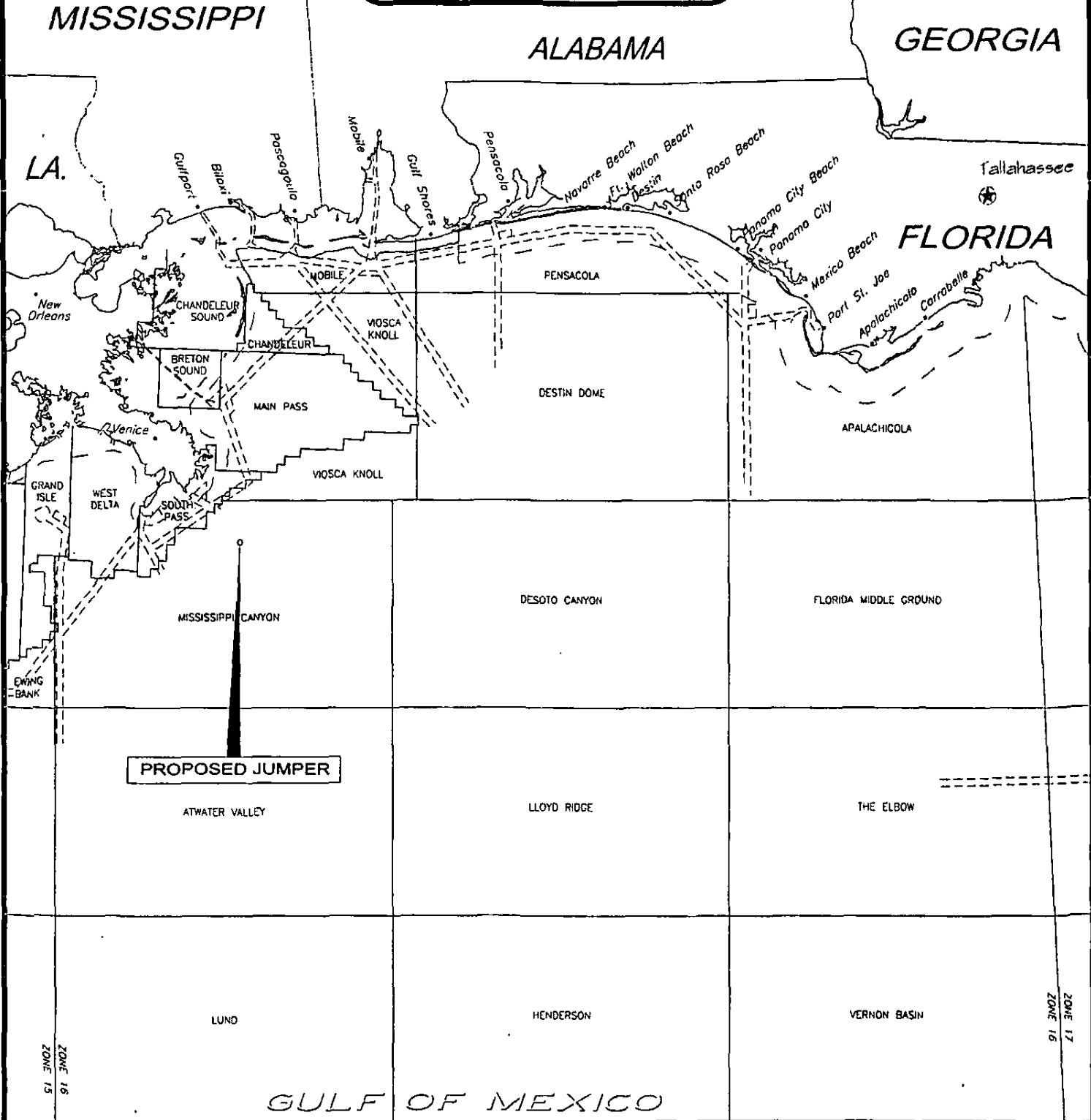
DATE: Mar. 23, 2011

SHEET 3 of 3

Attachment C

Proposed 4in Well Jumper

VICINITY MAP



PROPOSED JUMPER



GEODETIC DATUM: NAD27
 ELLIPSOID: CLARKE 1866
 GRID UNITS: U.S. SURVEY FEET
 PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
 ZONE: 16N
 CENTRAL MERIDIAN: 87° 00' W
 FALSE EASTING: 1,640,416.67 ft. at C.M.
 FALSE NORTHING: 0.00 ft. at 00° 00' N

DATE: 05/09/2011 TIME: 17:46 FILENAME: Z:\110092\ACAD\PERMIT\PRM110092CVR_J.DWG



PROPOSED 4" WELL JUMPER
 WELL No. SS-1 HUB to MANIFOLD
 Block 199, Mississippi Canyon Area

PREPARED BY: **C&C Technologies**
 SURVEY SERVICES
 730 E. ALBISTE SULLOW ROAD, LAFAYETTE, LA (337) 281-0660

JOB No: 110092, 110367
 FILENAME: PRM110092CVR_J.DWG

REVISED: 5-9-2011

DATE: Mar. 23, 2011

SHEET 1 of 2

Attachment E

Design Information Sheets/Drawings

Pipeline
Jumpers
Manifold
Risers

LLOG EXPLORATION COMPANY
East 5" Bulk Oil, Bi-Directional Pipeline
Mississippi Canyon 199 PLET
to Mississippi Canyon 243 "A"
Rev. 0, 5/17/11

PIPELINE DESIGN INFORMATION

I. Pipeline and Riser Description

A. Nominal Pipeline:

Size:	5.563 Inch
Wall Thickness:	0.438 Inch
Grade:	API 5L Gr. X65 , SMLS
Length:	10,441 Feet, 1.98 Miles
Bare Weight:	23.97 lbs/ft
Protection Coating Type and Thickness:	Fusion Bonded Epoxy (FBE); 12-14 mils
Insulation Coating:	Glass Synthactic Polyurethane (GSPU), 2 inches
Specific Gravity of Pipe in Seawater (empty):	1.27

B. Riser:

Size:	5.563 Inch
Wall Thickness:	0.625 Inch
Grade:	API 5L Gr. X65 , SMLS
Bare Weight:	32.96 lbs/ft
Protection Coating Type and Thickness:	
- Below Splash Zone:	FBE 12-14 mils & GSPU 1 inch
- In Splash Zone:	Splashtron Coating; ½ Inch
- Above Splash Zone:	Fusion Bonded Epoxy; 12-14 mils and/or a three coat paint system; 12 mils DFT.
Weight Coating:	None

II. Cathodic Protection System

The riser and pipeline shall be protected by tapered bracelet type anodes.

Pipeline and Riser Sacrificial Anodes System:

Design Life:	20 yrs.
Type of Anode:	Galvotec CW III
Spacing Interval:	500 ft.
Output:	1150 Amps - hrs./lb.
Efficiency:	0.85
Current Density:	2 ma/sq. ft.
% Assumed Bare Pipe:	5%
Minimum Required Weight of Anode:	N/A

$$\# = (.002) (3.14159) (5.563) (500) (.05) (20) (365) (24) / (1150) (12) (.85) = 13.1 \text{ lbs.}$$

Use one (1) 37# net weight anode every 500 feet.

III. Water-Depth for Pipeline:

The water depth along the pipeline is approximately between (-)2470 and (-)2810 feet.

IV. Description of Internal Protective Measures:

Internal Coating:	None
Corrosion Inhibitor Program:	As necessary
Pigging Program:	The MC 199 Bulk Oil pipeline will be set up to be piggable. Frequency will be determined after first production.

V. Riser Protection

At Mississippi Canyon 243 "A", the riser will be protected by a riser guard.

VI. Specific Gravity of the Empty Pipe Based on Seawater:

The formula used to calculate the specific gravity is as follows:

$$S.G. \approx \frac{(W_P + W_{CONC})}{W_{H_2O}}$$

Where:

$$\begin{aligned}W_p &= \text{Weight of the pipe (lbs/ft)} = 23.97 \\W_{GSPU} &= \text{Weight of GSPU (lbs/ft)} = 16.50 \\W_{1120} &= \text{Displaced weight of the seawater (lbs/ft)} = 31.92\end{aligned}$$

The above weights are based on the pipe outside diameter and corrosion coating thickness and on the densities of the various materials which are listed below.

$$\begin{aligned}\text{Density of Pipe} &= 490 \text{ lbs/ft}^3 \\ \text{Density of Seawater} &= 64 \text{ lbs/ft}^3 \\ \text{The specific gravity of the pipeline} &= 1.27\end{aligned}$$

VII. Specific Gravity & Temperature of the Product:

The specific gravities and temperature of the oil and gas to be transported is anticipated to be:

$$\begin{aligned}\text{S.G. (Gas)} &= 0.69 \text{ (Air} = 1.0) @ T = 80 \text{ Degrees} \\ \text{S.G. (Oil)} &= 0.81 \text{ (Water} = 1.0) @ T = 80 \text{ Degrees} \\ \text{Temperature} &= 95 \text{ Degrees Fahrenheit}\end{aligned}$$

VIII. Design Capacity:

The design flowing capacity of the flowline is 10 MMSCFD and 5000 BLPD. The total-volume capacity of the pipeline is 223 bbls.

IX. Maximum Operating Pressure:

1. Calculations based on CFR, Title 30, Part 250, Subparts H and J.

$$\begin{aligned}P &= \frac{2st}{D} \\ PI &= \frac{2s(t-ca)(F)(E)(T)}{D}\end{aligned}$$

Where:

- P = Pressure as 100% SMYS (psig)
 P1 = Internal Design Pressure (psig)
 s = Specified Minimum Yield Strength (SMYS) (psi)
 t = Pipe Wall Thickness in Inches
 ca = Corrosion Allowance (use 0.000 inches)
 D = Pipe Outside Diameter in Inches
 (F) = Design Factor
 0.60 for Risers
 0.72 for Pipelines
 (E) = Joint Factor
 1.0 for Seamless Pipe
 (T) = Temperature Derating Factor
 1.0 for Operating Temperatures below 250 Degrees Fahrenheit

1) Pipeline: 5.563" OD x 0.438" W.T. API 5L Gr. X65

- a) $P = (2) (65,000) (0.438) / (5.563) = 10,235 \text{ psig}$
 b) $P1 = (2) (65,000) (0.438 - 0.000) (0.72) (1) (1) / 5.563 = 7,370 \text{ psig}$
 c) Hydrostatic Test Pressure = HTP
 Maximum HTP = $0.95 P = (0.95) (10,235) = 9,724 \text{ psig}$
 Minimum HTP will be 4,632 psig for 8 hour hold time
 Rated MAOP = $4,632 \text{ psig} / 1.25 = 3,705 \text{ psig}$
 d) Maximum Allowable Operating Pressure (MAOP) = 3,705 psig

2) Riser: 5.563" OD x 0.625" W.T. API 5L Gr. X65

- a) $P = (2) (65,000) (0.625) / (5.563) = 14,605 \text{ psig}$
 b) $P1 = (2) (65,000) (0.625 - 0.000) (0.60) (1) (1) / 5.563 = 8,763 \text{ psig}$
 c) Hydrostatic Test Pressure = HTP
 Maximum HTP = $0.95 P = (0.95) (14,605) = 13,875 \text{ psig}$
 Minimum HTP will be 4,632 psig for 8 hour hold time
 Rated MAOP = $4,632 \text{ psig} / 1.25 = 3,705 \text{ psig}$
 d) Maximum Allowable Operating Pressure (MAOP) = 3,705 psig

B. MAOP of Flange, Fittings and Valves:

1) Under Water:

ANSI 1500 class = 3,705 psig

2) Platform Facilities (See Safety Schematic):

ANSI 1500 class = 3,705 psig

C. Summary

This pipeline and riser will have an MAOP of 3,705 psig

X. Design Standard:

The design of the proposed pipeline is in accordance with the Department of Interior Subparts H & J Part 250, Title 30, of The Code of Federal Regulations.

XI. Construction Information:

A)	Anticipated Start Date:	November 1, 2011
B)	Method of Construction:	Lay Barge
C)	Method of Burial:	N/A
D)	Time Required to Lay Pipe:	15 Days
E)	Time Required to Complete the Project:	30 Days

LLOG EXPLORATION OFFSHORE, L.L.C.
 4" Jumper Design
 Mississippi Canyon 199
 Tree to Manifold & 4 in Bulk Oil PLET to Manifold
 Rev. 0, 5/17/11

Maximum Operating Pressure:

1. Calculations based on CFR, Title 30, Part 250, Subparts H and J.

$$P = \frac{2st}{D}$$

$$P = \frac{2s(t-ca)(F)(E)(T)}{D}$$

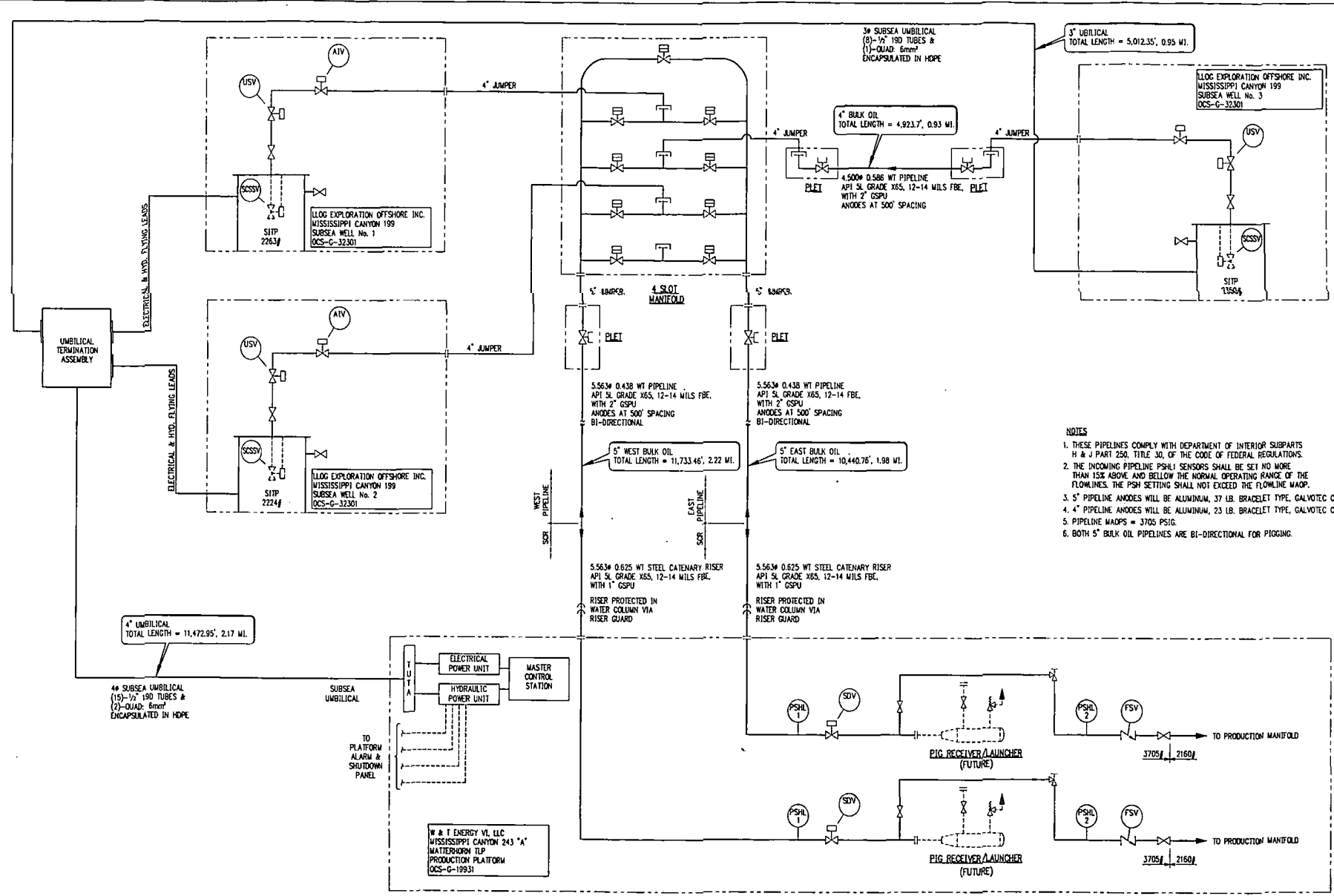
Where:

- P = Pressure as 100% SMYS (psig)
 P1 = Internal Design Pressure (psig)
 s = Specified Minimum Yield Strength (SMYS) (psi)
 t = Pipe Wall Thickness in Inches
 ca = Corrosion Allowance (use 0.000 inches)
 D = Pipe Outside Diameter in Inches
 (F) = Design Factor
 0.60 for Risers
 0.72 for Pipelines & Jumpers
 (E) = Joint Factor
 1.0 for Seamless Pipe
 (T) = Temperature Derating Factor
 1.0 for Operating Temperatures below 250 Degrees Fahrenheit

- 1) Jumper: 4.500" OD x 0.586" W.T. API 5L Gr. X65

- a) $P = (2) (65,000) (0.586) / (4.500) = 16,929 \text{ psig}$
 b) $P1 = (2) (65,000) (0.586 - 0.000) (0.72) (1) (1) / 4.500 = 12,189 \text{ psig}$
 c) Hydrostatic Test Pressure = HTP
 Maximum HTP = $0.95 P = (0.95) (16,929) = 16,082 \text{ psig}$
 Minimum HTP will be 4,632 psig for 8 hour hold time
 Rated MAOP = $4,632 \text{ psig} / 1.25 = 3,705 \text{ psig}$
 d) Maximum Allowable Operating Pressure (MAOP) = 3,705 psig

Revision: 05/19/11 11:00 P:\Pinnacle\ENR\T\SCHEMATIC\243\24300001.dwg



- NOTES**
1. THESE PIPELINES COMPLY WITH DEPARTMENT OF INTERIOR SUBPARTS H & J PART 250, TITLE 30, OF THE CODE OF FEDERAL REGULATIONS.
 2. THE INCOMING PIPELINE PSH1 SENSORS SHALL BE SET NO MORE THAN 15% ABOVE AND BELOW THE NORMAL OPERATING RANGE OF THE FLOWLINES. THE PSH SETTING SHALL NOT EXCEED THE FLOWLINE MAOP.
 3. 5" PIPELINE ANODES WILL BE ALUMINUM, 37 LB. BRACELET TYPE, GALVOTEC CW III.
 4. 4" PIPELINE ANODES WILL BE ALUMINUM, 23 LB. BRACELET TYPE, GALVOTEC CW III.
 5. PIPELINE MAOPS = 3705 PSIG.
 6. BOTH 5" BULK OIL PIPELINES ARE BI-DIRECTIONAL FOR PIGGING.

NOTES

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NO.	DATE	REVISION	BY	APPR
A		ISSUED FOR PERMIT		

PINNACLE ENGINEERING

TX REGISTERED ENGR FIRM F-567

APPROVAL	
Drawn By	R. DEMALOFF
Date	5-9-11
Checked By	
Date	
Designed By	
Date	
Approved By	
Date	

LLOG
exploration

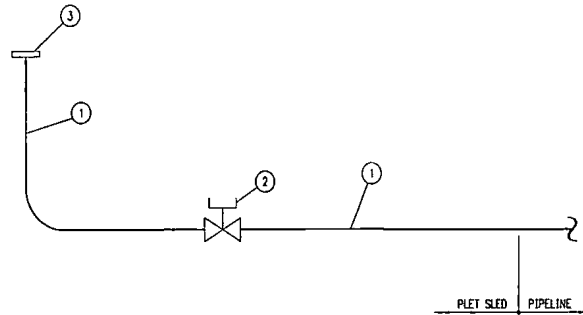
MANDY SUBSEA DEVELOPMENT
MC 199 TO MC 243 "A"

DUAL 5" & 4" PIPELINE SAFETY SCHEMATIC

JOB NO. 202800 SCALE: NOTED DWG. NO. 901 REV. A

MATERIAL SUMMARY

ITEM	QTY.	DESCRIPTION
1	-	PIPE, 5.563# 0.438 WT., API 5L OR X65, SMLS. COATED WITH 12-14 MILS D.F.T. FUSION BONDED EPOXY, WITH 2" GSPU
2	ONE	VALVE, 4 1/4", GATE, API 5000, MANUAL OPERATOR WITH ROV INTERFACE, WE x WE, BTM 0.438 WT. OR X65 PIPE, RATED FOR SUBSEA SERVICE
3	ONE	REMOTE ARTICULATED CONNECTOR, 4 1/4", API 10000, MALE CONNECTOR ASSEMBLY, OIL STATES



NOTES

1. HYDROTEST:
THE PLET ASSEMBLY SHALL BE HYDROTESTED TO A MINIMUM OF 4632 PSI AND HELD FOR A PERIOD OF 8 HOURS. THE PRESSURE SHALL HOLD OR RISE OVER THE LAST TWO HOURS.

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NO.	DATE	REVISION	BY	APPR
A		ISSUED FOR PERMIT		

PINNACLE
ENGINEERING

TX REGISTERED ENGR FIRM F-567

APPROVAL	
Drawn By	J. GUEVARA
Date	5-19-11
Checked By	
Date	
Designed By	
Date	
Approved By	
Date	

LLOG
exploration

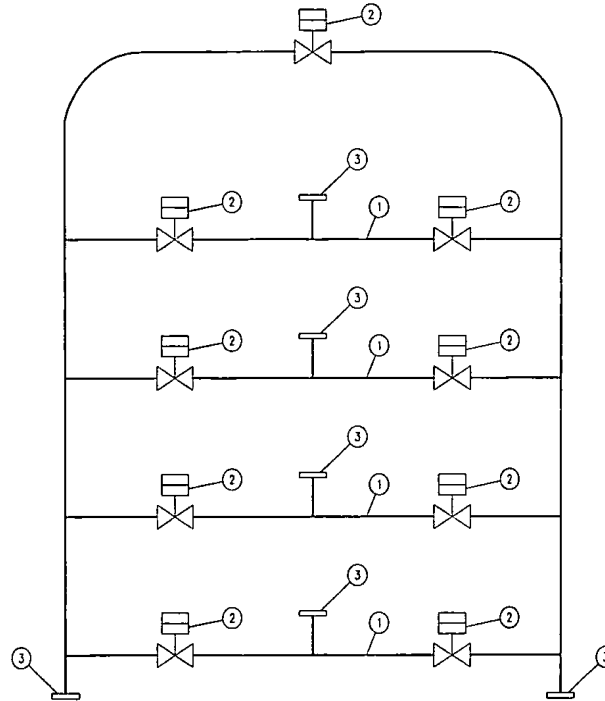
MANDY SUBSEA DEVELOPMENT
MC 199 TO MC 243 "A"

5" PLET PIPING SCHEMATIC

JOB NO. 202800	SCALE: NOTED	DWG. NO. 903	REV. A
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MATERIAL SUMMARY

ITEM	QTY.	DESCRIPTION
1	-	PIPE, 5.563M 0.438 WT., API 5L OR X65, SMLS, COATED WITH 12-14 MILS D.F.T. FUSION BONDED EPOXY, WITH 2" CSPU
2	9	VALVE, 4 1/4", GATE, API 5000, MANUAL OPERATOR WITH ROV INTERFACE, WE ± WE, B1M 0.438 WT. GR X65 PIPE, RATED FOR SUBSEA SERVICE
3	6	REMOTE ARTICULATED CONNECTOR, 4 1/4", API 10000, MALE CONNECTOR ASSEMBLY, OIL STATES



NOTES

1. HYDROTEST:
THE MANIFOLD ASSEMBLY SHALL BE HYDROTESTED TO A MINIMUM OF 4632 PSI AND HELD FOR A PERIOD OF 8 HOURS. THE PRESSURE SHALL HOLD OR RISE OVER THE LAST TWO HOURS.

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NO.	DATE	REVISION	BY	APPR
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PINNACLE
ENGINEERING

TX REGISTERED ENGR FIRM F-567

APPROVAL

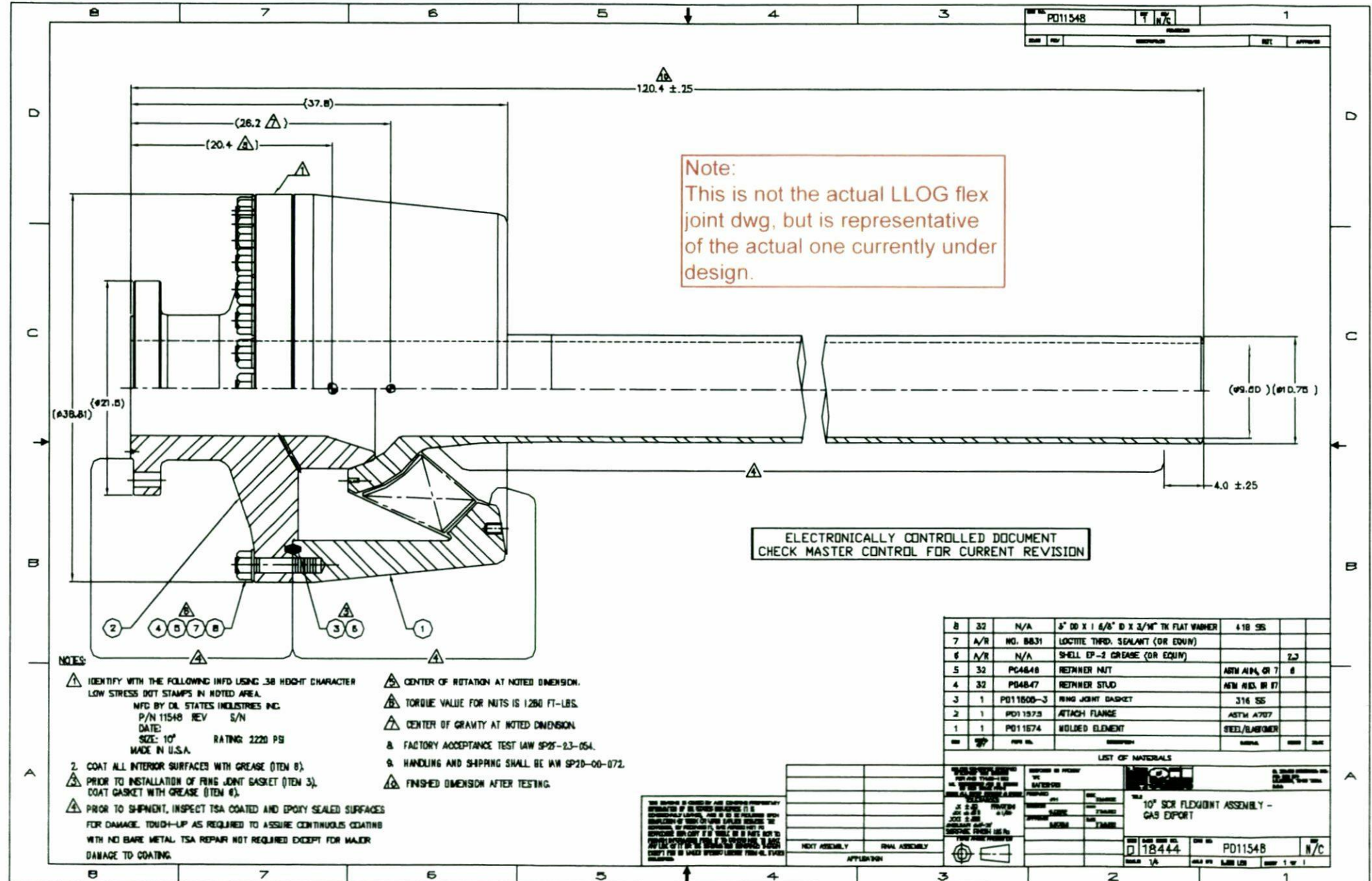
Drawn By	J. GUEVARA
Date	5-19-11
Checked By	
Date	
Designed By	
Date	
Approved By	
Date	

LLOG
exploration

MANDY SUBSEA DEVELOPMENT
MC 199 TO MC 243 "A"

MANIFOLD SCHEMATIC

JOB NO. 202800	SCALE: NOTED	DWG. NO. 904	REV. A
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Note:
This is not the actual LLOG flex joint dwg, but is representative of the actual one currently under design.

ELECTRONICALLY CONTROLLED DOCUMENT
CHECK MASTER CONTROL FOR CURRENT REVISION

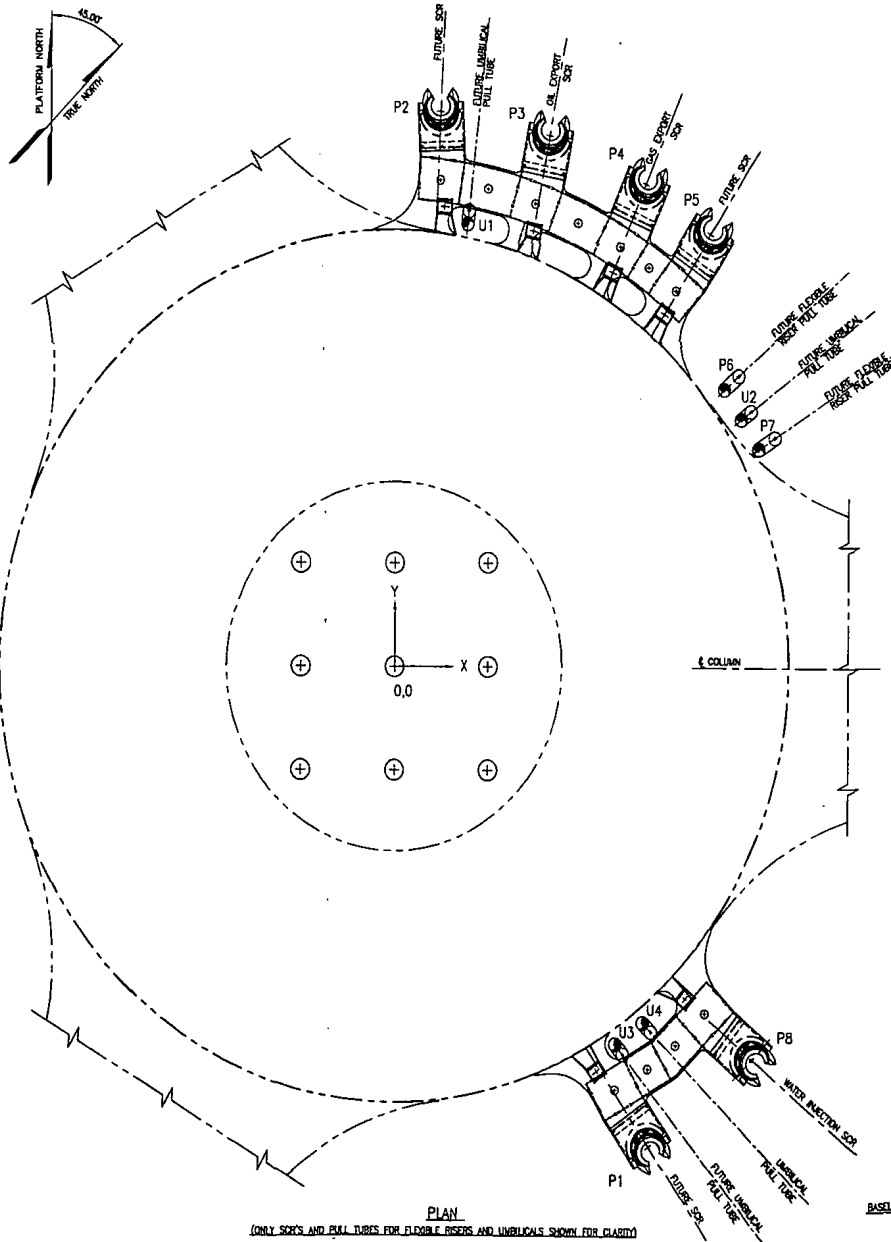
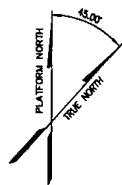
NOTES:

- △ IDENTIFY WITH THE FOLLOWING INFO USING .38 HIGH CHARACTER LOW STRESS DOT STAMPS IN NOTED AREA.
MFD BY OIL STATES INDUSTRIES INC.
P/N 11548 REV 5/N
DATE:
SIZE: 10" RATING: 2220 PS
MADE IN U.S.A.
 - △ CENTER OF ROTATION AT NOTED DIMENSION.
 - △ TORQUE VALUE FOR NUTS IS 1250 FT-LBS.
 - △ CENTER OF GRAVITY AT NOTED DIMENSION.
 - △ FACTORY ACCEPTANCE TEST LAW SP25-23-054.
 - △ HANDLING AND SHIPPING SHALL BE IAN SP20-00-072.
 - △ FINISHED DIMENSION AFTER TESTING.
2. COAT ALL INTERIOR SURFACES WITH GREASE (ITEM 8).
PRIOR TO INSTALLATION OF RING JOINT BASKET (ITEM 3), COAT BASKET WITH GREASE (ITEM 8).
PRIOR TO SHIPMENT, INSPECT TSA COATED AND EPOXY SEALED SURFACES FOR DAMAGE. TOUCH-UP AS REQUIRED TO ASSURE CONTINUOUS COATING WITH NO BARE METAL. TSA REPAIR NOT REQUIRED EXCEPT FOR MAJOR DAMAGE TO COATING.

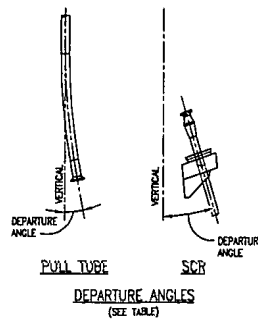
QTY	UNIT	DESCRIPTION	REVISION	DATE
8	32	N/A	3" OD X 1 1/8" ID X 3/16" TH FLAT WASHER	4 18 95
7	A/R	NO. 8831	LOCTITE THRD. SEALANT (OR EQUIV)	
6	N/A	N/A	SHELL EP-2 GREASE (OR EQUIV)	2,3
5	32	PG4848	RETAINER NUT	ATM A14, OR 7
4	32	PG4847	RETAINER STUD	ATM A14, OR 7
3	1	PD11500-3	RING JOINT BASKET	316 SS
2	1	PD11573	ATTACH FLANGE	ASTM A707
1	1	PD11574	WOLDED ELEMENT	STEEL/CLADMETAL

LIST OF MATERIALS

<p>THIS DRAWING IS CONTROLLED BY THE DRAWING IDENTIFICATION SYSTEM. IT IS THE RESPONSIBILITY OF THE USER TO OBTAIN THE CURRENT REVISION OF THIS DRAWING. THE USER SHALL BE RESPONSIBLE FOR OBTAINING THE CORRECT COPY OF THIS DRAWING. IT IS NOT TO BE USED FOR FABRICATION UNLESS IT IS THE CURRENT REVISION. THE USER SHALL BE RESPONSIBLE FOR OBTAINING THE CORRECT COPY OF THIS DRAWING. IT IS NOT TO BE USED FOR FABRICATION UNLESS IT IS THE CURRENT REVISION.</p>	<p>APPROVED BY: [Signature]</p> <p>DATE: [Date]</p>	<p>10" SCR FLEXJOINT ASSEMBLY - GAS EXPORT</p> <p>REV: 18444</p> <p>DATE: [Date]</p>
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PLAN
(ONLY SCR'S AND PULL TUBES FOR FLEXIBLE RISERS AND UMBILICALS SHOWN FOR CLARITY)



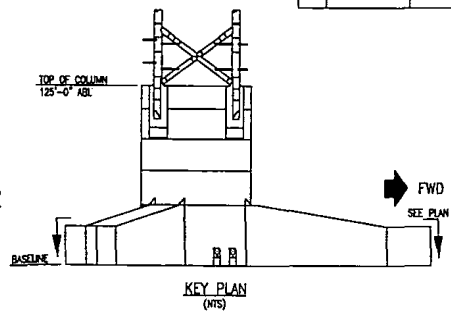
**REVISED
APPROVED FOR
CONSTRUCTION
SEPT 26, 2002**

REVISIONS					
NO	BY	DESCRIPTION	DATE	CHK	APVD
A	JIS	ISSUED FOR INFORMATION ONLY	26 OCT 01		
B	JIS	ISSUED FOR INFORMATION ONLY	10 JAN 02		
C	JIS	ISSUED FOR INFORMATION ONLY	24 JAN 02		
D	JIS	ISSUED FOR INFORMATION ONLY	20 MAR 02		
0	JIS	APPROVED FOR CONSTRUCTION	27 JUN 02	WMC	ACK
1	BTP	1. REVISED DEPARTURE ANGLE ON P5 2. REVISED WALL THICKNESS CALL OUT TO REFLECT REFERENCE DRAWING NO. 1	07 AUG 02	WMC	WMC
2	BTP	REVISED WALL THICKNESS CALL OUTS.	26 SEP 02	WMC	ACK

REFERENCE DRAWINGS		
NO.	DWG NO.	DRAWING TITLE
1	21078-06-0011	HULL/TOPSIDES INTERFACE PIPING MATRIX

- DRAWING NOTES**
- PULLTUBE "X,Y,Z" COORDINATES ARE TO THE BOTTOM FLANGE FACE.
 - SCR "X,Y,Z" COORDINATES ARE TO THE CENTER OF ROTATION OF THE FLEX JOINT.
 - "DIRECTIONAL BEARING" IS RELATIVE TO TRUE NORTH.
 - ALL FLEXIBLE RISER PULL TUBES HAVE 60° BEND RADIUS. ALL UMBILICAL PULL TUBES HAVE 50° BEND RADIUS.
 - ALL PULL TUBE FLANGES ARE 18" 000# RPMN ANSI Gr. 105, FLANGE BORE TO MATCH PULL TUBE WALL THICKNESS.
 - 12" DIA CLAMPS TO BE PROVIDED ON HULL FOR P1, P2 AND P5.

FLEXIBLE RISER, SCR & UMBILICAL SYSTEM ARRANGEMENT								
SLOT	DESCRIPTION	PULL TUBE OR PIPE OD	WALL THICKNESS (WT)	COORDINATES			DEPARTURE ANGLE	DIRECTIONAL BEARING
				X	Y	Z		
P1	FUTURE SCR	6"	-	27'-2 3/8"	-45'-1 3/4"	12'-1 3/8"	15 deg	S 80.00° E
P2	FUTURE SCR	6"	-	5'-0 1/4"	53'-3 3/16"	12'-1 3/8"	15 deg	N 42.50° W
P3	OIL EXPORT SCR	8"	0.5	16'-7"	51'-1 7/8"	12'-1 3/8"	18 deg	N 34.50° W
P4	GAS EXPORT SCR	10"	0.594	26'-10 1/4"	46'-6 5/8"	12'-1 3/8"	15 deg	N 21.50° W
P5	FUTURE SCR	6"	-	33'-8"	41'-6 15/16"	12'-1 3/8"	18 deg	N 11.50° W
P6	FUTURE FLEXIBLE RISER PULL TUBE	16"	0.656	36'-7 1/8"	26'-1 7/8"	3'-6"	11 deg	N 4.50° E
P7	FUTURE FLEXIBLE RISER PULL TUBE	16"	0.656	40'-5 13/16"	22'-2 3/8"	3'-6"	11 deg	N 12.50° E
P8	WATER INJECTION SCR	6"	0.432	36'-3 1/2"	-37'-8 7/8"	12'-1 3/8"	15 deg	N 84.00° E
U1	FUTURE UMBILICAL PULL TUBE	16"	0.656	6'-0 1/2"	43'-10 9/16"	3'-6"	10 deg	N 38.50° W
U2	FUTURE UMBILICAL PULL TUBE	16"	0.656	37'-11 3/16"	24'-8 11/16"	3'-6"	10 deg	N 8.50° E
U3	FUTURE UMBILICAL PULL TUBE	16"	0.656	24'-5 1/8"	-37'-3 7/8"	3'-6"	10 deg	S 85.00° E
U4	UMBILICAL PULL TUBE	16"	0.656	27'-5 3/8"	-35'-1 7/8"	3'-6"	10 deg	N 89.00° E



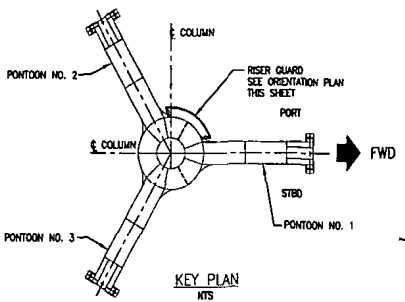
PATENTED <small>THE SERVICE - U.S. PATENT NO. 6,117,774, 6,127,452, 6,127,453, 6,127,454, 6,127,455, 6,127,456, 6,127,457, 6,127,458, 6,127,459, 6,127,460, 6,127,461, 6,127,462, 6,127,463, 6,127,464, 6,127,465, 6,127,466, 6,127,467, 6,127,468, 6,127,469, 6,127,470, 6,127,471, 6,127,472, 6,127,473, 6,127,474, 6,127,475, 6,127,476, 6,127,477, 6,127,478, 6,127,479, 6,127,480, 6,127,481, 6,127,482, 6,127,483, 6,127,484, 6,127,485, 6,127,486, 6,127,487, 6,127,488, 6,127,489, 6,127,490, 6,127,491, 6,127,492, 6,127,493, 6,127,494, 6,127,495, 6,127,496, 6,127,497, 6,127,498, 6,127,499, 6,127,500, 6,127,501, 6,127,502, 6,127,503, 6,127,504, 6,127,505, 6,127,506, 6,127,507, 6,127,508, 6,127,509, 6,127,510, 6,127,511, 6,127,512, 6,127,513, 6,127,514, 6,127,515, 6,127,516, 6,127,517, 6,127,518, 6,127,519, 6,127,520, 6,127,521, 6,127,522, 6,127,523, 6,127,524, 6,127,525, 6,127,526, 6,127,527, 6,127,528, 6,127,529, 6,127,530, 6,127,531, 6,127,532, 6,127,533, 6,127,534, 6,127,535, 6,127,536, 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6,127,719, 6,127,720, 6,127,721, 6,127,722, 6,127,723, 6,127,724, 6,127,725, 6,127,726, 6,127,727, 6,127,728, 6,127,729, 6,127,730, 6,127,731, 6,127,732, 6,127,733, 6,127,734, 6,127,735, 6,127,736, 6,127,737, 6,127,738, 6,127,739, 6,127,740, 6,127,741, 6,127,742, 6,127,743, 6,127,744, 6,127,745, 6,127,746, 6,127,747, 6,127,748, 6,127,749, 6,127,750, 6,127,751, 6,127,752, 6,127,753, 6,127,754, 6,127,755, 6,127,756, 6,127,757, 6,127,758, 6,127,759, 6,127,760, 6,127,761, 6,127,762, 6,127,763, 6,127,764, 6,127,765, 6,127,766, 6,127,767, 6,127,768, 6,127,769, 6,127,770, 6,127,771, 6,127,772, 6,127,773, 6,127,774, 6,127,775, 6,127,776, 6,127,777, 6,127,778, 6,127,779, 6,127,780, 6,127,781, 6,127,782, 6,127,783, 6,127,784, 6,127,785, 6,127,786, 6,127,787, 6,127,788, 6,127,789, 6,127,790, 6,127,791, 6,127,792, 6,127,793, 6,127,794, 6,127,795, 6,127,796, 6,127,797, 6,127,798, 6,127,799, 6,127,800, 6,127,801, 6,127,802, 6,127,803, 6,127,804, 6,127,805, 6,127,806, 6,127,807, 6,127,808, 6,127,809, 6,127,810, 6,127,811, 6,127,812, 6,127,813, 6,127,814, 6,127,815, 6,127,816, 6,127,817, 6,127,818, 6,127,819, 6,127,820, 6,127,821, 6,127,822, 6,127,823, 6,127,824, 6,127,825, 6,127,826, 6,127,827, 6,127,828, 6,127,829, 6,127,830, 6,127,831, 6,127,832, 6,127,833, 6,127,834, 6,127,835, 6,127,836, 6,127,837, 6,127,838, 6,127,839, 6,127,840, 6,127,841, 6,127,842, 6,127,843, 6,127,844, 6,127,845, 6,127,846, 6,127,847, 6,127,848, 6,127,849, 6,127,850, 6,127,851, 6,127,852, 6,127,853, 6,127,854, 6,127,855, 6,127,856, 6,127,857, 6,127,858, 6,127,859, 6,127,860, 6,127,861, 6,127,862, 6,127,863, 6,127,864, 6,127,865, 6,127,866, 6,127,867, 6,127,868, 6,127,869, 6,127,870, 6,127,871, 6,127,872, 6,127,873, 6,127,874, 6,127,875, 6,127,876, 6,127,877, 6,127,878, 6,127,879, 6,127,880, 6,127,881, 6,127,882, 6,127,883, 6,127,884, 6,127,885, 6,127,886, 6,127,887, 6,127,888, 6,127,889, 6,127,890, 6,127,891, 6,127,892, 6,127,893, 6,127,894, 6,127,895, 6,127,896, 6,127,897, 6,127,898, 6,127,899, 6,127,900, 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REVISIONS				
NO	BY	DESCRIPTION	DATE	CHK APVD
0	SM	APPROVED FOR CONSTRUCTION	10 MAY 02	CM ACK

REFERENCE DRAWINGS		
NO.	DWG NO.	DRAWING TITLE
0	21079-DG-1001	HULL GENERAL NOTES
1	21079-DG-1005	PRINCIPAL DIMENSIONS
2	21079-DG-1010	MOLDED LINES
3	21079-DG-1050	COLUMN STRUCTURE
4	21079-DG-1070	STANDARD STRUCTURAL DETAILS
5	21079-DG-1080	GRINDING LOCATIONS AND DETAILS

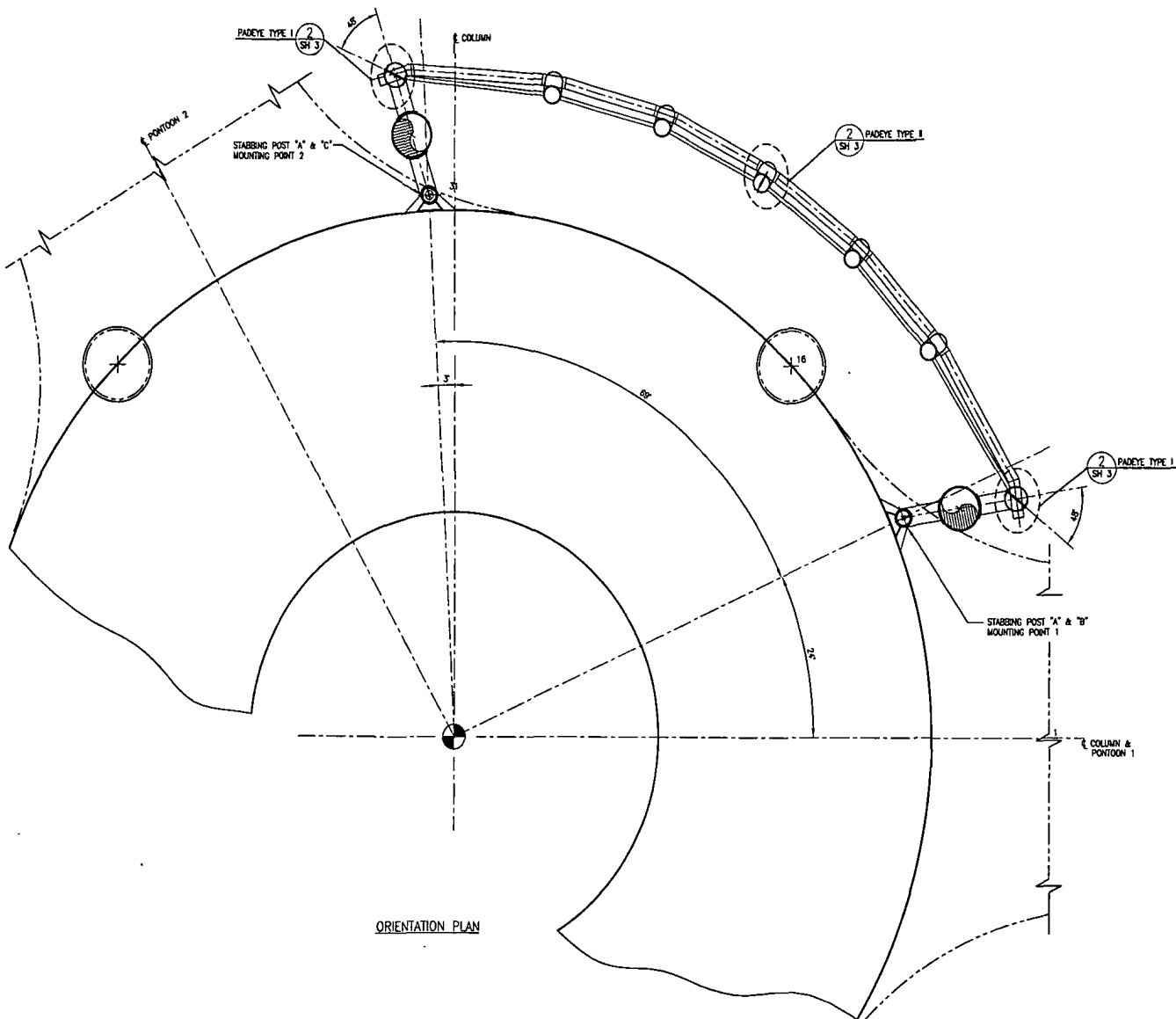
DRAWING NOTES
1) ALL PLATE MATERIAL TO BE ABS GRADE AH36, TUBULAR STEEL TO BE API 5LX52, UNLESS NOTED OTHERWISE.
2) ALL WELDING TO BE IN ACCORDANCE WITH ABS RULES FOR WELDING AND AWS D1.1, LATEST EDITION.
3) FREE EDGES OF PLATE MUST MEET AWS OXYGEN CUTTING SURFACES ROUGHNESS GAUGE CA.1-G, SAMPLE 4.
4) ALL DIMENSIONS GIVEN ARE SUBORDINATE TO PRINCIPAL DIMENSIONS AS GIVEN IN REF NO. 1. REPEATED DIMENSIONS GIVEN HERE ARE FOR INFORMATION ONLY. WHERE ANY CONTRADICTION ARISES, REF NO. 1 SHALL BE CONSIDERED AUTHORITY.
5) FABRICATOR SHALL OBSERVE MOLDED DIMENSIONS. REFERENCE NO. 2 SHALL BE REGARDERD AS AUTHORITY IN DETERMINING ALL MOLDED SURFACES FRAMING. ADDITIONAL DIMENSIONS GIVEN HERE SHALL BE REGARDERD AS MOLDED UNLESS NOTED OTHERWISE.

APPROVED FOR
CONSTRUCTION
MAY 10, 2002



PATENTED <small>THE SEASTAR - U.S. PATENT NO. 5,117,814, SEASTAR 8-10,11,12, 8,9,10,11, AND 8,9,10,12. THE FIG. OR FIGS. DISCLOSED IN THIS DOCUMENT ARE PROPRIETARY AND STRICTLY PROTECTED UNDER THE UNITED STATES PATENT LAWS. FOREIGN AND OTHER U.S. PATENTS PENDING.</small>		PROPRIETARY <small>THIS DOCUMENT AND THE INFORMATION DISCLOSED HEREIN ARE THE PROPERTY OF ATLANTIA OFFSHORE LIMITED - HOLDINGS (USA) INC. AND ARE NOT TO BE REPRODUCED OR USED TO PROMOTE ANY PRODUCT OR SERVICE WITHOUT THE WRITTEN CONSENT OF ATLANTIA OFFSHORE LIMITED.</small>	
		TotalFinaElf E&P USA, Inc. MATTERHORN MISSISSIPPI CANYON 243	
SCALE: 1/4" = 1'-0"		DATE: 22 MAR 02	
DESIGNED BY: SM		SEASTAR® TENSION LEG PLATFORM	
CHECKED BY: DCH		RISER GUARD PLAN	
ENGINEER BY: CM		DRAWING NO. 21079-DG-1283	
QA CHK BY: DBL		CHECKED BY:	
APPROVED BY: ACK		PROJECT NO. 21079	
SHEET 1 OF 4		REV. 0	

M:\21079\A\A\022222\AFC Drawings\21079001283_01_00.dwg 31 Oct 2002 08:17

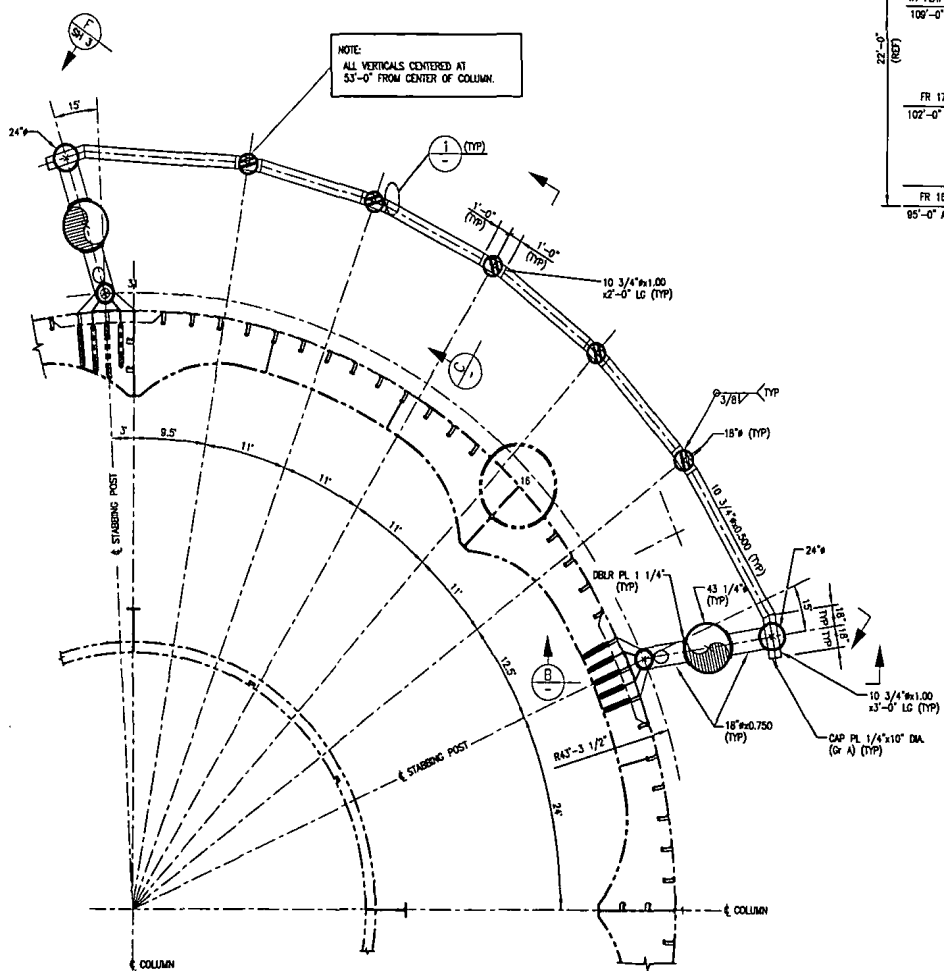


ORIENTATION PLAN

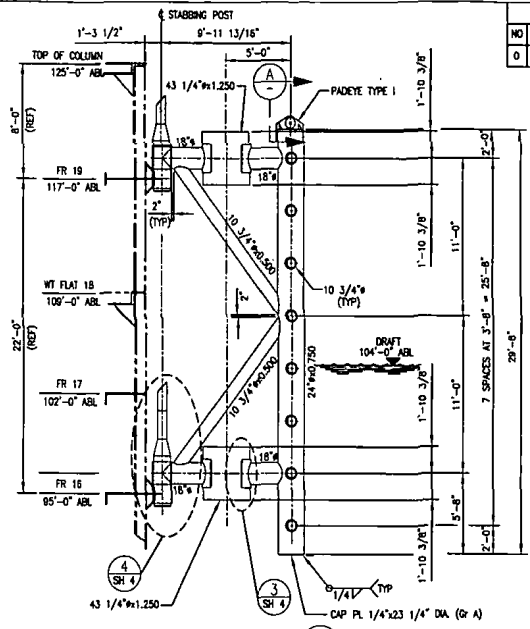
DETAIL
SCALE: 3" = 1'-0"

SECTION
SCALE: 3" = 1'-0"

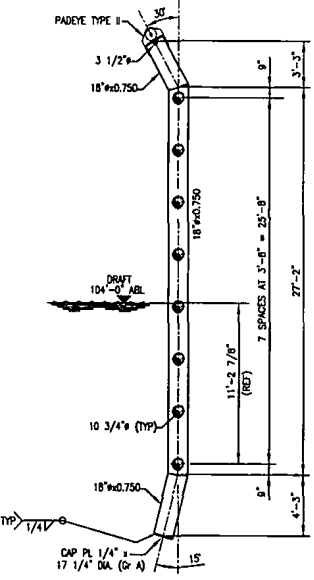
NOTE:
ALL VERTICALS CENTERED AT
53'-0" FROM CENTER OF COLUMN.



PLAN AT EL 117'-0" ABL
FRAME NO. 19




SECTION
SCALE: 1/4" = 1'-0"

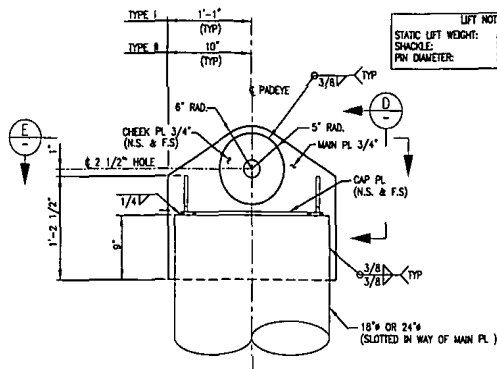


SECTION
SCALE: 1/4" = 1'-0"

REVISIONS				
NO	BY	DESCRIPTION	DATE	CHK
0	SM	APPROVED FOR CONSTRUCTION	10 MAY 02	CAI ACK

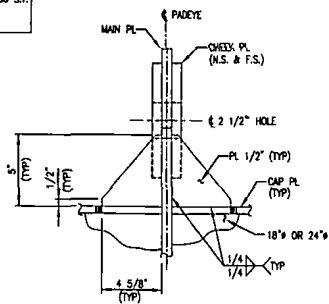
APPROVED FOR
CONSTRUCTION
MAY 10, 2002

PATENTED		PROPRIETARY	
<small>SEE SECTION - U.S. PATENT NO. 6,117,814, 6,574,824, 6,553,526 AND 6,546,148. THE REV OR REV. PROCESSED IN THIS DOCUMENT ARE PROPRIETARY AND STRICTLY PROTECTED UNDER THE UNITED STATES PATENT LAWS. FOREIGN AND OTHER U.S. PATENTS PENDING.</small>		<small>THIS DOCUMENT AND THE INFORMATION DISCLOSED HEREIN ARE THE PROPERTY OF ATLANTIA OFFSHORE LIMITED - HOLDINGS/TECH - U.S.A. AND ARE NOT TO BE REPRODUCED OR USED TO FURNISH ANY INFORMATION FOR BEHALF OF OWNERS OR APPLICANTS EXCEPT WHERE PROVIDED BY WRITTEN AGREEMENT WITH ATLANTIA OFFSHORE LIMITED.</small>	
 Atlantia Offshore Limited		TotalFinaElf E&P USA, Inc. MATTERHORN MISSISSIPPI CANYON 243	
SCALE: 1/4" = 1'-0" DESIGNED BY: SM DTDG CHK BY: DCH ENGRD CHK BY: CM CA CHK BY: DEB APPROVED BY: ACK		DATE: 23 MAY 02 10 MAY 02 10 MAY 02 10 MAY 02	
PROJECT NO. 21079		CLIENT ORDER NO. 21079-DC-1283 SHEET 2 OF 2 REV. 0	

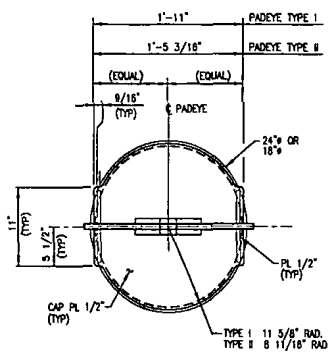


DETAIL 2
 SCALE: 1 1/2" = 1'-0"
 PAD EYE DETAIL - TYPE I & II AS NOTED
 (SEE SH 1 FOR ORIENTATION)

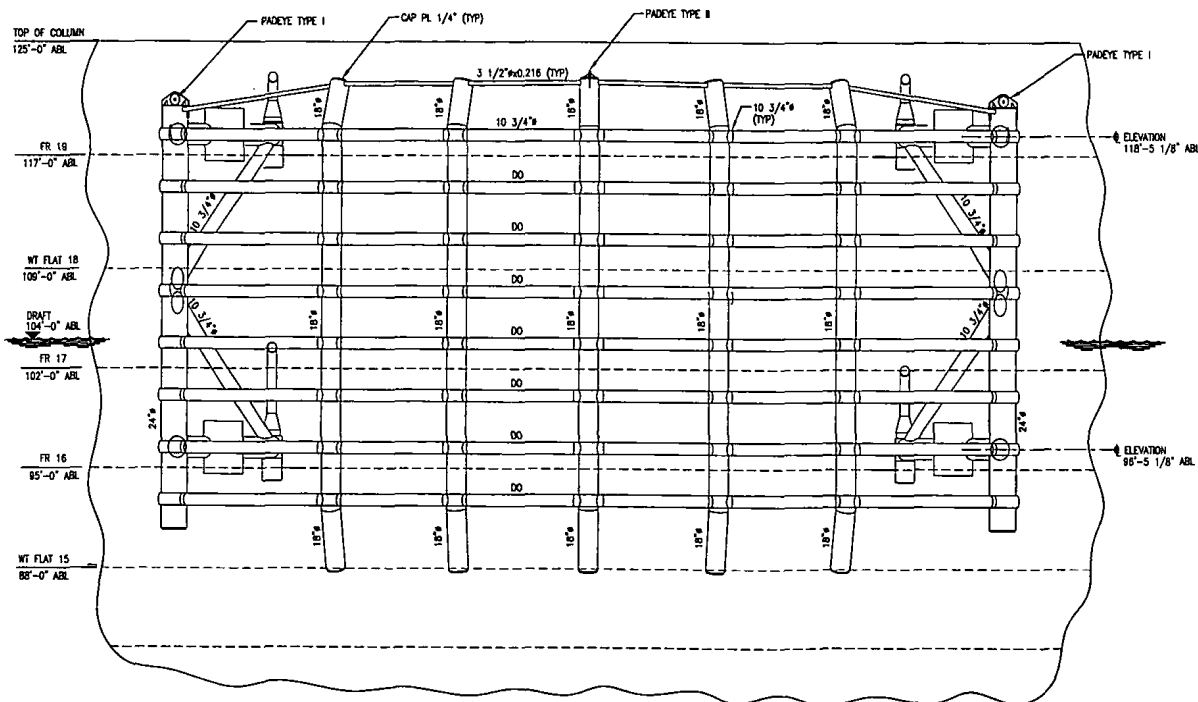
LIFT NOTE
 STATIC LIFT WEIGHT: APPROX. 30 S.T.
 SHACKLE: 50 TONS
 PIN DIAMETER: 2 1/4"



SECTION D
 SCALE: 3" = 1'-0"



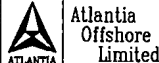
SECTION E
 SCALE: 1 1/2" = 1'-0"



SECTION F
 SCALE: 1/4" = 1'-0"
 SH 2

REVISIONS				
NO	BY	DESCRIPTION	DATE	CHK APD
0	SM	APPROVED FOR CONSTRUCTION	10 MAY 02	GM ACK

APPROVED FOR CONSTRUCTION
 MAY 10, 2002

PATENTED		PROPRIETARY	
<small>THE SEASTAR - U.S. PATENT NO. 6,117,814, 6,174,437, 6,432,323, 6,564,944 AND 6,564,920. THE FORM OR FORMS DISCLOSED IN THIS DOCUMENT ARE PROPRIETARY AND SIMILARLY PROTECTED UNDER THE UNITED STATES PATENT LAWS. FOREIGN AND OTHER U.S. PATENTS PENDING.</small>		<small>THIS DOCUMENT AND THE INFORMATION DISCLOSED HEREIN ARE THE PROPERTY OF ATLANTIA OFFSHORE LIMITED - HOUSTON/TX 77058-1154, AND ARE NOT TO BE REPRODUCED OR USED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF ATLANTIA OFFSHORE LIMITED.</small>	
		TotalFinaElf E&P USA, Inc. MATTERHORN MISSISSIPPI CANYON 243	
SCALE: 1/4" = 1'-0" DESIGNED BY: SM DATE: 22 MAR 02 DTDG CHK BY: DEH 10 MAY 02 ENGRD CHK BY: CM 10 MAY 02 CA CHK BY: DEL 10 MAY 02 APPROVED BY: ACK 10 MAY 02	DATE: 22 MAR 02 10 MAY 02 10 MAY 02 10 MAY 02	SEASTAR® TENSION LEG PLATFORM RISER GUARD SECTIONS & DETAILS DRAWING NO. 21079-DG-1283 CLIENT DRAWING NO.	
PROJECT NO. 21079	CLIENT DRAWING NO.	SHT. 3	REV. 0

LLOG EXPLORATION OFFSHORE, L.L.C.
 5" Jumper Design
 Mississippi Canyon 199 Manifold
 to Mississippi Canyon 199 5in Bulk Oil PLETs
 Rev. 0, 5/17/11

Maximum Operating Pressure:

1. Calculations based on CFR, Title 30, Part 250, Subparts H and J.

$$P = \frac{2st}{D}$$

$$P = \frac{2s(t-ca)(F)(E)(T)}{D}$$

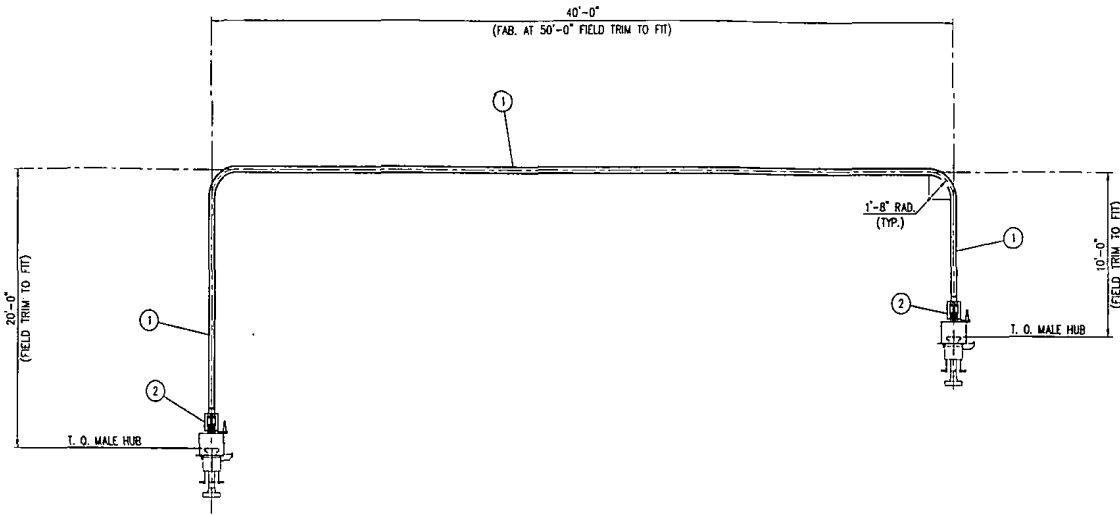
Where:

- P = Pressure as 100% SMYS (psig)
 PI = Internal Design Pressure (psig)
 s = Specified Minimum Yield Strength (SMYS) (psi)
 t = Pipe Wall Thickness in Inches
 ca = Corrosion Allowance (use 0.000 inches)
 D = Pipe Outside Diameter in Inches
 (F) = Design Factor
 0.60 for Risers
 0.72 for Pipelines & Jumpers
 (E) = Joint Factor
 1.0 for Seamless Pipe
 (T) = Temperature Derating Factor
 1.0 for Operating Temperatures below 250 Degrees Fahrenheit

- 1) Jumper: 5.563" OD x 0.438" W.T. API 5L Gr. X65

- a) P = (2) (65,000) (0.438) / (5.563) = 10,235 psig
 b) PI = (2) (65,000) (0.438 - 0.000) (0.72) (1) (1) / 5.563 = 7,370 psig
 c) Hydrostatic Test Pressure = HTP
 Maximum HTP = 0.95 P = (0.95) (10,235) = 9,724 psig
 Minimum HTP will be 4,632 psig for 8 hour hold time
 Rated MAOP = 4,632 psig / 1.25 = 3,705 psig
 d) Maximum Allowable Operating Pressure (MAOP) = 3,705 psig

MATERIAL SUMMARY		
ITEM	QTY.	DESCRIPTION
1	-	PIPE, 5.563" O.D. 38 WT., API 3X, GR. X65, SMLS, COATED WITH 12-14 MILS D.F.T. FUSION BONDED EPOXY, WITH 2' SSPU
2	2	REMOTE ARTICULATED CONNECTOR, 4 1/2", API 10000, FEMALE CONNECTOR ASSEMBLY, OIL STATES



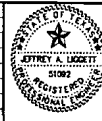
ELEVATION
5" JUMPER SPOOL DETAILS
N.T.S.

Joshua Quinonez 05/20/11 14:49 P:\PINNACLE\PROJECTS\STRUCT_202800\2028000906.DWG

NOTES
1. HYDROTTEST:
THE JUMPER ASSEMBLY SHALL BE HYDROTTESTED TO A MINIMUM OF 4532 PSI AND HELD FOR A PERIOD OF 8 HOURS. THE PRESSURE SHALL HOLD OR RISE OVER THE LAST TWO HOURS.

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NO.	DATE	REVISION	BY	APPV
A		ISSUED FOR PERMIT		



PINNACLE
ENGINEERING

TX REGISTERED ENGR FIRM F-567

APPROVAL	
Drawn By	J. OLIVERA
Date	5-19-11
Checked By	
Date	
Designed By	
Date	
Approved By	
Date	

LLOG exploration			
MANDY SUBSEA DEVELOPMENT			
MC 199 TO MC 243 "A"			
5" JUMPER DETAILS			
JOB NO. 202800	SCALE: NOTED	DWG. NO. 906	REV. A

LLOG EXPLORATION OFFSHORE, L.L.C.
 4" Jumper Design
 Mississippi Canyon 199
 Tree to Manifold & 4 in Bulk Oil PLET to Manifold
 Rev. 0, 5/17/11

Maximum Operating Pressure:

1. Calculations based on CFR, Title 30, Part 250, Subparts H and J.

$$P = \frac{2st}{D}$$

$$P = \frac{2s(t-ca)(F)(E)(T)}{D}$$

Where:

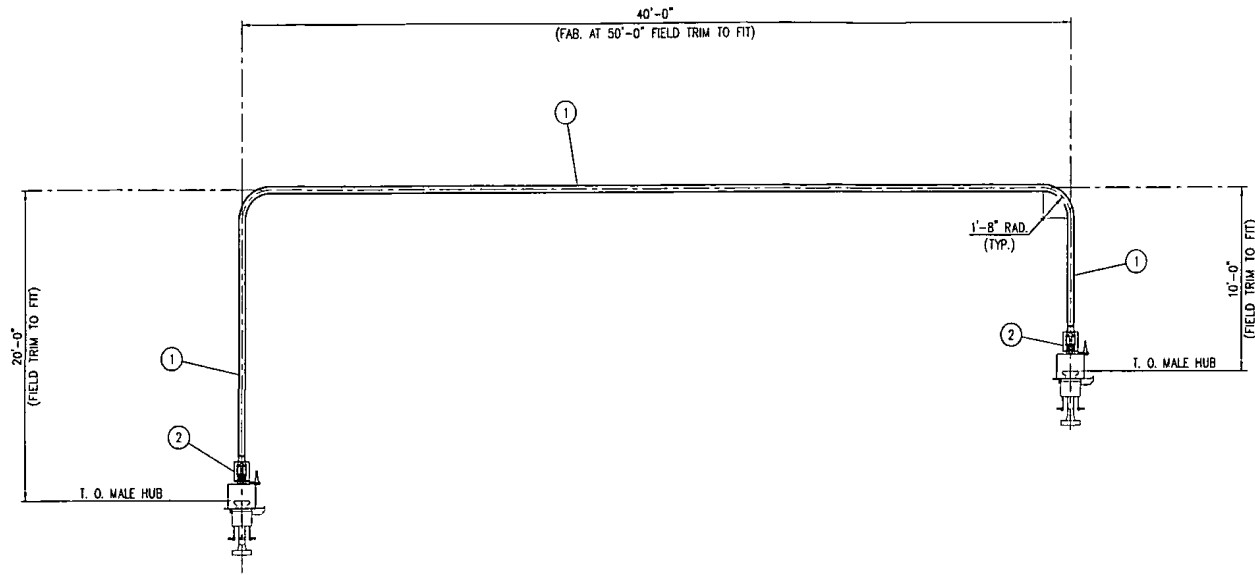
- P = Pressure as 100% SMYS (psig)
 P1 = Internal Design Pressure (psig)
 s = Specified Minimum Yield Strength (SMYS) (psi)
 t = Pipe Wall Thickness in Inches
 ca = Corrosion Allowance (use 0.000 inches)
 D = Pipe Outside Diameter in Inches
 (F) = Design Factor
 0.60 for Risers
 0.72 for Pipelines & Jumpers
 (E) = Joint Factor
 1.0 for Seamless Pipe
 (T) = Temperature Derating Factor
 1.0 for Operating Temperatures below 250 Degrees Fahrenheit

- 1) Jumper: 4.500" OD x 0.586" W.T. API 5L Gr. X65

- a) P = (2) (65,000) (0.586) / (4.500) = 16,929 psig
 b) P1 = (2) (65,000) (0.586 - 0.000) (0.72) (1) (1) / 4.500 = 12,189 psig
 c) Hydrostatic Test Pressure = HTP
 Maximum HTP = 0.95 P = (0.95) (16,929) = 16,082 psig
 Minimum HTP will be 4,632 psig for 8 hour hold time
 Rated MAOP = 4,632 psig / 1.25 = 3,705 psig
 d) Maximum Allowable Operating Pressure (MAOP) = 3,705 psig

MATERIAL SUMMARY

ITEM	QTY.	DESCRIPTION
1	-	PIPE, 4.500" 0.586 WT., API 5L OR X65, SWLS, COATED WITH 12-14 MILS D.F.T. FUSION BONDED EPOXY, WITH 2" GSPU
2	2	REMOTE ARTICULATED CONNECTOR, 4 1/8", API 10000, FEMALE CONNECTOR ASSEMBLY, OIL STATES



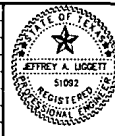
ELEVATION
 4" JUMPER SPOOL DETAILS
 N.T.S.

05/20/11 14:40 P:\PINNACLE\ROOT\STRUCT\202800\202800905.DWG

NOTES
 1. HYDROTEST:
 THE JUMPER ASSEMBLY SHALL BE HYDROTESTED TO A MINIMUM OF 4832 PSI AND HELD FOR A PERIOD OF 8 HOURS. THE PRESSURE SHALL HOLD OR RISE OVER THE LAST TWO HOURS.

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NO.	DATE	REVISION	BY	APPR
A		ISSUED FOR PERMIT		



PINNACLE
 ENGINEERING

TX REGISTERED ENGR FIRM F-567

APPROVAL	
Drawn By	J. GLEWHA
Date	5-19-11
Checked By	
Date	
Designed By	
Date	
Approved By	
Date	

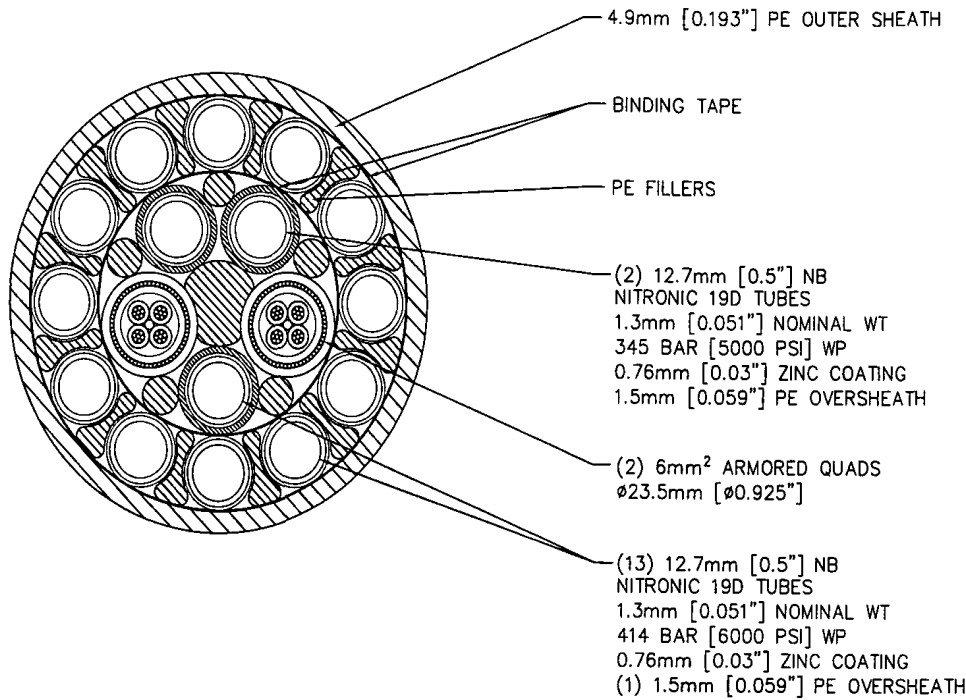
LLOG
 exploration

MANDY SUBSEA DEVELOPMENT
 MC 199 ID MC 243 "A"

4" JUMPER DETAILS

JOB NO. 202800	SCALE: NOTED	DWG. NO. 905	REV. A
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CALCULATED PROPERTIES OF UMBILICAL	
DIAMETER outside ($\pm 3\text{mm}$)	103.3 mm
VOLUME:	
internal - Tubes	1.91 l/m
external - Umbilical displacement	8.39 l/m
MASS:	
tubes empty	15.8 kg/m
tubes water filled (MANUFACTURE)	17.7 kg/m
WEIGHT:	
in sea water, tubes water filled (INSTALLATION)	98.8 N/m
in sea water, tubes fluid filled (SERVICE)	98.8 N/m
BUOYANCY FACTOR in sea water	2.32
DIAMETER: WEIGHT RATIO	10.3 mm.kg ⁻¹ .m
MINIMUM BREAKING LOAD (straight)	531.7 kN
MAXIMUM WORKING LOAD (straight)	359.6 kN
MAXIMUM INSTALLATION LOAD (straight)	472.0 kN
MINIMUM BENDING RADIUS for STORAGE	1.55 m
SPOOLING TENSION for M.B.R.	2,395 N
BENDING STIFFNESS at 20°C	5,754 N.m ²
UMBILICAL LENGTH(S):	
4176m	

REV	CODE	ESR	DATE	MODIFICATIONS
01	-		04/Mar/11	ORIGINAL DRAWING



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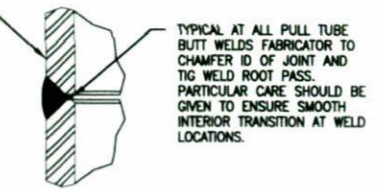
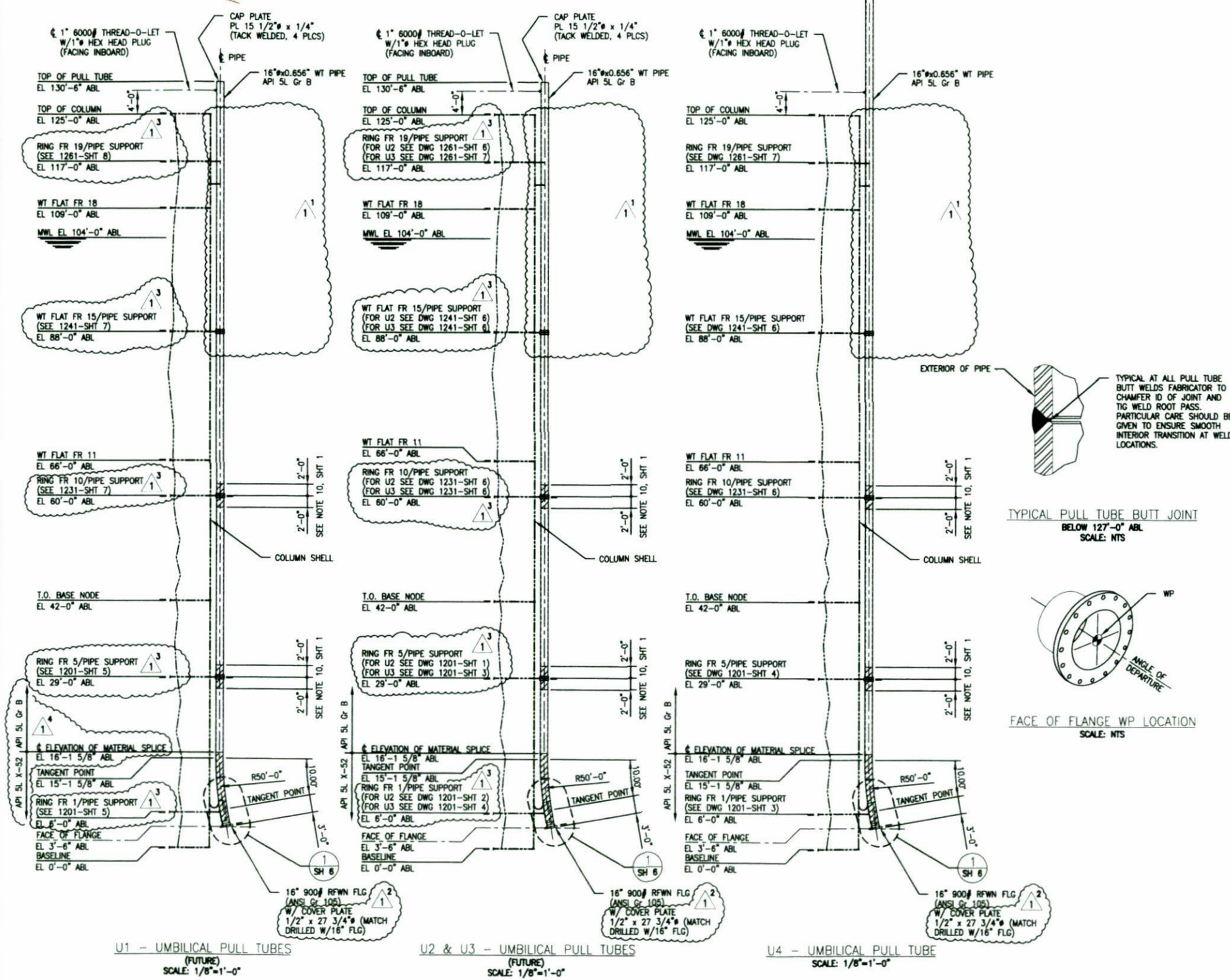
PROJECT NAME: LLOG MANDY MC 199

UMBILICAL REF.: STOCK & NEW 19D OPTION

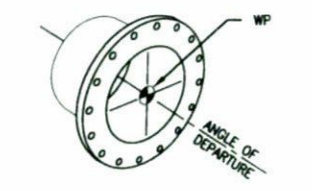
TITLE: UMBILICAL CROSS-SECTION

	DRAWN	CHECKED	APPROVED	PROD CLR	DRAWING No.:
NAME	JHA	SSO	SRA	DCO	DI019198-01-002 REV.01
DATE	04/Mar/11	04/Mar/11	04/Mar/11	04/Mar/11	SCALE: NTS SHEET 1 OF 1

U1 >>>proposed
5in umbilical I-tube



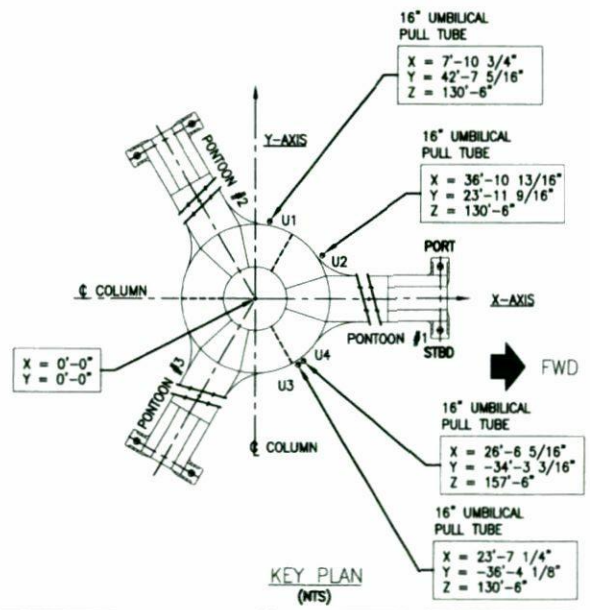
TYPICAL PULL TUBE BUTT JOINT
BELOW 127'-0" ABL
SCALE: NTS



FACE OF FLANGE WP LOCATION
SCALE: NTS

REVISIONS					
NO	BY	DESCRIPTION	DATE	CHK	APVD
0	MAG	APPROVED FOR CONSTRUCTION	18 JUN 02	TK	WMG
1	MAG	1) REMOVED NOTE 10 RESTRICTION 2) ADDED COVER PLATES 3) REVISED SUPPORT DRAWING REFERENCES 4) ADDED MATERIAL GRADE SPLICE LOCATION	02 JUL 02	TK	ACK

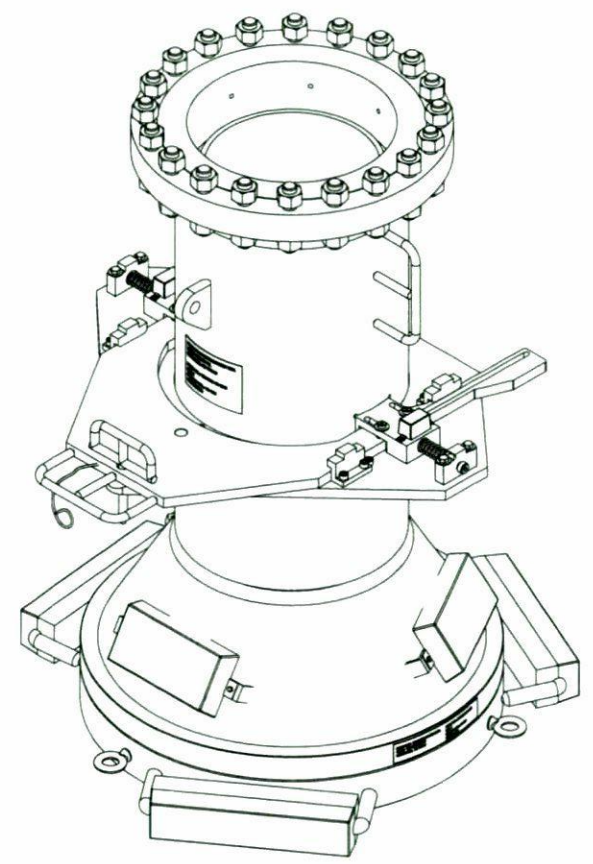
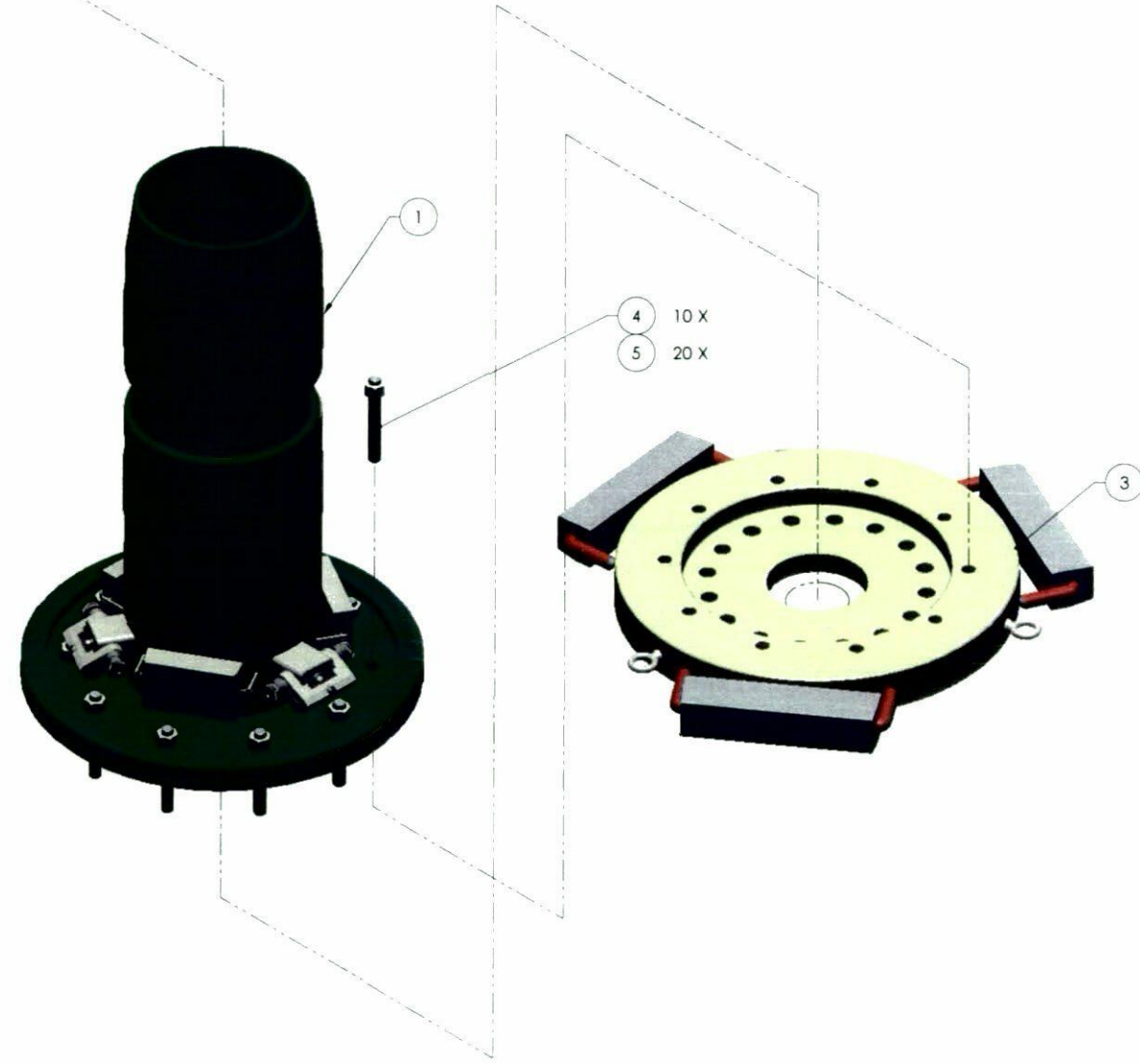
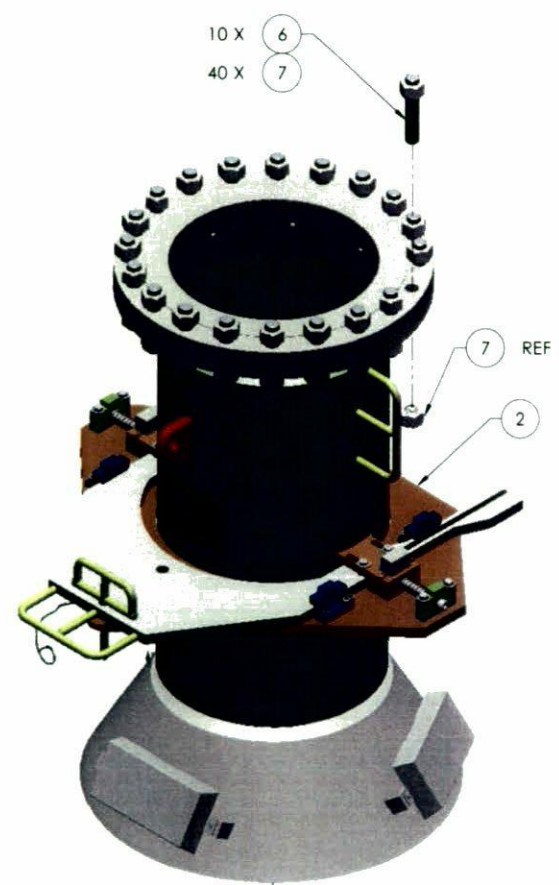
REVISED
APPROVED FOR
CONSTRUCTION
JULY 02, 2002



PATENTED		PROPRIETARY	
<small>THE SEASTAR - U.S. PATENT NO. 5,117,814, 5,287,832, 5,433,273, 5,548,184 AND 5,964,550. THE ITEM OR ITEMS DISCLOSED IN THIS DOCUMENT ARE PROPRIETARY AND STRICTLY PROTECTED UNDER THE UNITED STATES PATENT LAWS, FOREIGN AND OTHER U.S. PATENTS PENDING.</small>		<small>THIS DOCUMENT AND THE INFORMATION DISCLOSED HEREIN ARE THE PROPERTY OF ATLANTIA OFFSHORE LIMITED * HOUSTON, TEXAS * U.S.A. AND ARE NOT TO BE REPRODUCED OR USED TO FURNISH ANY INFORMATION FOR MAKING OF DRAWINGS OR APPARATUS EXCEPT WHERE PROVIDED BY WRITTEN AGREEMENT WITH ATLANTIA OFFSHORE LIMITED.</small>	
		TotalFinaElf E&P USA, Inc. MATTERHORN MISSISSIPPI CANYON 243	
SCALE: AS NOTED	DATE: 28 NOV 02	SEASTAR® TENSION LEG PLATFORM	
DESIGNED BY: MAG	18 JUN 02	RISERS	
DFTG CHK BY: DCH	18 JUN 02	PULL TUBES	
ENGRG CHK BY: TK	18 JUN 02	DRAWING NO. 21079-DG-1282	
QA CHK BY: WMG	18 JUN 02	CLIENT DRAWING NO.	SHT. 5
PROJECT NO. 21079			REV. 1

REVISIONS				
REV	DESCRIPTION	BY	DATE	APPROVED
0	APPROVED FOR CONSTRUCTION	UP	20 APR 2011	US

NOTE
 This is not the actual LOGO MC 199 umbilical bend stiffener connector dwg but is representative of the one currently being designed.



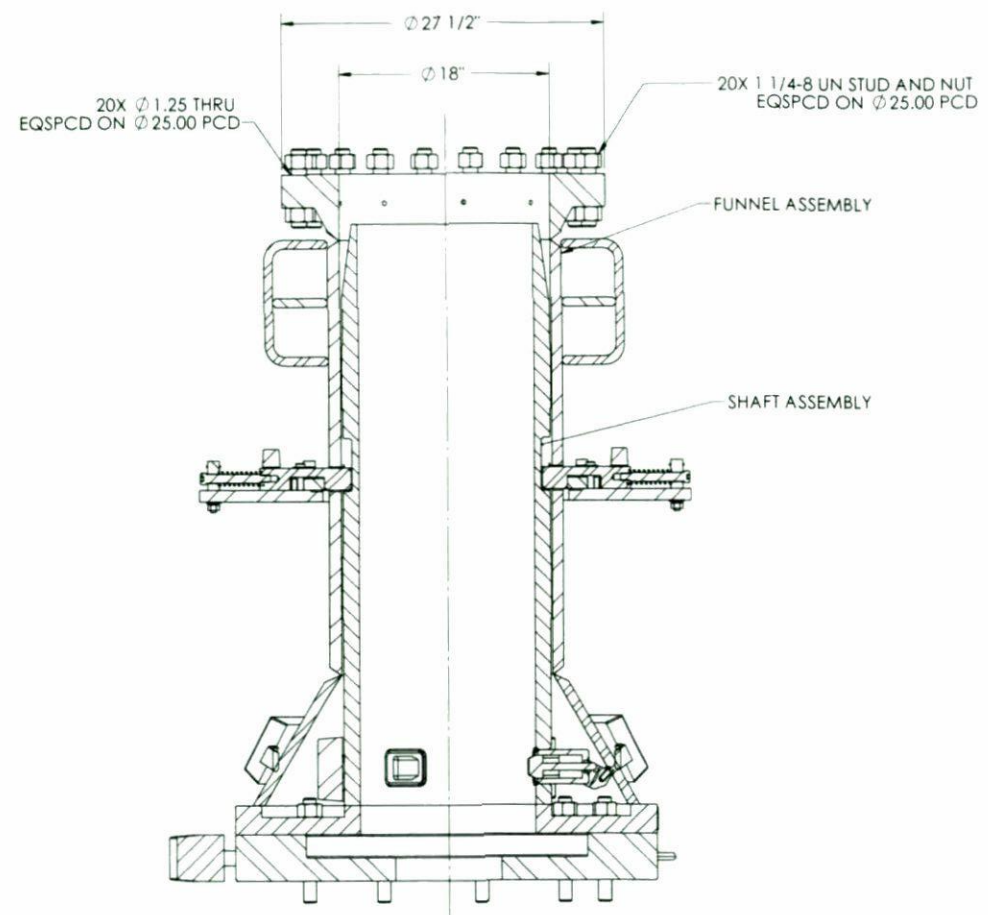
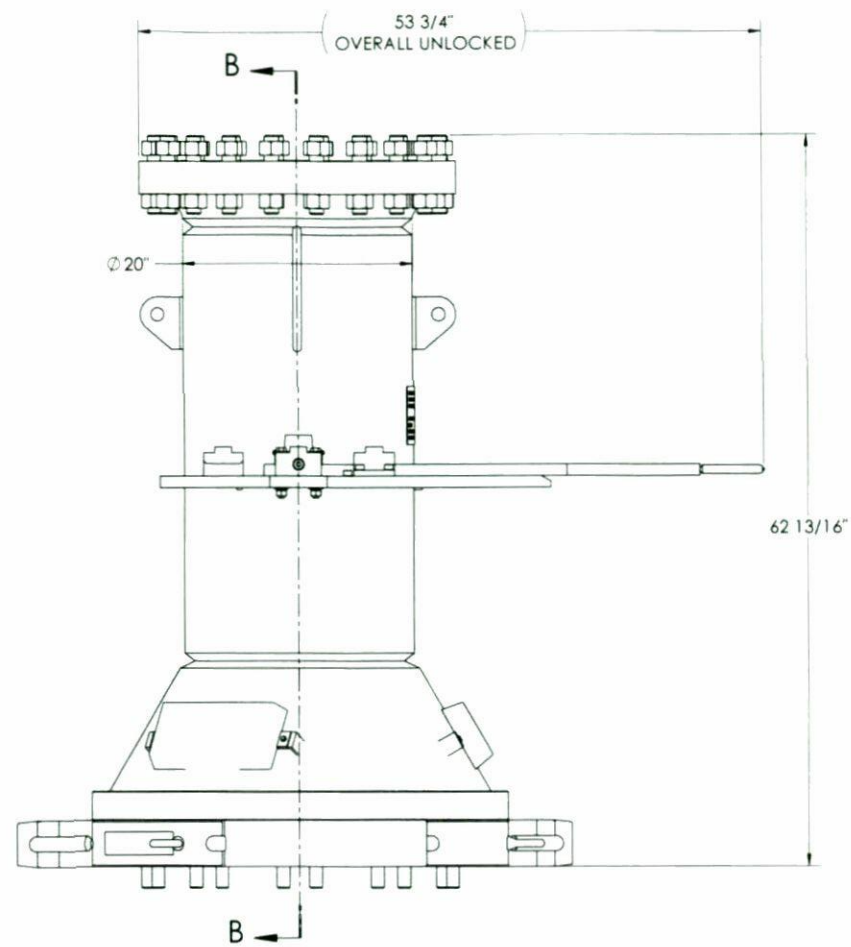
- 7. FUNNEL WEIGHT IN AIR 1,700 LBS APPROX.
- 6. SHAFT WEIGHT IN AIR 1,800 LBS APPROX.
- 5. ADAPTER WEIGHT IN AIR 1,000 LBS APPROX.
- 4. SHAFT ASSEMBLY PROCEDURE PER PR11001-3.
- 3. FUNNEL ASSEMBLY PROCEDURE PER PR11001-2.
- 2. ITEMS 4 & 5 TO BE PRELOADED TO 564 FT-LB.
- 1. ITEMS 8 & 9 TO BE PRELOADED TO 777 FT-LB.

NOTES:

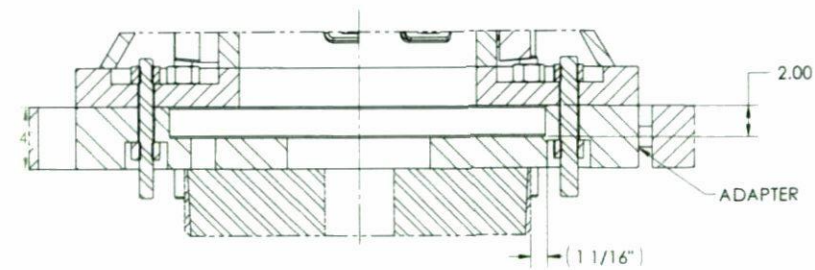
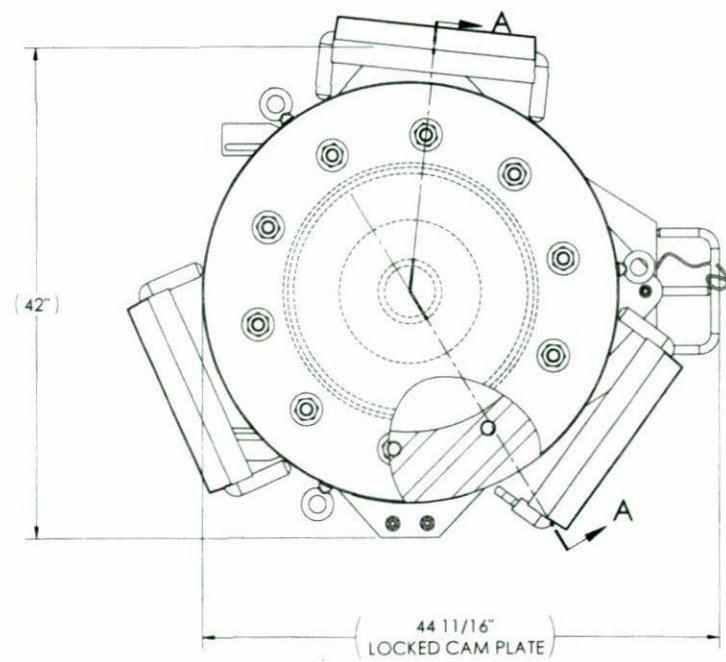
ITEM NO.	PART NUMBER	DESCRIPTION	Material	Locked/ QTY.
7	-	HEAVY HEX NUT 1.25 DIA - 8 UN	-	40
6	-	ALL THREADED ROD 1.25 8 UN IN 6.75IN LONG	-	10
5	-	HEAVY HEX NUT 1-1/8" 8 UN THRD	-	20
4	-	ALL THREADED ROD 1.125 8 UN IN 9IN LONG	-	10
3	D11001-01-204	SHAFT ADAPTER ASSEMBLY	SEE BOM	1
2	D11001-01-202	FUNNEL ASSEMBLY	SEE BOM	1
1	D11001-01-203	SHAFT ASSEMBLY	SEE BOM	1

BOM Table

MATERIAL: SEE BOM		DEEPIKA TECHNOLOGIES, INC 10811 TRAIN COURT, HOUSTON, TX 77041	
COATING:		FINAL ASSEMBLY 20" BEND STIFFENER CONNECTOR LLOG WHODAT	
TOLERANCES UNLESS SPECIFIED DIMS ARE IN INCHES (FRACTIONS)		THIS DOCUMENT CONTAINS INFORMATION WHICH IS THE PROPERTY OF DEEPIKA TECHNOLOGIES, INC. THE INFORMATION CONTAINED HEREIN IS UNCLASSIFIED, BUT IS NOT TO BE RELEASED OR FOR ANY PURPOSE OTHER THAN TO EVALUATE THIS DOCUMENT.	
FRAC: NONE (1/16)	CONC: ENDRIC: 003	DRAWN: USR/NGH	20 APR 2011
DEC: SMALL	BREAK: EDRIC: 03	CHECKED: USR/NGH	20 APR 2011
F: 1/32	MATCH SURFACE: ✓	ENG APPR: USR/NGH	20 APR 2011
XX: 1/16		DWG: 110	
XXX: 1/8		SCALE: NTS	
ANGLES: (1/16)		WEIGHT: SEE NOTES	



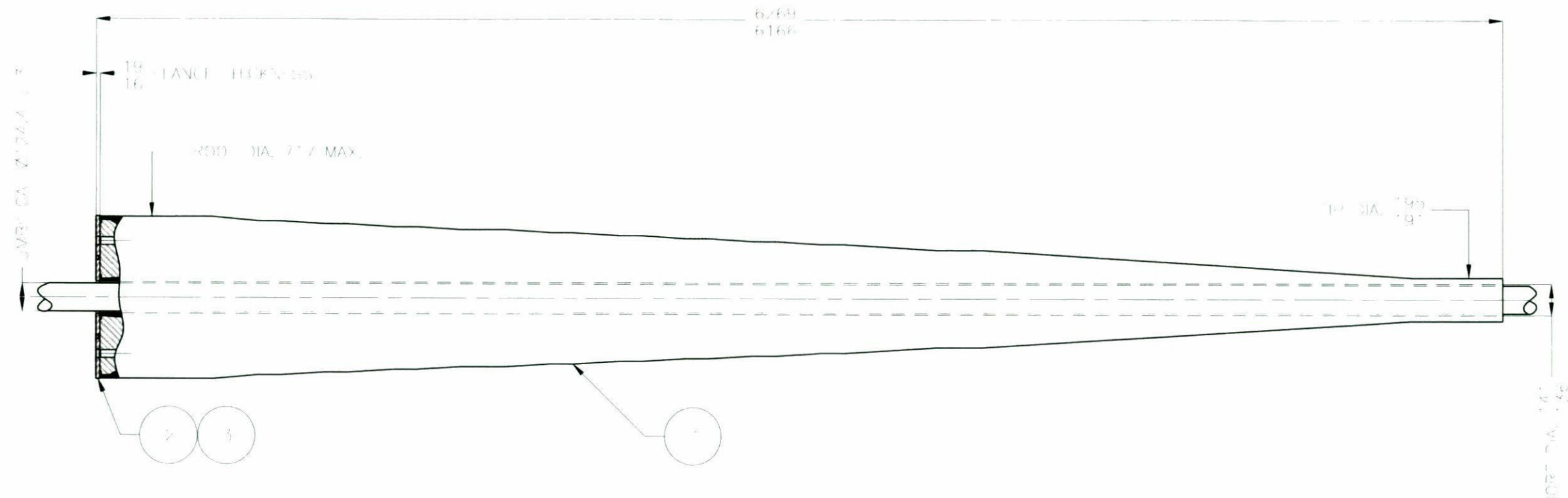
SECTION B-B



SECTION A-A

MATERIAL: SEE BOM		 10811 TRAIN COURT, HOUSTON, TX 77041	
TOLERANCES UNLESS SPECIFIED DIMS ARE IN INCHES MILLIMETERS		THIS DOCUMENT CONTAINS INFORMATION WHICH IS THE PROPERTY OF DUCIPER TECHNOLOGIES, INC. THE INFORMATION CONTAINED HEREIN SHALL NOT BE DISCLOSED, DUPLICATED, USED IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN TO FULFILL THE OBLIGATION.	
FRACTIONS: 1/16 DECIMALS: .01 CONCENTRIC: 0.01 BRK: 0.01 SURFACE: 0.01 ANGLE: 1/16"	DRAWN: UPR/ANR CHECKED: US/NGH ENG APPR: US/NGH	DATE: 20 APR 2011 DATE: 20 APR 2011 DATE: 20 APR 2011	TITLE: FINAL ASSEMBLY 20° BEND STIFFENER CONNECTOR LLOG WHODAT D11001-01-201 REV: 0
DWG. NO. SCALE: NTS		WEIGHT: SEE NOTES SHEET 2 OF 2	

Item No	Qty	Material	Component Part	Drg No.	Part Description
1	1	PU/CARBON STEEL	1013196	9310	DYNAMIC BEND STIFFENER
2	1	CARBON STEEL	1013200	9312	PROTECTION FLANGE-ZINC PLATE & CHROMATE PASSIVATE TO BS EN12329:2000 Fe//Zn 25//C
3	4	STEEL GRADE 8.8	1000220	N/A	M10 x 30 SOCKET HEAD CAP SCREW - BZP



MOUNTING DETAIL
 16 HOLES
 APPROX M36 X 4.0 HOLE DIA
 85 MINIMUM FLANGE THICKNESS
 HOLES SPACED ON A 500 PITCH C.C.B.
 BOLTING DESIGNED FOR STEEL FASTENERS
 AT 8.8 GRADE 3/4" FASTENERS PRE-TENSIONED
 TO 60% OF YIELD (270 KN PRE-TENSION)

NOTE:
 This is not the actual LLOG umbilical
 bend stiffener dwg, but is representative
 of the one currently being designed.

MAXIMUM LOADS AT MOUNTING FACE PRODUCED BY THE DESIGN LOAD CASES ARE A
 BENDING MOMENT OF 273.6 kNm COMBINED WITH A SHEAR LOAD OF 73.9 kN

ISSUE	DATE	DESCRIPTION	DRAWN	CHK'D	APP'D
1	16/03/11	ISSUE	WW	GD	GD
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TRELLEBORG OFFSHORE www.trelleborg.com/offshore					
CUSTOMER	SUCCO INC				
PROJECT	470631 / MC 503				
TITLE	GENERAL ARRANGEMENT DYNAMIC BEND STIFFENER				
SCALE	1:20	UNITS AND DIM	MM	SHEET SIZE	A3
PROJECTION					
PROJECT NUMBER	6000	MODEL ED BY	N/A	DRAWING STATUS	UNCONTROLLED
DRAWING NUMBER	9309	SHEET		OF 2	REV
					1

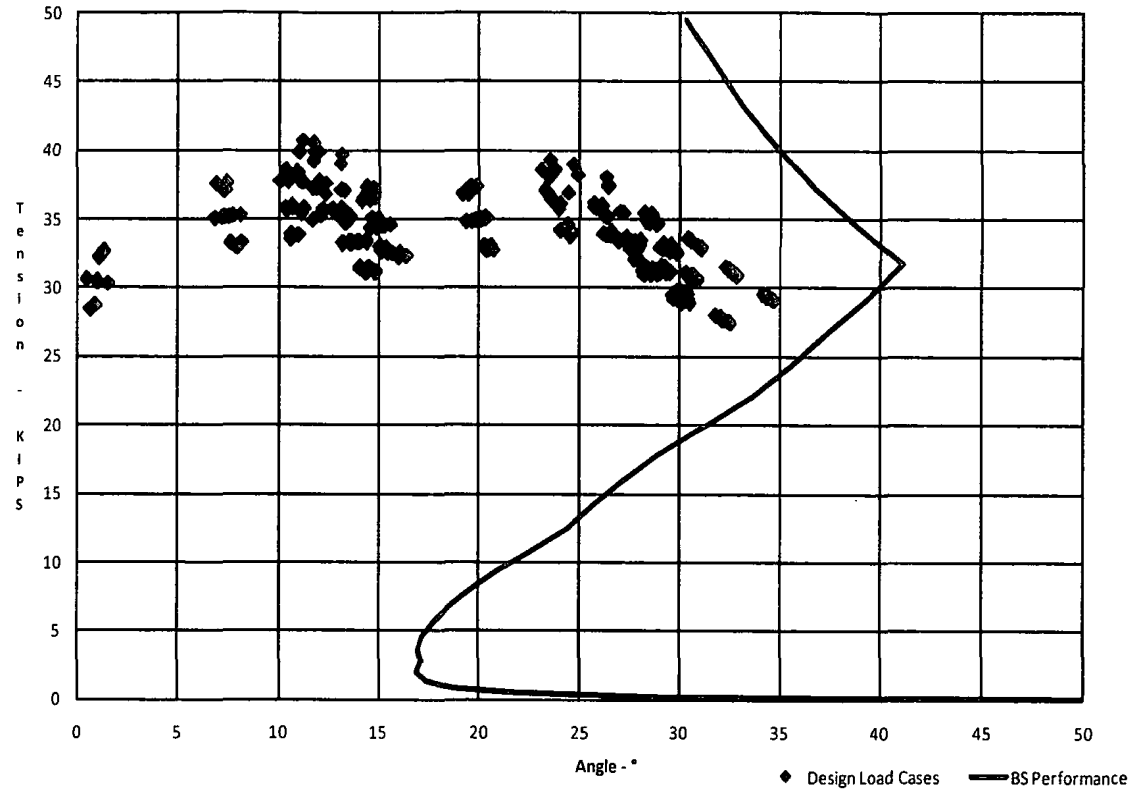
CALCULATED WEIGHTS
 WEIGHT IN AIR = 1782 KG APPROX.
 WEIGHT IN WATER = 566 KG APPROX.

TRELLEBORG PART No. 1013188

Performance Plot - Dynamic Bend Stiffener - DUCO Inc - MC-503

Umbilical Bending Stiffness = $10.324 \text{ kNm}^2 \pm 25\%$

MBR for Plot = 6.8 m



1	16/03/11	FIRST ISSUE	WW	GD	GD
ISSUE	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
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TRELLEBORG OFFSHORE www.trelleborg.com/offshore					
CUSTOMER	DUCO INC				
PROJECT	H70631 / MC-503				
TITLE	GENERAL ARRANGEMENT DYNAMIC BEND STIFFENER				
SCALE	UNITS U.N.D.	SHEET SIZE	PROJECTION		
N.T.S.	MM	A3			
IF IN DOUBT ASK, DO NOT MANUALLY DIMENSION OR ALTER.	MODELLED BY	DRAWING STATUS			
	N/A	UNCONTROLLED			
PROJECT NUMBER	DRAWING NUMBER	SHEET 2 OF 2		ISSUE	
J6000	9309			1	