

**STRATEGIC PETROLEUM RESERVE  
ENGINEERING CHANGE PROPOSAL  
SUMMARY SHEET  
CLASS I CHANGE**

ECP NUMBER SJ-M/O-4656	TITLE <b>Sugarland Terminal B.C. Static Mixer and Sampling System Installation</b>																														
BUDGET SOURCE  <input type="checkbox"/> SPR BLI _____  <input type="checkbox"/> CONTRACTOR BASELINE  <input type="checkbox"/> BCR  <input type="checkbox"/> OTHER	AUTHORITY <input type="checkbox"/> PCCB <input type="checkbox"/> ECC																														
	SCHEDULE  <input type="checkbox"/> YES MILESTONE NUMBER _____  CMCR NUMBER _____  <input type="checkbox"/> NO	TOTAL ESTIMATED COST OF CHANGE <table style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">FY _____</td> <td style="text-align: center;">FY _____</td> <td style="text-align: center;">FY _____</td> </tr> <tr> <td style="text-align: center;">DESIGN</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td style="text-align: center;">CONST. MNGMT.</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td style="text-align: center;">CONSTR./M&amp;O</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td style="text-align: center;">GFE:</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td style="text-align: center;">LOE:</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td style="text-align: center;">TOTAL</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </table>				FY _____	FY _____	FY _____	DESIGN	_____	_____	_____	CONST. MNGMT.	_____	_____	_____	CONSTR./M&O	_____	_____	_____	GFE:	_____	_____	_____	LOE:	_____	_____	_____	TOTAL	_____	_____
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GFE:	_____	_____	_____																												
LOE:	_____	_____	_____																												
TOTAL	_____	_____	_____																												

PCCB / ECC SIGNATURES	DISPOSITION			COMMENTS CONDITIONS / LIMITATIONS
	CONCUR	NON CONCUR	DATE	
DOE SENIOR SITE OFFICIAL				
<i>For [Signature]</i> APM TECHNICAL ASSURANCE	✓		7/26/13	
<i>[Signature]</i> APM SYSTEMS AND PROJECTS	✓		7/29/13	
<i>[Signature]</i> APM MAINTENANCE AND OPERATIONS	✓		7/26/13	
<i>[Signature]</i> APM MANAGEMENT AND ADMINISTRATION	✓		7/26/13	
DEPUTY PROJECT MANAGER				
DOE CMO				
PROJECT MANAGER				
DEPUTY ASSISTANT SECRETARY -SPR				

PCCB / ECC ACTION

FULL APPROVAL                     
  CONDITIONAL / LIMITED APPROVAL                     
  DISAPPROVAL

NUMBER: SJ-M/O-4656  
TITLE: Sugarland Terminal B.C. Static Mixer and Sampling System Installation

**EXECUTIVE SUMMARY:**

Opportunity exists to mitigate measurement issues and concerns at the Bayou Choctaw meters at the Sugarland Terminal in conjunction with the debottlenecking work that is being done there. Installation of a static mixer and measurement system would increase the reliability of the sampling system at the meters and would help comply with current Shell Measurement Standards.

**IMPLEMENTATION PLAN:**

Installation of Static Mixer and sampling system to be completed by Shell Distribution's Project Engineering Group following industry and company standards and processes. Sampling design to be completed by Wood Group PSN's Engineering. PCM has been awarded the debottleneck work and will be utilized for this scope of work as well. The contractor meets Shell's stringent safety requirements. Information for new portion of work will be included in the Metering Debottleneck Databook and will include detailed documentation of the project design, equipment installed and applicable drawings and specifications followed.

**IMPLEMENTATION COST:**

**DESIGN: .1 M**  
**CONSTRUCTION: .1 M**

**TOTAL: .2 M – project to be paid for by Shell**

**LIFE CYCLE COST:**

**IMPACT SUMMARY:**

**LEVEL I, II, III CRITERIA:**

**CODES, REGULATIONS,  
PERMITS, ETC.:**

**SAFETY, ENVIRONMENTAL, FIRE  
PROTECTION SYSTEMS, SECURITY:**

**CONTRACT COMPLETION DATES:**

**GFE:**

**SCHEDULES:**

# STRATEGIC PETROLEUM RESERVE

WR #

## ENGINEERING CHANGE PROPOSAL

ECP NUMBER SJ-M/O-4656	ECP TITLE <b>Sugarland Terminal B.C. Static Mixer and Sampling System Installation</b>			PAGE 1 OF 6
CONTRACTOR CHANGE NO./REV.	INITIATED BY <b>Moises Martinez</b>	DATE <b>06/20/2013</b>	SUBMITTED BY <b>Kayode Olaniyi</b>	DATE <b>6/24/2013</b>
PRIORITY  <input type="checkbox"/> EMERGENCY  <input checked="" type="checkbox"/> URGENT  <input type="checkbox"/> ROUTINE	ORG./CONTRACTOR <b>Shell Pipeline Co.</b>	PHONE NO. <b>713-241-1850</b>	ORG./CONTRACTOR <b>Shell Pipeline Co.</b>	PHONE NO. <b>504-616-5490</b>
VALUE ENGINEERING  <input type="checkbox"/> VEP (MANDATORY)  <input type="checkbox"/> VECP (VOLUNTARY)		DRAWDOWN CRITICAL  <input type="checkbox"/> YES  <input type="checkbox"/> NO	ROM ESTIMATE  _____	

**DESCRIPTION:**  
**PROBLEM / EXISTING CONFIGURATION:**  
 The current sampling system at the Bayou Choctaw Meters does not comply with Shell Measurement Standards. There is currently no mixing element installed on the Bayou Choctaw Meters as mixing is assumed to occur through the various meter runs, strainers, bends, etc...

**PROPOSED SOLUTION / ENHANCEMENT:**  
 Installation of a static mixer on the inlet to the Bayou Choctaw Meters will provide adequate mixing of the crude and compliance with the Shell Measurement Standards. Downtime could be reduced if done in conjunction with the debottleneck work at the meters.

In addition to the static mixer an automated sampling system will be installed including a sample probe and sample pots.

The planned changes are as follows:

- Installation of one 30" Triple Element static mixer with flange for sampler and manual sample port
- Installation of one C-22-26 ext with CD-20B motor
- Three 5 gallon sample containers
- Two 15 gallon sample containers
- Five valves and CI DII actuators for sample pot select
- Installation of isolation valve for sampler
- Installation of one Manual sample probe and valve
- Installation of all required electrical conduit runs and wiring

See attached drawings for plot plans and design details.

**REASON / JUSTIFICATION:**  
 Proposed changes will ensure proper measurement of movements through the Bayou Choctaw meters in compliance with current Shell Measurement Standards.

CI'S AFFECTED

TECHNICAL ANALYSIS/RECOMMENDATION	IMPLEMENTATION METHOD  <input type="checkbox"/> SUBCONTRACT <input type="checkbox"/> M&O LABOR (LOE) <input type="checkbox"/> COMBINATION
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ENGINEERING	DATE	DOE SSR	DATE	<input type="checkbox"/> CONCUR <input type="checkbox"/> NONCONCUR
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STRATEGIC PETROLEUM RESERVE  
ENGINEERING CHANGE PROPOSAL  
CONFIGURATION CHANGE AFFECTED REPORT

WR #

TO BE COMPLETED BY TECHNICAL REVIEW PROCESS, ENGINEERING AND CONFIGURATION MANAGEMENT ORGANIZATION DEFINED PROCESS

ECP NO. SJ-M/O-4656	CONTRACTOR CHANGE NO.	REV.	CHANGE CLASSIFICATION <input type="checkbox"/> CLASS I <input type="checkbox"/> CLASS II	PAGE 2 OF 6
FUNCTIONS AFFECTED			DOCUMENTS AFFECTED	
YES/NO	ITEM	YES/NO	ITEM	
	<b>LEVEL I <input type="checkbox"/> LEVEL II <input type="checkbox"/> CRITERIA</b>		<b>ELECTRICAL (cont'd)</b>	
NO	PERFORMANCE CRITERIA	NO	315 - CATHODIC PROTECTION	
NO	RAM	NO	350 - STANDARDS	
NO	INTERFACE CHARACTERISTICS		<b>INSTRUMENTATION</b>	
NO	I/O POINTS	NO	401 - BLOCK DIAGRAM	
NO	DOE LEVEL I, II, III SCHEDULES	NO	402 - LOOP DIAGRAMS	
NO	GUARANTEES/DELIVERABLES	NO	403 - INSTRUMENT PLANS	
NO	SAFETY/ENV/FP (CIRCLE ONE)	NO	404 - INSTRUMENT WIRING DIAGRAM	
NO	SECURITY REQUIREMENTS	NO	409 - INSTRUMENT INDEX	
NO	OPCS SOFTWARE	NO	450 - STANDARDS	
NO	OPCS HARDWARE		<b>MAPPING</b>	
NO	OPCS FIRMWARE	NO	501 - ALIGNMENT SHEETS	
NO	SETPOINTS/RANGES	NO	509 - PIPELINE DRWGS (MAINLINE VALVES, DRIPS, SCRAPER, TRAPS, ETC.)	
NO	DIP SWITCH SETTINGS/JUMPERS	NO	550 - STANDARDS	
NO	MASTER CI LIST		<b>ARCHITECTUAL</b>	
NO	WELLHEAD CONFIGURATION	NO	720 - ELEVATIONS AND FLOOR PLANS	
NO	SPARES/ROVISIONING REQUIREMENTS	NO	750 - STANDARDS	
NO	GOVERNMENT FURNISHED EQUIPMENT		<b>DOCUMENTATION</b>	
NO	ENERGY USAGE	NO	900 - RESERVED	
NO	OPERATIONS MODESL	NO	901 - TECHNICAL/PERFORMANCE/DESIGN CRITERIA	
NO	OTHER	NO	910 - DESIGN DESCRIPTION/BASIS	
	<b>DOCUMENTS AFFECTED</b>	NO	911 - PROCESS SET POINT DOCUMENTS	
YES/NO	<b>ITEMS</b>	YES	912 - EQUIPMENT LIST	
	<b>PIPING</b>	NO	913 - MOV LIST	
YES	101 - PROCESS FLOW DIAGRAMS	NO	915 - ELECTRICAL SAFETY	
YES	102 - MECHANICAL FLOW DIAGRAMS	NO	920 - I/O DOCUMENT	
NO	103 - PIPING AND INSTRUMENTATION DIAGRAMS (P&ID'S)	NO	930 - OPERATIONS MANUALS	
YES	104 - UTILITY FLOW DIAGRAMS	NO	930 - MAINTENANCE MANUALS	
YES	105 - GENERAL PIPING PLANS	NO	950 - STANDARD SPECIFICATIONS	
NO	106 - AREA PLANS (MECHANICAL EQUIPMENT LOCATION)	NO	970 - TASK SPECIFICATIONS	
NO	122 - WELL HEAD DRAWINGS	NO	990 - CONFIGURATION MANAGEMENT REPORTS/I.B.M.	
YES	130 - VALVE LIST		COMENTS:	
NO	135 - LINE LIST			
NO	140 - PSV LIST			
NO	150 - STANDARDS			
	<b>CIVIL/STRUCTURAL</b>			
NO	201 - PLOT PLANS			
NO	202 - SITE WORK: GRADING (ROUGH & FINISH) DRAIN FENCING			
NO	210 - FOUNDATIONS: LOCATION PLANS			
NO	216 - MINES (WEEKS ISLAND ONLY)			
NO	250 - STANDARDS			
	<b>ELECTRICAL</b>			
YES	301 - AREA CLASSIFICATION			
YES	302 - ONE LINE DIAGRAMS			
NO	303 - SCHEMATIC DIAGRAMS			
NO	304 - POWER PLANS AND DETAILS			
NO	305 - LIGHTING PLANS AND DETAILS			
NO	307 - SUBSTATION PLANS AND DETAILS			
NO	308 - WIRING DIAGRAMS			
NO	310 - GROUNDING			
YES	311 - CONDUIT & CABLE SCHEDULES (INCLUDING INST.)			
NO	313 - MCC/SWITCH GEAR EVALUATION & SCHEDULE			
ENGINEERING	DATE	CONFIGURATION MANAGEMENT	DATE	

# STRATEGIC PETROLEUM RESERVE

## ENGINEERING CHANGE PROPOSAL

### SOFTWARE, HARDWARE, FIRMWARE CHANGE

WR #

CONTRACTOR CHANGE NUMBER

REVISION NUMBER

ECP NUMBER

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SJ-M/O-4656

SOFTWARE CHANGE ANALYSIS

HARDWARE/SOFTWARE AFFECTED

(NOTE: REDLINE CI BOM)

**DISPOSITION OF PARTS**

REWORK SITE COMPONENTS ONLY       REWORK ALL SITE COMPONENTS       COMPONENTS NOT AFFECTED

OTHER (DESCRIBE)

COMPONENT COMPATIBILITY (LIST COMPONENTS SEPERATELY IF COMPATIBILITIES ARE DIFFERENT)

INTERCHANGEABLE

DRAWDOWN COMPATIBLE

NONCOMPATIBLE

OPCS SUPPORT ENGINEER

DATE

FUNCTIONAL MANAGER

DATE

IMPLEMENTATION / TEST COMMENTS

WITNESSED BY

DATE

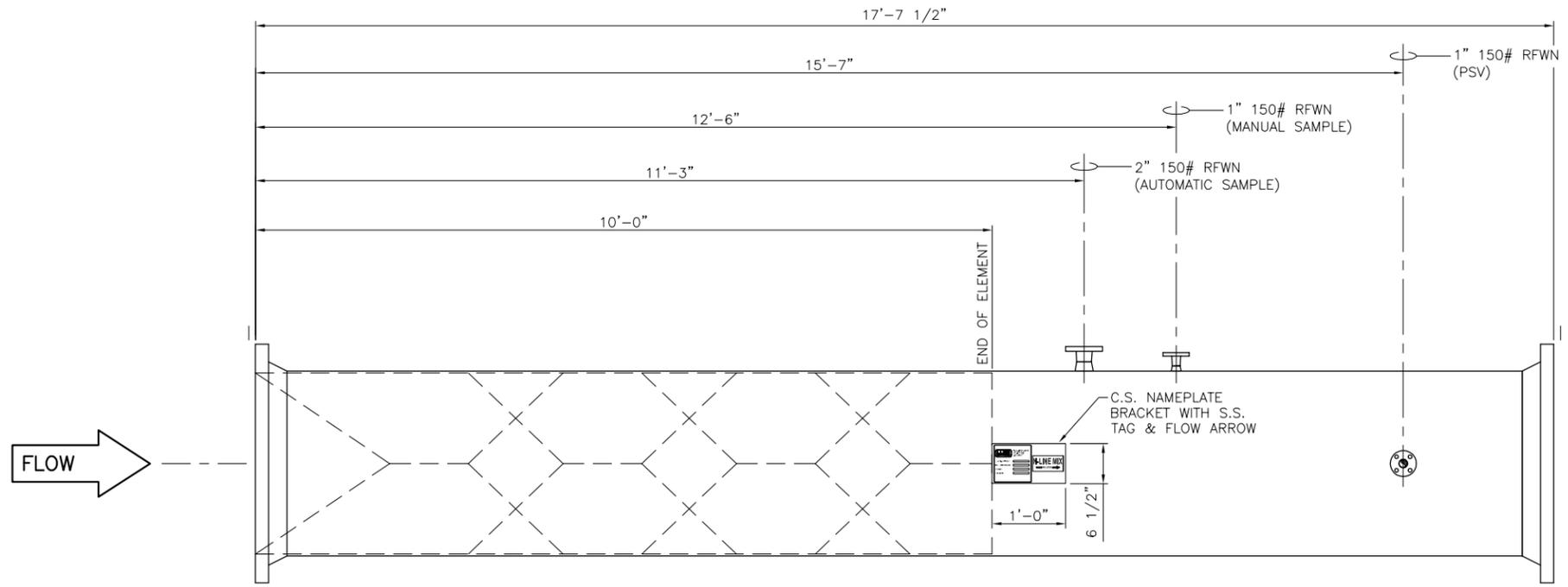
TEST APPROVED BY

DATE

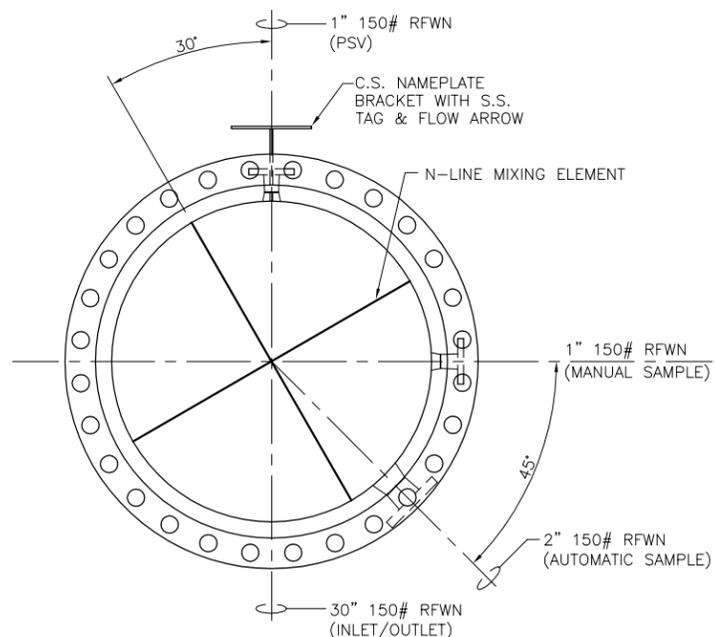
CHANGE RELEASE AUTHORITY

DATE



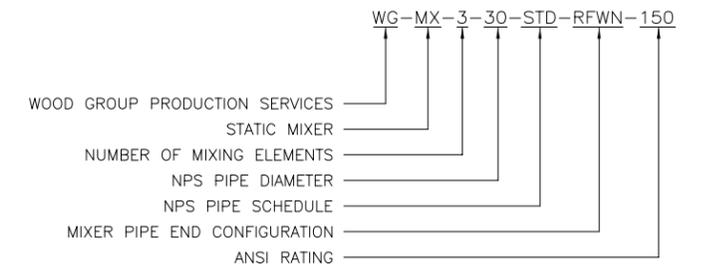


MIXER AS VIEWED FROM TOP OF MIXER



SECTION A-A

- GENERAL NOTES:**
- WOOD GROUP "WG" MIXERS MAY BE INSTALLED HORIZONTALLY OR VERTICALLY IN PIPE RUNS. AT HORIZONTAL POSITION, THE MIXER SHOULD BE ORIENTED WITH THE "TOP" MARK AT THE TOP OF PIPE TO ENSURE PROPER MIXING.
  - STANDARD AUTOMATIC SAMPLER TO BE A CLIFF MOCK C-22.
  - STANDARD MANUAL SAMPLER TO BE A WOOD GROUP 1/2" NPT.
  - STANDARD MIXER ELEMENT TO BE CARBON STEEL.



WOODGROUP MODEL NUMBERS

NAME TAG  
(1) REQ'D.

FLOW ARROW PLATE  
(1) REQ'D.

NOTES

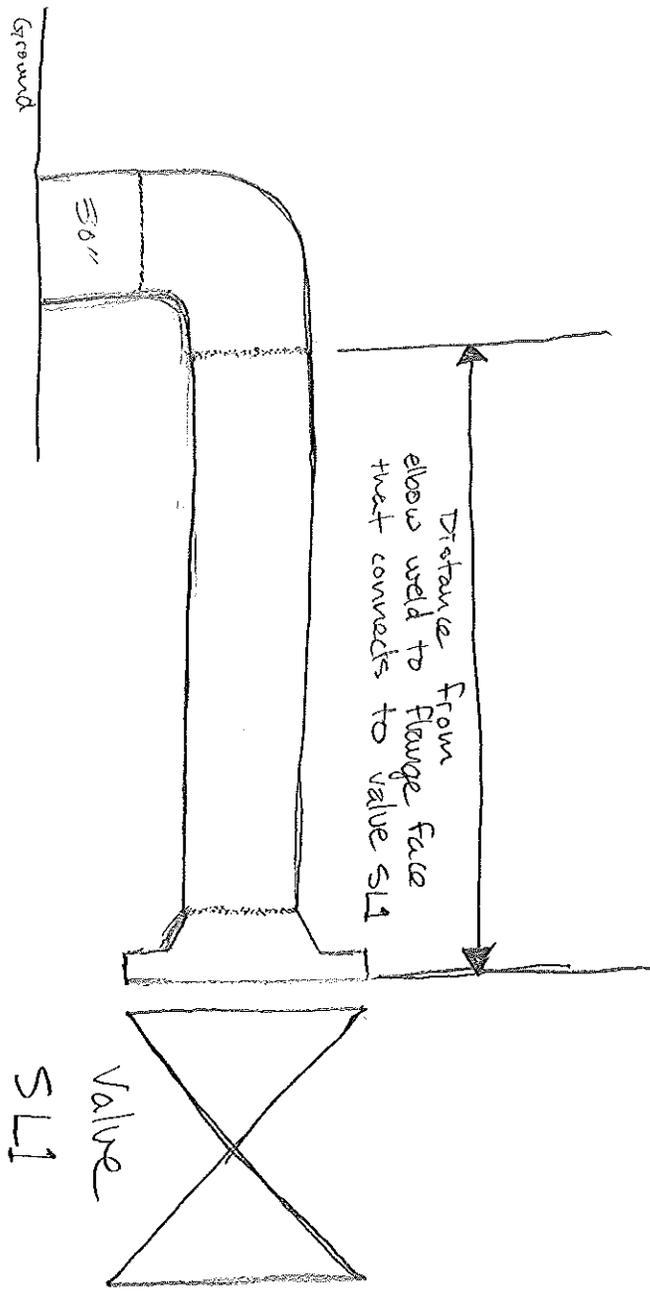
REVISIONS

NO.	DATE	BY	DESCRIPTION	CK'D.	APP.
A	05/21/13	JRM	ISSUED FOR REVIEW		

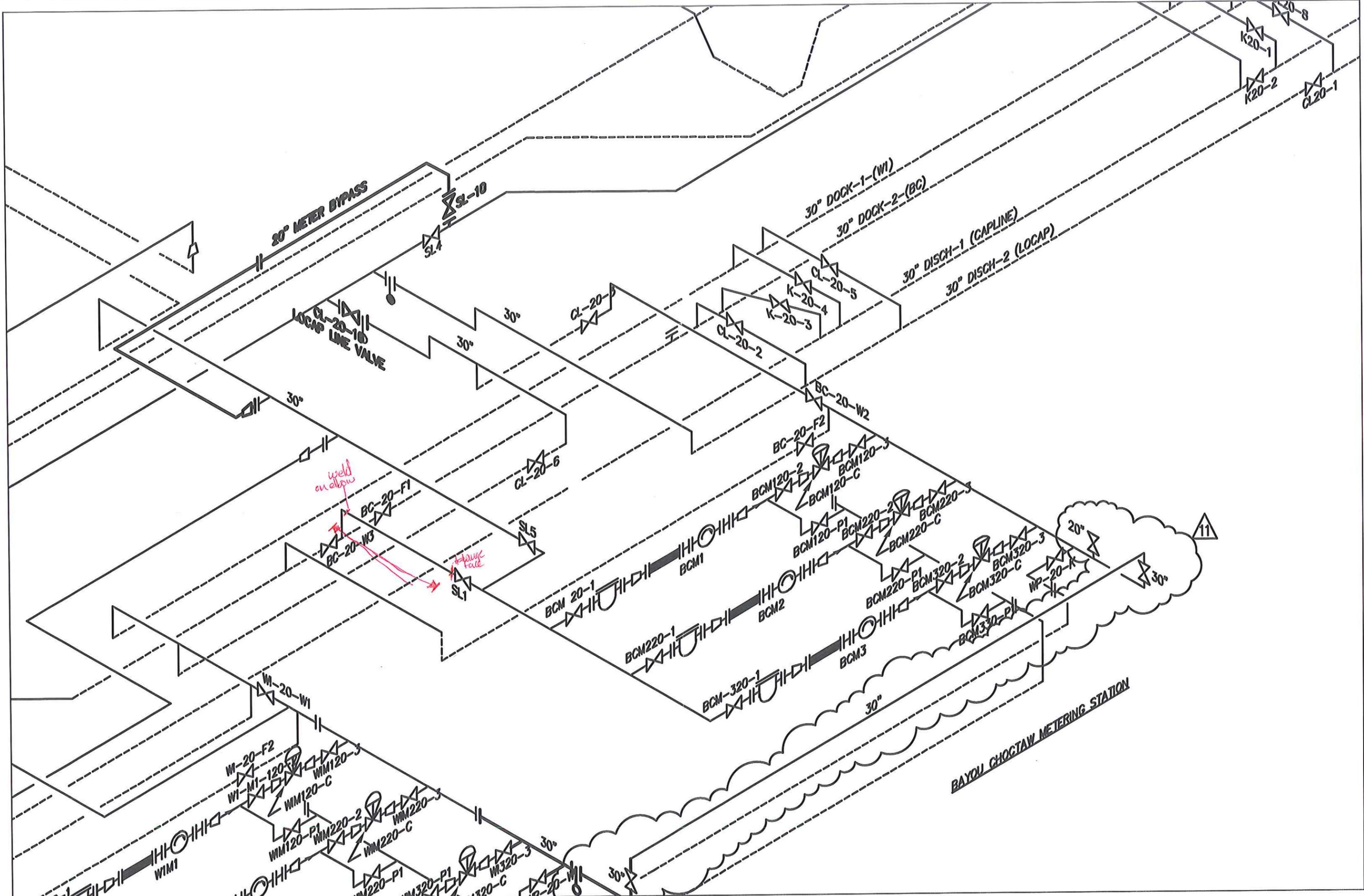


WOOD GROUP MEASUREMENT SERVICES  
HOUMA (985) 868-4116  
LAFAYETTE (337) 234-0100

CUSTOM 30" 3-ELEMENT MIXER		SHELL PIPELINE SUGARLAND TERMINAL SUGARLAND METERING DEBOTTLENECK	
PROJECT NO.	CAD FILE NO.	DRAWN BY	CHECKED BY
11A1101	11A1101-550	JRM	HAK
		DESIGNED BY	APPROVED BY
		DATE	CLIENT'S DWG. NO.
		06/12/13	
		SCALE	SHT. NO.
		NONE	550
			REV. 0



→ Bayou Chodrau  
 Refers



BAYOU CHOCTAW METERING STATION

11

20" METER BYPASS

LOCAP LINE VALVE

30" DOCK-1-(WI)

30" DOCK-2-(BC)

30" DISCH-1 (CAPLINE)

30" DISCH-2 (LOCAP)

weld on elbow

tearout face