



OIL & GAS DEVELOPMENT COMPANY LIMITED PAKISTAN



KPD-TAY GAS & LPG PROCESSING PLANT

PROJECT NO	PROJECT TITLE				MAXIMO REF
KT-ECR-1104	SALES GAS COMPRESSOR PACKAGE K-6301E				N/A
DOCUMENT NO.	KT-ECR-1104-63-SOW-0004	REVISION	00	DATE	01-07-2022

**SOW FOR HIRING OF TECHNICAL SERVICES FOR INSTALLATION,
PRE-COMMISSIONING / COMMISSIONING OF SALES GAS
COMPRESSOR PACKAGE AT KPD-TAY PLANT**

Tender No. TE/MECH/WT/KPD-0006/2022

00	01-07-2022	SOW FOR HIRING OF TECHNICAL SERVICES FOR INSTALLATION, PRE-COMMISSIONING / COMMISSIONING OF SALES GAS COMPRESSOR PACKAGE AT KPD-TAY PLANT	Muzammil Abbas	Bahauddin Tarin	Muhammad Riaz Rasheed Ahmad
Rev	Date	Description	PRPD BY	CHKD BY	APPD

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LIST OF ABBREVIATIONS USED:

Abbreviation	Description
OGDCL	Oil & Gas Development Company Limited
SOW	Scope of Work
LPG	Liquefied Petroleum Gas
GPP	Gas Processing Plant
PKR	Pakistani Rupee
ESDV	Emergency Shutdown Valve
BDV	Blowdown Valve
LCP	Local Control Panel

1 INTRODUCTION

Oil and Gas Development Company Ltd (OGDCL) is Pakistan's National Oil & Gas Exploration and Production Company. OGDCL is currently operating Country's largest Oil & Gas sector.

KPD-TAY Integrated Development Project Phase-II is a Gas & NGL Processing Plant, located in Hyderabad District about 25 km away from Hyderabad City and approx. 195 km from Karachi, Sindh Province of Pakistan.

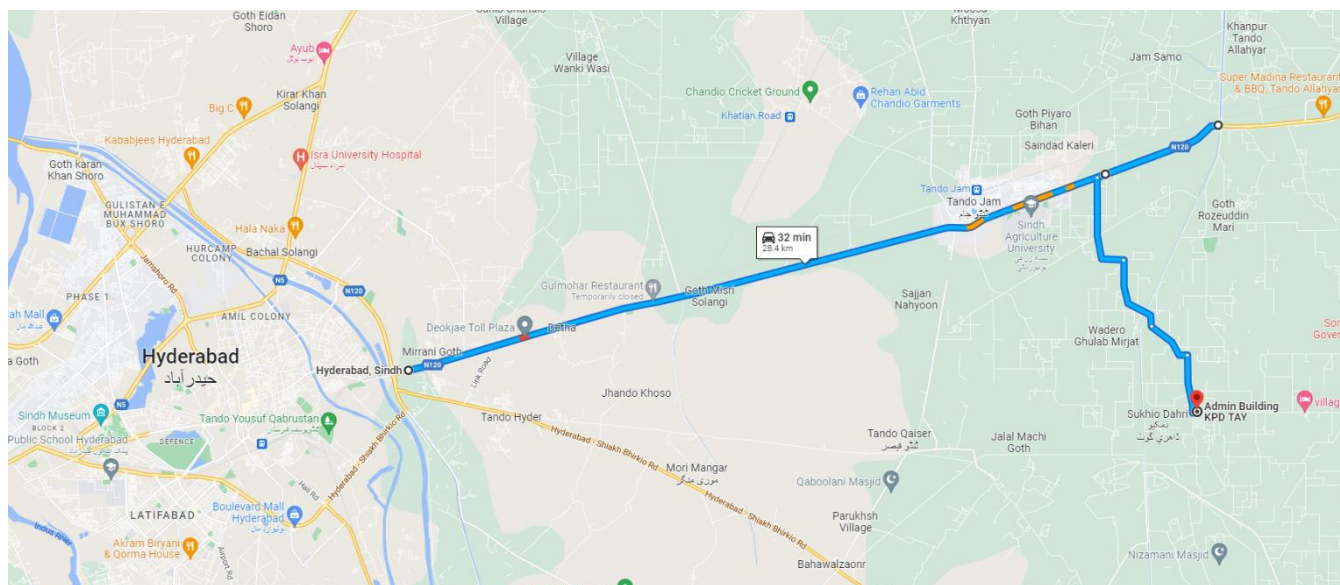


Figure 1: Location of the Plant

Currently there are 03 Gas Turbine Driven Centrifugal and 01 Gas Engine Driven Reciprocating Compressor Packages installed at KPD-TAY Plant to inject processed gas into SSGC's network. OGDCL intends to install 01 No. Gas Engine Driven Reciprocating Compressor Package at KPD-TAY Plant for which Services from reputed 3rd Party Companies are required as per scope of work described in this document.

2 PLANT OVERVIEW

- 2.1 KPD-TAY Integrated Facility is comprised of Wellheads, Gas Gathering network and Gas Processing Plant (GPP).
- 2.2 The GPP is combination of two independent identical capacity process trains, comprised of following main units:-
 - Plant Reception Facilities including KPD (K) and TAY (T) 'Finger Type' Slug Catchers and K and T Production Separators.
 - Gas Sweetening Units to remove CO₂ using MDEA solvent (2x50% Independent identical trains).
 - Gas Dehydration Units using Molecular Sieve Adsorbent (2x 50 % Independent identical trains).

- LPG Extraction Units (2 x 50 % trains of Dew point Control, Turbo-Expander/Re-Compressor, independent identical trains).
- Condensate Stabilization Units (2 x 50 % trains, Independent identical trains).
- Sales Gas Compressors (3 x 50 % Capacity independent identical capacity units).
- Sales Gas Metering.
- LPG & Condensate Storage & Loading.
- Power Generation.

2.3 Utilities such as Hot Oil System, Fuel Gas System, Compressed Air System, Cooling water system, Produced water disposal, Flare System, Closed Drain System, etc.

3 OBJECTIVES

OGDCL desires to engage an experienced Contractor for Installation of 01 No. Gas Engine Driven Saes Gas Compressor Package at KPD-TAY Plant in Tando Jam, district Hyderabad.

4 SCOPE OF WORK

The Scope of Work comprises of following activities but not limited, to:

All the activities to be performed in line with industry best practices, superior quality workmanship and in safe manner.

4.1 Supply of Technical Services for Installation and commissioning of Auxiliary Equipment / interconnecting on & off skid Piping / Components / Valves and all Accessories of Compressor Package and Cooler in line with GA drawing (attached) and tagging for mechanical completion of compressor package. 01 Crane of 30 Tonnes Capacity along with Crane Operator will be provided by the Company to assist installation of Auxiliary Equipment / Piping / Components / Valves and Accessories of Compressor Package while all other resources including manpower, PPEs & Safety Gears, tools & tackles etc. will be the responsibility of Contractor. Contractor will depute a competent team responsible for installation and carryingout proper installation, alignment and leveling of Compressor & Cooler Skids.

4.2 Installation & Commissioning of following valves:

- i. Suction ESDV, Size: 10"
- ii. Discharge ESDV, Size: 8"
- iii. Liquid Drain ESDV, Size: 2"
- iv. BDV-2019 , Size: 2"
- v. Recycle Valve PCV-2040, Size: 2"

Services includes but not limited to Installation & fitting of new SS tubing (approximately 150 ft cummulative length) and 13 Nos. Single Pair Cables in tray / conduit for above mentioned valves. The cables to be laid from ESDVs/ BDV to Local Control Pannel (with total approximate cummulative length 250ft) along with glanding, dressing, drilling of cable entry holes in LCP, cable tray Insytallation and terminations on both sides.

- 4.3 Inspection of Terminations on Field & Panel Side, verification of security loops as per C&E for list of I/Os (provided in Annexure-01) and troubleshooting of identified issues. Certified test equipment to verify K type thermocouples & Multimeters etc. for loop testing & troubleshooting to be provided by Bidder.

5 WARRANTIES AND GUARANTEES

Contractor will be required to render warranties and guaranties for all of the works to be completed as part of this SOW. Contractor shall have primary accountability and responsibility for safe execution of all works which constitute part of SOW in timely and safe manner. In the event any mishap arising from deviation from best industrial practices, Contractor shall have the responsibility to take remedial action and rectify all issues under the scope of this Contract and with no additional cost to Company. Contractor shall hold full responsibility for safe planning & execution of all jobs under this SOW up to Company's satisfaction.

6 PROJECT EXECUTION PLAN

No	Activity Description	Time for Activity	Notes
1.	Award of Contract	0	Start of Contract
2.	Kick off meeting	1 days	
3.	Site visit by Contractor team (onsite)	1~2 days	
4.	Execution of Scope of Work	1.5~2 week	After site visit
5.	Close Out Meeting	1 day	

7 METHODOLOGY AND EXECUTION STRATEGY

- 7.1. Bidders are encouraged to consider JV and/or engagement of "Subject Specialist" resources, for all such work where expertise may not be available within their existing organization. The Company's objective is to carry out all jobs under defined Scope of Work in Safe manner and in line with best Industrial Practices.
- 7.2. Contractor will ensure use of 3rd party certified tools and equipment for execution of works (where applicable by standard practice / law).
- 7.3. Contractor will ensure adherence to Company's Work Procedures, Permit to Work System and Integrated HSE System Manual during planning and execution of all jobs under this scope of work.

8 GENERAL TERMS & CONDITIONS

- 8.1 Company will provide food and accommodation to Contractor's personnel at their camp located within the close proximity of KPD-TAY Gas Process Plant.
- 8.2 All documents to be produced by Contractor will be in English language.
- 8.3 Company reserves the right to monitor/ assess the performance of Contractor to ensure conformity with the Contract Documents. Contractor shall promptly rectify all such deficiencies and/or flaws that are brought to the Contractor's knowledge by the Company. Company's review/approval of any document shall not relieve the Contractor from any of their responsibilities/ accountabilities and obligations under the Contract/ PO.
- 8.4 Company reserves the right to cancel the Contract/ PO at any stage without any obligation, if it proves that the objectives are not being achieved and/or suitably experienced people / equipment / tools / machinery are not on-board to carry out the SOW.
- 8.5 Contractor shall submit progress report of executed and in-progress jobs on daily basis along with look ahead for next day.
- 8.6 Contractor shall ensure that all piping, tubings and equipment are purged and cleaned properly before installation of connections and interfaces.
- 8.7 Contractor shall arrange all Tools and Tackles, PPEs and work specific safety gears for its manpower and shall submit calibration third party certifications, where applicable.
- 8.8 All consumables required for execution of jobs under this SOW will be provided by the Company.
- 8.9 Contractor to ensure use of certified lifting tools and accessories for safe lifting and rigging jobs where required during installation works.
- 8.10 Contractor to ensure that all jobs are executed under direct supervision of field specialists and competent personnel (separate for instrumentation & mechanical works) having minimum 10 years of relevant experience.
- 8.11 Contractor shall be responsible for provision of manpower during start up and commissioning of compressor package around the clock.

9 DOCUMENTS TO BE SUBMITTED ALONG WITH TECHNICAL BIDS

Following documents should be attached with the technical bids:

- 9.1. CVs. of Project Manager and Teams Leads proposed by the bidder to carry out this SOW. The Manager / Team Lead(s) CVs should include exact description of similar projects work completed along with the details of their scope/role.
- 9.2. List of year-wise projects completed / current in last 10 years.
- 9.3. Detailed Execution Methodology with Level-IV Schedule on MS Project
- 9.4. Resource Deployment Plan
- 9.5. Organization chart for this project scope.
- 9.6. CVs for the team members / supervisors covering overall proposed organization to undertake this project.

10 COMMERCIAL QUOTE SUBMISSION

This is single stage TWO ENVELOP bid submission.

Therefore Technical and Financial bids will be submitted in two separate sealed envelopes (then placed in single envelop and sealed & stamped by the bidder with transparent tape on sealing flap).

Financial bids to be submitted in accordance with the Annexure-2. Financial bids will only be opened after completing the technical bids evaluation process and for the technically compliant bidders.

ANNEXURE-1

LIST OF DOCUMENTS ATTACHED WITH SCOPE OF WORK DOCUMENT

Sr #	Description	Document #
1	GA Drawings of Compressor Package	V38690200-01~15-02
2	Compressor Package Weight Details	KT-ECR-1104-63-LL-001 REV.00
3	I/O & Trips List of Compressor Package	KT-ECR-1104-63-IOL-001 REV.00

NOTE: Additional docs will be provided by Company on request and as per requirement of the Bidder.

ANNEXURE-2

COMMERCIAL QUOTE FORMAT

SR. NO	SCOPE OF WORK	COST ON LUMPSUM BASIS	NOTES
1	Supply of Technical Services for Installation and commissioning of Auxiliary Equipment / On & Off Skid Interconnecting Piping / Components / Valves and Accessories of Compressor Package per detailed SOW attached with Tender Enquiry		
2	Supply of Technical Services for Installation and commissioning of Tubing / Cables of ESDVs and Loop Testing as per detailed SOW attached with Tender Enquiry		
	TOTAL QUOTE VALUE		

Note:

1. Quoted prices shall be inclusive of all taxes, duties, levies, and charges. ICT/PST (which ever applicable) on services shall be quoted as separate line item accordingly to applicability on each line item on the basis of province wherein the services are being rendered.
2. 100% payment shall be made through account payee cheque after completion of jobs awarded as per Contract / PO and submission of final report along with invoice duly accepted/approved by OGDCL. Taxes shall be deducted at source.
3. Quote validity shall be 120 days from the date of submission
4. Prices shall not vary within the Quote validity.

PLC DATA TAGS

All tags are “Controller Tags” and can be accessed with any Allen Bradley Ethernet/IP compatible driver such as RSLinx.

Digital Inputs

“.Value” is a 0 or 1 with a 1 showing a closed contact

Also each tag has an “.Alarm” with a 1 indicating an alarm condition

- Aux_Water_Level_Low.Value
- Comp_Oil_Level_Low.Value
- Comp_Vib.Value
- Cooler_Vib_A.Value
- Cooler_Vib_B.Value
- Cooler_Vib_C.Value
- Engine_Alarm.Value
- Engine_Knock.Value
- Engine_Oil_Level_Low.Value
- Engine_Tripped.Value
- Engine_Vib.Value
- FireDetector_A_Fire.Value
- FireDetector_B_Fire.Value
- Fuse_01.Value
- Fuse_02.Value
- Fuse_03.Value
- Hardwire_ESD.Value
- Interstage_Scrubber_High.Value
- Jacket_Water_Level_Low.Value
- Local_Start.Value
- Local_Stop.Value
- Oil_No_Flow_A.Value
- Oil_No_Flow_B.Value
- Panel_ESD.Value
- Remote.Value
- Remote_Start.Value
- Remote_Stop.Value
- Reset_PB.Value
- Suction_Scrubber_High.Value

Analog Inputs

Each Analog Input also has the “.Value” for its value in Imperial engineering units. Also each tag has a “.Value_Sec” for its value in Metric engineering units. For values in percent and RPM .value and .value_Sec are equal.

Each tag also has several other attributes any of which can be accessed including: HHAAlarm, HAlarm, LAlarm, LAlarm, Quality

- Comp_Oil_Pressure.Value
- Discharge_Pressure_A.Value
- Engine_Load.Value
- Engine_Oil_Pressure_A.Value
- Engine_Oil_Pressure_B.Value
- Engine_RPM.Value
- Gas_Detection_A.Value
- Gas_Detection_B.Value
- Interstage_Pressure_A.Value
- Suction_Pressure_A.Value

Temperature Inputs

Each Temp input includes “.DegF” and “.DegC” and the same alarms as the Analog Inputs.

- Cat_Conv_Inlet_Temp.DegF
- Cat_Conv_Outlet_Temp.DegF
- Comp_Oil_Temp.DegF
- Cyl_1_Discharge_Temp.DegF
- Cyl_1_Suction_Temp.DegF
- Cyl_2_Discharge_Temp.DegF
- Cyl_2_Suction_Temp.DegF
- Cyl_3_Discharge_Temp.DegF
- Cyl_3_Suction_Temp.DegF
- Cyl_4_Discharge_Temp.DegF
- Cyl_4_Suction_Temp.DegF
- Engine_Bearing_1.DegF
- Engine_Bearing_2.DegF
- Engine_Bearing_3.DegF
- Engine_Bearing_4.DegF
- Engine_Bearing_5.DegF
- Engine_Bearing_6.DegF
- Engine_Bearing_7.DegF
- Engine_Cyl_Left_1.DegF
- Engine_Cyl_Left_2.DegF
- Engine_Cyl_Left_3.DegF
- Engine_Cyl_Left_4.DegF
- Engine_Cyl_Left_5.DegF
- Engine_Cyl_Left_6.DegF
- Engine_Cyl_Right_1.DegF
- Engine_Cyl_Right_2.DegF
- Engine_Cyl_Right_3.DegF
- Engine_Cyl_Right_4.DegF
- Engine_Cyl_Right_5.DegF
- Engine_Cyl_Right_6.DegF
- Engine_Oil_Temp.DegF
- Engine_Turbo_Left.DegF
- Engine_Turbo_Right.DegF

Trips

- Trip_01.Out1 Hardwire Trip Relay
- Trip_01.Out2 Local/Panel ESD
- Trip_01.Out3 Engine ESD
- Trip_01.Out4 Fire Detector A Fire Detected
- Trip_01.Out5 Fire Detector B Fire Detected
- Trip_01.Out6 Suction Scrubber High Level
- Trip_01.Out7 Interstage Scrubber High Level
- Trip_01.Out8 Fuel Scrubber Level High
- Trip_02.Out1 Cylinder Oil No Flow Switch A
- Trip_02.Out2 Cylinder Oil No Flow Switch B
- Trip_02.Out3 Compressor Vibration
- Trip_02.Out4 Engine Vibration
- Trip_02.Out5 Cooler Vibration A
- Trip_02.Out6 Cooler Vibration B
- Trip_02.Out7 Cooler Vibration C
- Trip_02.Out8 Spare
- Trip_03.Out1 Compressor Oil Level Low
- Trip_03.Out2 Engine Oil Level Low
- Trip_03.Out3 Jacket Water Level Low
- Trip_03.Out4 Aux Water Level Low
- Trip_03.Out5 Spare
- Trip_03.Out6 Digital Input Fuse 1 Bad
- Trip_03.Out7 Digital Input Fuse 2 Bad
- Trip_03.Out8 Digital Input Fuse 3 Bad
- Trip_04.Out1 Suction Pressure High
- Trip_04.Out2 Suction Pressure Low
- Trip_04.Out3 Suction Pressure Quality
- Trip_04.Out4 Interstage Pressure High
- Trip_04.Out5 Interstage Pressure Low
- Trip_04.Out6 Interstage Pressure Quality
- Trip_04.Out7 Discharge Pressure High
- Trip_04.Out8 Discharge Pressure Low
- Trip_05.Out1 Discharge Pressure Quality
- Trip_05.Out2 Compressor Oil Pressure High
- Trip_05.Out3 Compressor Oil Pressure Low
- Trip_05.Out4 Compressor Oil Pressure Quality
- Trip_05.Out5 Engine Oil Pressure High
- Trip_05.Out6 Engine Oil Pressure Low
- Trip_05.Out7 Engine Oil Pressure Quality
- Trip_05.Out8 Spare
- Trip_06.Out1 Spare
- Trip_06.Out2 Spare
- Trip_06.Out3 Spare
- Trip_06.Out4 Spare
- Trip_06.Out5 Spare
- Trip_06.Out6 Spare
- Trip_06.Out7 Spare
- Trip_06.Out8 Engine OverCrank

- Trip_07.Out1 Compressor Oil Temp High
- Trip_07.Out2 Compressor Oil Temp Quality
- Trip_07.Out3 Engine Oil Temp High
- Trip_07.Out4 Engine Oil Temp Quality
- Trip_07.Out5 Cylinder 1 Discharge Temp High
- Trip_07.Out6 Cylinder 1 Discharge Temp Quality
- Trip_07.Out7 Cylinder 2 Discharge Temp High
- Trip_07.Out8 Cylinder 2 Discharge Temp Quality
- Trip_08.Out1 Cylinder 3 Discharge Temp High
- Trip_08.Out2 Cylinder 3 Discharge Temp Quality
- Trip_08.Out3 Cylinder 4 Discharge Temp High
- Trip_08.Out4 Cylinder 4 Discharge Temp Quality
- Trip_08.Out5 Spare
- Trip_08.Out6 Spare
- Trip_08.Out7 Spare
- Trip_08.Out8 Spare
- Trip_09.Out1 Spare
- Trip_09.Out2 Spare
- Trip_09.Out3 Spare
- Trip_09.Out4 Spare
- Trip_09.Out5 Spare
- Trip_09.Out6 Spare
- Trip_09.Out7 Spare
- Trip_09.Out8 Spare
- Trip_10.Out1 Cylinder 1 Rod Load High
- Trip_10.Out2 Cylinder 2 Rod Load High
- Trip_10.Out3 Cylinder 3 Rod Load High
- Trip_10.Out4 Cylinder 4 Rod Load High
- Trip_10.Out5 Spare
- Trip_10.Out6 Spare
- Trip_10.Out7 Engine Start Fail
- Trip_10.Out8 Engine Speed Fail
- Trip_11.Out1 Engine Overspeed
- Trip_11.Out2 Suction Valve Fault
- Trip_11.Out3 Spare
- Trip_11.Out4 Spare
- Trip_11.Out5 Spare
- Trip_11.Out6 Discharge Valve Fault
- Trip_11.Out7 Spare
- Trip_11.Out8 Spare
- Trip_12.Out1 Spare
- Trip_12.Out2 Spare
- Trip_12.Out3 Spare
- Trip_12.Out4 Spare
- Trip_12.Out5 Spare
- Trip_12.Out6 Spare
- Trip_12.Out7 Spare
- Trip_12.Out8 Spare

ESDVS & BDV IO's

- i. BDV-2019 (DO)
- ii. BDV ZSC-2019 (DI)
- iii. BDV ZSO-2019 (DI)
- iv. Suction SDV-2010 (DO)
- v. Suction SDV ZSC-2010 (DI)
- vi. Suction SDV ZSO-2010 (DI)
- vii. Discharge SDV-2040 (DO)
- viii. Discharge SDV ZSC-2040 (DI)
- ix. Discharge SDV ZSO-2040 (DI)
- x. Liquid Drain ESDV-2033 (DO)
- xi. Liquid Drain ESDV ZSC-2033 (DI)
- xii. Liquid Drain ESDV ZSO-2033 (DI)
- xiii. PCV-2040 (AO)



VALERUS COMPRESSION

Document #: KT-ECR-1104-63-LL-001 REV.00

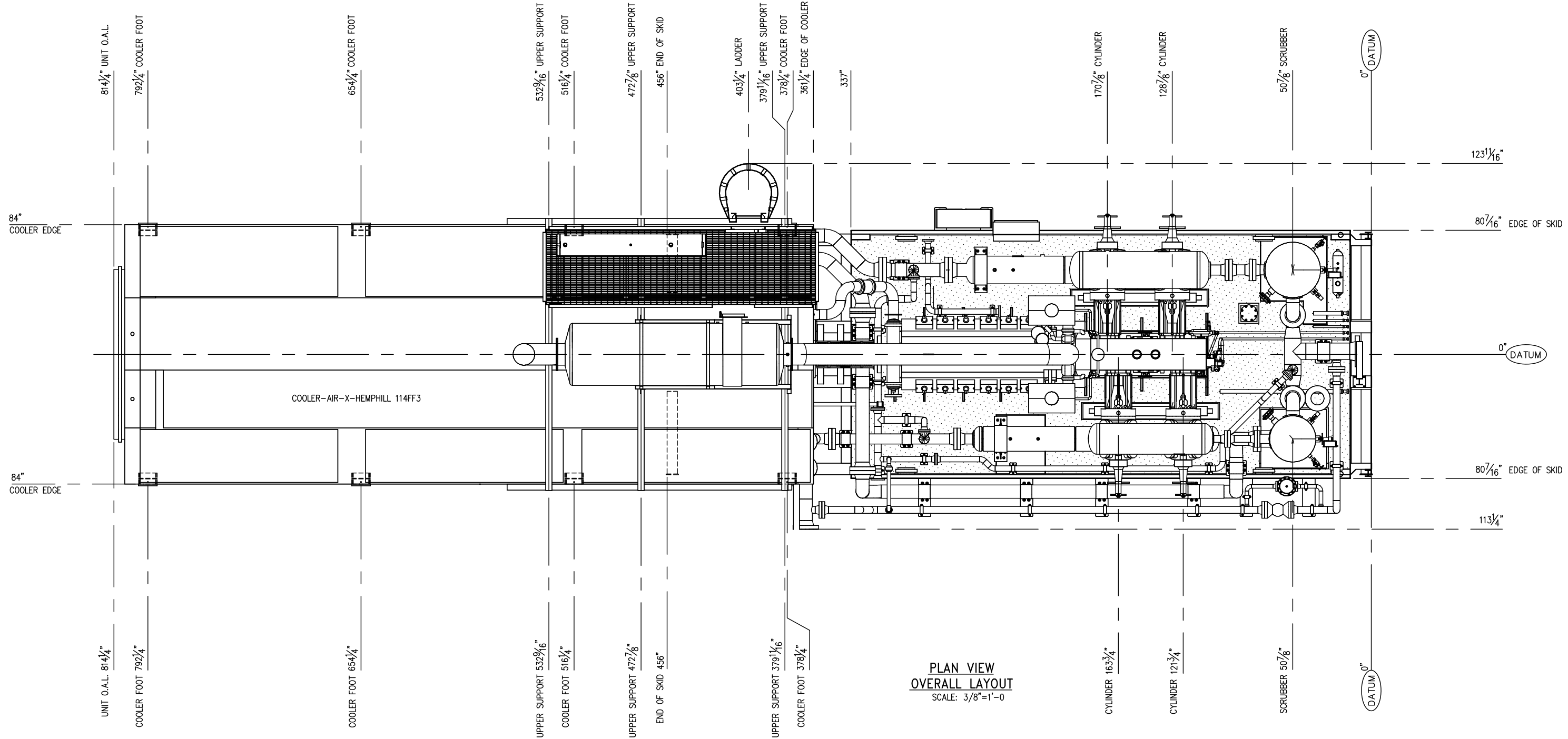
Compressor Package Weight

Unit Number FG102477
Customer OIL AND GAS DEVELOPMENT COMPANY
Description 5794/JGT4 (2)9.125T x 6.75T

Components Shipping With Skid		
Engine	22,750 Lbs.	WAUK 5794/7044GSI
Frame & Cylinders	20,967 Lbs.	JGT
Crosshead Supports	1,382 Lbs.	FG501104
Coupling	559 Lbs.	FS70-28
Scrubbers	8,952 Lbs.	FG501167 & FG501168
Bottles	8,735 Lbs.	FG501169-FG501172
Skid	58,147 Lbs.	FG501173
Fuel Filter	250 Lbs.	FG102031
Weld Pipe	6,646 Lbs.	
Misc. Piping, Etc.	5,136 Lbs.	4 % of on-skid items

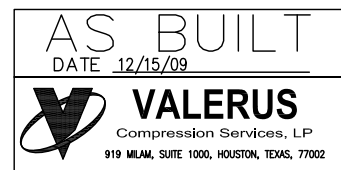
Additional Components For Complete Package		
Ladder	441 Lbs.	
Muffler/Support	2,320 Lbs.	EAC4-67-14/FG102188
Exhaust Pipe	900 Lbs.	
Surgetank	380 Lbs.	FG102013
Catwalk	780 Lbs.	FG501265
Cooler	43,500 Lbs.	49598
Additional Weld Pipe	4,189 Lbs.	
Valves	2,800 Lbs.	
Misc. Piping, Etc.	1,106 Lbs.	2 % of ship loose items

Total w/ Cooler	189,940 Lbs.
Total w/o Cooler	133,530 Lbs. (Shipping Weight)



**PLAN VIEW
OVERALL LAYOUT**
SCALE: 3/8"=1'-0"

- NOTE:
- 316SS/NACE PROCESS VALVE & INSTRUMENT CONNECTIONS
 - EXTRA WIRE TO BE BUNDLED AT EDGE OF SKID.
 - 100% X-RAY VESSELS AND PIPING.
 - SUCTION VALVE, SUCTION SPOOL (10"600#S/XH, OAL 30"), & DISCHARGE VALVES TO SHIP LOOSE.
 - HARDNESS TEST ALL WELDS. PHWT IF FAILURE.
 - TOTAL UNIT WEIGHT: 189,940 LBS; UNIT WEIGHT MINUS COOLER & FALL OFF: 133,530 LBS
 - TOTAL UNIT CG: X: 286.02 Y: 53.02 Z: 0.95
UNIT MINUS COOLER & FALL OFF: X: 180.30 Y: 37.84 Z: 3.19
 - SHIP LOOSE ORIFICE PLATES R0-2030/R0-2011
 - BAY CITY TO SUPPLY PAST THIS POINT.
 - BAY CITY TO SUPPLY ENGINE WATER JACKET PIPING & EXHAUST PIPING.
 - FULL BORE ORIFICES INSTALLED IN R2010/2032/2033/2041/2021,
INSTALL SUPPLIED ORIFICES IF NEEDED.



LETTER	QTY	SIZE	RATING	TYPE	SERVICE	ELEVATION
L	FOUR	2"	2000 LB.	FNPT	SKID DRAINS	11 5/8"
K	ONE	1"	2000 LB.	FNPT	LUBE OIL MAKEUP	21 7/16"
J	ONE	1"	2000 LB.	FNPT	INSTRUMENT AIR SUPPLY	21 7/16"
H	ONE	1"	2000 LB.	FNPT	EJW LOW POINT DRAIN / TAW DRAIN	21 7/16"
G	ONE	2"	2000 LB.	FNPT	ENGINE AND COMPRESSOR OIL DRAIN	22"
F	ONE	2"	2000 LB.	FNPT	FUEL GAS INLET	22"
E	ONE	3"	150 LB.	RFWN	LOW PRESSURE VENT HEADER	22 1/2"
D	ONE	1"	2000 LB.	FNPT	SCRUBBER DRAINS	21 7/16"
C	ONE	4"	150 LB.	RFWN	HIGH PRESSURE VENT HEADER	24 1/2"
B	ONE	8"	600 LB.	RFWN	UNIT DISCHARGE	22 1/2"
A	ONE	10"	600 LB.	RFWN	UNIT SUCTION	32 11/16"

FIG. 8 BLIND No.	SINGLE STAGE	TWO STAGE
③	○ OPEN ● CLOSED	
②	○ OPEN ● CLOSED	
①	● CLOSED ○ OPEN	

COMPONENT	DESCRIPTION	QUANTITY	UNIT
COMPRESSOR	ARIEL JGT-4	1	
CYLINDERS	(2) 9 1/8" (2) 6 3/4"	2	
ENGINE	WAUKESHA 5794	1	
COUPLING	TWOODS FSH70-28	1	
COOLER	AIR-X-HEMPHILL 114FF3	1	
PANEL	-	1	
MUFFLER	-	1	
SHIMS	ENGINE (10) SM20/3/4" SHM	10	
BOLTING	COMPRESSOR SOLE PLATES & GROUT	1	
SHEAVES	DIST/PC SUPPORT 1/4" SHIM	1	
	ENGINE (10) CAPSCREW, 3/4" x 5" LG.	10	
	COMPRESSOR ALLTHRD, 1 1/8", 8TPI	1	
	DIST/PC SUPPORT (8) CAPSCREW, 1" x 5" LG.	8	
	COOLER SHV, 6C, 24.4" OD W/F QD	1	
	ENGINE SHV, 6C, 9.4" OD W/F QD	1	
	IDLER SHV, 6C, 8.4" OD W/E QD	1	

CONNECTION SCHEDULE

STAGE CONFIGURATION

MAJOR COMPONENTS

MOUNTING AND COOLER COMPONENTS

REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - NOTES	12/15/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL

DATE	DRAWN	CHECKED	APPROVED
6/1/09	CDN	-	

CLIENT: OGDCL

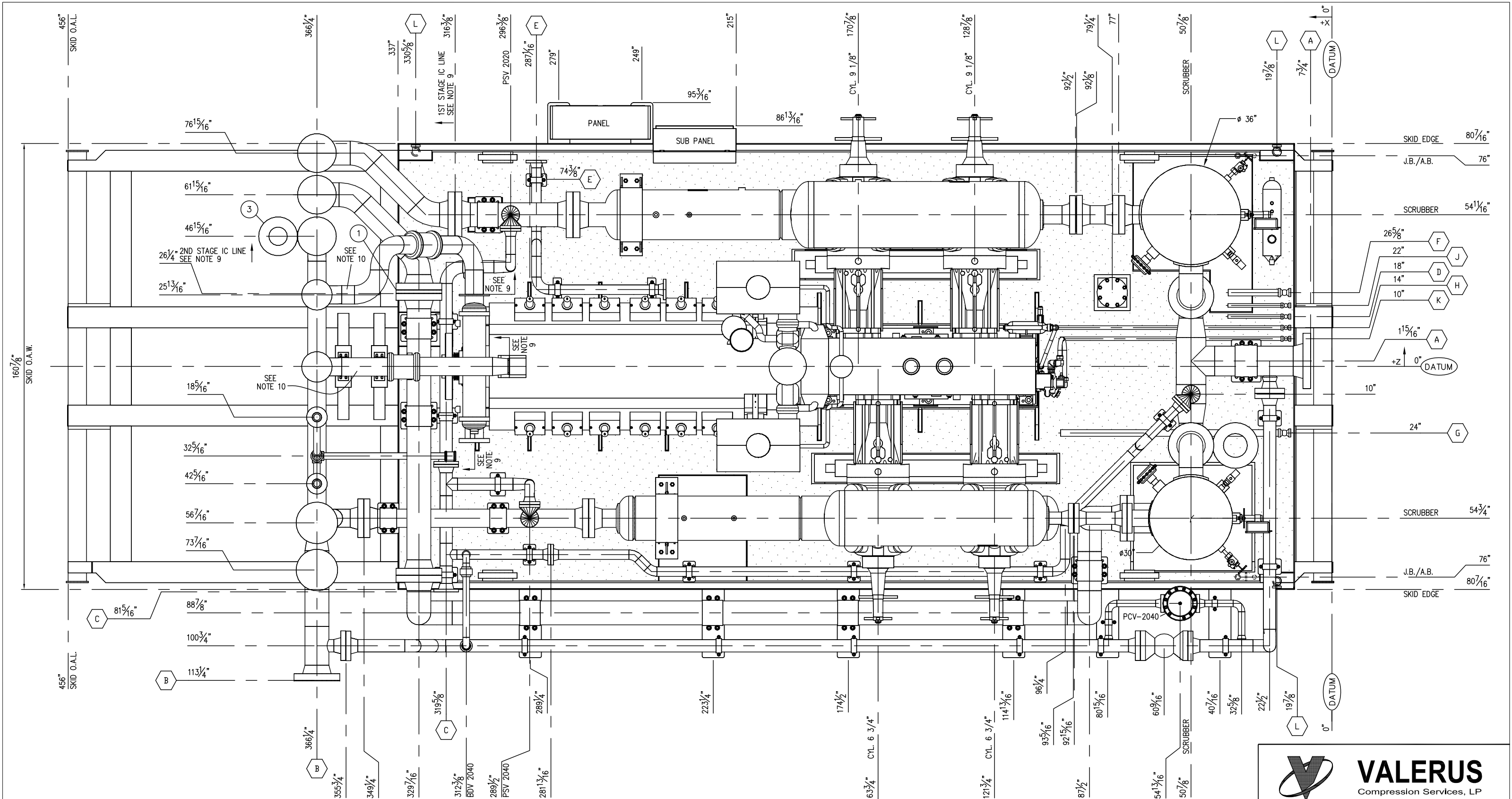
TITLE: COMPRESSOR PACKAGE
GENERAL ARRANGEMENT OVERALL
REFERENCE: MD-V3869 (AS-BUILT)

SCALE: 3/8"=1'-0" FG# FG102477 JOB#

DRAWING NUMBER: V38690200-01-02 SHEETS: 1 OF 15 REV: 2


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SEE SHEET V38690200-02 FOR SKID END CONNECTIONS




PLAN VIEW
SKID ONLY
SCALE: 1/2"=1'-0"

AS BUILT
DATE 12/15/09



VALERUS
Compression Services, LP
919 MILAM, SUITE 1000, HOUSTON, TEXAS, 77002

REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - NO CHANGES	12/15/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL



VALERUS
Compression Services, LP
919 Milam, Ste. 1000, Houston, TX, 77002

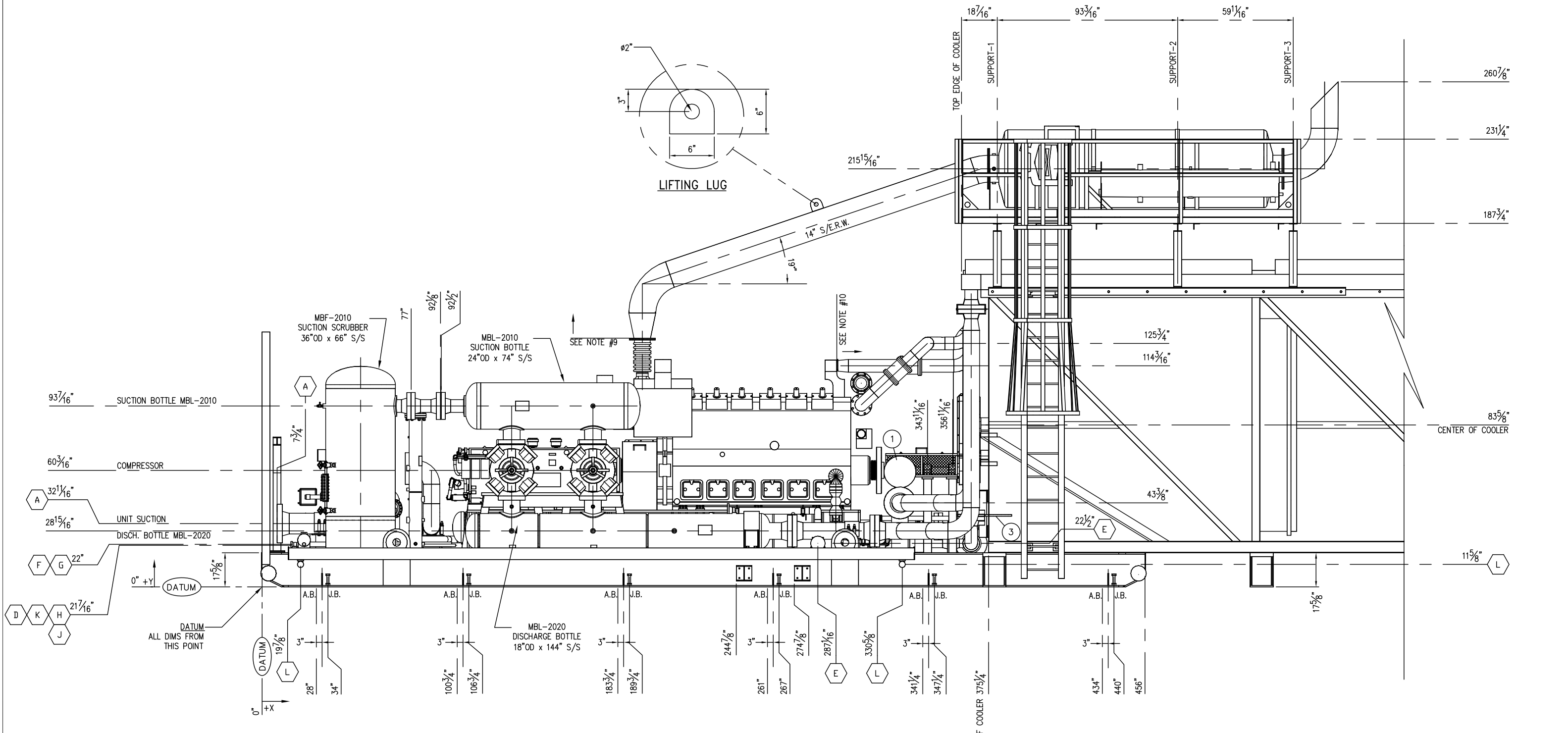
DATE	DRAWN	CHECKED	APPROVED
6/1/09	CDN	-	-

CLIENT: OGDCL

TITLE: COMPRESSOR PACKAGE
GENERAL ARRANGEMENT SKID ONLY
REFERENCE: MD-V3869 (AS-BUILT)

SCALE:	FG#	JOB#
1/2"=1'-0"	FG102477	

DRAWING NUMBER	SHEETS	REV
V38690200-02-02	2 OF 15	2



NORTH VIEW
SCALE: 1/2"=1'-0"

VALERUS
Compression Services, LP
919 Milam, Ste. 1000, Houston, TX, 77002

DATE	DRAWN	CHECKED	APPROVED
6/1/09	CDN	-	

CLIENT: **OGDCL**

TITLE: **COMPRESSOR PACKAGE
GENERAL ARRANGEMENT
NORTH SIDE VIEW**

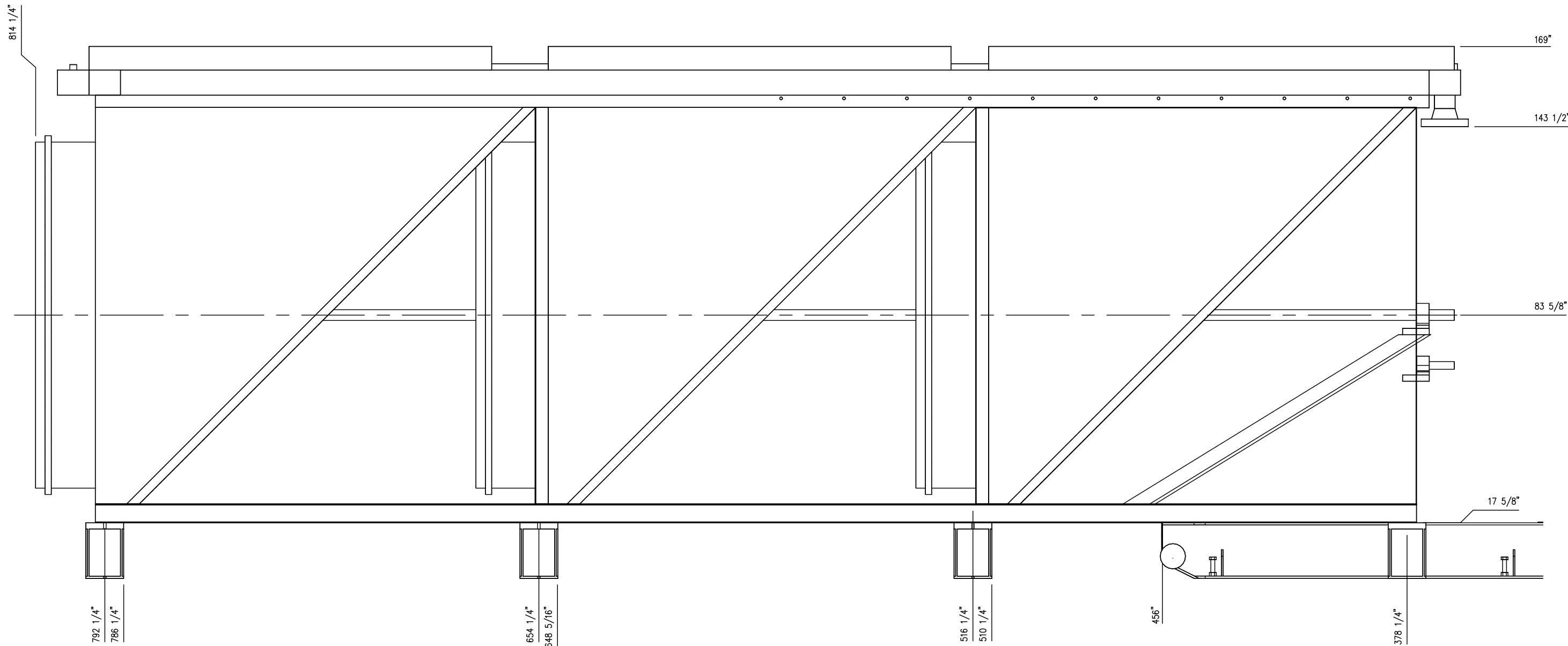
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DRAWING NUMBER	SHEETS	REV
V38690200-04-02	SHT# 4 OF 15	2

REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - NO CHANGES	12/15/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL

AS BUILT
DATE 12/15/09

VALERUS
Compression Services, LP
919 MILAM, SUITE 1000, HOUSTON, TEXAS, 77002

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COOLER END VIEW



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919 Milam, Ste. 1000, Houston, TX, 77002

DATE	DRAWN	CHECKED	APPROVED
6/1/09	CDN	-	

CLIENT
OGDCL

TITLE
COMPRESSOR PACKAGE
GENERAL ARRANGEMENT
COOLER LEFT SIDE VIEW

SCALE: 3/4" = 1'-0"	FG# FG102477	JOB#
---------------------	--------------	------

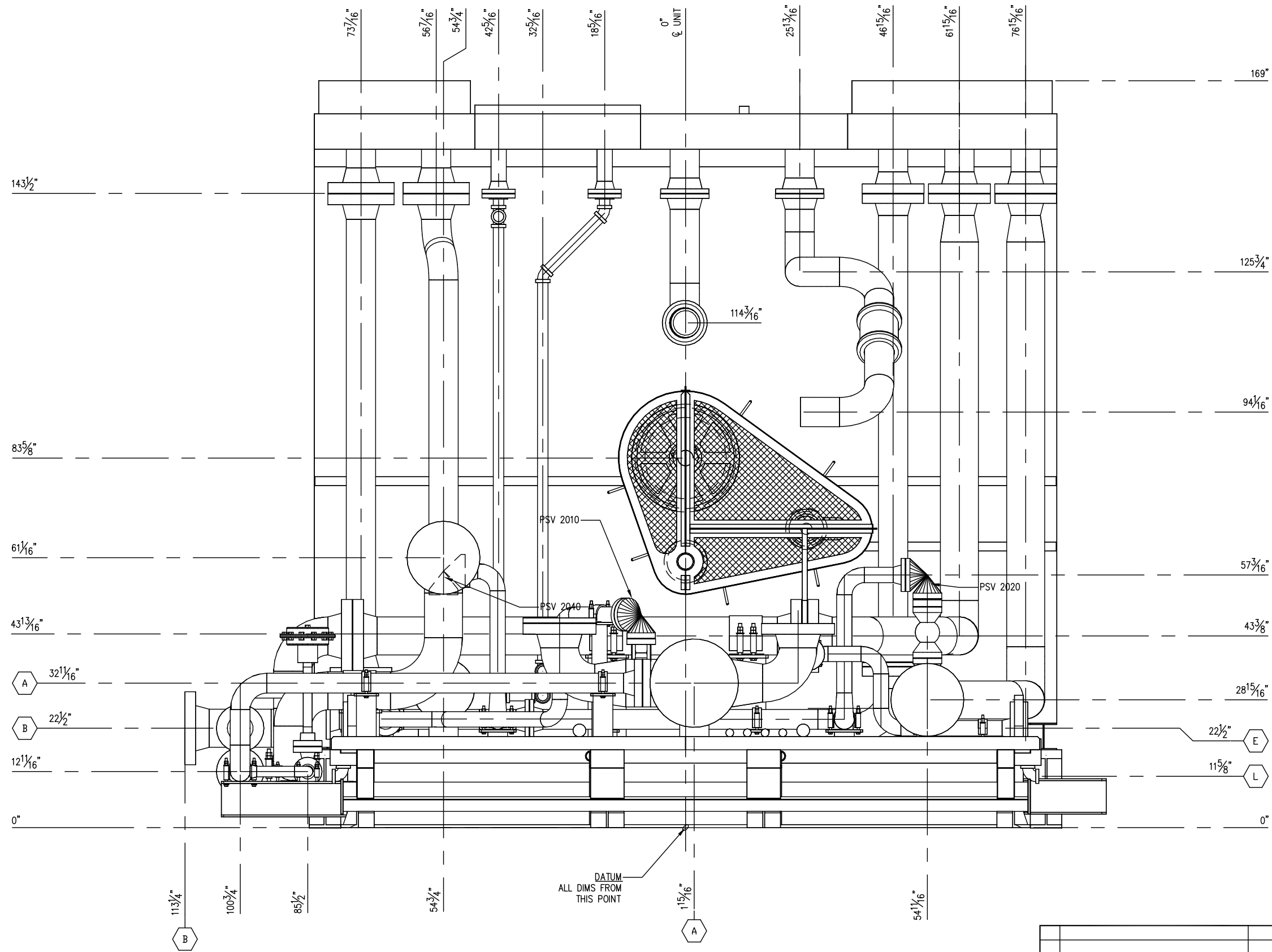
DRAWING NUMBER	SHEETS	REV
V38690200-05-02	5 OF 15	2

REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - NO CHANGES	12/15/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL

AS BUILT
DATE 12/15/09


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COOLER END VIEW

AS BUILT
DATE 12/15/09



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919 MILAM, SUITE 1000, HOUSTON, TEXAS, 77002

REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - NO CHANGES	12/15/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL



VALERUS
Compression Services, LP
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DATE	DRAWN	CHECKED	APPROVED
6/1/09	CDN	-	

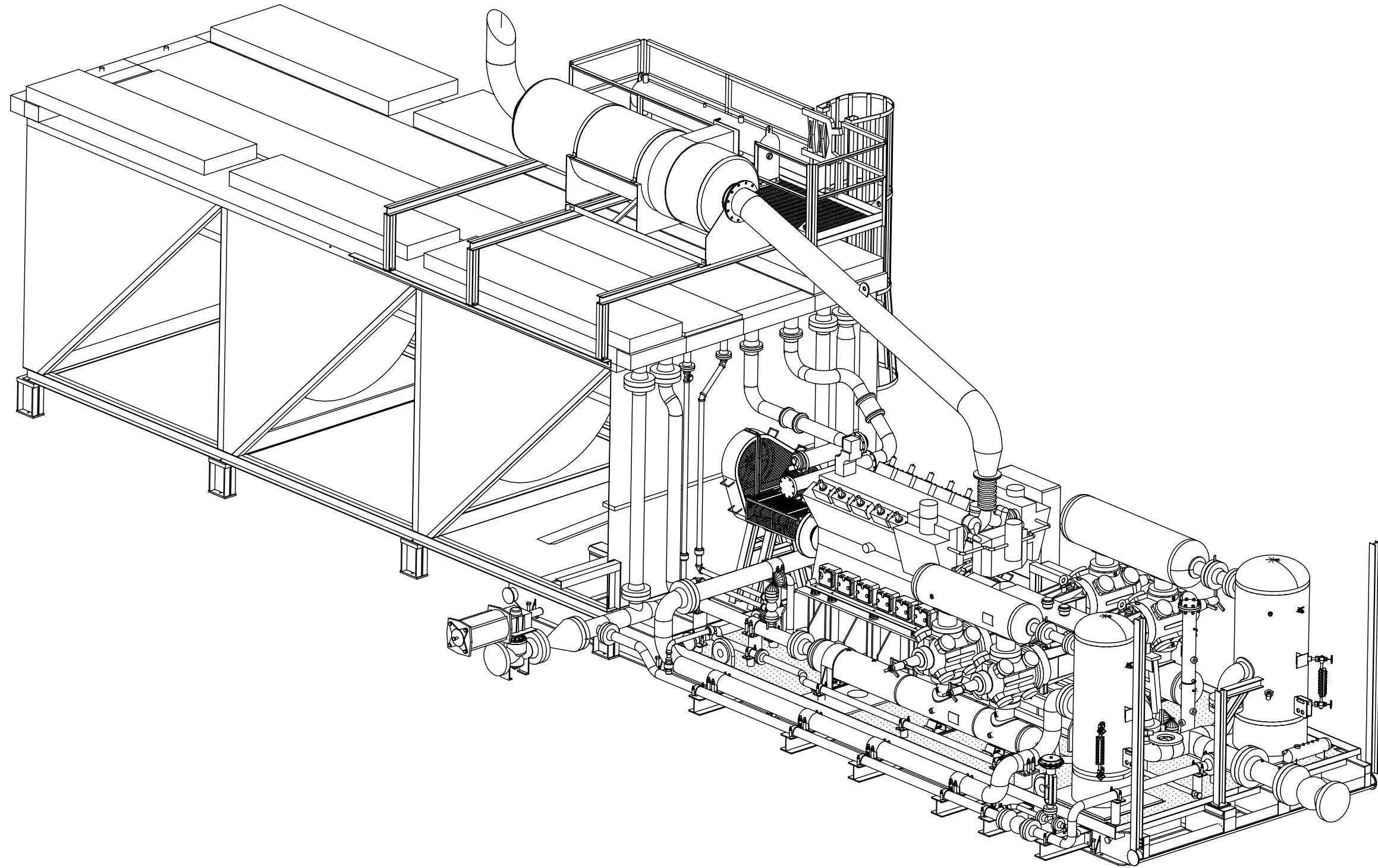
CLIENT: OGDCL

TITLE: COMPRESSOR PACKAGE
GENERAL ARRANGEMENT
COOLER END VIEW


SCALE: 3/4" = 1'-0" FG# FG102477 JOB#

DRAWING NUMBER	SHEETS	REV
V38690200-06-02	SHT# 6 OF 15	2


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ISOMETRIC IVEW

AS BUILT
 DATE 12/15/09
 **VALERUS**
 Compression Services, LP
 919 MILAM, SUITE 1000, HOUSTON, TEXAS, 77002

REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - NO CHANGES	12/15/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL

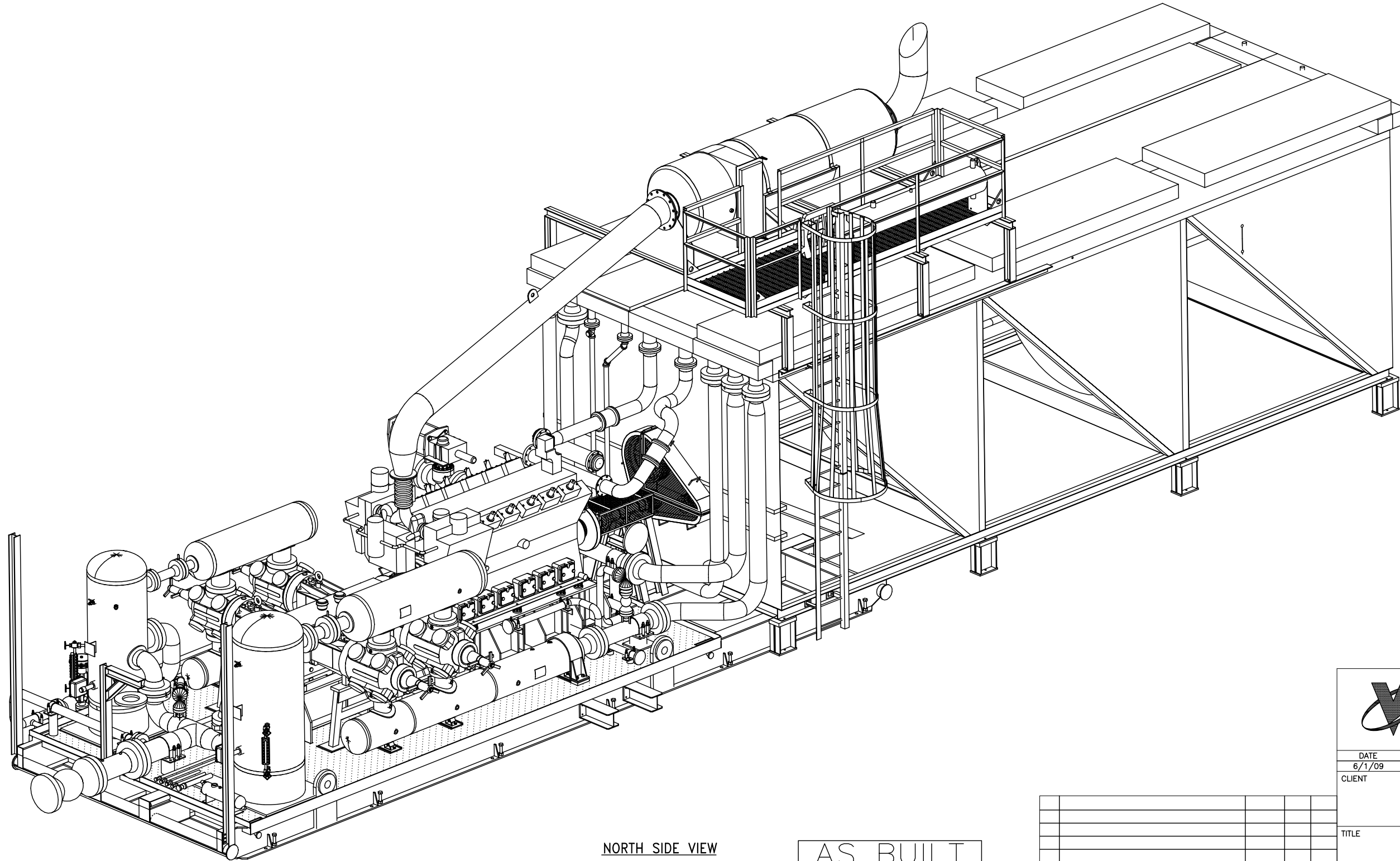


VALERUS

Compression Services, LP
 919 Milam, Ste. 1000, Houston, TX, 77002


DATE 6/1/09	DRAWN CDN	CHECKED -	APPROVED
CLIENT OGDCL			
TITLE COMPRESSOR PACKAGE GENERAL ARRANGEMENT ISO VIEW			
SCALE: 3/4" = 1'-0"	FG# FG102477	JOB#	
DRAWING NUMBER V38690200-07-02		SHEETS 7 OF 15	REV 2

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NORTH SIDE VIEW

AS BUILT
DATE 12/15/09



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Compression Services, LP
919 MILAM, SUITE 1000, HOUSTON, TEXAS, 77002

REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - NO CHANGES	12/15/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL



VALERUS
Compression Services, LP
919 Milam, Ste. 1000, Houston, TX, 77002

DATE	DRAWN	CHECKED	APPROVED
6/1/09	CDN	-	

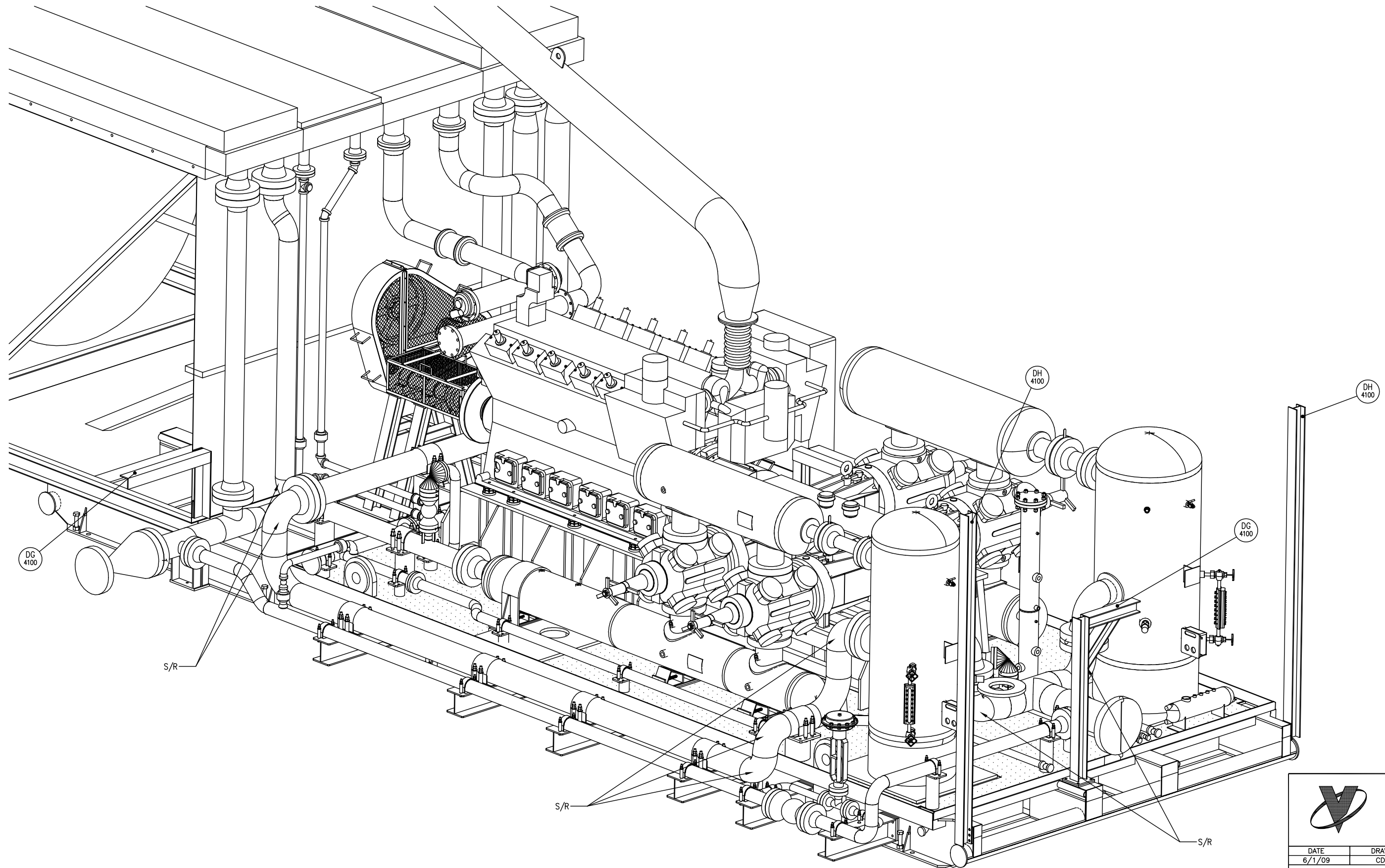
CLIENT
OGDCL

TITLE
COMPRESSOR PACKAGE
GENERAL ARRANGEMENT
ISO VIEW 2


SCALE:	FG#	JOB#
3/4"=1'-0"	FG102477	

DRAWING NUMBER	SHEETS	REV
V38690200-08-02	SHT# 8 OF 15	2


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ISOMETRIC IVEW

AS BUILT
 DATE 12/15/09
 **VALERUS**
 Compression Services, LP
 919 MILAM, SUITE 1000, HOUSTON, TEXAS, 77002

REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - NO CHANGES	12/15/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL

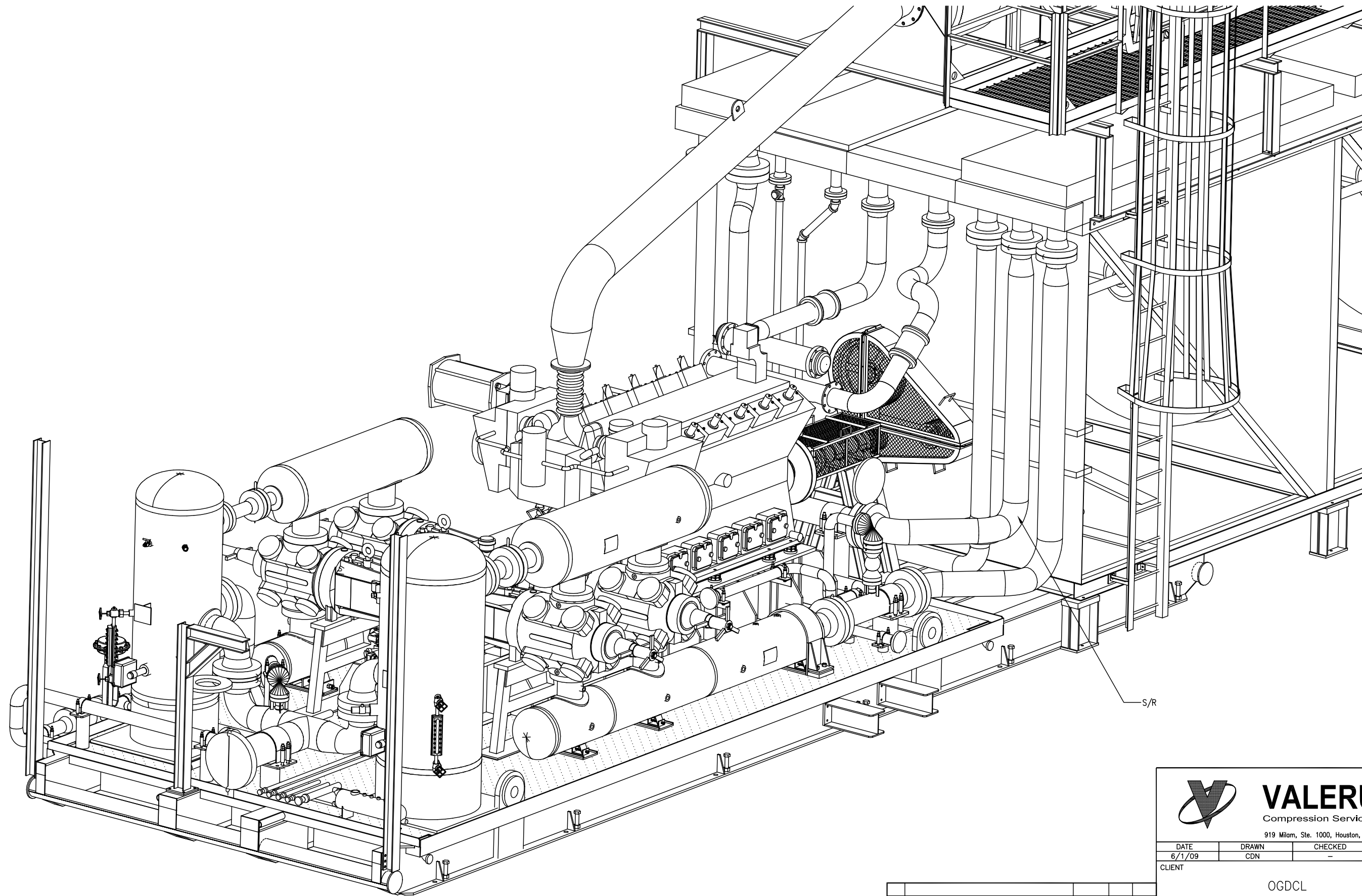


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DATE 6/1/09	DRAWN CDN	CHECKED -	APPROVED
CLIENT OGDCL			
TITLE COMPRESSOR PACKAGE GENERAL ARRANGEMENT ISO VIEW			
SCALE: 3/4"=1'-0"	FG# FG102477	JOB#	
DRAWING NUMBER V38690200-09-02		SHEETS 9 OF 15	REV 2

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ISOMETRIC IVEW

AS BUILT
DATE 12/15/09



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Compression Services, LP
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REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - NO CHANGES	12/15/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL



VALERUS
Compression Services, LP
919 Milam, Ste. 1000, Houston, TX, 77002

DATE	DRAWN	CHECKED	APPROVED
6/1/09	CDN	-	

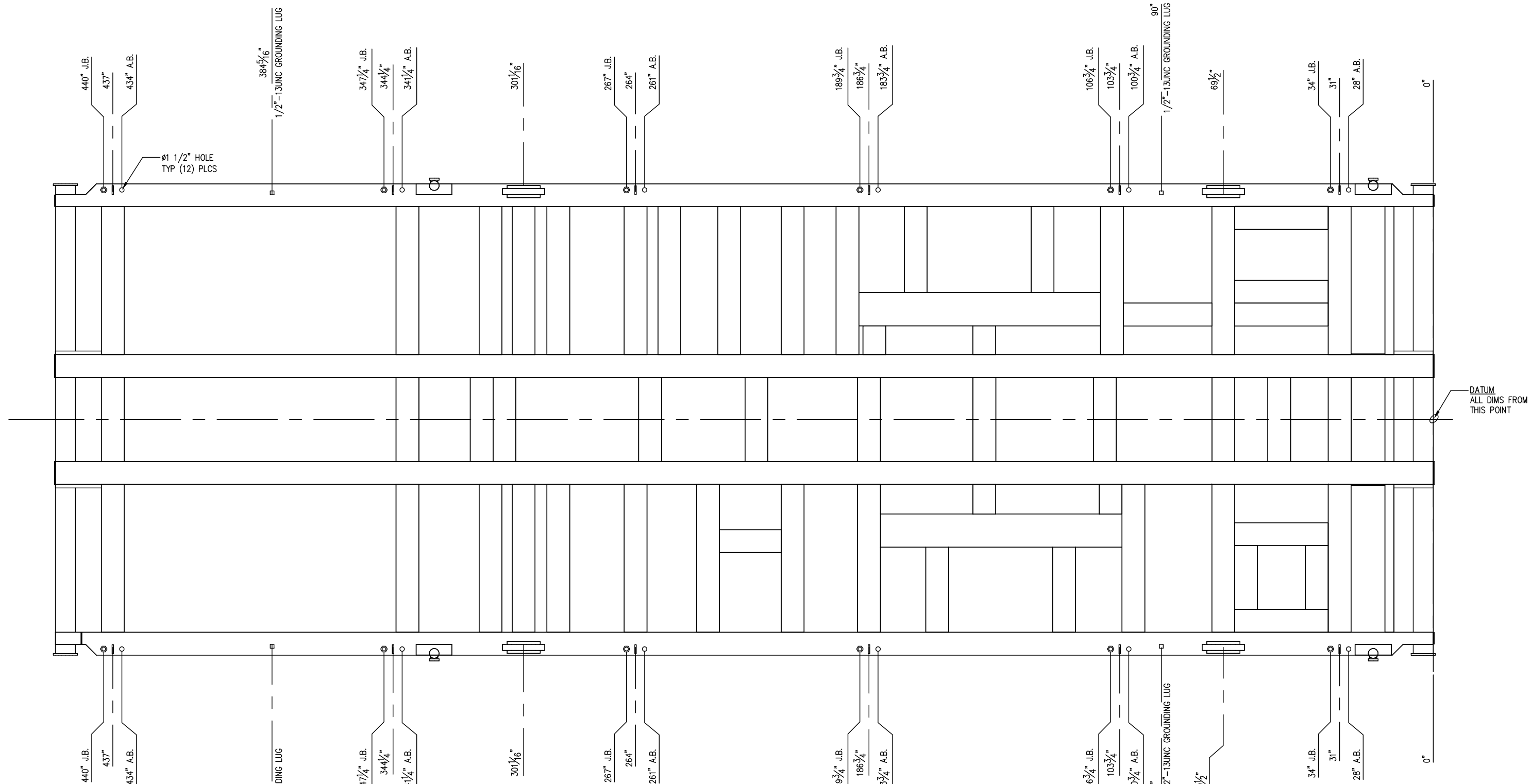
CLIENT
OGDCL

TITLE
COMPRESSOR PACKAGE
GENERAL ARRANGEMENT
ISO VIEW


SCALE:	FG#	JOB#
3/4"=1'-0"	FG102477	

DRAWING NUMBER	SHEETS	REV
V38690200-10-02	SHT# 10 OF 15	2

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AS BUILT
DATE 12/15/09



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REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - NO CHANGES	12/15/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL



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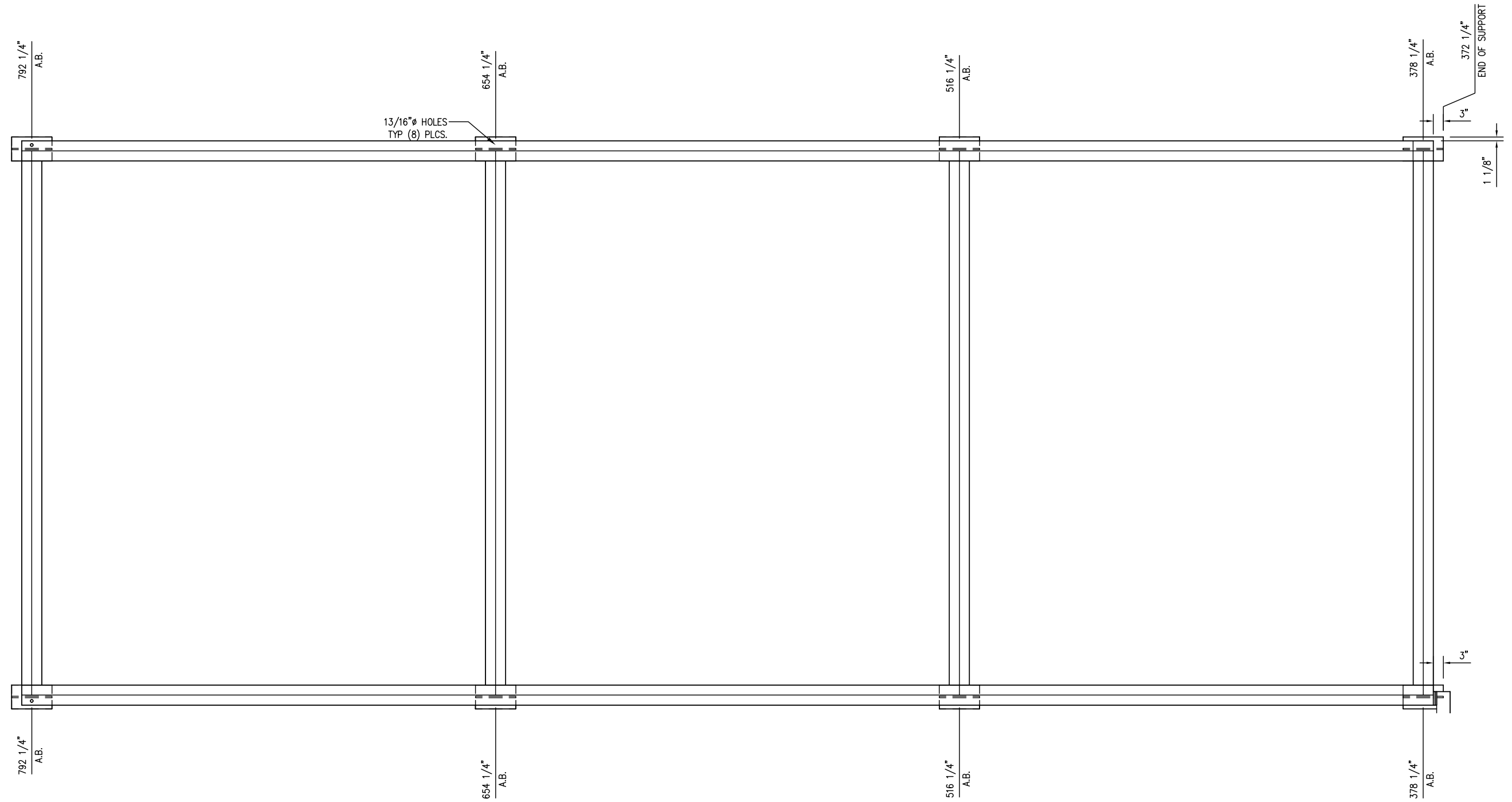
DATE	DRAWN	CHECKED	APPROVED
6/1/09	CDN	-	

CLIENT: OGDCL

TITLE: COMPRESSOR PACKAGE
GENERAL ARRANGEMENT
ANCHOR BOLT LAYOUT

SCALE: 3/4" = 1'-0"	FG# FG102477	JOB#
DRAWING NUMBER	SHEETS	REV
V38690200-11-02	SHT# 11 OF 15	2


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13/16" Ø HOLES
TYP (8) PLCS.


NOTE:
1. ALL DIMS ARE FROM DATUM.

AS BUILT
DATE 12/15/09



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REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - NO CHANGES	12/15/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL



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DATE	DRAWN	CHECKED	APPROVED
6/1/09	CDN	-	

CLIENT
OGDCL

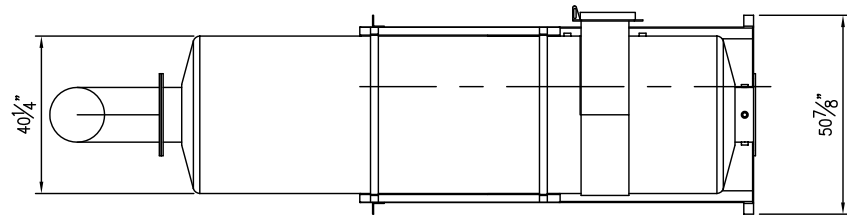
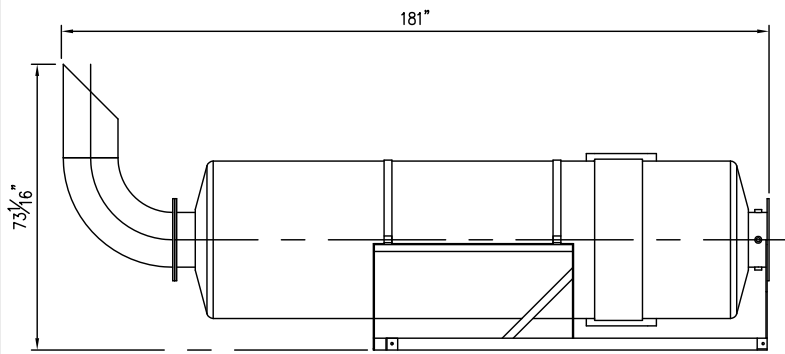
TITLE
COMPRESSOR PACKAGE
GENERAL ARRANGEMENT
ANCHOR BOLT LAYOUT

SCALE: 3/4" = 1'-0" FG# FG102477 JOB#

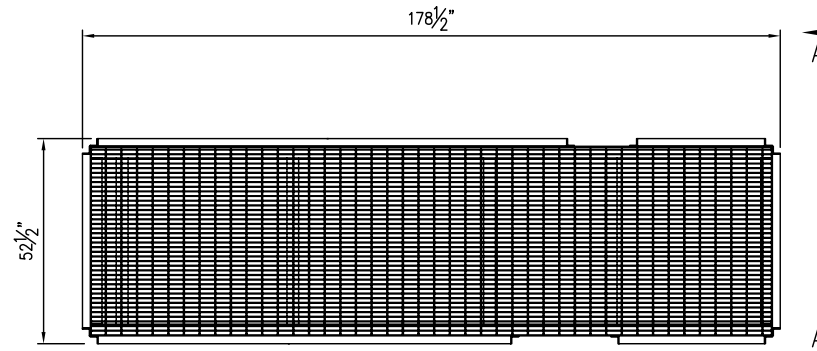
DRAWING NUMBER	SHEETS	REV
V38690200-12-02	SHT# 12 OF 15	2

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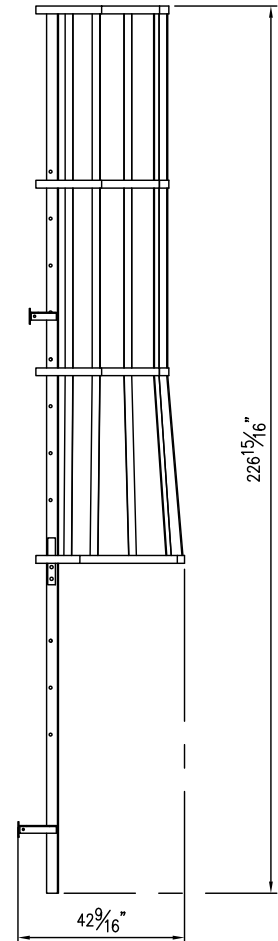
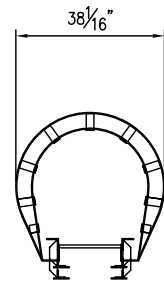
BAY CITY RESPONSIBLE FOR SHIP LOOSE ITEMS (SHEETS 13-15) FOR ALL 14 UNITS



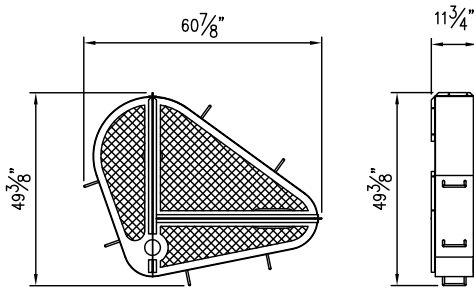
MUFFLER/MUFFLER SUPPORT



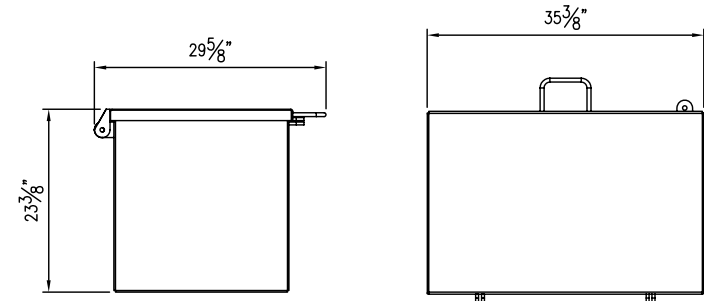
CATWALK



LADDER

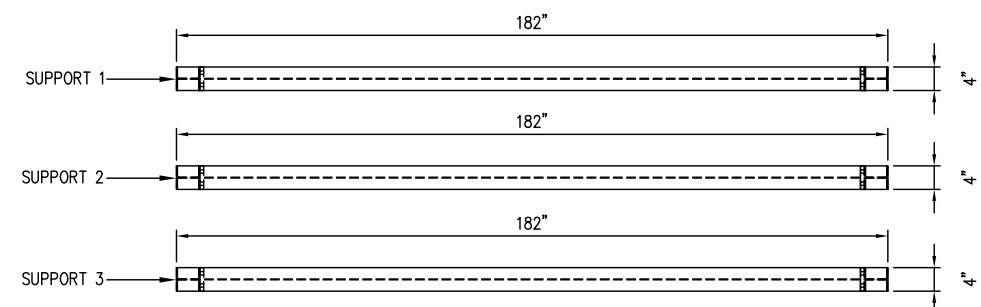


BELT GUARD

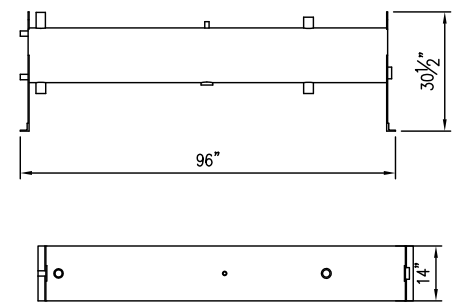


SPARE PARTS BOX

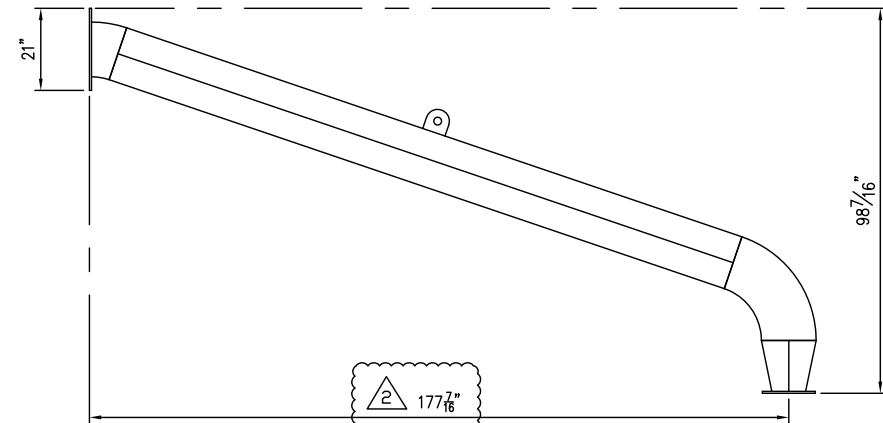
SCALE: 1"=1'-0"



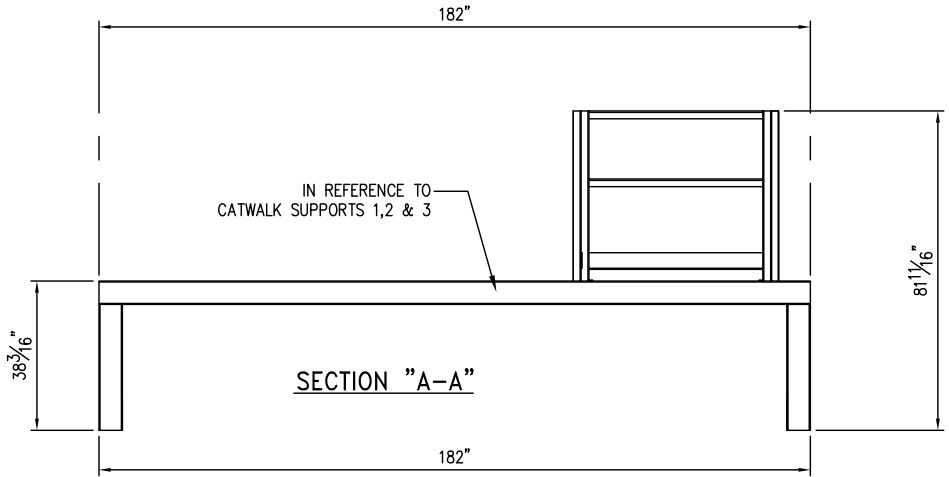
CATWALK SUPPORTS PLAN VIEW



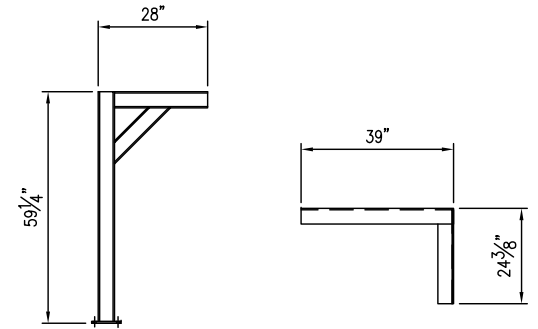
SURGE TANK



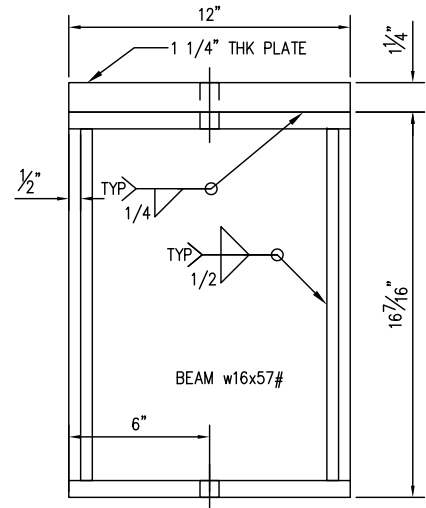
MUFFLER PIPE



SECTION "A-A"

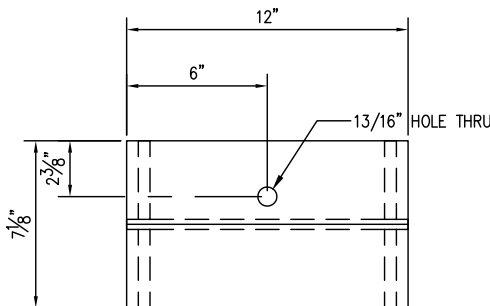


GAS DETECTOR SUPPORTS
ONE (1) EACH REQ'D

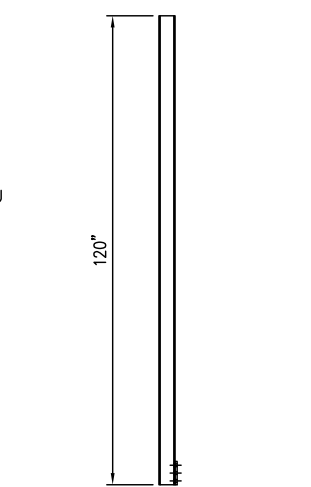


COOLER SUPPORT

EIGHT (8) REQ'D
EIGHT (8) 5/8" x 4" LG. BOLTS/NUTS



COOLER SUPPORT



FIRE DETECTOR SUPPORT
TWO (2) REQ'D

NOTE:
1. ALL DIMS ARE FROM DATUM.

AS BUILT
DATE 12/15/09
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DATE	DRAWN	CHECKED	APPROVED
6/1/09	CDN	-	

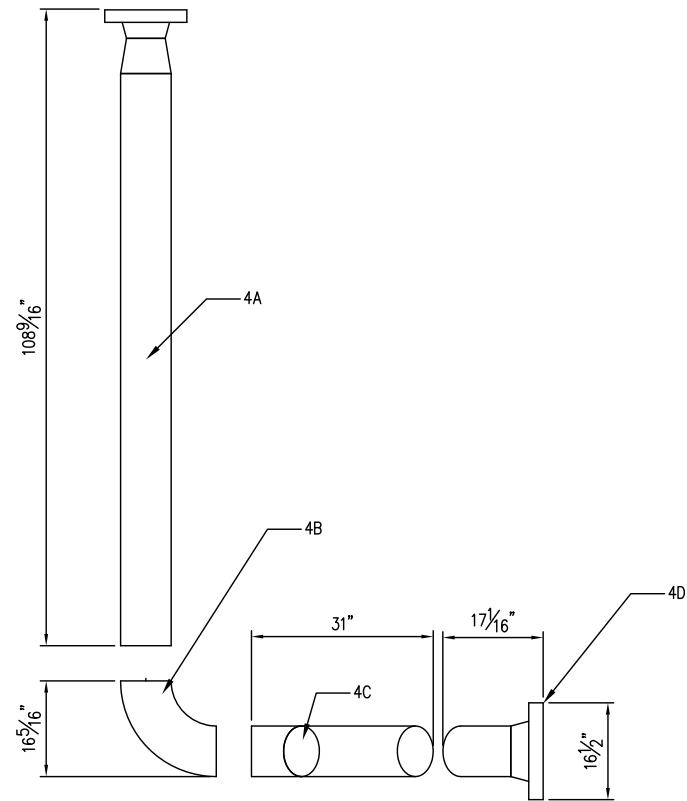
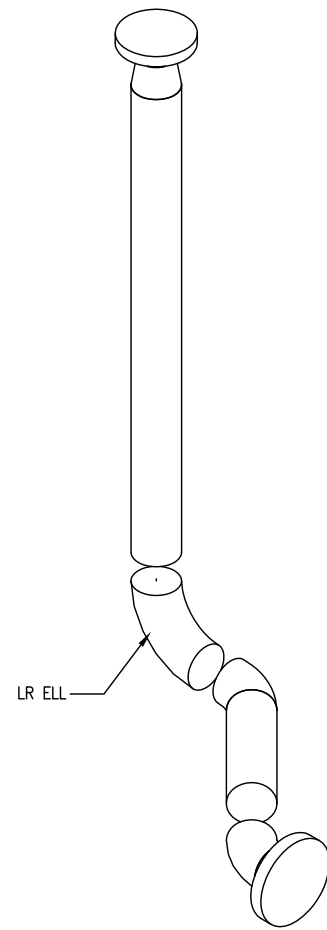
CLIENT
OGDLC

TITLE
COMPRESSOR PACKAGE
GENERAL ARRANGEMENT
SHIP LOOSE SHEET

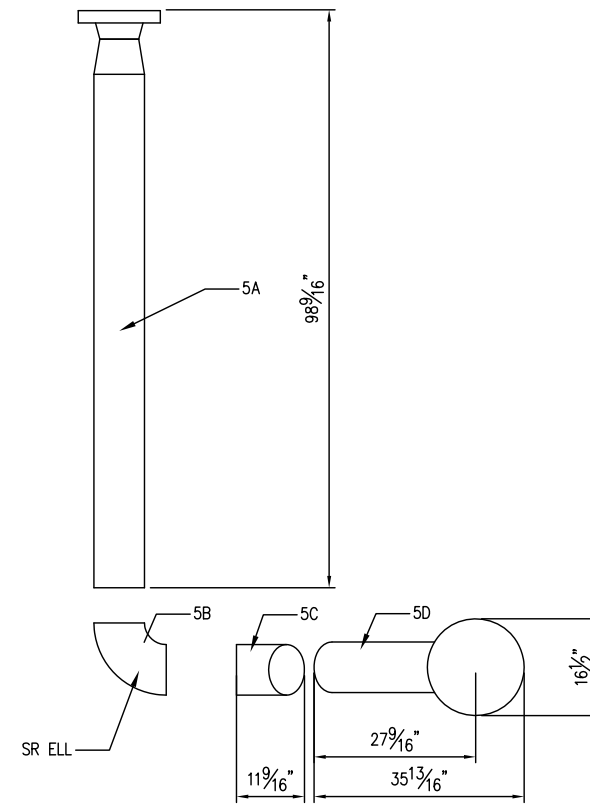
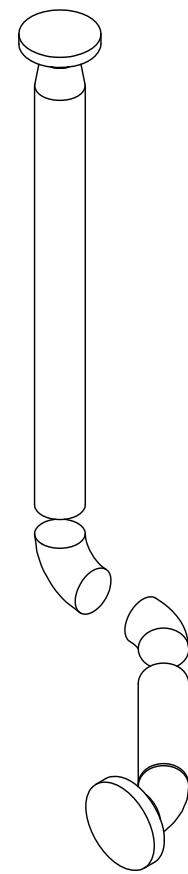
REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - MUFFLER DIMENSION	12/15/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL

SCALE: 1/2"=1'-0"	FG# FG102477	JOB#
DRAWING NUMBER	SHEETS	REV
V38690200-13-02	SHT# 13 OF 15	2

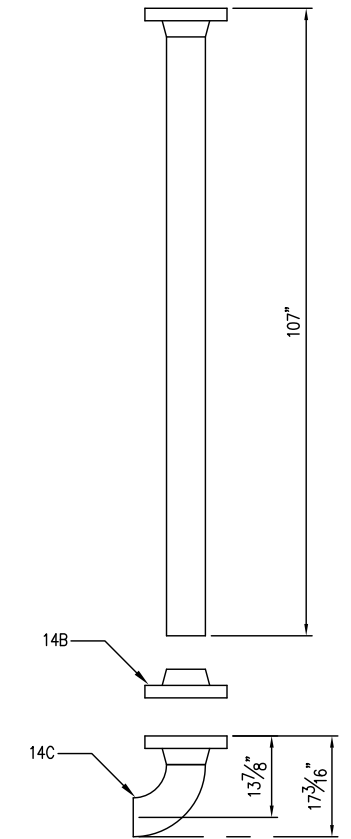
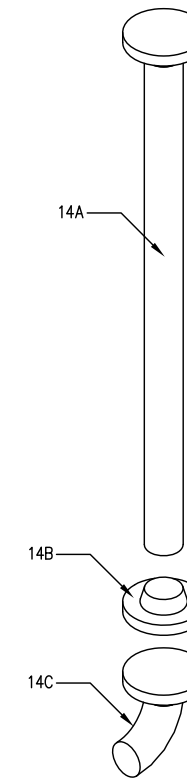
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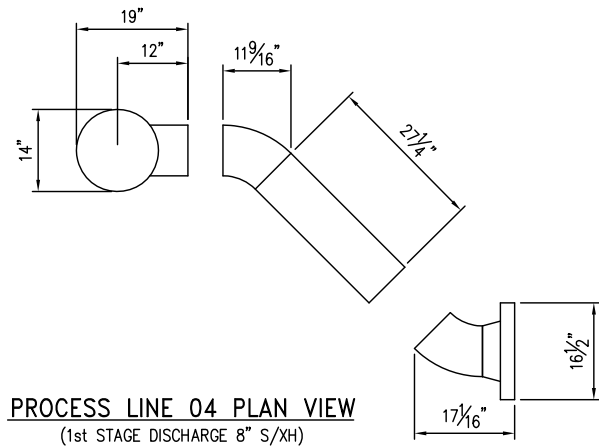
PROCESS LINE 04 ELEVATION VIEW
(1st STAGE DISCHARGE 8" S/XH)



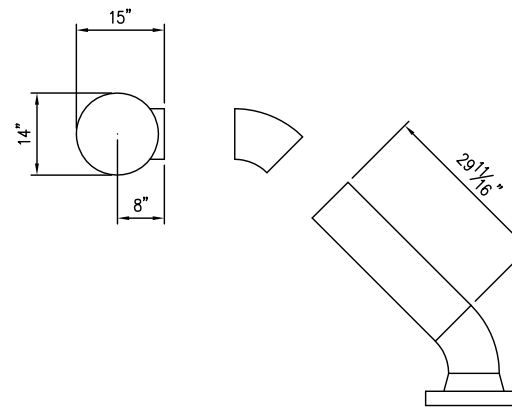
PROCESS LINE 05 ELEVATION VIEW
(2nd STAGE SUCTION 8" S/XH)



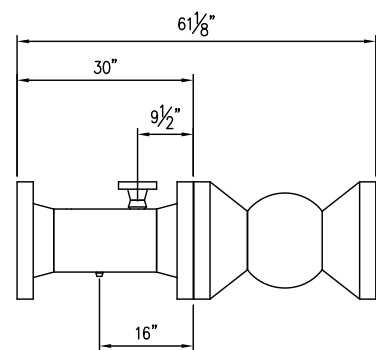
PROCESS LINE 14 PLAN VIEW
(FINAL DISCHARGE 6" S/XH)



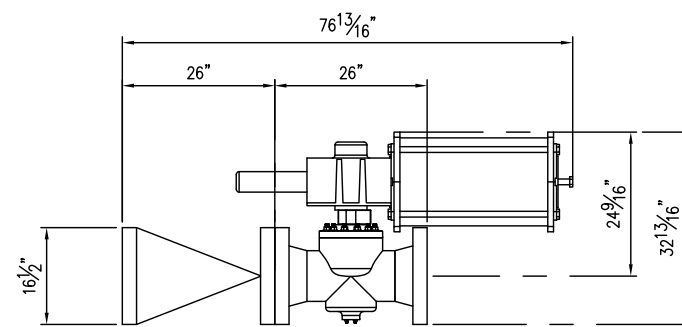
PROCESS LINE 04 PLAN VIEW
(1st STAGE DISCHARGE 8" S/XH)



PROCESS LINE 05 PLAN VIEW
(2nd STAGE SUCTION 8" S/XH)

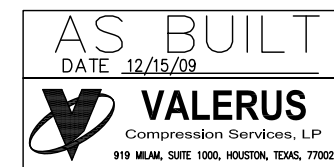


SUCTION SPOOL
(1st STAGE SUCTION SPOOL 10" S/XH)



FINAL DISCHARGE SPOOL
(8" S/XH)

NOTE:
1. ALL DIMS ARE FROM DATUM.



REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - NO CHANGES	12/15/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL

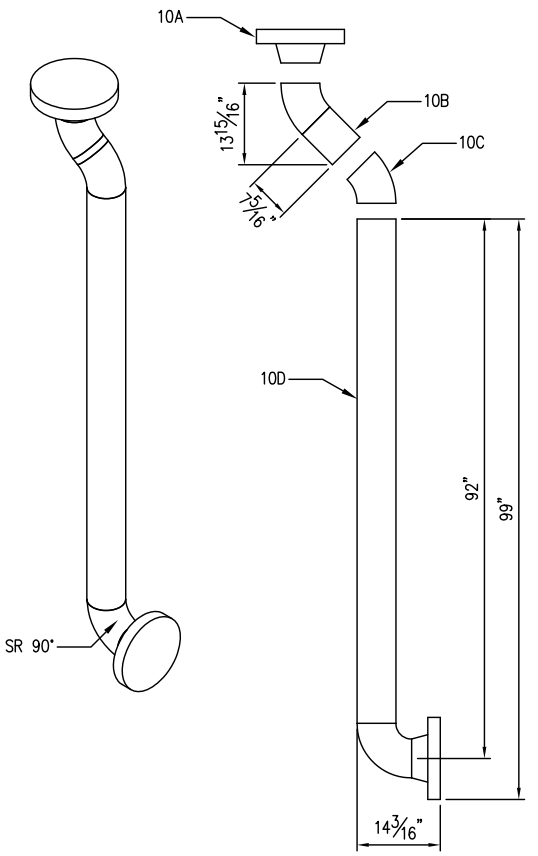
VALERUS
Compression Services, LP
919 Milam, Ste. 1000, Houston, TX, 77002

DATE 6/1/09	DRAWN CDN	CHECKED -	APPROVED
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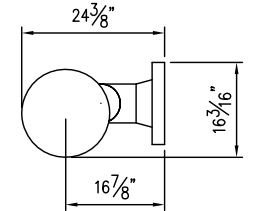
CLIENT: OGDCL

TITLE COMPRESSOR PACKAGE GENERAL ARRANGEMENT SHIP LOOSE PIPE SPOOLS SHT 1			
SCALE: 1/4" = 1'-0"	FG# FG102477	JOB#	
DRAWING NUMBER V38690200-14-02	SHEETS SHT# 14 OF 15	REV 2	

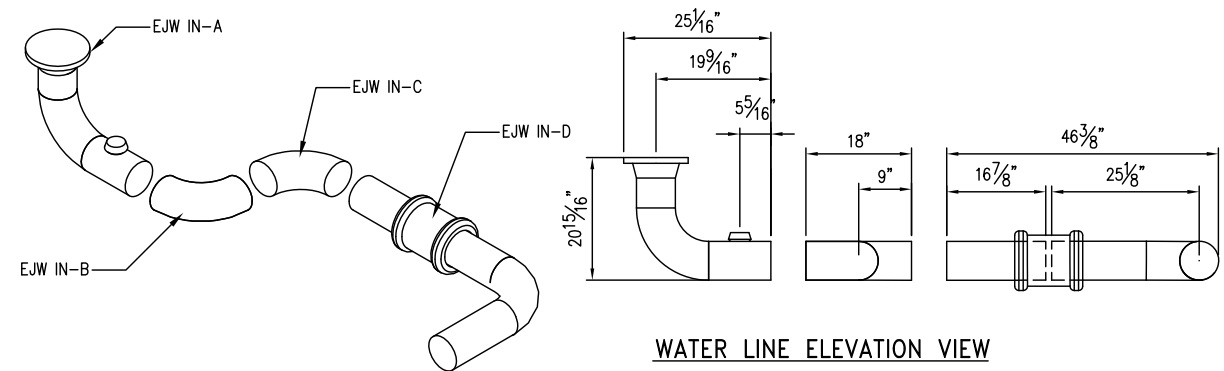
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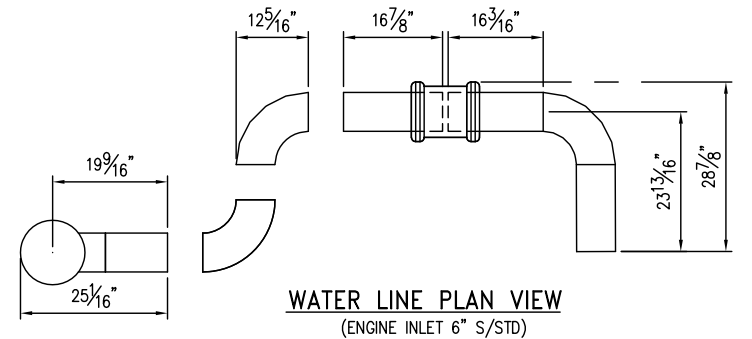
PROCESS LINE 10 ELEVATION VIEW
(2nd STAGE DISCHARGE 6" S/XH)



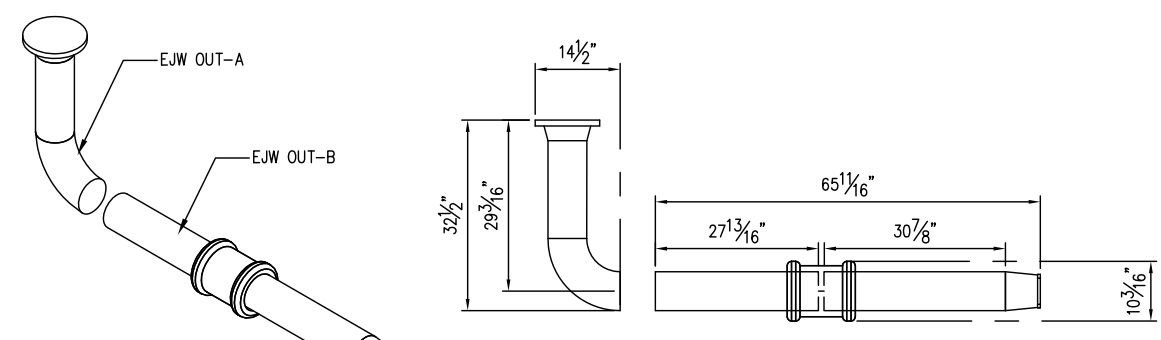
PROCESS LINE 10 PLAN VIEW
(2nd STAGE DISCHARGE 6" S/XH)



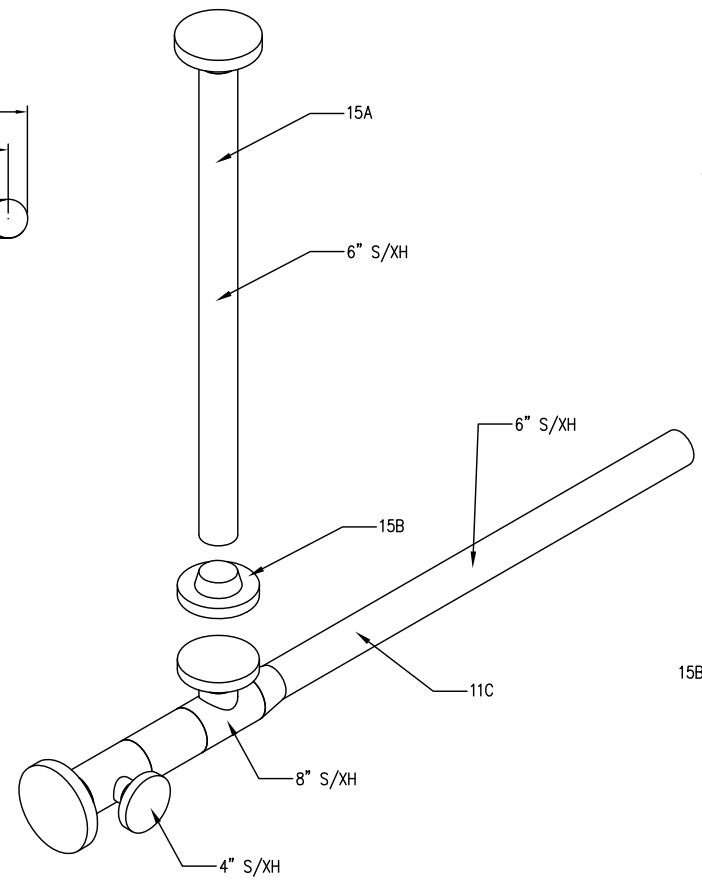
WATER LINE ELEVATION VIEW



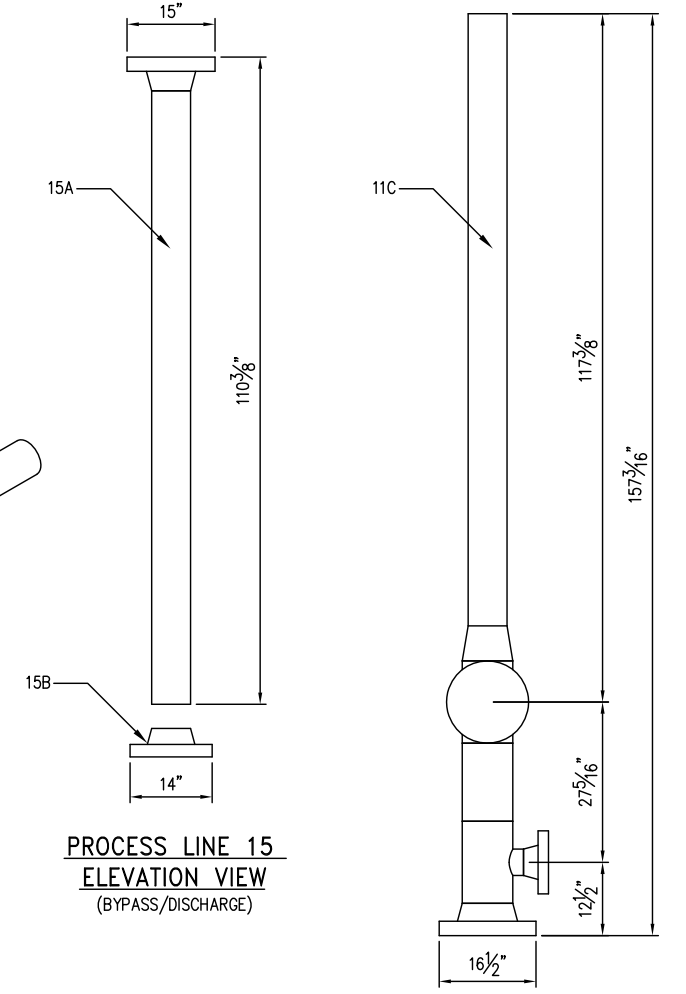
WATER LINE PLAN VIEW
(ENGINE INLET 6" S/STD)



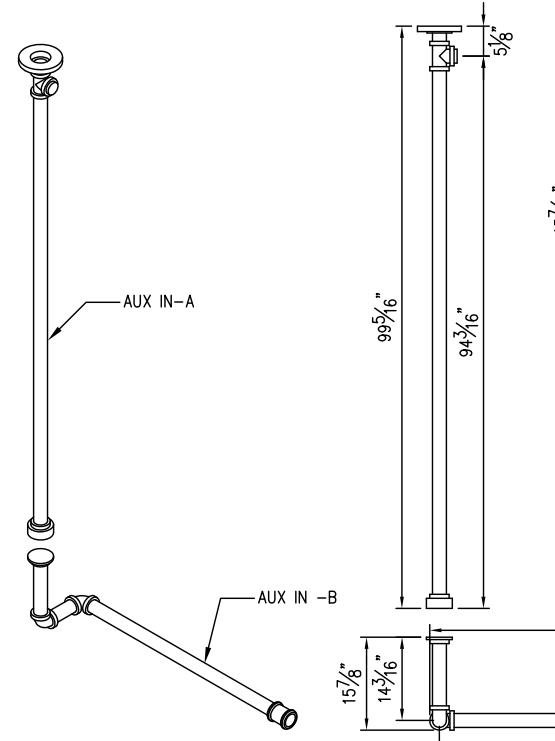
WATER LINE
(ENGINE OUTLET 6" S/STD)



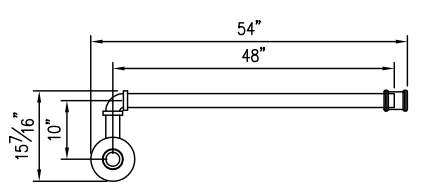
PROCESS LINE 15 ELEVATION VIEW
(BYPASS/DISCHARGE)



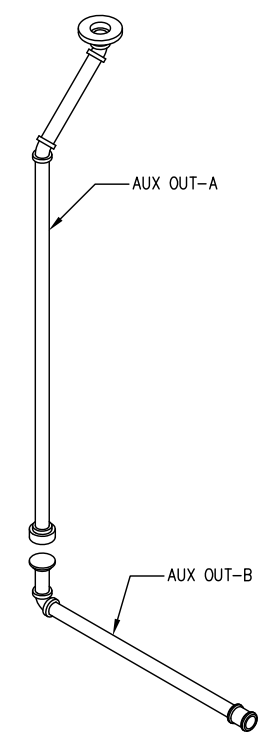
PROCESS LINE 11 PLAN VIEW
(BYPASS/DISCHARGE 6", 8" & 4" S/XH)



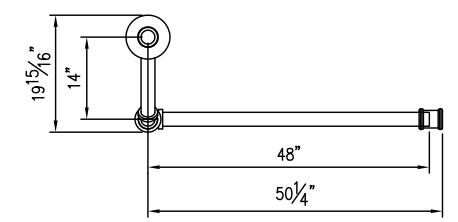
AUXILIARY-IN ELEVATION VIEW
(AUX IN-A & B 2" NPT S/XH)



AUXILIARY-IN PLAN VIEW
(AUX IN-A & B 2" NPT S/XH)



AUXILIARY-OUT ELEVATION VIEW
(AUX OUT-A & B 2" NPT S/XH)



AUXILIARY-OUT PLAN VIEW
(AUX OUT-A & B 2" NPT S/XH)

NOTE:
1. ALL DIMS ARE FROM DATUM.

REV.	DESCRIPTION	DATE	BY	CK
2	AS BUILT - NO CHANGES	12/14/09	RB	ML/RL
1	REVISED PER ECN #552	11/19/09	RB	ML/RL
0	ISSUED FOR CONSTRUCTION	10/5/09	RB	AM/RL

AS BUILT
DATE 12/15/09
VALERUS
Compression Services, LP
919 Milam, Suite 1000, Houston, Texas, 77002

VALERUS
Compression Services, LP
919 Milam, Ste. 1000, Houston, TX, 77002

DATE	DRAWN	CHECKED	APPROVED
6/1/09	CDN	-	

CLIENT: OGDCL

TITLE: COMPRESSOR PACKAGE
GENERAL ARRANGEMENT
SHIP LOOSE PIPE SPOOLS SHT 2

SCALE: 1/4" = 1'-0"	FG# FG102477	JOB#
DRAWING NUMBER	SHEETS	REV
V38690200-15-02	SHT# 15 OF 15	2