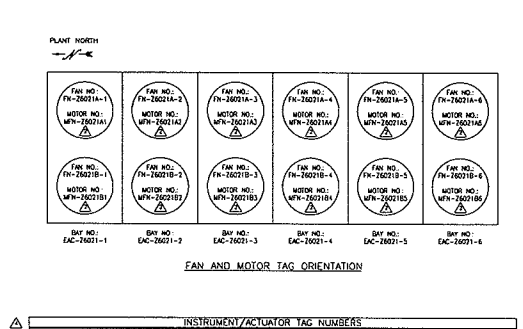


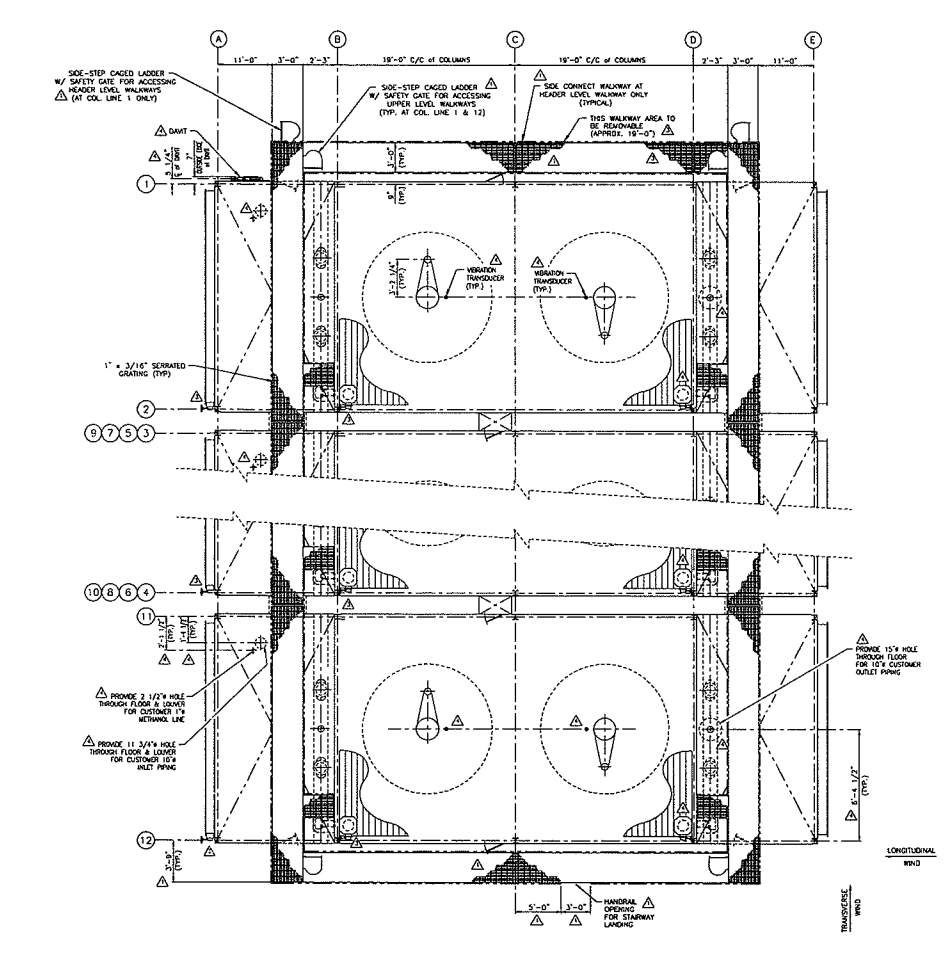
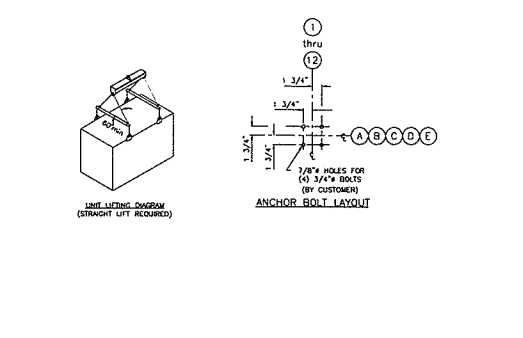
NOTES FOR LOADING PANELS:

- 1) ALL LOADS ARE IN POUNDS
- 2) LIVE LOADS INCLUDE WALKWAY LOADS BASED ON 100 PSF.
- 3) OPERATING LOADS INCLUDE LOAD OF HEADERS & TUBES FULL OF WATER & DOWNWARD
- 4) WIND LOADS ARE PER ASCE 7-10, TABLE 6-2, 6.5.5.5. (SEE FIGURE 6.5.5.5 FOR WIND DIRECTION)
- 5) WIND LOADS ARE PER ASCE 7-10, TABLE 6-2, 6.5.5.5. (SEE FIGURE 6.5.5.5 FOR WIND DIRECTION)
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- 25) WIND LOADS ARE PER ASCE 7-10, TABLE 6-2, 6.5.5.5. (SEE FIGURE 6.5.5.5 FOR WIND DIRECTION)

LOAD POINT	WIND 1	WIND 2	WIND 3	WIND 4
1	11972	11150	8875	
2	8100	8850	6750	
3	6750	7350	5625	
4	11550	11550	11550	

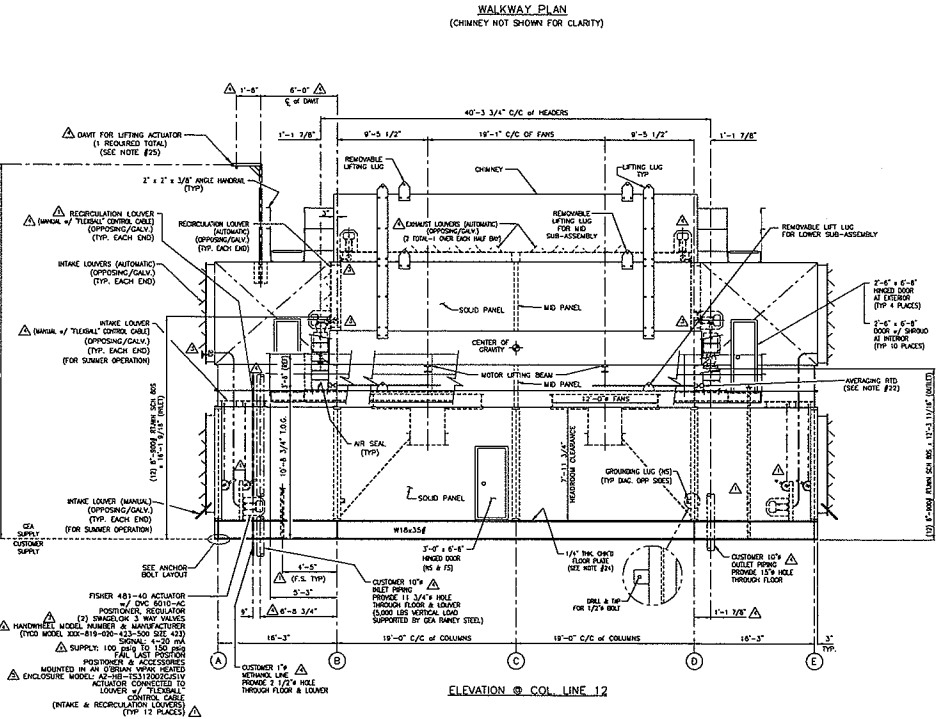
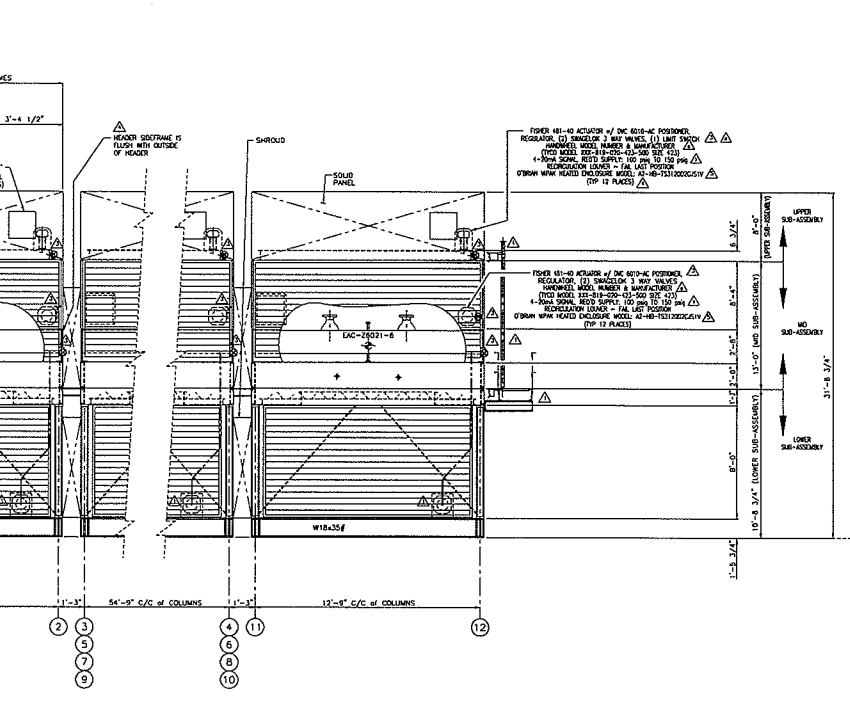
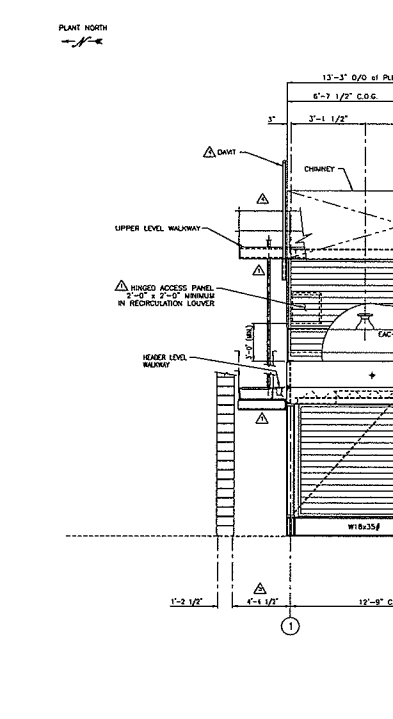


ACTUATOR TAG NUMBER	ACTUATOR TAG NUMBER	ACTUATOR TAG NUMBER	ACTUATOR TAG NUMBER	ACTUATOR TAG NUMBER	ACTUATOR TAG NUMBER
TI-25002 1038	TI-25002 1039	TI-25002 1040	TI-25002 1041	TI-25002 1042	TI-25002 1043
TI-25002 1044	TI-25002 1045	TI-25002 1046	TI-25002 1047	TI-25002 1048	TI-25002 1049
TI-25002 1050	TI-25002 1051	TI-25002 1052	TI-25002 1053	TI-25002 1054	TI-25002 1055



GENERAL NOTES:

- 1) DESIGNER PER ASCE 7-10, TABLE 6-2, 6.5.5.5. (SEE FIGURE 6.5.5.5 FOR WIND DIRECTION)
- 2) DESIGNER PER ASCE 7-10, TABLE 6-2, 6.5.5.5. (SEE FIGURE 6.5.5.5 FOR WIND DIRECTION)
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- 25) DESIGNER PER ASCE 7-10, TABLE 6-2, 6.5.5.5. (SEE FIGURE 6.5.5.5 FOR WIND DIRECTION)



WorleyParsons

REVIEWED BY: *[Signature]* DATE: 7/7/10

Purchaser's review and/or release for fabrication shall not be construed as relieving seller of any obligation or responsibilities with respect to these documents of the items to be furnished by seller pursuant thereto.

- VC RELEASED FOR FABRICATION - CORRECT AND RESUBMIT
- VF FINAL - DO NOT RESUBMIT
- VI FINAL - INFORMATION ONLY
- VN NOT RELEASED FOR FABRICATION - CORRECT AND RESUBMIT
- VM FINAL, MANUAL(S) - NOT RETURNED TO VENDOR
- VEF FINAL - ELECTRONIC FILES
- VV VOID - SEE COMMENTS ON DOCUMENTS
- E0 DO NOT ISSUE THIS REVISION SUPERCEDED BY ANOTHER REVISION

NO.	DESCRIPTION	REVISIONS	DATE	BY	APPROV.
1	INITIAL DESIGN		6/2/10	JY	JY
2	REVISED DESIGN		6/2/10	JY	JY
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18	REVISED DESIGN		6/2/10	JY	JY
19	REVISED DESIGN		6/2/10	JY	JY

NOTES FOR LOADING CHART:
 1) ALL LOADS ARE IN POUNDS.
 2) LIVE LOADS INCLUDE WALKWAY LOADS BASED ON 100 PSF.
 3) OPERATING LOADS INCLUDE LOAD OF HEADERS & TUBES FULL OF WATER & DOWNWARD NOZZLE LOADS PER API-651, 6th ED., 2006, FIGURE 1.28 TABLE 4.
 4) WIND LOADS ARE PER IBC 2003 & CUSTOMER SPECIFICATIONS USING:
 $w = (0.00256)(Kz)(Kd)(Kv)(V)^2$
 $w = (0.00256)(Kz)(Kd)(Kv)(V)^2$
 $F = (qz)(Cf)(Ae)$
 $Kz = 1.04$ $G = 0.85$
 $Kd = 1.0$ $Cf = 1.3$
 $Kz = 1.0$ $C = \text{EXPOSURE CATEGORY}$
 $V = 110 \text{ MPH}$ $F = \text{DESIGN WIND FORCE}$
 $I = 1.15$ $Ae = \text{AREA PROJECTED TO WIND}$

(VERTICAL) WIND LOADS RESULTS FROM OVERTURNING MOMENT:
 5) EARTHQUAKE LOADS ARE PER IBC 2003 SECTIONS 1613-1620 AND CUSTOMER SPECIFICATIONS USING:
 $V = C_w W$ $S_s = 0.35g$ $S_1 = 0.15g$ $I = 1.25$ (SEISMIC USE GRP. I)
 $C_e = 1.0$ $S_s = 1.0$ $S_1 = 1.0$ $R = 3.0$
 $C_s = R/I$ $F_a = 0.30$ $F_v = 0.10$
 $S_s = 0.25$ $S_1 = 0.07$ $W = \text{DEAD LOAD}$
 $V = \text{TOTAL DESIGN LATERAL FORCE}$
(VERTICAL) EARTHQUAKE LOADS RESULTS FROM OVERTURNING MOMENT ASSUMING THE SHEAR LOAD AT CENTER OF GRAVITY:
 6) SNOW LOADS ARE PER IBC 2003 & CUSTOMER SPECIFICATIONS USING:
 $p = (0.7)(C_e)(C_t)(I)(p_g) = 48.2 \text{ PSF}$ $C_e = 1.0$ $p_g = 50 \text{ PSF}$
 $C_t = 1.2$ $I = 1.10$ $p_f = \text{FLAT ROOF SNOW LOAD}$

BARGE ACCELERATIONS ARE PER CUSTOMER LETTER "REVISED BARGE ACCELERATIONS" REV. 1 AS FOLLOWS:
 BRV = 0.00232 + 0.33 (LATERAL, ROLL) FOR LZ ≥ 50 FEET
 BRV = 0.00852 + 0.12 (LATERAL, ROLL) FOR LZ ≤ 50 FEET
 BRP = 0.1 (LONGITUDINAL, PITCH)
 BRV = 0.33 (VERTICAL, HEAVE)
 BRP = 0.00812 + 0.31 (LATERAL, ROLL)
 BRV = 0.001652 + 0.11 (LONGITUDINAL, PITCH)
 BRV = BRV + 0.00264 + 0.40 (VERTICAL, HEAVE)
 SAFETY FACTOR = 1.2

ELEVATION ABOVE BARGE DECK: 54 FT.

GENERAL NOTES:
 1) DESIGNED PER API-661, 6th ED., 2006. OVERALL TOLERANCES PER API-661, FIG. 10 AND APPLICABLE SPECIFICATIONS.
 2) MAXIMUM PIPING NOZZLE LOAD 2 TIMES NOZZLE LOADING SPECIFIED IN API-661, 6th ED., 2006, TABLE 4.
 3) PROVISION FOR MINIMUM LATERAL MOVEMENT FOR TUBE BUNDLES ARE 1/4" IN BOTH DIRECTIONS OR 1/2" IN ONE DIRECTION.
 4) STRUCTURAL STEEL DESIGNED PER AISC/OSHA REQUIREMENTS AND APPLICABLE SPECIFICATIONS.
 5) REFERENCE DWGS:
 64992010H ~ HEADER DETAIL
 64992010B ~ BUNDLE OUTLINE
 64992017 ~ FINNED TUBE DETAIL
 64992016 ~ FAN DRIVE ASSEMBLY
 64992005 ~ ASSEMBLY, TESTING & SHIPPING
 6459-1E ~ FIELD ERECTION
 6) TEMPORARY HEADER SHIPPING BRACES (PAINTED GREEN) SHALL BE REMOVED PRIOR TO UNIT START-UP.
 7) HIGH STRENGTH BOLTED CONNECTIONS SHALL USE ASTM A320, GRADE L7 BOLTS AND ASTM A194 GRADE 7 S/NUTS.
 8) BOLTS & NUTS SHALL BE ASSEMBLED WITH A NON-VOLATILE AND NON-WATER SUITABLE THREAD LUBRICANT TO PREVENT GALVING.
 9) STRUCTURAL BOLTING ASTM A307 BOLTS SHALL BE 5/8" MAX. ASTM A325 BOLTS SHALL BE 3/4" MIN. LOAD INDICATING WASHERS AND HARDENED FLAT WASHERS SHALL BE PROVIDED FOR HIGH STRENGTH BOLTING OF FIELD ASSEMBLED CONNECTIONS. LW'S SHALL BE CORNER DIRECT TENSION INDICATORS. BY J & M TURNER, INC. OR APPROVED EQUIVALENT AND SHALL CONFORM TO ASTM F193.
 11) UNIT SUPPORT COLUMNS, X-BRACING, K-BRACING, HEADER SUPPORTS & LOAD BEARING MEMBERS SHALL BE MADE OF A36, A572 OR 50, OR AS88 OR 50, CHAMPI IMPACT 15'12" FT. LBS @ -50°F. MIP'S ALSO REQUIRED.
 12) STEEL SHEET MATERIALS USED IN THE CONSTRUCTION OF AIR DUCTS AND WINTERIZATION PANELS SHALL BE 7 GAUGE.
 13) ITEMS FABRICATED FROM LOW TEMPERATURE STEEL PLATE SHALL BE MARKED IT IN THE FABRICATION SHOP FOR POSITIVE IDENTIFICATION.
 14) THE PENETRATE TEST ARE REQUIRED ON 10% OF ALL LOAD BEARING STRUCTURAL WELDS. MIP SHALL BE PERFORMED ON ALL SPLICES.
 15) IMPACT TESTING WELDING PROCEDURES FOR JOINTING LOW TEMPERATURE MATERIAL SHALL BE DONE IN ACCORDANCE WITH ASTM A570 AND AWS D1.1. APPENDIX II, EXCEPT THAT THE SPECIMEN SHALL BE TAKEN NEAR (WITHIN 1/4") THE SURFACE OF ONE SIDE OF THE MATERIAL.
 16) LIFTING LUGS SHALL BE DESIGNED FOR 100K IMPACT (2 TIMES LIFTING LOAD)
 17) ALL STRUCTURAL WELDS REQUIRE 100% VISUAL INSPECTION.
 18) STRUCTURAL BOLT HOLES SHALL BE PUNCHED, DRILLED OR SUB-PUNCHED AND REAMED. NO FLAME CUT HOLES ALLOWED.
 19) BAY EMPTY WT.: 90,100# ±10%
 BAY FULL OF WATER WT.: 93,000# ±10%
 20) PROFESSIONAL ENGINEERS STAMP IS REQUIRED ON STRUCTURAL CALCULATIONS. STRUCTURAL CALCULATIONS SHALL INCLUDE BARGE TRANSPORTATION LOADS SPECIFIED IN OPI-55-0001. REVISED BARGE ACCELERATIONS DOCUMENT AND DRAWING 64992016.
 21) FEA HEADER STRESS ANALYSIS REQUIRED FOR NOZZLE LOADS AND DIFFERENTIAL EXPANSION.
 22) FOUR (4) 3-WIRE AVERAGING RTD'S PER FAN ARE REQUIRED. AVERAGING RTD'S SHALL BE ATE ALTEMP WKA MODEL NO. ATS-8309-51. FOR REDUNDANCY OF RTD'S SEE DOCUMENT: 64992020RE AND CUSTOMER REQUIREMENT # 14.
 23) LOWER BLADES SHALL BE AT LEAST 14 GAUGE AND THE MAXIMUM UNSUPPORTED LOWER BLADE LENGTH SHALL BE 4 FEET. LOWER BLADES SHALL BE DESIGNED TO OPERATE NORMALLY AT -50°F.
 24) ALL CHECKERED FLOOR PLATE SHALL BE ATTACHED TO FRAMING WITH COUNTER SUNK FLATHEAD HEX SOCKET CAP SCREWS (ASTM A835). CHECKERED FLOOR PLATE SHALL CONFORM TO ASTM A786. DAVIT ARM (1 REQUIRED TOTAL) SHALL BE DESIGNED TO SUPPORT 200 LBS MAX.

LOAD REACTIONS

LOAD POINT	1 & 12	2 & 11	3 thru 10
DEAD LOAD	12825	12150	9825
LIVE LOAD	8350	6925	6150
OPERATING LOAD	1590	1590	1590
TRANSVERSE WIND SHEAR	11550	11550	11550
LONGITUDINAL WIND SHEAR	2175	2175	2175
LONGITUDINAL WIND MOMENT	25500	25500	25500
EARTHQUAKE VERTICAL	1800	1800	1800
EARTHQUAKE HORIZONTAL	5075	5075	5075
SNOW LOAD	3650	3650	3650

LOAD POINT	1 & 12	2 & 11	3 thru 10
DEAD LOAD	22125	21250	22500
LIVE LOAD	17825	12625	14775
OPERATING LOAD	2750	2750	2750
TRANSVERSE WIND SHEAR	2100	2100	2100
LONGITUDINAL WIND SHEAR	475	475	475
LONGITUDINAL WIND MOMENT	1025	1025	1025
EARTHQUAKE VERTICAL	375	375	375
EARTHQUAKE HORIZONTAL	0	0	0
SNOW LOAD	5300	5300	5300

LOAD POINT	1 & 12	2 & 11	3 thru 10
DEAD LOAD	21925	19325	20875
LIVE LOAD	18150	12150	13350
OPERATING LOAD	3000	3000	3000
TRANSVERSE WIND SHEAR	3000	3000	3000
LONGITUDINAL WIND SHEAR	3000	3000	3000
LONGITUDINAL WIND MOMENT	3500	3500	3500
EARTHQUAKE VERTICAL	2200	2200	2200
EARTHQUAKE HORIZONTAL	3875	3875	3875
SNOW LOAD	4625	4625	4625

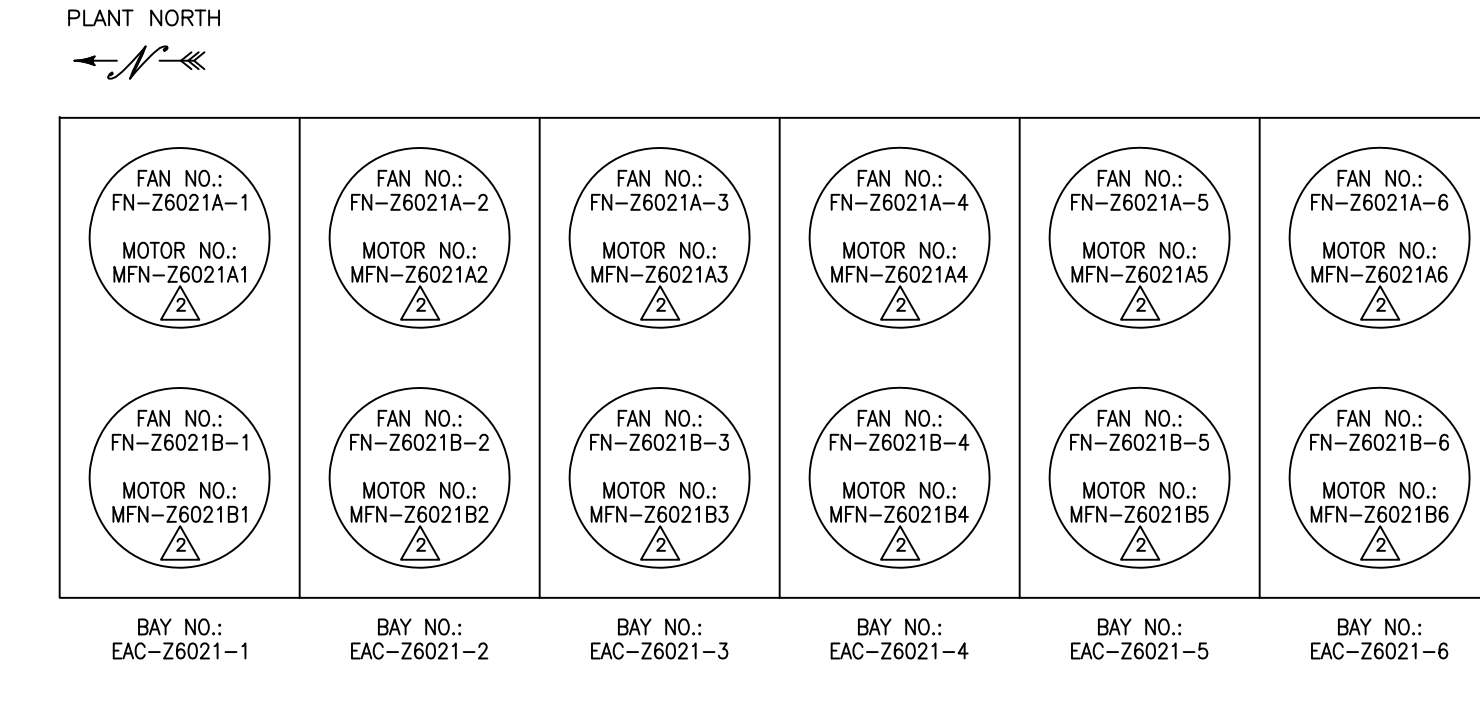
LOAD POINT	1 & 12	2 & 11	3 thru 10
DEAD LOAD	12750	12175	9825
LIVE LOAD	8425	6975	6150
OPERATING LOAD	1590	1590	1590
TRANSVERSE WIND SHEAR	11550	11550	11550
LONGITUDINAL WIND SHEAR	2125	2125	2125
LONGITUDINAL WIND MOMENT	35000	35000	35000
EARTHQUAKE VERTICAL	1800	1800	1800
EARTHQUAKE HORIZONTAL	5075	5075	5075
SNOW LOAD	3650	3650	3650

MAINTENANCE PLATFORM DEAD LOAD.
 UNIFORM DISTRIBUTED LOAD BETWEEN LOAD POINTS A & E.
 (TYP AT COLUMN LINES 1 THRU 12)

MAINTENANCE PLATFORM LIVE LOAD.
 UNIFORM DISTRIBUTED LOAD BETWEEN LOAD POINTS A & E.
 (TYP AT COLUMN LINES 1 THRU 12)

MAINTENANCE PLATFORM DEAD LOAD.
 UNIFORM DISTRIBUTED LOAD BETWEEN LOAD POINTS A & E.
 (TYP AT COLUMN LINES 1 THRU 12)

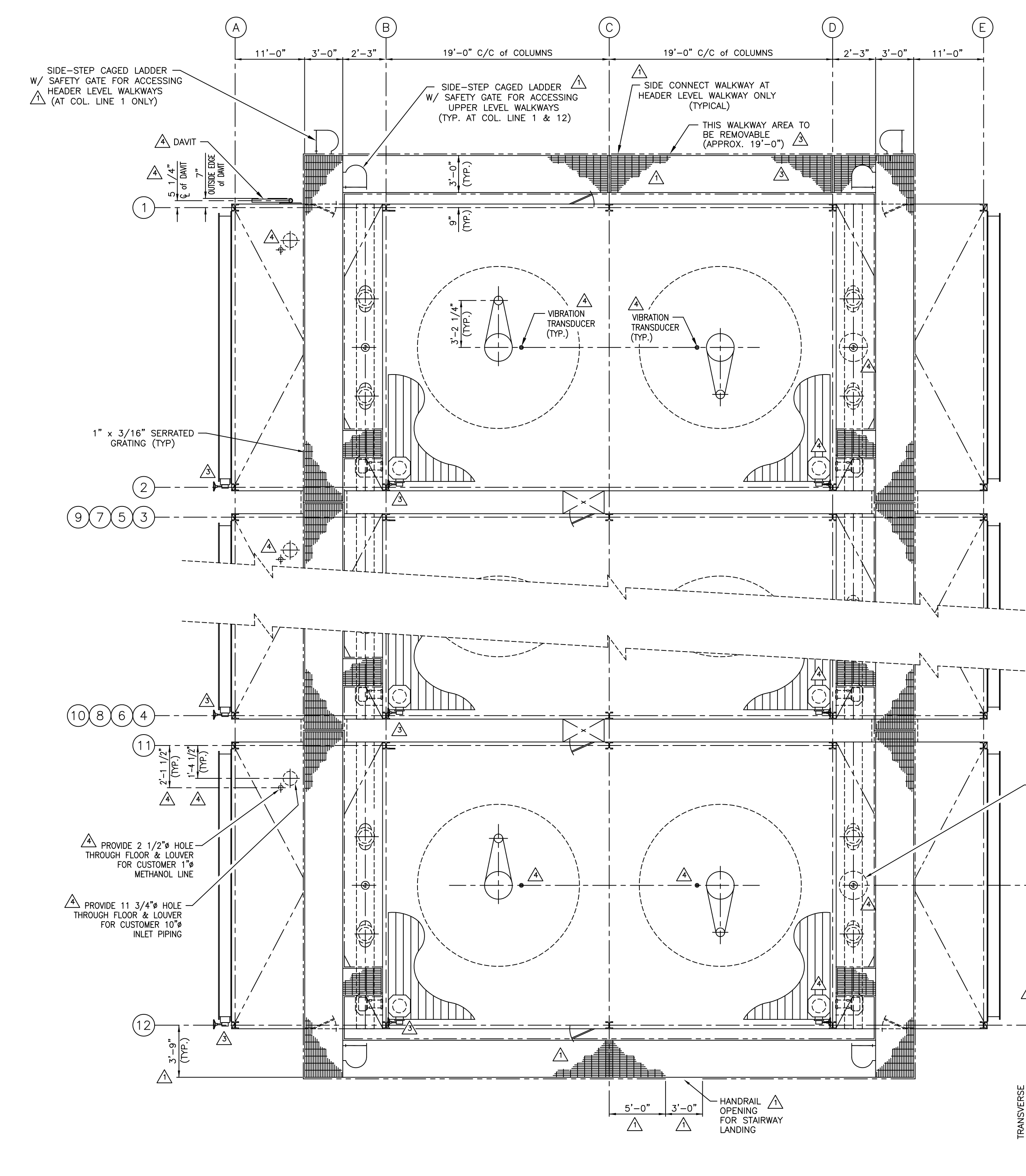
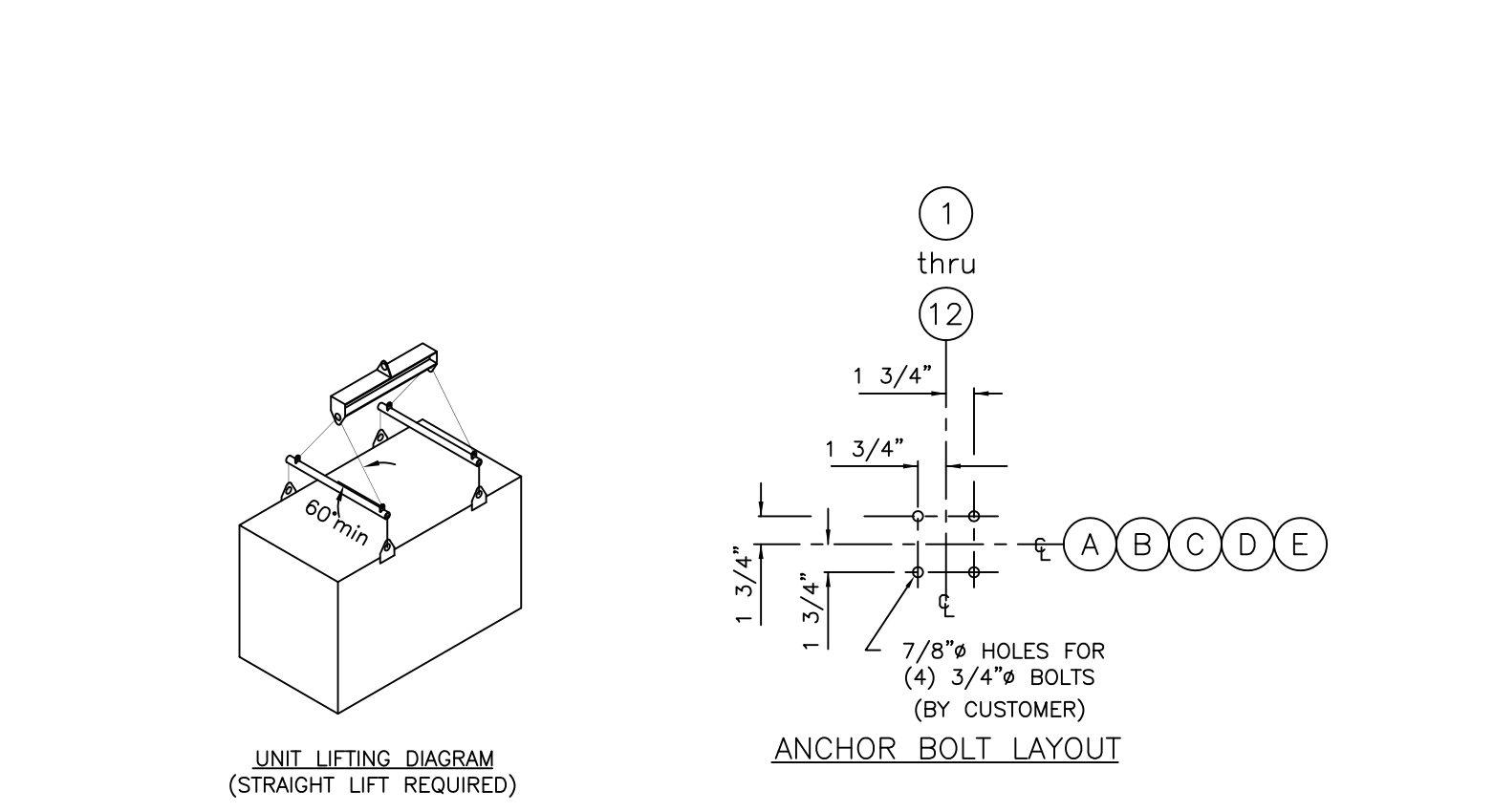
MAINTENANCE PLATFORM LIVE LOAD.
 UNIFORM DISTRIBUTED LOAD BETWEEN LOAD POINTS A & E.
 (TYP AT COLUMN LINES 1 THRU 12)



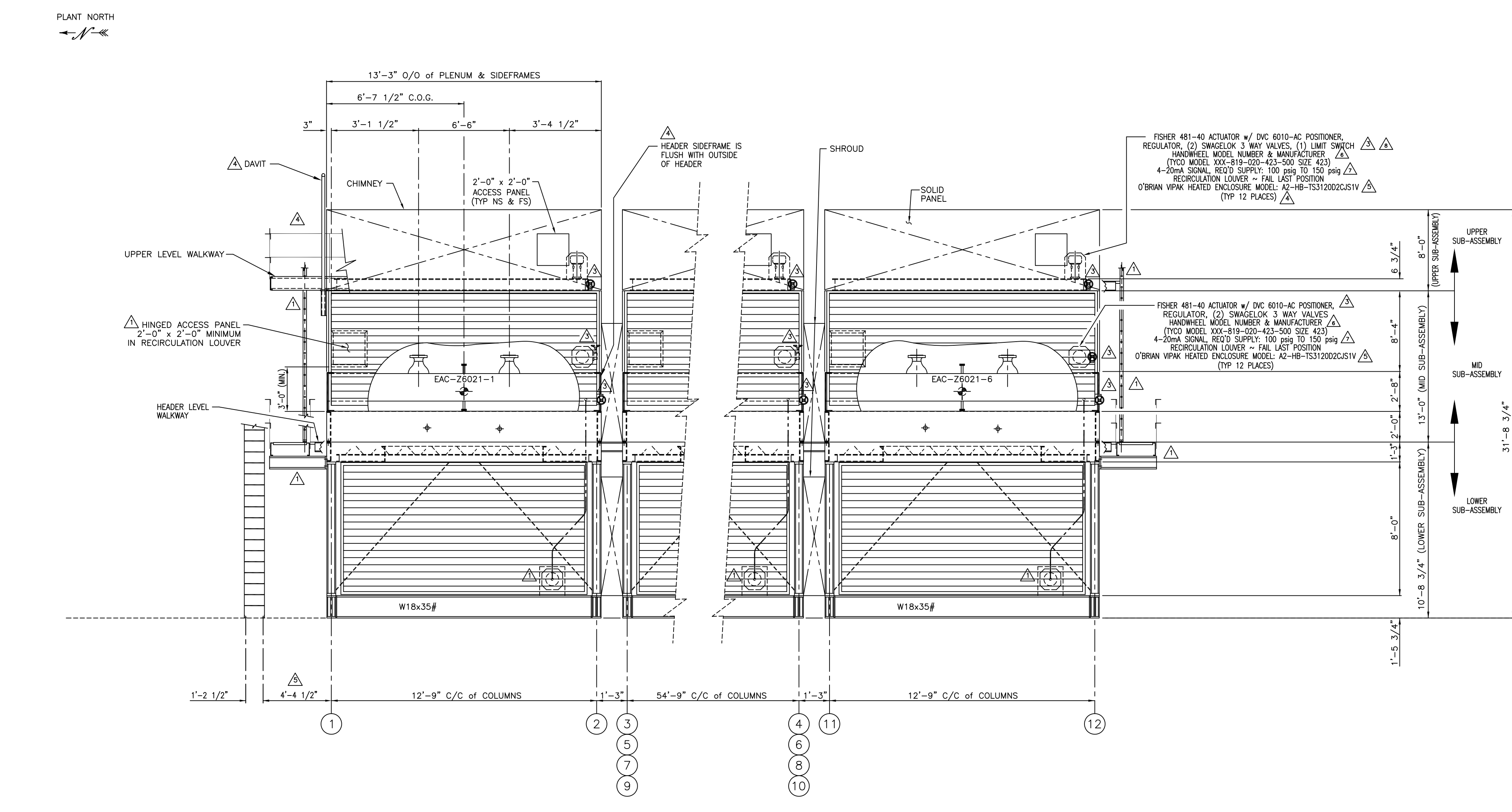
FAN AND MOTOR TAG ORIENTATION

INSTRUMENT/ACTUATOR TAG NUMBERS

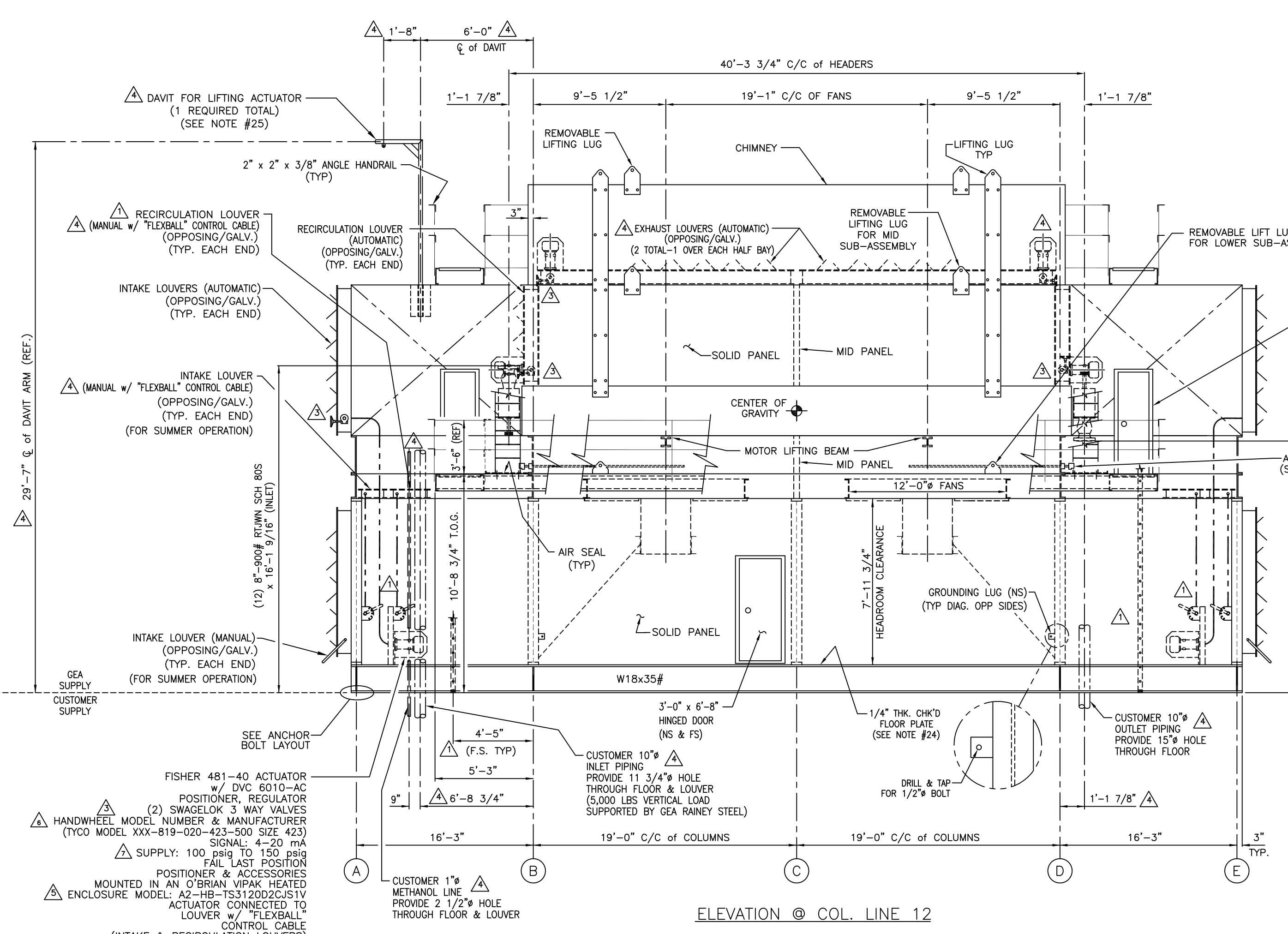
BAY TAG NUMBER	EAC-26021-1	EAC-26021-2	EAC-26021-3	EAC-26021-4	EAC-26021-5	EAC-26021-6
EXHAUSTERS - RTD'S	TE-252602 1028 TE-252602 1029 TE-252602 1030	TE-252602 2028 TE-252602 2029 TE-252602 2030	TE-252602 3028 TE-252602 3029 TE-252602 3030	TE-252602 4028 TE-252602 4029 TE-252602 4030	TE-252602 5028 TE-252602 5029 TE-252602 5030	TE-252602 6028 TE-252602 6029 TE-252602 6030
ACTUATORS - EXHAUST LOUVERS	TY-252602 1038 TY-252602 1039 TY-252602 1040	TY-252602 2038 TY-252602 2039 TY-252602 2040	TY-252602 3038 TY-252602 3039 TY-252602 3040	TY-252602 4038 TY-252602 4039 TY-252602 4040	TY-252602 5038 TY-252602 5039 TY-252602 5040	TY-252602 6038 TY-252602 6039 TY-252602 6040
ACTUATORS - RECIRCULATION LOUVERS	TY-252602 1037 TY-252602 1038 TY-252602 1039	TY-252602 2037 TY-252602 2038 TY-252602 2039	TY-252602 3037 TY-252602 3038 TY-252602 3039	TY-252602 4037 TY-252602 4038 TY-252602 4039	TY-252602 5037 TY-252602 5038 TY-252602 5039	TY-252602 6037 TY-252602 6038 TY-252602 6039
ACTUATORS - FRESH AIR LOUVERS	TY-252602 1034 TY-252602 1035 TY-252602 1036	TY-252602 2034 TY-252602 2035 TY-252602 2036	TY-252602 3034 TY-252602 3035 TY-252602 3036	TY-252602 4034 TY-252602 4035 TY-252602 4036	TY-252602 5034 TY-252602 5035 TY-252602 5036	TY-252602 6034 TY-252602 6035 TY-252602 6036
LIMIT SWITCHES - EXHAUST LOUVERS	TS/250-23060 1031 TS/250-23060 1032 TS/250-23060 1033	TS/250-23060 2031 TS/250-23060 2032 TS/250-23060 2033	TS/250-23060 3031 TS/250-23060 3032 TS/250-23060 3033	TS/250-23060 4031 TS/250-23060 4032 TS/250-23060 4033	TS/250-23060 5031 TS/250-23060 5032 TS/250-23060 5033	TS/250-23060 6031 TS/250-23060 6032 TS/250-23060 6033
VIBRATION TRANSDUCERS - EAST SIDE	VE-252104 VE-252105	VE-252204 VE-252205	VE-252304 VE-252305	VE-252404 VE-252405	VE-252504 VE-252505	VE-252604 VE-252605
VIBRATION TRANSDUCERS - WEST SIDE	WE-252104 WE-252105	WE-252204 WE-252205	WE-252304 WE-252305	WE-252404 WE-252405	WE-252504 WE-252505	WE-252604 WE-252605



WALKWAY PLAN
(CHIMNEY NOT SHOWN FOR CLARITY)



ELEVATION @ COL. LINE A
(HEADER WALKWAYS NOT SHOWN FOR CLARITY)



ELEVATION @ COL. LINE 12

NO.	REVISIONS	DATE	BY	CHK	APP'D	TITLE
8	ADD UNIT WEIGHTS TO DRAWING	6/29/10	JOY			
7	REVISE UNIT WEIGHTS TO MATCH LOAD REACTIONS SHEET AS NOTED	1/22/10	JOY	JRA		
6	REVISE UNIT WEIGHTS TO MATCH LOAD REACTIONS SHEET AS NOTED	10/17/09	JOY	JRA		
5	REVISE UNIT WEIGHTS TO MATCH LOAD REACTIONS SHEET AS NOTED	6/11/09	JOY	JRA		
4	ADD WB TRANS LOC/OUT PING POINTING/DRAWING ACCURACIES	6/23/09	JOY	JRA		
3	REVISE UNIT WEIGHTS TO MATCH LOAD REACTIONS SHEET AS NOTED	10/7/08	JOY	JRA		
2	MOTOR TAG NUMBERS/NOTE #20	7/8/08	JOY	JRA		
1	ORIGINAL ISSUE	2/6/08	JOY	JRA		

NO.	DESCRIPTION	DATE	BY	CHK	APP'D	TITLE
1	ORIGINAL ISSUE	10/10/07	JOY	JRA		

1st STAGE DISCHARGE COOLER - EAC-26021

BP EXPLORATION (ALASKA) INC.
 BP GAS PARTIAL PROCESSING (GPP) PROJECT
 BP 2 PAD FACILITY
 NORTH SLOPE, ALASKA
 PROJECT NO. 10742208
 EPT NO. 36324248-02

GRC JOB NO: R-6459-2
 CUST. P.O. NO. 10742209-0007
 CUST. ITEM NO. EAC-26021
 SERVICE: 1ST STAGE DISCHARGE COOLER

GEA Rainey Corporation
 10070/107
 Cotaco, Oklahoma

PLAN & ELEVATION

SCALE: NONE

DWG. NO. 6459020PE

REV. 8