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PULSE-JET BAGHOUSE

FOR

DOE RUN PERU S.A.

LA OROYA, PERU

APPLICATION & DESIGN SPECIFICATIONS:

APPLICATION:	CUPOLA FURNACE VENTILATION	
DUST:	NOx FUMES	
AIR VOLUME:	30,000 ACFM	51,000 m ³ /hr.
FILTER AREA:	12,370 FT ²	1,149.2 m ²
AIR-TO-CLOTH RATIO:	2.43 CFM/FT ²	0.74 m ³ /min./m ²
MAX. FILTER TEMP:	500° F	260° C
COLLECTOR DESIGN TEMP:	500° F	260° C
DESIGN PRESSURE:	±25" W.G.	635mm W.G.

COMPRESSED AIR REQUIREMENTS

- 90-100 PSIG (CLEAN, DRY, & OIL FREE)
- NORMAL: 108 SCFM (15 SEC. BETWEEN PULSES)
- MAXIMUM: 270 SCFM (6 SEC. BETWEEN PULSES)

FILTER TYPE	RECOMMENDED INITIAL PRESSURE SETTING
BAG	80 PSIG
PLEATED (CARTRIDGE)	60 PSIG

SHOP NOTES:

- UNLESS OTHERWISE SPECIFIED: ALL STRUCTURAL STEEL SHAPES AND PLATE 3/16" AND THICKER ARE TO BE ASTM A36 STEEL. ALL SHEET TO BE ASTM A569 STEEL. ALL PIPE TO BE ASTM A500 GRADE B STEEL.
- GRIND SMOOTH ALL BURRS, SHARP EDGES AND WELD SPATTER. REMOVE ALL LOOSE MILL SCALE, RUST ETC. AS OUTLINED IN "STEEL STRUCTURES PAINTING COUNCIL" SPEC. NO. 3, POWER TOOL CLEANING, (SSPC SP3) IN ACCORDANCE WITH PAINT MANUFACTURERS SPECIFICATIONS. FINISH PAINT EXTERIOR WITH SHERWIN-WILLIAMS METALASTIC DIRECT-TO-METAL ACRYLIC MODIFIED ENAMEL SERIES B552-600, SLATE GRAY #SW4026, 3-5 MILS DFT MIN. PAINT INTERIOR OF CLEAN AIR PLENUM AND TOP SIDE OF TUBESHEET WITH ONE COAT OF SHOP GRAY PRIMER, 1 MIL DFT MIN. NOTE: THERE MUST NOT BE ANY DRIPS OR EXCESS PAINT ON THE INSIDE OF THE TUBESHEET HOLES.
- ALL ITEMS ARE TO BE INSPECTED IN ACCORDANCE WITH GE PROCEDURE SPS-1046 "QUALITY REQUIREMENTS FOR SUBCONTRACTED FABRICATION".
- ALL FABRICATED PIECES TO BE MARKED WITH PART NUMBERS, USING A ORANGE PAINT STICK.
- ALL ITEMS ARE TO BE PREPARED FOR SHIPMENT IN ACCORDANCE WITH GE PROCEDURE SPS-1016 "GENERAL REQUIREMENTS FOR PACKAGING & SHIPPING OF FABRICATED PARTS".
- PRIOR TO SHIPPING, ALL INLET, OUTLET AND HOPPER DISCHARGE OPENINGS IN UNIT ARE TO BE COVERED TO PREVENT MOISTURE FROM COLLECTING INSIDE HOUSING.
- I.D. PLATE (P/N 100-0273) TO BE METAL STAMPED AS FOLLOWS:
EQUIPMENT I.D.: NOx BH
P.O. NUMBER: POPRY-2235
GE JOB/PART NUMBER: 210924

FIELD NOTES:

- WHEN WELDING STAINLESS STEEL TO CARBON STEEL USE 316 STAINLESS STEEL WELDING WIRE/STICK.
- LADDER VANE BAFFLING: THIS TYPE OF BAFFLE HAS BEEN VERY SUCCESSFUL AT REDUCING ABRASION OF THE FILTERS CAUSED BY THE INLET DUST. WHILE EVEN DISTRIBUTION IS THE GOAL OF THE BAFFLE, IT IS VIRTUALLY IMPOSSIBLE TO ATTAIN AND IN SOME INSTALLATIONS A MODIFICATION TO THE BAFFLE MAY BE REQUIRED TO FURTHER REDUCE ABRASION. THE END USER SHOULD MONITOR THE FILTERS AND THE BAFFLE ASSEMBLY FOR UNUSUAL WEAR PATTERNS AND IF WEAR OCCURS IT MAY BE NECESSARY TO MODIFY THE BAFFLE ASSEMBLY. GE ENERGY WILL BE READY TO ASSIST YOU FROM AN ENGINEERING STANDPOINT SHOULD MODIFICATION BE REQUIRED BUT WE CANNOT BE RESPONSIBLE FOR BAG FAILURES THAT MAY OCCUR.

REFERENCE DRAWINGS:

- CONTROLLER FIELD WIRING DIAGRAM: 850-1180 SHEET 1
- FIELD TUBING DIAGRAM FOR CONTROLLER: 850-1180 SHEET 2
- PIPING AND INSTRUMENTATION: 850-1181
- SINGLE LINE WIRING DIAGRAM: 850-1182
- INTERNATIONAL STEEL SHAPES: 844-5048

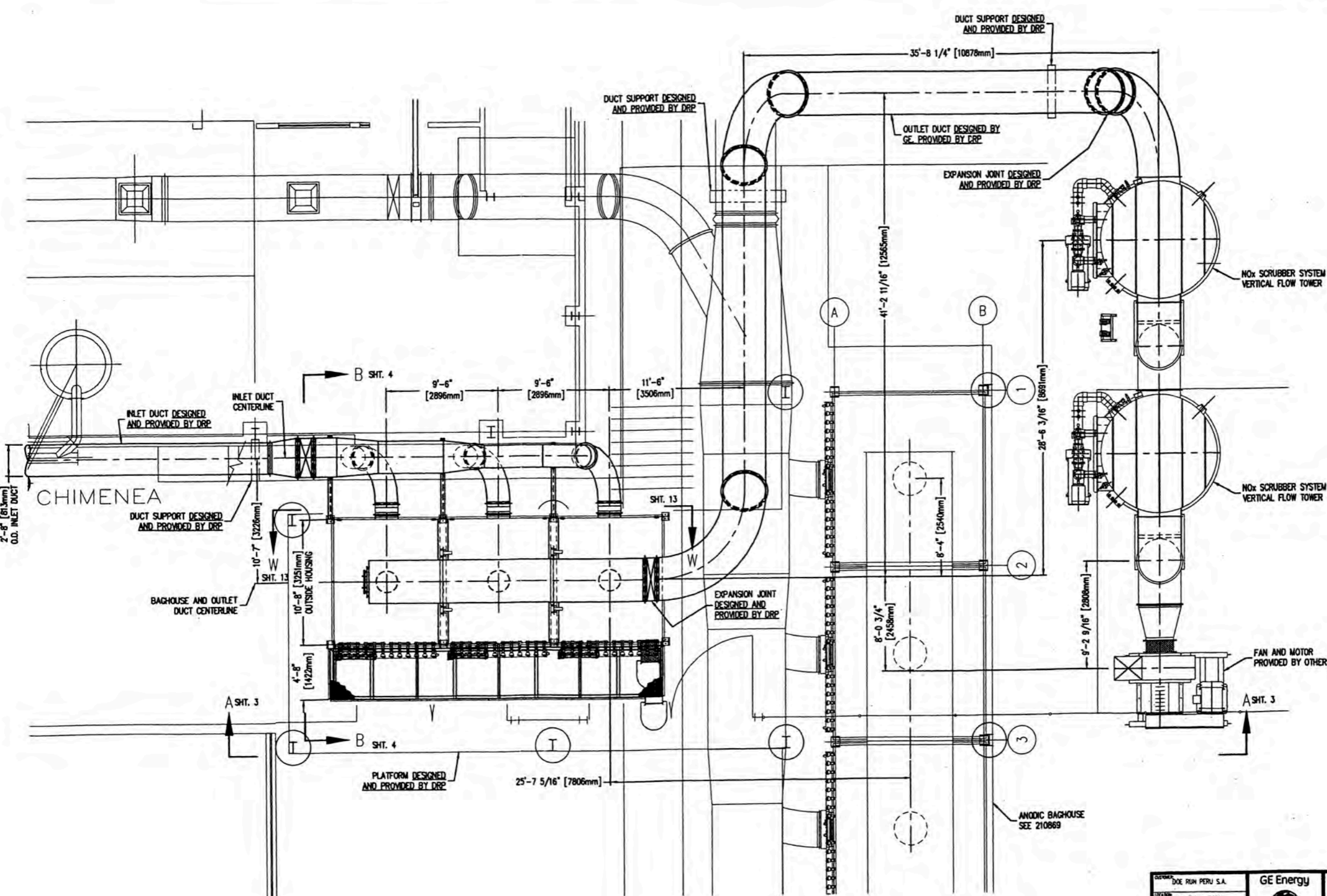
SHIPPING INFORMATION:

- APPROX. WEIGHT OF ITEM #1 & #2: 308#
- APPROX. DIMENSIONS OF ITEM #1: 10'-6" L x 4'-5" W x 0'-10" H
- APPROX. WEIGHT OF ITEM #3: 140#
- APPROX. DIMENSIONS OF ITEM #2: 8'-11" L x 0'-9" W x 1'-9" H

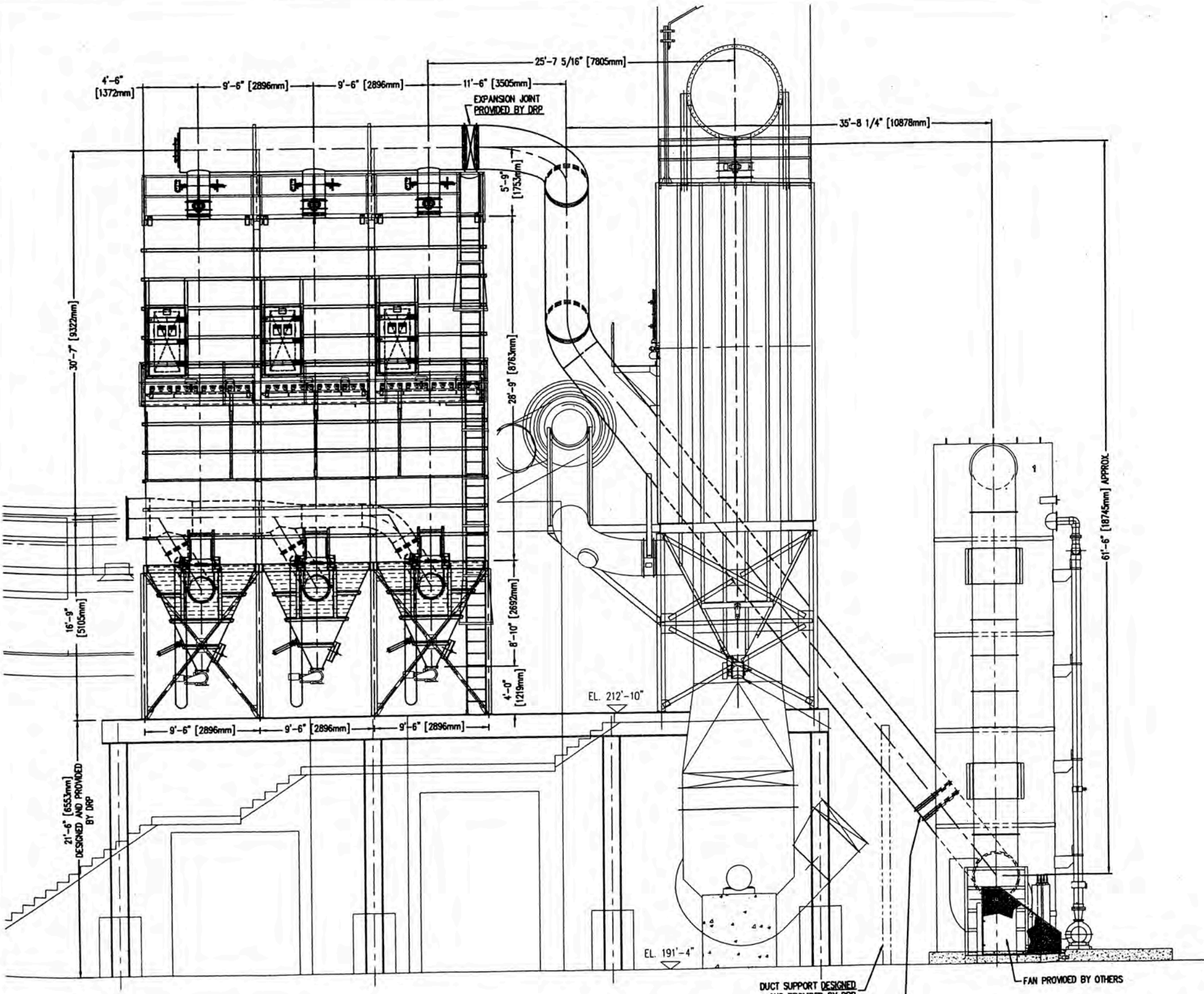
** ITEMS FABRICATED BY DRP. NOT PROVIDED BY GE.

QTY.	ITEM NO.	PART NO.	DESCRIPTION	DRAWING NUMBER
1	37	843-11228	ACCESS PORT, 20" KNAPPCO, #LE1110-SFY 316 S.S. INSULATION PAN	D 843-8042
1	36	819-0810	DIFFERENTIAL DIGHELIC KIT,120/240V,50-60 Hz	
3	35	845-2292	HOPPER HAMMER	
3	34	845-2316	INLET GUILLOTINE DAMPER, 23" I.D., C.S.	
3	33	845-2317	OUTLET BUTTERFLY DAMPER, 22" I.D., 316 S.S.	
3	32	822-0617	1 1/2 NPT BALL VALVE, APOLLO #77-107-07 W/TEE HANDLE	
3	31	819-0533	SEQUENTIAL CONTROLLER,10-STEP,100-260V,50-60 Hz	
3	30	851-0750-100IB	CPM-750	
540	29	0307000526	CAGE,180,SS009,5.80X167.5,20W,RFTXV	
108	28	02986361	BAG,0180,0T015,6.25X168,SBDJ3WS	
432	27	0297001447	BAG,0180,0G061,6.25X167.75,SBDJ	
3	26	820-0153	MAGNEHELIC GAUGE KIT	D 820-0153
3	25	822-0547	1" AIR FILTER & REGULATOR ASSY. 0-125 PSI.	A 822-0547
4	24	820-1138	SURGE VALVE KIT	D 820-1138
36	23	820-1159	SAFETY SNAP PIN 304 S.S.	B 820-1159
3	22	350-0901	SILICONE SEALER	
3	21	834-0217	ROTARY AIRLOCK 10"x10", 316 S.S.	
24	20	700-0012	WASHER,FLAT 1/2 TYPE A,N PL	
12	19	700-0015	WASHER,LOCK 1/2 MED SPRG PL	
12	18	701-0061	NUT,HEX 1/2-13NC G5 PL	
12	17	702-0069	BOLT,HEX 1/2-13NC X 1 3/4" G5 PL	
72	16	807-0058	CLAMP 2"-3"	B 807-0058
36	15	820-0220	HOSE,1 7/8" I.D. X 0'-4"	B 820-0220
3	14	843-11219	ACCESS DOOR 25"x60" (316 S.S. GAS CONTACT, C.S. OUTER)	D 843-11219
4	13	843-10791-101	TUBESHEET ALIGNMENT JIG	D 843-10791
**	-	12	ROOFTOP ACCESS HANDRAILS	SHT. 21-22
**	1	11	CAGED LADDERS	SHT. 23
**	1	10	PLATFORM & PLATFORM HANDRAILS	SHT. 19-20
**	1	9	STRUCTURAL	SHT. 6-7
**	1	8	HOPPER	SHT. 12
**	1	7	DIRTY AIR PLENUM	SHT. 9, 11
**	1	6	CLEAN AIR PLENUM	SHT. 9-11
12	5	841-0578-149	NIPPLE PLATE 316 S.S.	D 841-0578
36	4	841-1360-106	BLOWPIPE 316 S.S.	D 841-1360
3	3	841-1368	AIR HEADER CS	D 841-1368
3	2	817-3103-101	TUBESHEET 316 S.S.	D 817-3103
3	1	817-3103-100	TUBESHEET 316 S.S.	D 817-3103

210924	CUSTOMER: DOE RUN PERU	<p>8800 East 63rd Street Kansas City, MO, USA 64133 PHONE: +1-816-258-8400 FAX: +1-816-253-1873 SALES: +1-816-253-2022</p>	<p>PULSE-JET BAGHOUSE TITLE SHEET & BOM</p>	DESIGNED BY: JAS	DATE: 4-27-06
	CHECKED BY: LA OROYA, PERU			DESIGNED BY: JAS	DATE: 4-27-06
	CUSTOMER EQUIPMENT NO.: ARSINCO NOx BH			DESIGNED BY: ERJ	DATE: 4-27-06
	CUSTOMER I.D. NO.: 65303			DESIGNED BY: ERJ	DATE: 4-27-06
CUSTOMER P.O. NO.: POPRY-2235	CUSTOMER PROJECT NO.: 171997	GE ENERGY PROJECT NO.: 210924	SCALE: N.T.S.	DATE: D	
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CUSTOMER: DOE RUN PERU S.A. LOCATION: LA OROYA, PERU CUSTOMER EQUIPMENT TAG: ARSENIC NOx BH CUSTOMER TAG NO.: 65383 CUSTOMER P.O. NO.: POPPY-2225 GE ENERGY ORDER NO.: 171997 GE ENERGY PROJECT NO.: DOEPR-4032	GE Energy 8000 East 63rd Street Kansas City, MO, USA 64133 PHONE: +816-256-8400 FAX: +816-353-1873 SALES: +800-527-2222	PULSE-JET BAGHOUSE GENERAL ARRANGEMENT		DRAWN BY: JAS CHECKED BY: JAS DESIGNED BY: ERJ APPROVED BY: ERJ SCALE: N.T.S. DATE: 5-8-04
				SHEET NO.: 210924 OF SHEETS: 24



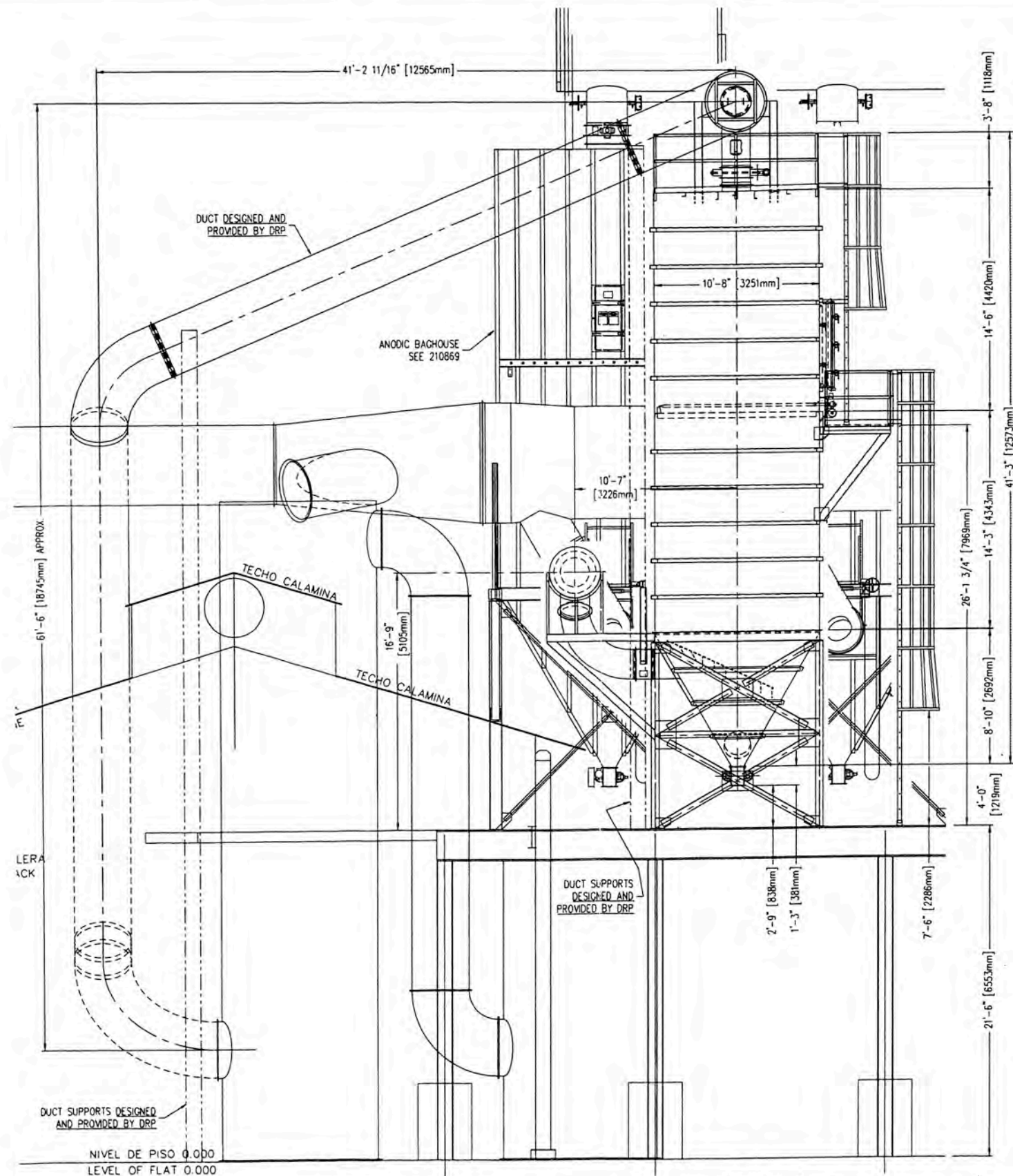
VIEW A-A

CUSTOMER: DOE RUN PERU S.A. LOCATION: LA OROYA, PERU CUSTOMER EQUIPMENT NO.: ARSENIC MOx BH CUSTOMER P.O. NO.: 65383 GE ENERGY PROJECT NO.: 171997 GE ENERGY ORDER NO.: DOEPER-1032	GE Energy 800 East 43rd Street Kenosha, WI, USA 53133 PHONE: 414-386-3600 FAX: 414-386-3673 SALES: 800-521-2222	PULSE-JET BAGHOUSE GENERAL ARRANGEMENT	DRAWN BY: JAS CHECKED BY: JAS APPROVED BY: ERJ DATE: 5-4-06 SCALE: N.T.S. SHEET NO. 210924
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DUCT SUPPORT DESIGNED AND PROVIDED BY DRP
 EXPANSION JOINT DESIGNED AND PROVIDED BY DRP

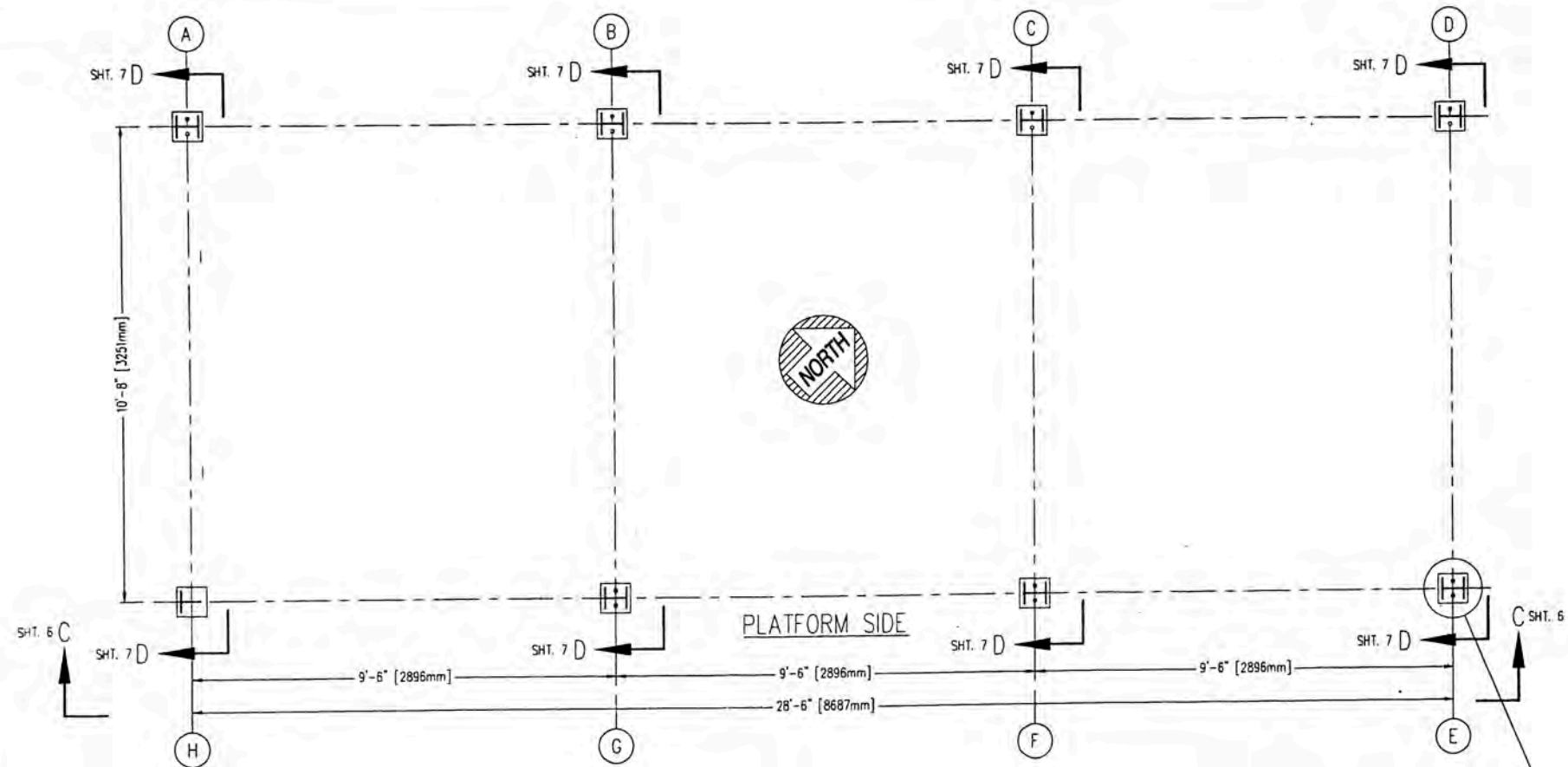
FAN PROVIDED BY OTHERS

61'-6" [18745mm] APPROX.



VIEW B-B

<p>CUSTOMER: DOE RUN PERU S.A. LOCATION: LA OROYA, PERU CUSTOMER EQUIPMENT I.D.: ARSENIC HQ. 18H CUSTOMER I.D. NO.: 65383 CUSTOMER P.O. NO.: POPRY-2235 GE ENERGY ORDER NO.: 171997 GE ENERGY PROJECT NO.: DOEPER-1032</p>	<p>GE Energy  8600 East 63rd Street Denver, CO, USA, 80113 PHONE +1 866-356-3400 FAX +1 816-353-1873 SALES +800-821-2222</p>	<p>PULSE-JET BAGHOUSE GENERAL ARRANGEMENT</p>	<p>DRW BY: JAS DATE: 5-4-06 CHECKED BY: JAS DATE: 5-4-06 DESIGNED BY: ERJ DATE: 5-5-06 APPROVED BY: ERJ DATE: 5-5-06 SCALE: N.T.S. SR: D</p>
<p>THIS DRAWING AND THE INFORMATION CONTAINED HEREIN IS CONFIDENTIAL AND THE PROPERTY OF GE ENERGY AND MAY NOT BE USED FOR ANY PURPOSE WHATSOEVER EXCEPT UNDER EXPRESS WRITTEN CONTRACT WITH GE ENERGY.</p>		<p>TOLERANCES UNLESS OTHERWISE SPECIFIED: GENERAL FABRICATION ±1/16" (1.5mm) REGULARITY ±1/16" FINISHES & CUTTING: COMMERCIAL TOLERANCES.</p>	<p>SHT 4 OF 24 210924</p>

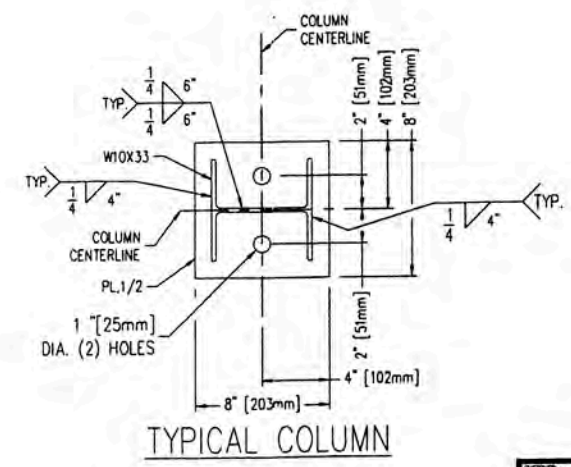


ANODIC NO_x BAGHOUSE
COLUMN BASE LOADS (KIPS)

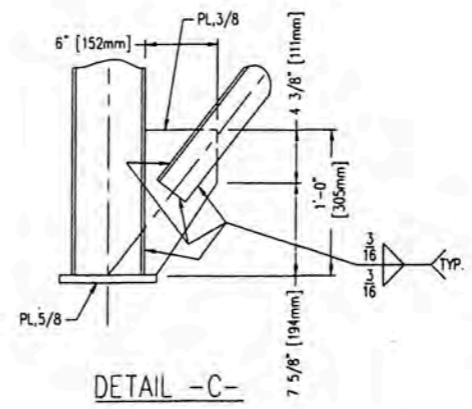
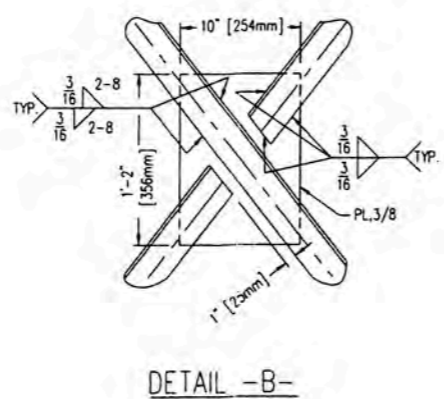
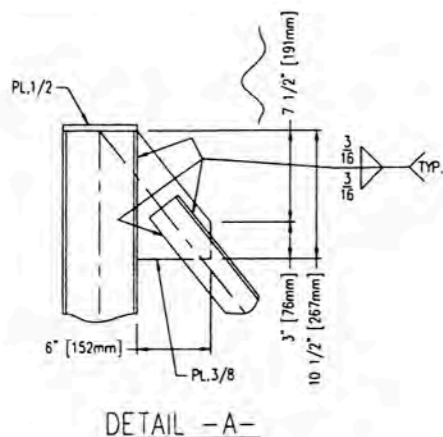
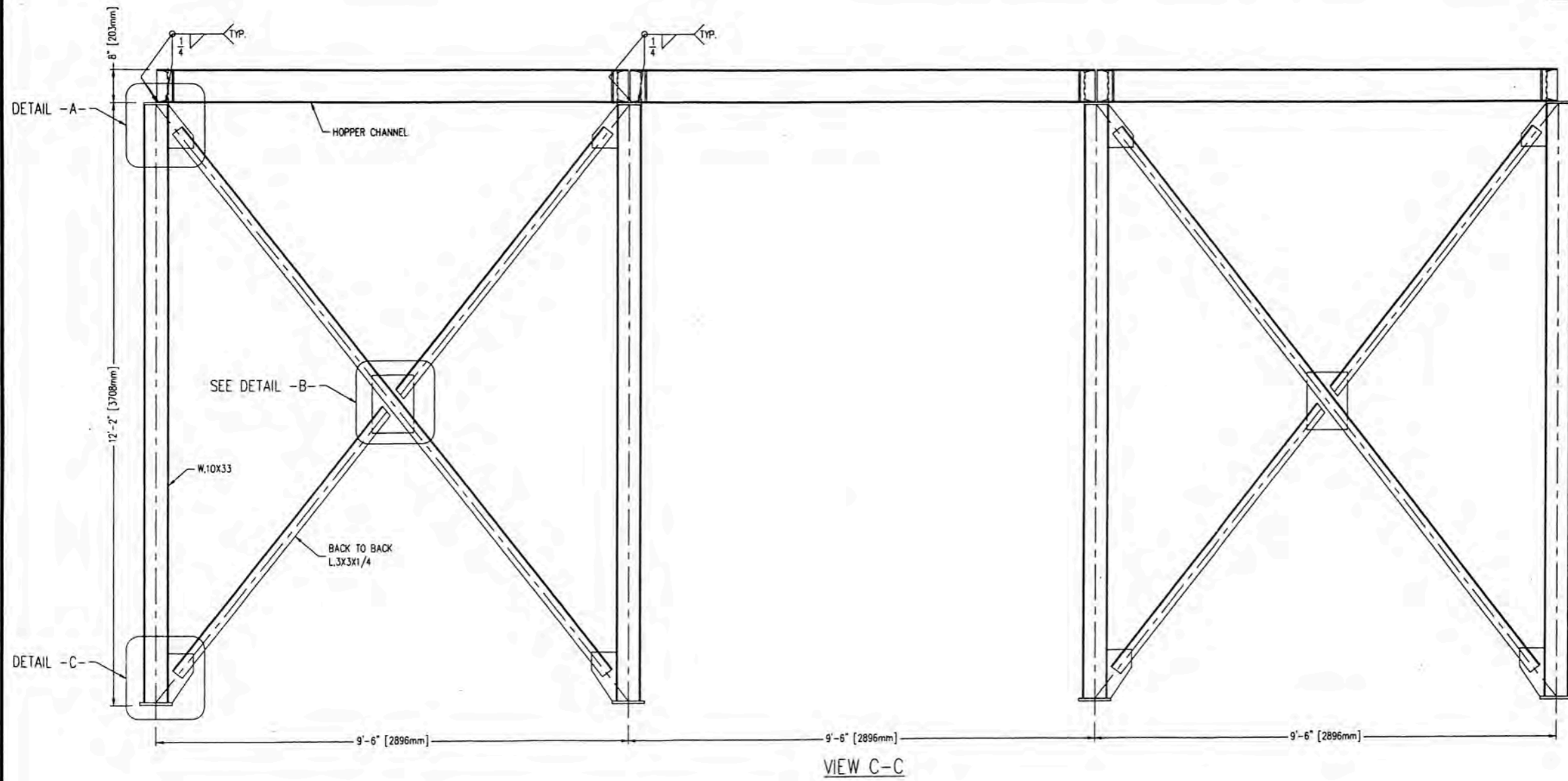
COLUMN	DEAD LOAD	LIVE LOAD	OUTLET DUCT LOAD	INLET DUCT LOAD	WIND LOAD				SEISMIC LOAD			
					LONGITUDINAL		TRANSVERSE		LONGITUDINAL		TRANSVERSE	
					VERTICAL	SHEAR	VERTICAL	SHEAR	VERTICAL	SHEAR	VERTICAL	SHEAR
A	+3.9	+13.7	+0.2	+0.5	±14.9	±1.5	±12.8	±1.3	±23.0	±5.9	±39.8	±5.9
B	+7.8	+27.4	+0.4	+1.0	±11.1	±3.0	±25.5	±2.5	±7.6	±11.7	±79.7	±11.7
C	+7.8	+27.4	+0.4	+1.0	±0.0	±3.0	±25.5	±2.5	±0.0	±11.7	±79.7	±11.7
D	+3.9	+13.7	+0.2	+0.5	±4.0	±1.5	±12.8	±1.3	±15.4	±5.9	±39.8	±5.9
E	+3.9	+27.4	+0.2	+0.5	±4.0	±1.5	±12.8	±1.3	±15.4	±5.9	±39.8	±5.9
F	+7.8	+27.4	+0.4	+1.0	±0.0	±3.0	±25.5	±2.5	±0.0	±11.7	±79.7	±11.7
G	+7.8	+27.4	+0.4	+1.0	±11.1	±3.0	±25.5	±2.5	±7.6	±11.7	±79.7	±11.7
H	+3.9	+13.7	+0.2	+0.5	±14.9	±1.5	±12.8	±1.5	±23.0	±5.9	±39.8	±5.9

- NOTES:
- LIVE LOADS BASED ON:
 90 PCF DUST DENSITY.
 1/4" DUST LAYER ON FILTERS.
 2/3 OF HOPPER VOLUME FILLED WITH DUST.
 50 PSF SNOW OR ROOF LOAD.
 - WIND AND SEISMIC LOADS PER UNIFORM BUILDING CODE (LATEST EDITION).

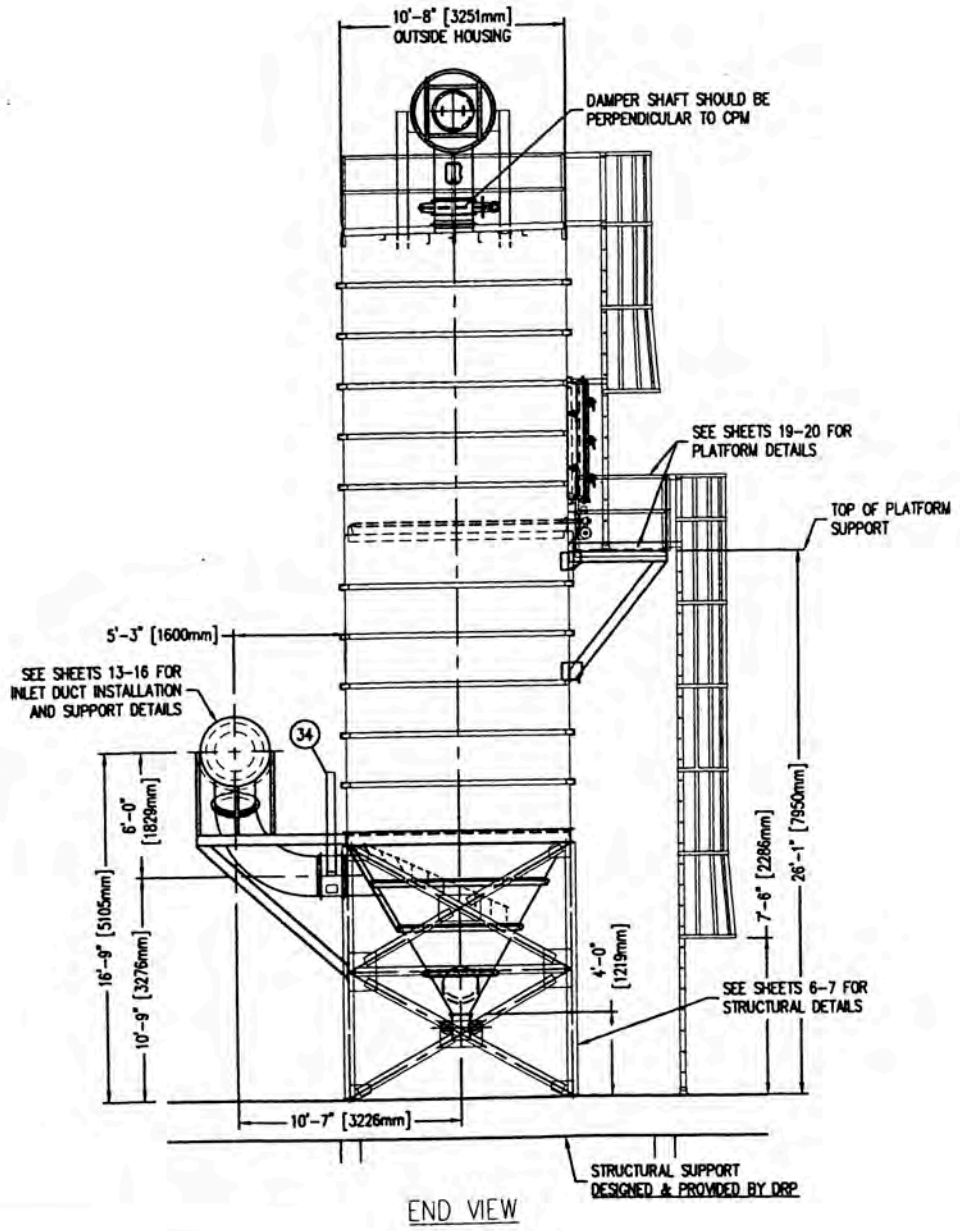
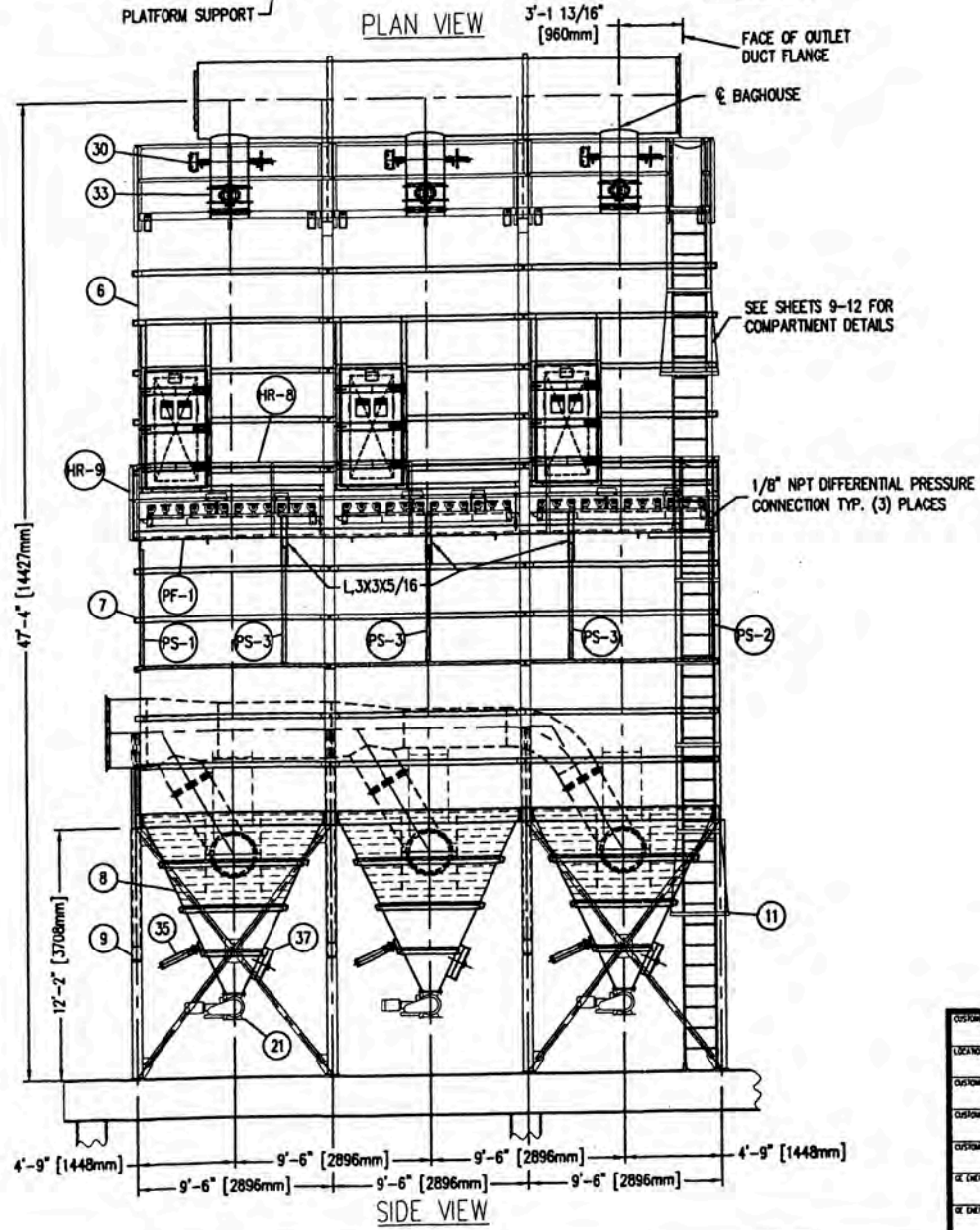
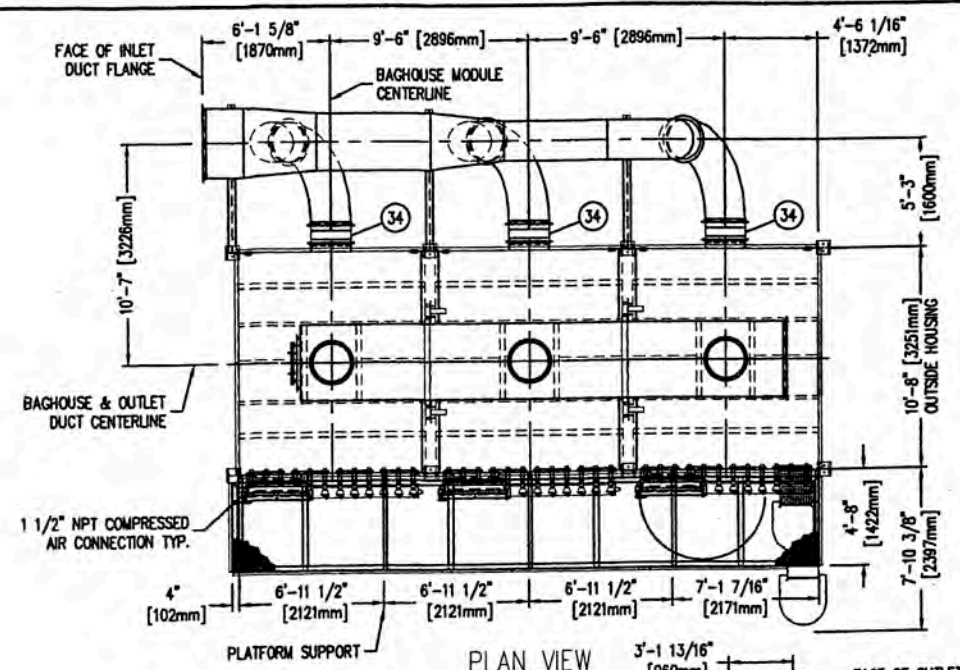
+ VERTICAL LOADS ARE UPWARD
 - VERTICAL LOADS ARE DOWNWARD
 ALL WIND LOADS ARE REVERSIBLE



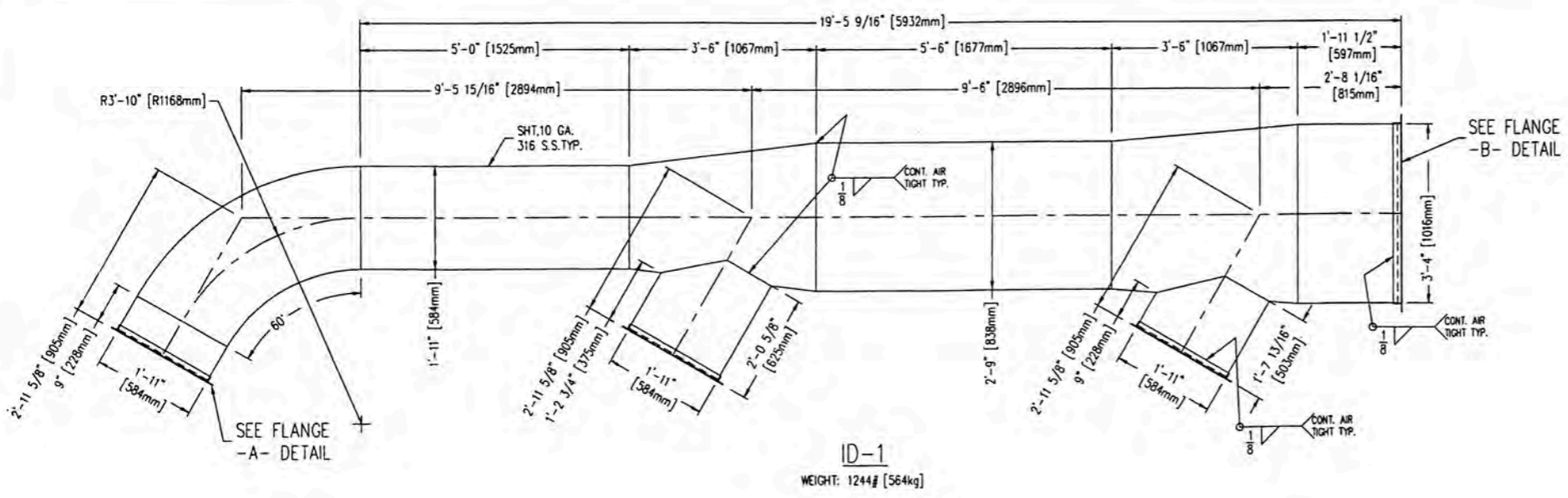
CUSTOMER: DOE RUN PERU S.A. LOCATION: LA OROYA, PERU CUSTOMER EQUIPMENT ID: ARSENIC NO _x BH CUSTOMER TAG NO: 65383 PROJECT: 171997 PROJECT NO: DOEPER-1032	GE Energy 8000 East 83rd Street Kansas City, MO, USA 64113 PHONE: +1-816-736-8400 FAX: +1-816-736-1973 SALES: +1-800-827-7222	PULSE-JET BAGHOUSE BASE PLATES & LOAD CHART	DRAWN BY: JAS CHECKED BY: JAS DESIGNED BY: ERJ APPROVED BY: ERJ SCALE: N.T.S. SHEET NO: 210924 SHEETS: 5 OF 24
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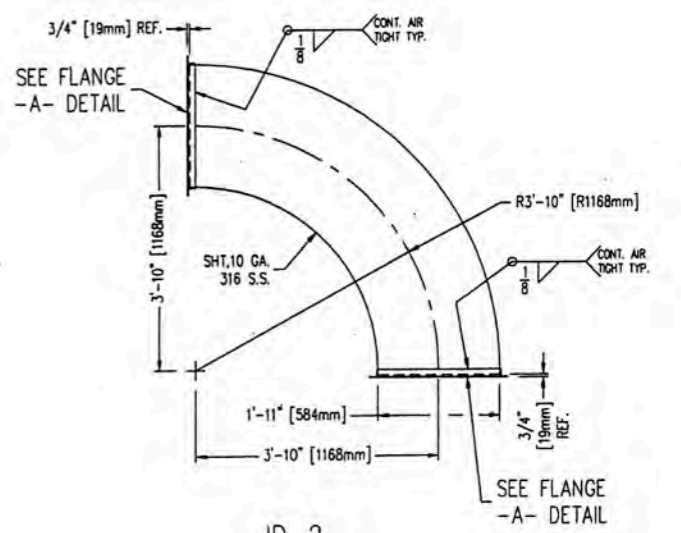
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<small>THIS DRAWING AND THE INFORMATION CONTAINED HEREIN IS CONFIDENTIAL AND THE PROPERTY OF GE ENERGY AND IS NOT TO BE USED FOR ANY PURPOSE AND WITHOUT GEENERGY EXPRESS WRITTEN CONSENT. CONTACT WITH GE ENERGY.</small>		MODEL: _____ SERIAL NUMBER: _____ TOLERANCES UNLESS OTHERWISE SPECIFIED GENERAL: FRACTIONS 1/16" (LARGE) DECIMALS 0.005" DIMENSIONS 1/16" (LARGE) DECIMALS 0.005" FINISHES & COATINGS: STANDARD	SHEET NO. 210924 OF 24



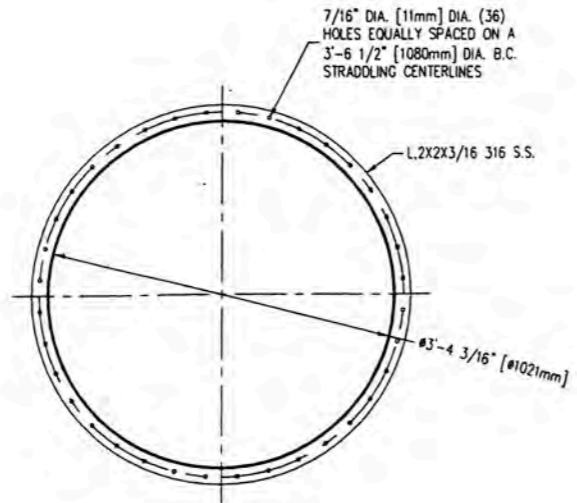
CUSTOMER: DOE RUN PERU S.A. LOCATION: LA OROYA, PERU CUSTOMER EQUIPMENT NO.: ARSENIC MOx BH CUSTOMER P.A. NO.: 65383 GE ORDER NO.: POPRY-2235 GE ORDER NO.: 171997 GE ORDER PROJECT NO.: DOEPER-1032	GE Energy 8000 East 83rd Street Kansas City, MO, USA 64133 PHONE +1-816-356-8400 FAX +1-816-353-1873 SALES +1-816-351-2222	PULSE-JET BAGHOUSE INSTALLATION DETAILS		DRAWN BY: JAS DATE: 5-4-06
		CHECKED BY: JAS DATE: 5-4-06	ORDERED BY: ERJ DATE: 5-5-06	APPROVED BY: ERJ DATE: 5-5-06
THIS DRAWING AND THE INFORMATION CONTAINED HEREIN IS THE PROPERTY OF GE ENERGY AND IS NOT TO BE USED FOR ANY PURPOSES WHATSOEVER EXCEPT UNDER EXPRESS WRITTEN CONTRACT WITH GE ENERGY.		TOLERANCES UNLESS OTHERWISE SPECIFIED: GENERAL FABRICATION (1/16" [1.6mm]) MEASUREMENT 11-4, FORMING & CASTING COMMERCIAL TOLERANCES.	NO NUMBER	DRAWING NO. 210924 SHEET 8 OF 24



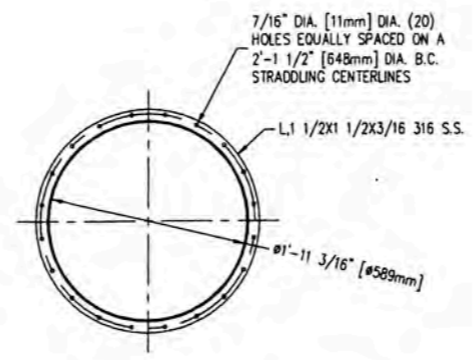
ID-1
WEIGHT: 1244# [564kg]



ID-2
WEIGHT: 231# [105kg]

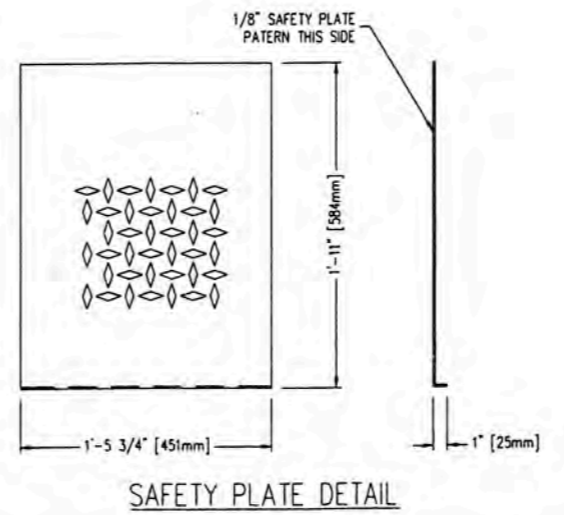
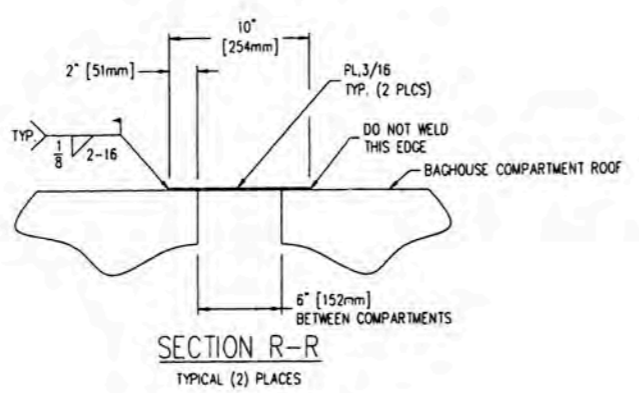
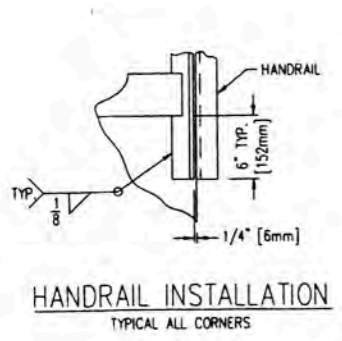
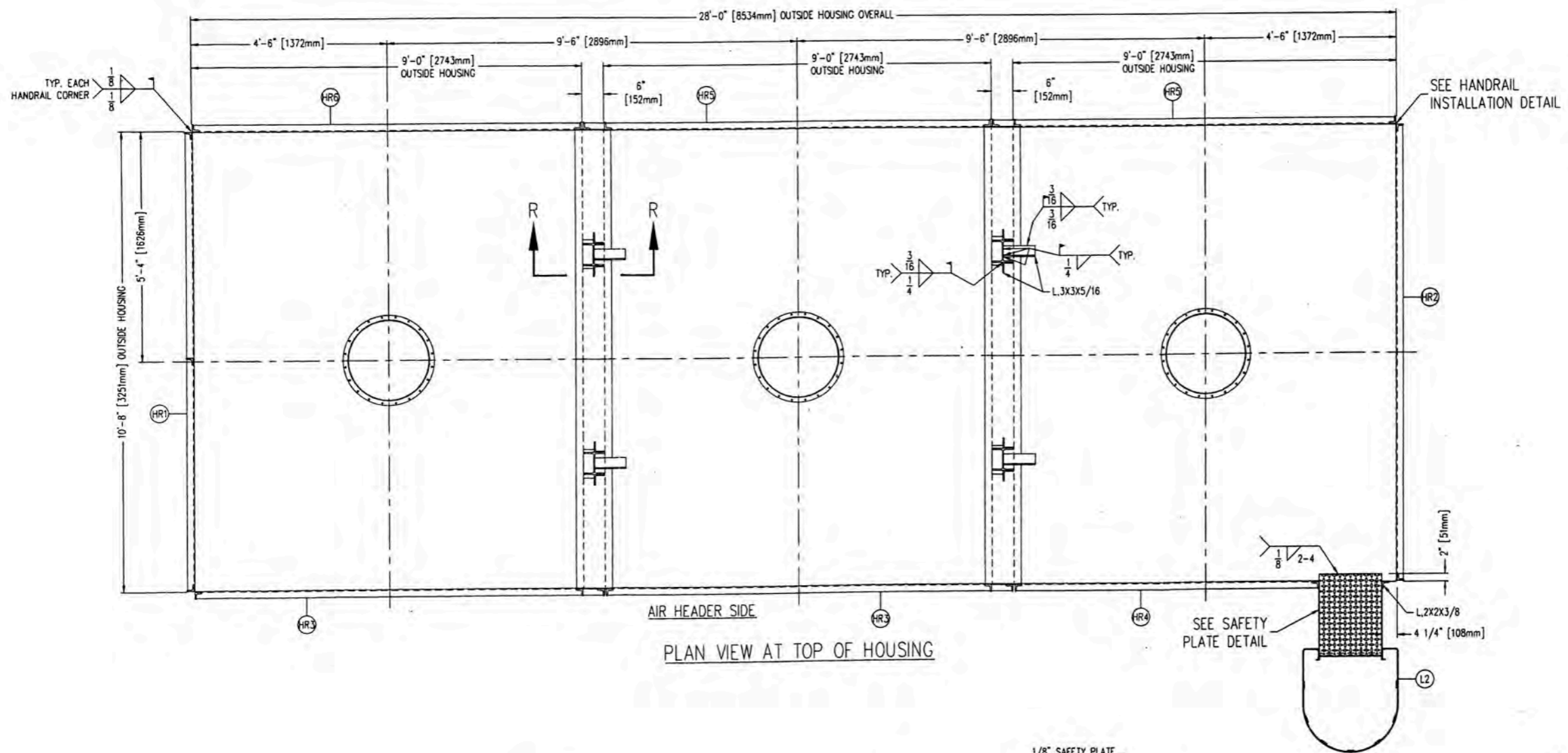


FLANGE -B-
WEIGHT: 26# [12kg]

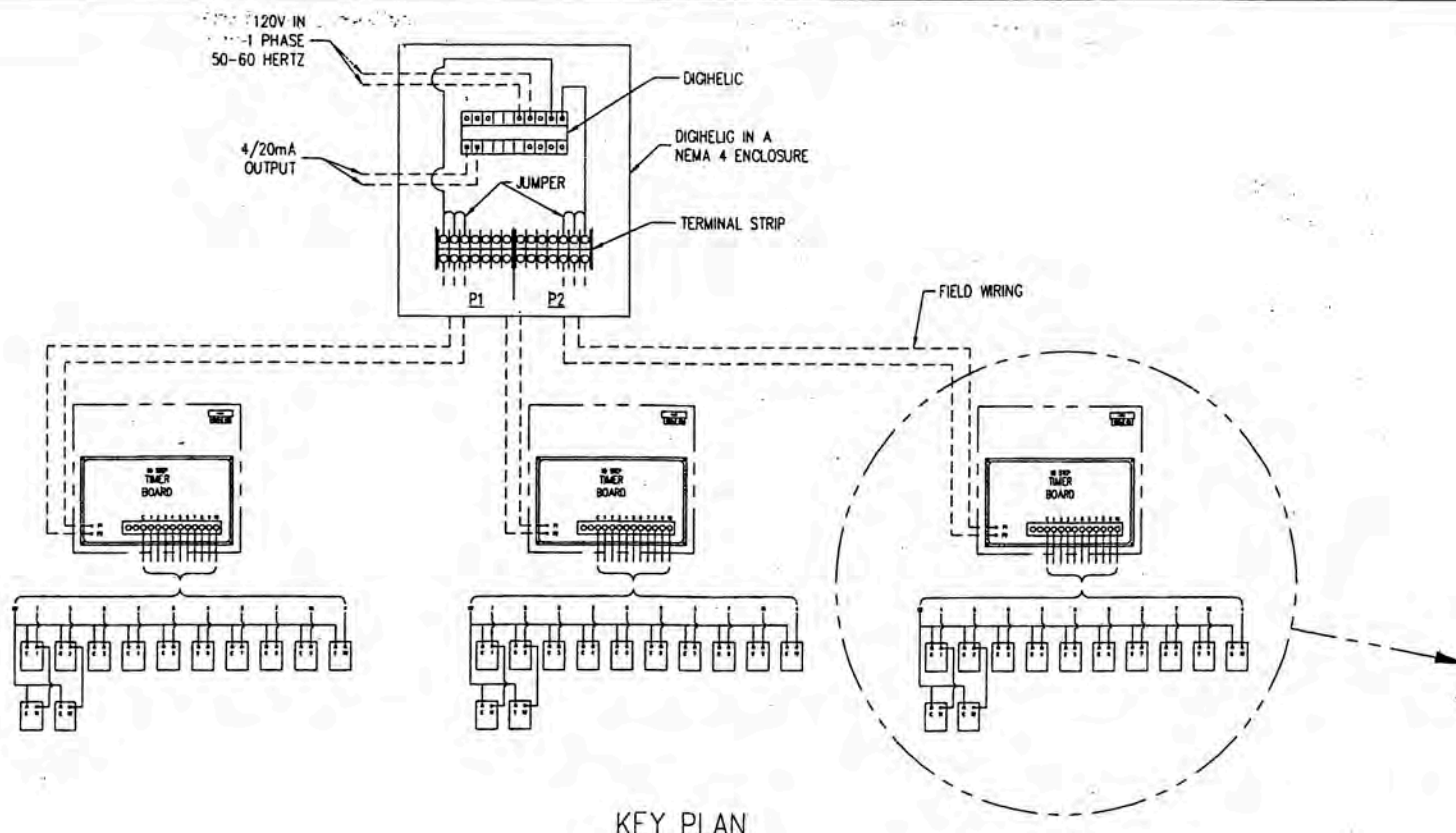


FLANGE -A-
WEIGHT: 11# [5kg]

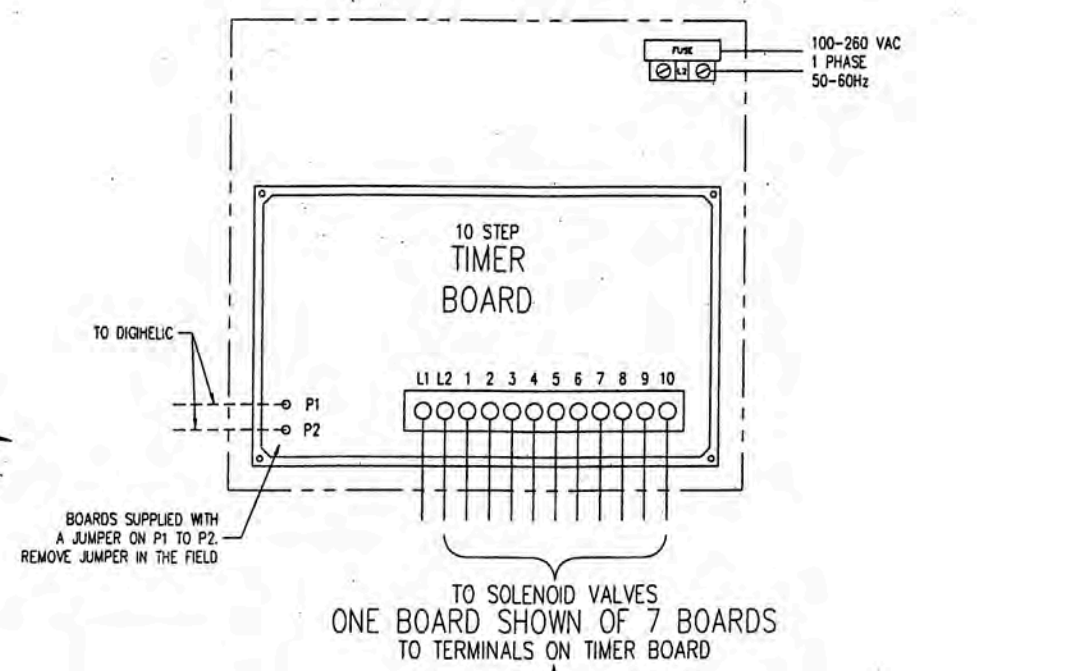
CUSTOMER DOE RUN PERU S.A. LOCATION LA OROYA, PERU CONTRACT DESCRIPTION ARSENIC MON. BH CONTRACT NO. 65383 PROJECT NO. POPRY-2235 SHEET NO. 171997 DRAWN BY DOOPER-4032	GE Energy 8000 East 43rd Street Denver, CO, USA 80231 PHONE: +866-399-0400 FAX: +866-353-1873 SALES: +866-451-2222	PULSE-JET BAGHOUSE INLET DUCT DETAILS SHEET NO. 210924	DRAWN BY JAS CHECKED BY JAS ORDERED BY ERJ APPROVED BY ERJ SCALE N.T.S. DATE 5-4-06 DATE 5-4-06 DATE 5-5-06 DATE 5-5-06 SHEET 14 OF 24
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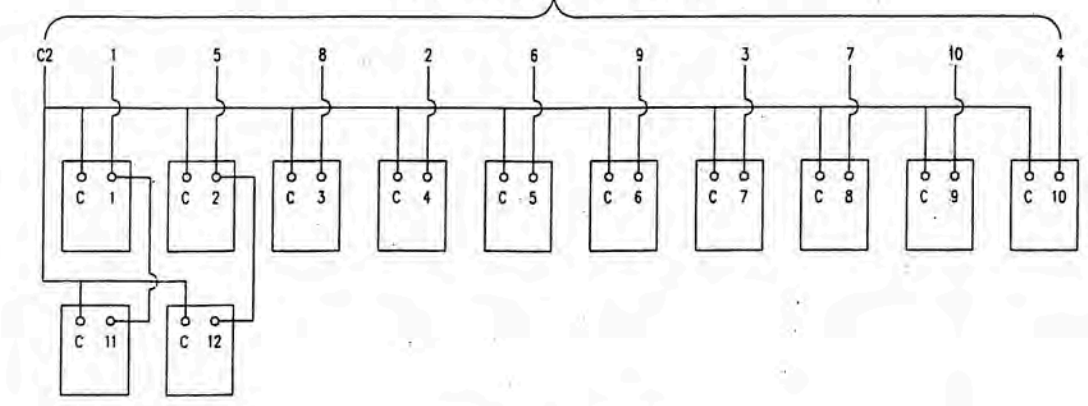
CUSTOMER: DOE RUN PERU S.A. LOCATION: LA OROYA, PERU EQUIPMENT SUPPLIER: ARSENAL MOY BH EQUIPMENT ID NO.: 85383 GE ENERGY P.O. NO.: 171997 GE ENERGY PROJECT NO.: DOEPR-2235 GE ENERGY PROJECT NO.: DOEPR-1032	GE Energy 8800 East 43rd Street Denver, CO, USA, 80231 PHONE: 303-756-8400 FAX: 303-756-1073 SALES: 303-756-2222	PULSE-JET BAGHOUSE CUSTOMER FABRICATION ROOFTOP ACCESS DETAILS	DRAWN BY: JAS CHECKED BY: JAS DESIGNED BY: ERJ APPROVED BY: ERJ DATE: 5-4-06 DATE: 5-4-06 DATE: 5-5-06 DATE: 5-5-06 SCALE: N.T.S. SIZE: D
THIS DRAWING AND THE INFORMATION CONTAINED HEREIN IS CONFIDENTIAL AND THE PROPERTY OF GE ENERGY. NO PART OF THIS DRAWING IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT EXPRESS WRITTEN PERMISSION OF GE ENERGY.		TOLERANCES UNLESS OTHERWISE SPECIFIED: GENERAL FABRICATION ±1/16" (1.5mm) MILL FINISH ±1/32" (0.75mm) & EXCEPT AS NOTED.	SHEET NO. 21 OF 24 210924



KEY PLAN



TO SOLENOID VALVES
ONE BOARD SHOWN OF 7 BOARDS
TO TERMINALS ON TIMER BOARD



SOLENOID VALVES
FOR WIRING SYSTEMS WITH
(18) SOLENOID VALVES

FIELD WIRING NOTE:

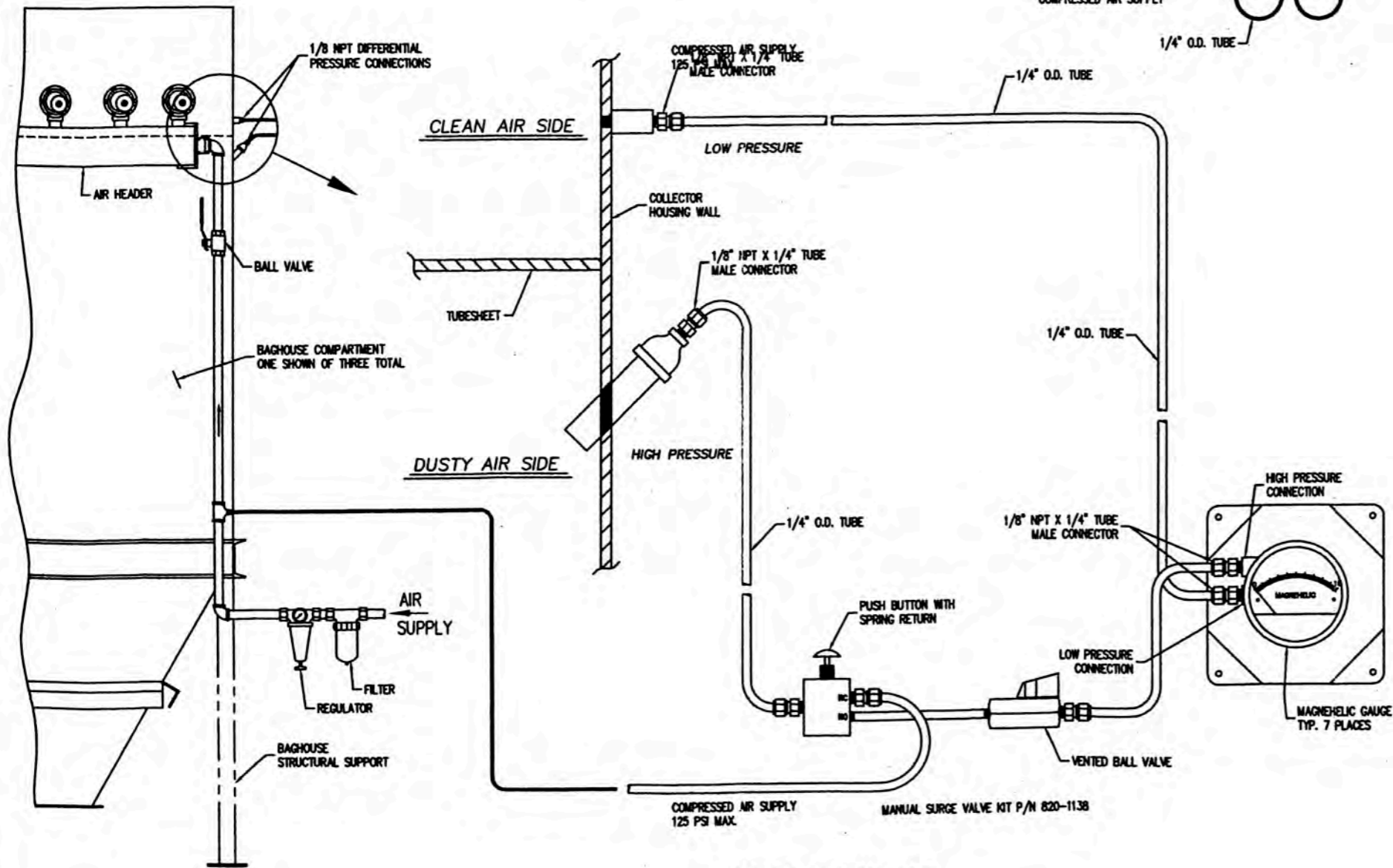
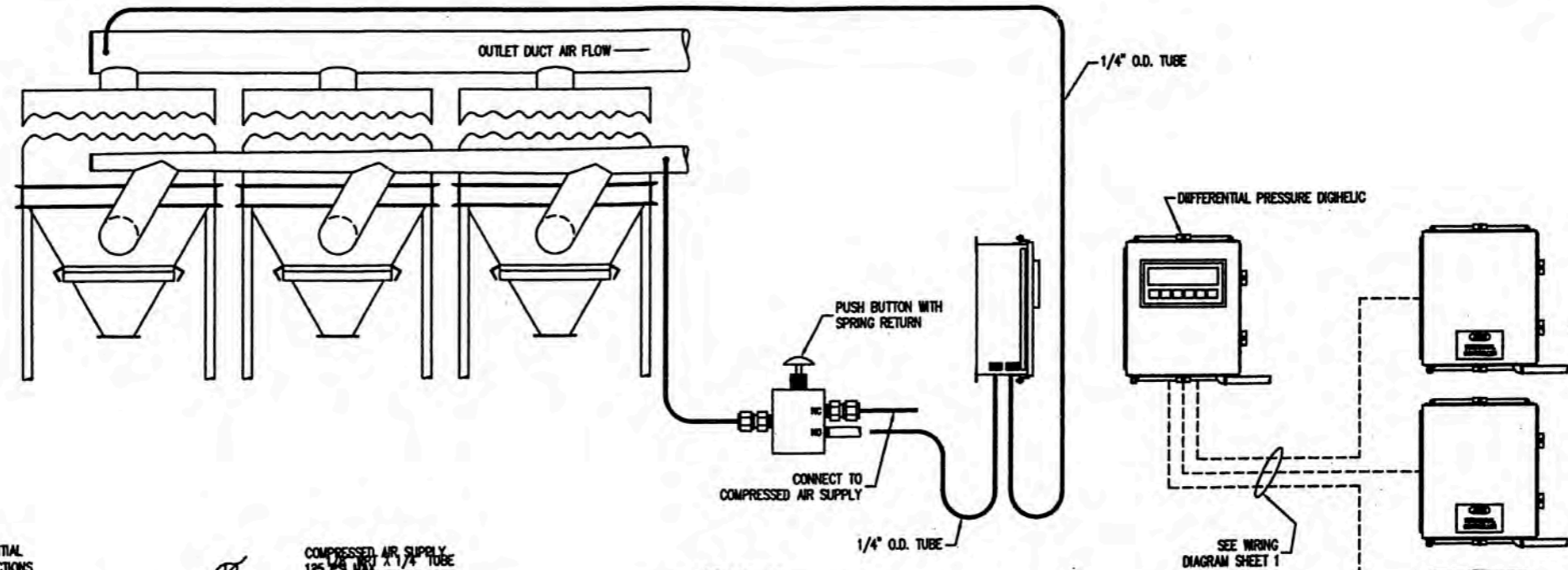
1. SEQUENTIAL CONTROLLER:
LAST SOLENOID OUTPUT SHOULD BE PROGRAMMED AS 10.
2. SOLENOID NUMBERS SHOWN ON DIAGRAM CORRESPOND TO PULSE VALVE NUMBERS SHOWN ON GENERAL ARRANGEMENT INSTALLATION DRAWING. CONNECT THE MAXIMUM NUMBER OF SOLENOIDS PER BAGHOUSE.
3. POWER SUPPLY TO THIS SEQUENTIAL CONTROLLER MUST BE INDEPENDENT AND ISOLATED.
4. OPERATING TEMPERATURE LIMITATIONS: (WITHOUT OPTIONAL HEATER & THERMOSTAT)
TIMER BOARD: -40F TO 150F
MAGNETIC GAUGE: 20F TO 140F
DIGHELIC GAUGE: 20F TO 120F
5. CURRENT DRAW FOR EACH SOLENOID COIL: SEE CHART BELOW

COIL TYPES	VOLTS	Hz	INRUSH mA	HOLDING mA
100/110V 50/60Hz	100	50	170	103
	110	60	160	94
110/120V 50/60Hz	110	50	192	123
	120	60	180	110

STARTING UP A NEW COLLECTOR OR A COLLECTOR WITH A NEW SET OF FILTERS

1. GE RECOMMENDS THE FOLLOWING EVALUATION AND START-UP STEPS, AS A MINIMUM, BE PERFORMED:
2. VISUALLY INSPECT THE EQUIPMENT INSTALLATION FOR CONFORMANCE TO DRAWINGS.
3. VISUALLY INSPECT THE FILTERS FOR PROPER INSTALLATION.
4. CHECK EACH OF THE PULSE VALVES AND SOLENOIDS FOR PROPER OPERATION.
5. SET THE PULSE-ON-DEMAND CONTROLLER FOR ACTIVATING THE SOLENOIDS AT 0.1 SECONDS "ON TIME" AND 15 SECONDS "OFF TIME" BETWEEN SOLENOID FIRINGS. MAKE SURE THE "OFF TIME" IS SUFFICIENT TO ALLOW THE COMPRESSED AIR TO REACH ITS MAXIMUM VALUE AND INCREASE IT AS NEEDED TO DO THIS.
6. SET THE PULSE-ON-DEMAND CONTROLLER TO INITIATE CLEANING AT 5.25" AND STOP CLEANING AT 4.75" W.C. FOR STANDARD BAGS & BAGS WITH GE-TEX. FOR PLEATED FILTERS THE RANGE SHOULD BE 3.5" TO INITIATE CLEANING & 3.0" TO STOP.
7. CHECK THE FAN FOR PROPER OPERATION AS DETAILED IN THE FAN O & M MANUAL.
8. PERFORM A VISOLITE LEAK DETECTION TEST. THIS WILL ASSURE THERE ARE NO LEAKS BETWEEN THE DIRTY SIDE & CLEAN SIDE OF THE TUBESHEET; INCLUDING NO LEAKS THROUGH THE FILTER BAGS (ELEMENTS).
9. ADJUST THE FAN DAMPER AS NEEDED TO PROVIDE THE DESIGN AIRFLOW.
10. MONITOR THE DUST COLLECTOR DIFFERENTIAL PRESSURE ACROSS THE FILTERS DURING STARTUP TO ASSURE IT IS WITHIN THE FOLLOWING EXPECTED PARAMETERS: THE DIFFERENTIAL PRESSURE ON STARTUP WITH NEW FILTERS IS EXPECTED TO BE 0.5" W.C. TO 1" W.C., AND IT SHOULD BE ALLOWED TO RISE UNTIL IT REACHES THE DESIRED OPERATING DIFFERENTIAL PRESSURE RANGE THAT GE RECOMMENDS IN #5 ABOVE. THE PULSE-ON-DEMAND CONTROLLER WILL NOT INITIATE PULSE-JET CLEANING UNTIL THIS PRE-SET OPERATING DIFFERENTIAL PRESSURE RANGE IS REACHED, AND THE CLEANING SHOULD BE CONTROLLED ON DIFFERENTIAL PRESSURE DEMAND TO MAINTAIN THIS DESIRED RANGE.
11. AFTER THE DIFFERENTIAL PRESSURE HAS REACHED THE DESIRED OPERATING RANGE READJUST THE FAN DAMPER TO PROVIDE THE DESIGN AIRFLOW.

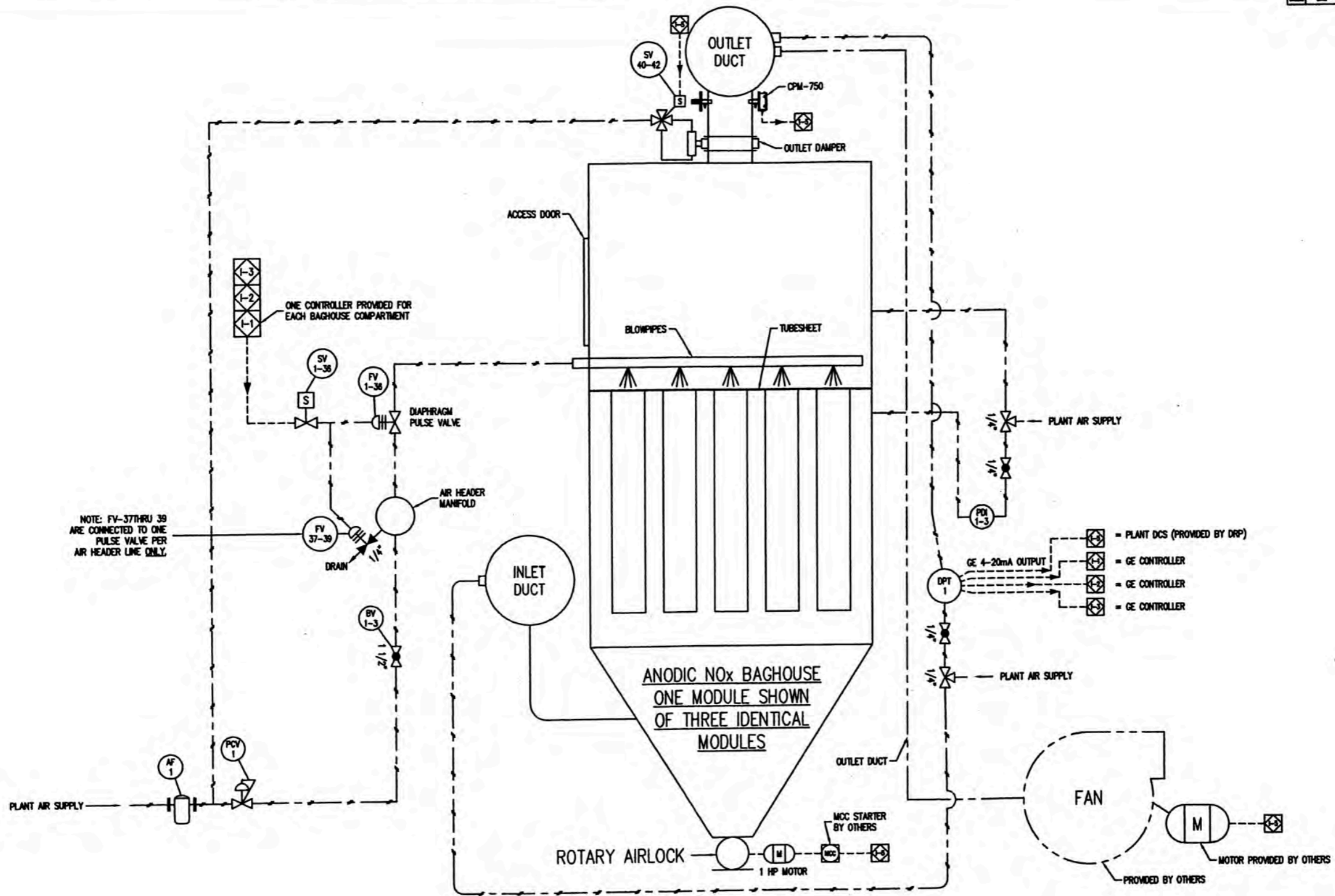
CUSTOMER: DOE RUN, PERU	GE Energy	FIELD WIRING DIAGRAM FOR 10-STEP 3-COMPARTMENT BAGHOUSE	DRAWN BY: ERJ DATE: 5-4-06
LOCATION: LA OROYA, PERU			CHECKED BY: SWE
CUSTOMER EQUIPMENT I.D.:	8000 East 83rd Street Farmers City, MO, USA 64133 PHONE: +1-816-326-5400 FAX: +1-816-326-1073 SALES: +1-800-521-2272		DRAWN BY: SWE
CUSTOMER I.D. NO.:	THIS DRAWING AND THE INFORMATION CONTAINED HEREIN IS THE PROPERTY OF GE ENERGY AND SHALL NOT BE USED FOR ANY PURPOSES WITHOUT THE WRITTEN CONSENT OF GE ENERGY. REVISED CONTRACT WITH GE ENERGY.	SCALE: N.T.S.	APPROVED BY: ERJ DATE: 5-5-06
CUSTOMER P.O. NO.:		SHIPPING DIMENSIONS:	SCALE: N.T.S.
GE ENERGY ORDER NO.:			SHEET 1 OF 2
GE ENERGY PROJECT NO.:			850-1180



SEE FIELD WIRING DIAGRAM SHEET 1 FOR CONNECTION OF CONTROLLER TO PULSE VALVE SOLENOIDS

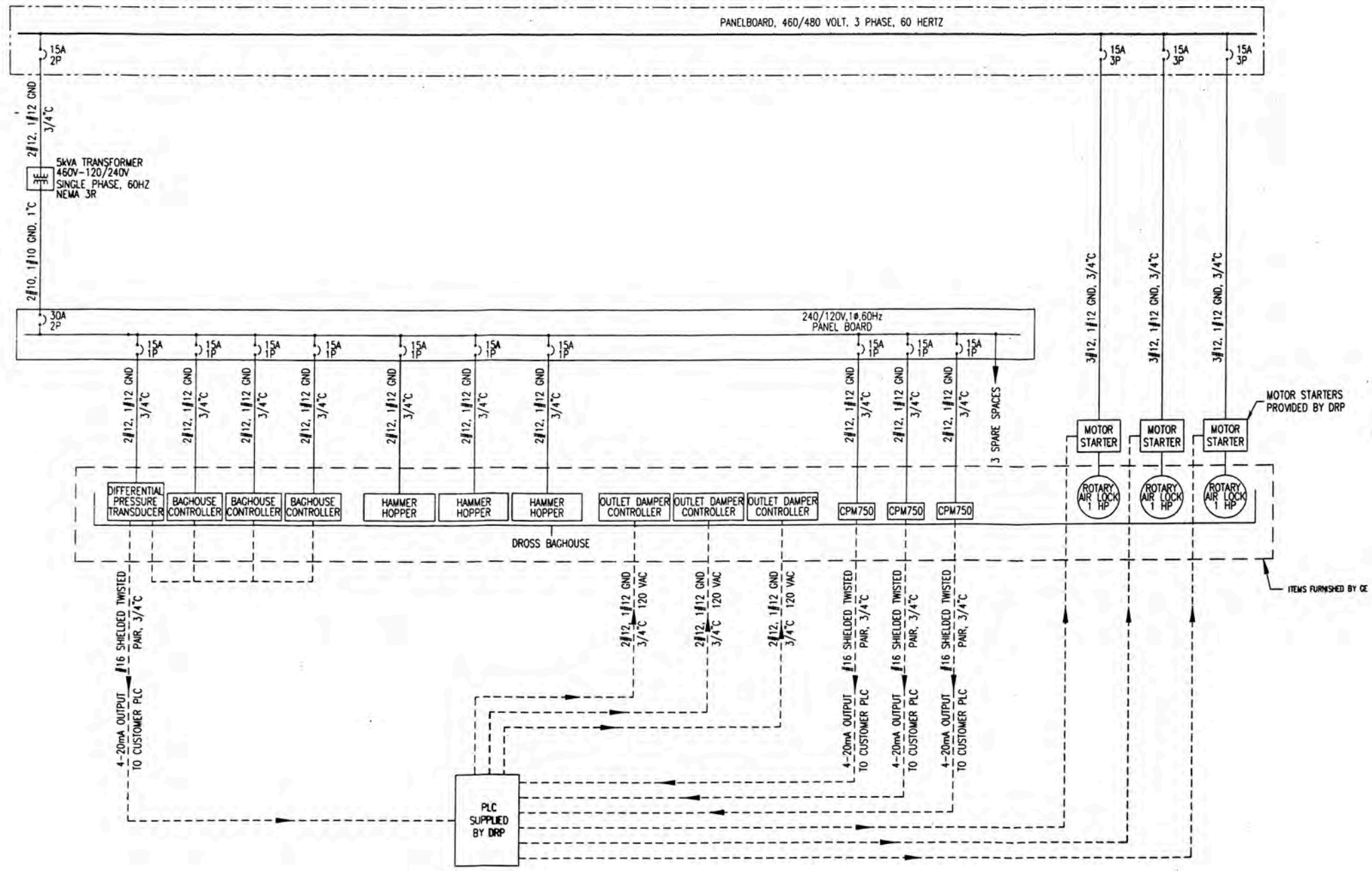
1/4" O.D. TUBING RUN
GENERAL ARRANGEMENT

CUSTOMER: DOE RUN, PERU	GE Energy	DATE: 3-10-06
LOCATION: LA OROYA	8500 East 83rd Street Kansas City, MO, USA 64113 PHONE: +1-816-295-6400 FAX: +1-816-353-1873 SALES: +1-800-527-2222	DRWN BY: MCM/c
CUSTOMER EQUIPMENT ID:		CHK: 3-17-06
CUSTOMER ID NO.:		DESIGNED BY: ERJ
CUSTOMER P.O. NO.:		DATE: 3-17-06
GE ENERGY ORDER NO.:		APPROVED BY: ERJ
GE ENERGY PROJECT NO.:		SCALE: N.T.S.
		DATE: 0
		SHT 2 OF 2
		850-1180



TAG NO.	QTY	DESCRIPTION	SYMBOLS	TAG DESCRIPTION	TAG DESCRIPTION
NF-1	1	AIR FILTER	⊙	AF	AIR FILTER
FV-1 THRU FV-36	36	PULSE VALVE DOUBLE DIAPHRAGM	⊕	SV	SOLENOID VALVE
FV-37 THRU 39	3	PULSE VALVE	⊕	SV	SOLENOID VALVE
PCV-1	1	AIR PRESSURE REGULATOR VALVE	⊕	SV	SOLENOID VALVE
PB-1 THRU PB-3	3	MAGNETIC GAUGE	⊕	SV	SOLENOID VALVE
SV-1 THRU SV-36	36	PULSE VALVE SOLENOID VALVE	⊕	SV	SOLENOID VALVE
SV-1 THRU 3	3	BALL VALVE	⊕	SV	SOLENOID VALVE
SV-40 THRU SV-42	3	OUTLET DAMPER SOLENOID VALVE	⊕	SV	SOLENOID VALVE
DPT-1	1	BIDIRECTIONAL DIFFERENTIAL PRESSURE TRANSMITTER, 4-20mA OUTPUT	⊕	SV	SOLENOID VALVE

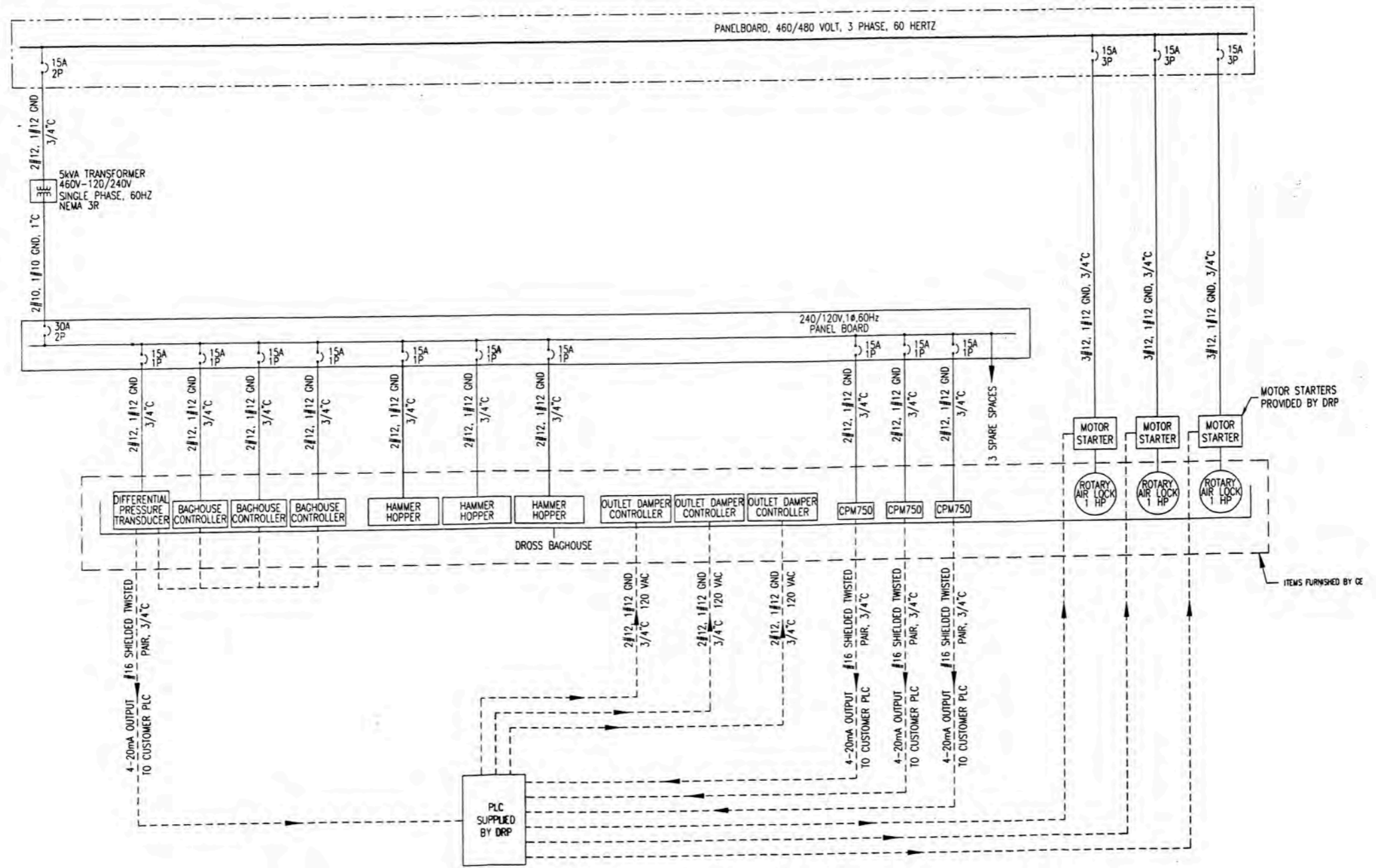
DOE INH PERU S.A. LA OROYA, JAMB, PERU ANODIC NO _x BAGHOUSE PROJECT FILE NO. 85283 PROJECT NO. 177917 DRAWING NO. DCEPER-8532	GE Energy 5000 West 43rd Street Denver, CO 80236 PHONE 303-250-0900 FAX 303-250-0923 SALES 303-250-2222	GENERAL ARRANGEMENT DRAWING PIPING & INSTRUMENTATION DIAGRAM ANODIC NO_x PROCESS BAGHOUSE	DRAWN BY ERJ CHECKED BY ERJ APPROVED BY ERJ DATE 5-3-08 SCALE N.T.S. SHEET 1 OF 1 850-1181
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PLC SUPPLIED BY DRP

NOTE:
 1. TRANSFORMERS, ALL WIRING, PANEL BOARDS AND MOTOR STARTERS ARE FURNISHED BY CUSTOMER.
 2. * CABLES ARE RATED FOR 5KV, ALL OTHER WIRING SHOWN IS RATED FOR 600V.

CUSTOMER: DOE RUN, PERU S.A. LOCATION: LA OROYA, PERU EQUIPMENT NO.: ANODIC HOX BAGHOUSE GE ORDER NO.: 171997 GE PROJECT NO.: DUEPER-1032	<p>2820 East 83rd Street Kansas City, MO, USA 64133 PHONE: +01-816-298-8400 FAX: +01-816-298-1873 SALES: +01-816-222-2222</p>	<p align="center">SINGLE LINE WIRING DIAGRAM</p>	DRAWN BY: ERJ CHECKED BY: ERJ APPROVED BY: ERJ DATE: 5-5-06 SCALE: N.T.S. SHEET: 1 OF 1
THIS DRAWING AND THE INFORMATION CONTAINED HEREIN IS THE PROPERTY OF GE ENERGY AND MAY BE USED FOR ANY PURPOSES WITHOUT WRITTEN EXPRESS AUTHORITY EXCEPT AS SPECIFIED IN THE CONTRACT WITH GE ENERGY.		TYPING: BACHMANN	850-1182



NOTE:
 1. TRANSFORMERS, ALL WIRING, PANEL BOARDS AND MOTOR STARTERS ARE FURNISHED BY CUSTOMER.
 2. * CABLES ARE RATED FOR 5KV, ALL OTHER WIRING SHOWN IS RATED FOR 600V.

CUSTOMER: DOE RUM, PERU S.A. LOCATION: LA OROYA, PERU ORDERED EQUIPMENT: ANODOC MDR BAGHOUSE CUSTOMER ID NO: 65382 ORDERED P.O. NO: POPRY-2235 GE ENERGY ORDER NO: 171997 GE ENERGY PROJECT NO: DOEPER-1032	GE Energy 8000 East 53rd Street Denver City, CO, USA, 80231 PHONE: +1-303-755-8400 FAX: +1-303-755-1873 SALES: +1-800-521-2222	SINGLE LINE WIRING DIAGRAM		DRAWN BY: ERJ DATE: 5-5-06
		CHECKED BY: ERJ DATE: 5-5-06		
		APPROVED BY: ERJ TITLE: N.T.S.	SHEET: 1 OF 1	
		THIS DRAWING AND THE INFORMATION CONTAINED HEREIN IS THE PROPERTY OF GE ENERGY AND IS NOT TO BE USED FOR ANY PURPOSES WHATSOEVER EXCEPT THOSE EXPRESSLY AUTHORIZED BY GE ENERGY.	SHIPPING INSTRUCTIONS:	850-1182

PLANTA
TOSTADORES DE COBRE

PLANTA DE ARSENICO

NUEVOS BAG HOUSE

PLANTA DE ANTIMONIO

SUB ESTACION

PLANTA

PRELIMINAR
NO PARA CONSTRUCCION SOLO REVISION

REV.	FECHA	DESCRIPCION DE REVISION	REVISADO POR	APROBADO POR	PLANO DE REFERENCIA	DESCRIPCION	DISEÑADO POR:	FECHA:	ADVERTENCIA		
					PRE 1-342-00-7-001	DISTRIBUCION EN 460 V-DIAGRAMA UNIFILAR	J. BOHORQUEZ	MAYO-06	ESTE PLANO Y LA INFORMACION CONTENIDA ES PROPIEDAD INTELLECTUAL DE DOE RUN/PERU S.R.L. SU REPRODUCCION, DIFUSION, COMERCIALIZACION O USO DE CUALQUIER TIPO, DEBERA TENER UNA AUTORIZACION ESCRITA, EMITIDA POR DRP S.R.L.		
						GEOMASTER SAC.	MAYO-06				
						C. RODRIGUEZ	MAYO-06				
						A. QUISPE	FECHA:				
							DOE RUN PERU <i>La Oroya Division</i>		F. Y.R.-PLANTA DE SUB PRODUCTOS PLANTA DE ARSENICO-NUEVO BAG HOUSE UBICACION DE SUB ESTACION ARREGLO GENERAL		
							GERENCIA DE PROYECTOS Y OBRAS		ESCALA: 1/100	NUMERO DE PLANO: PRE 1-342-00-7-004	REV.

ARCH.

PLANO DE REFERENCIA	DESCRIPCION
PRE 1-342-00-7002	RECORRIDO DE ELECTRODUCTOS
X	X

DESIGNED BY: J. BOHORQUEZ
 DRAWN BY: R.L.R.
 CHECKED BY: C. RODRIGUEZ
 APPROVED BY: A. QUISPE

DATE: MAYO-06
 DATE: MAYO-06
 DATE: MAYO-06

DOE RUN PERU
 La Orroya Division

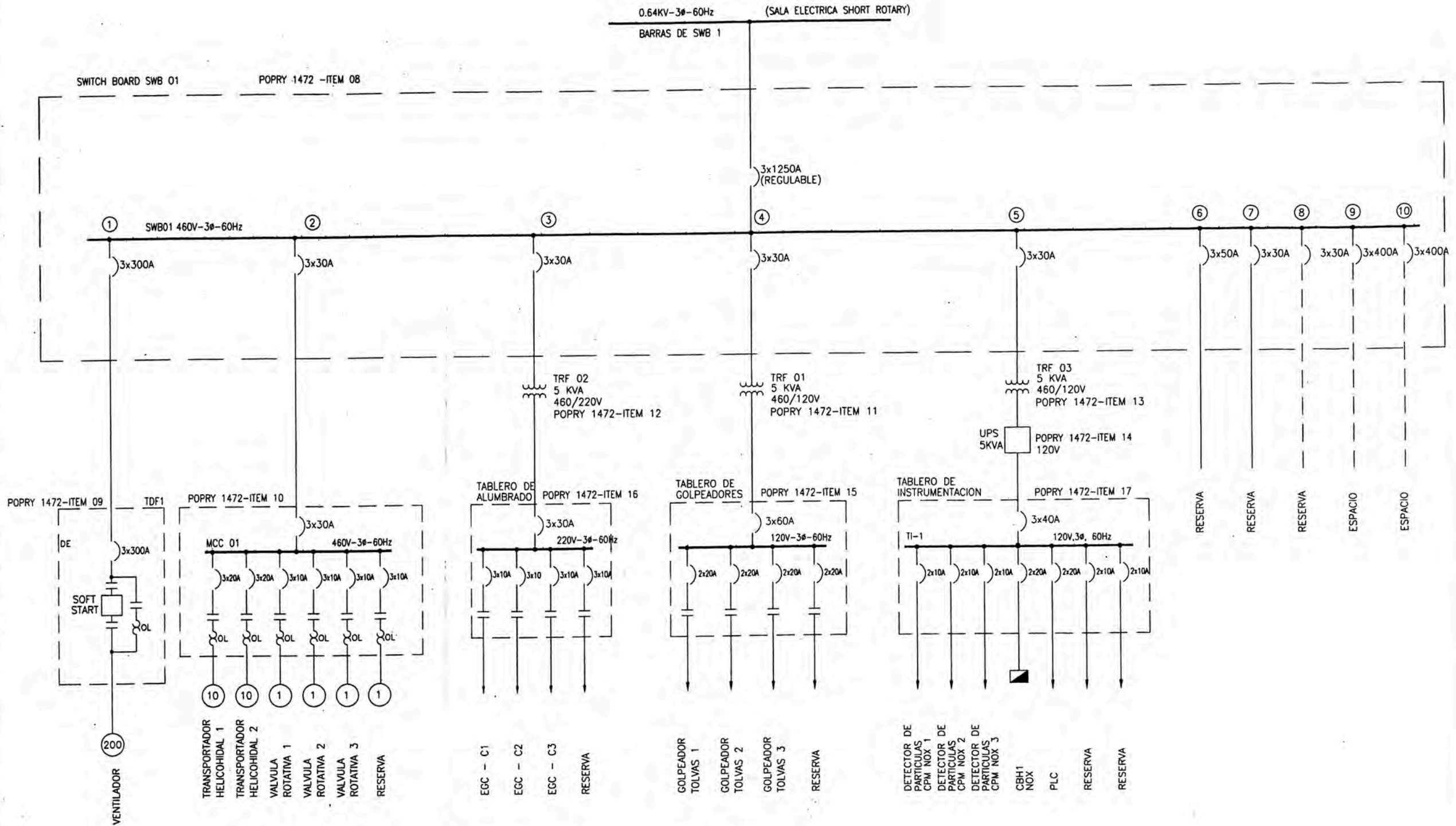
PROJECT DIVISION

F. Y R.-FUNDICION DE COBRE Y PLOMO
 PTAS. DE SUB PRODUCTOS-PTA. DE ARSENICO- NUAVO BAG HOUSE
 DISTRIBUCION ELECTRICA EN 460 V
 DIAGRAMA UNIFILAR

SCALE: S/E

DRAWING NUMBER: PRE 1-342-00-7-001

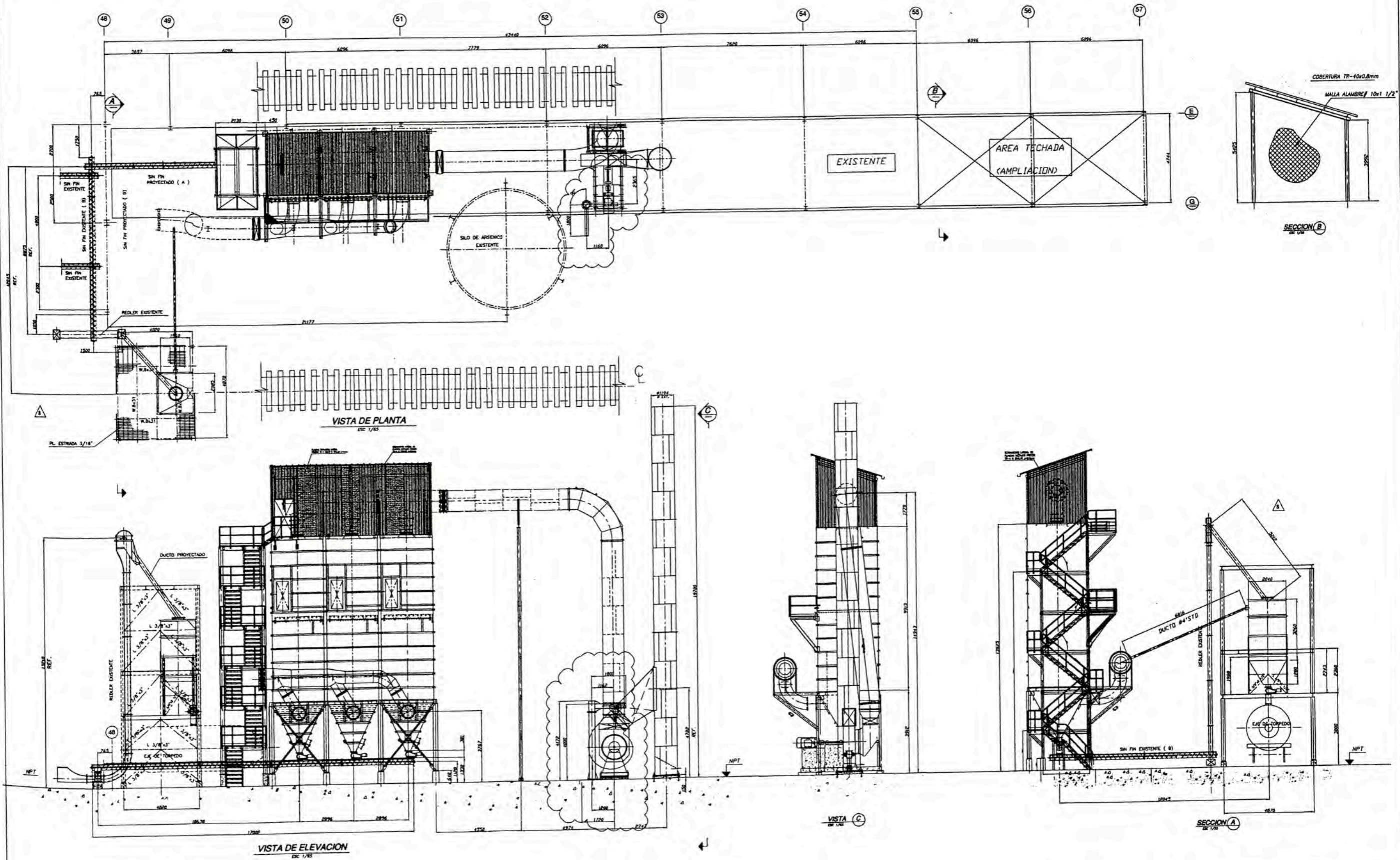
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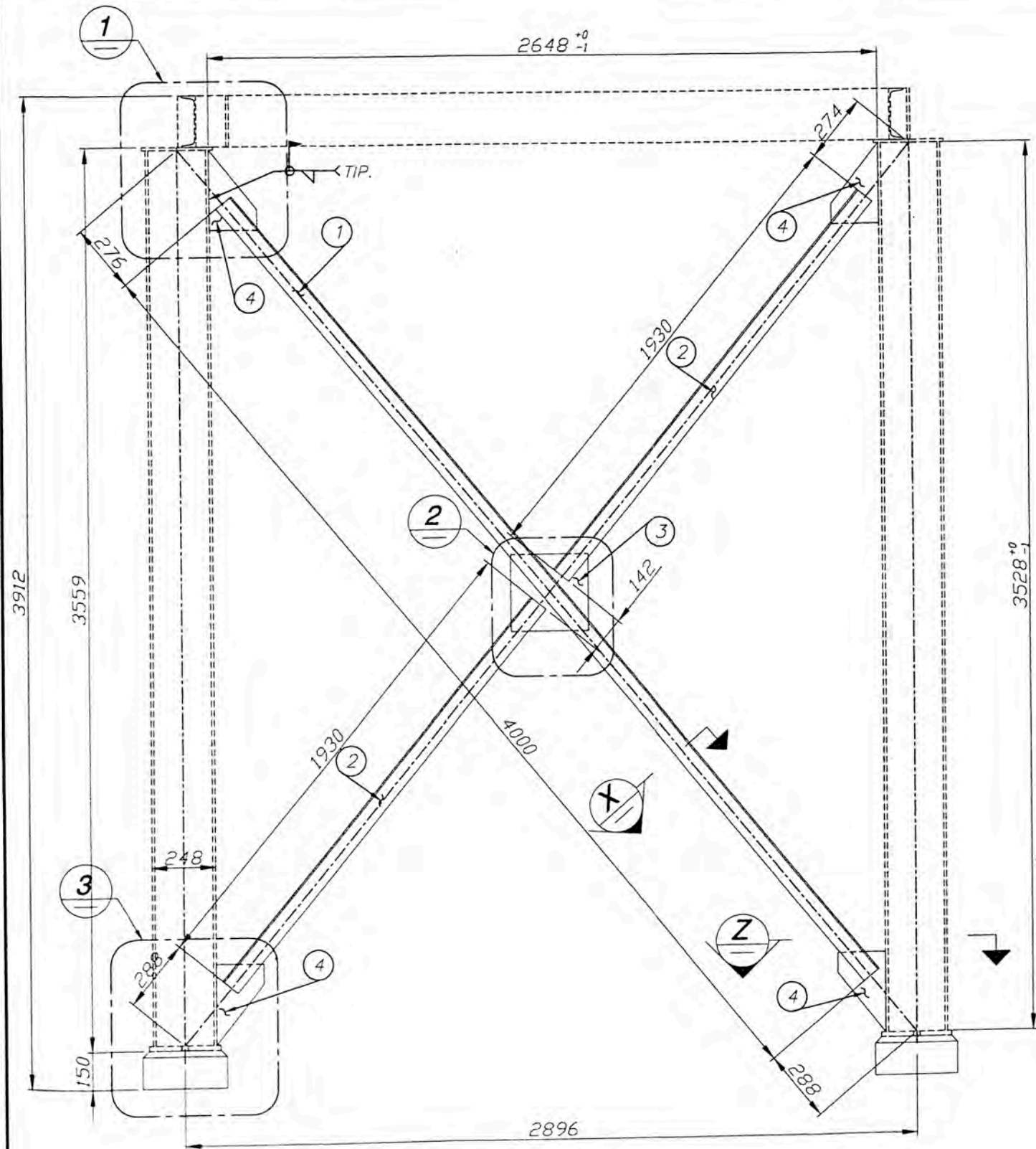
NOTA:
 1.- LOS ACTUADORES DE COMPUERTA SERAN ACTIVADOS DESDE EL PLC (CONTACTO SECO)

10 LAS POTENCIAS ESTAN EN HP

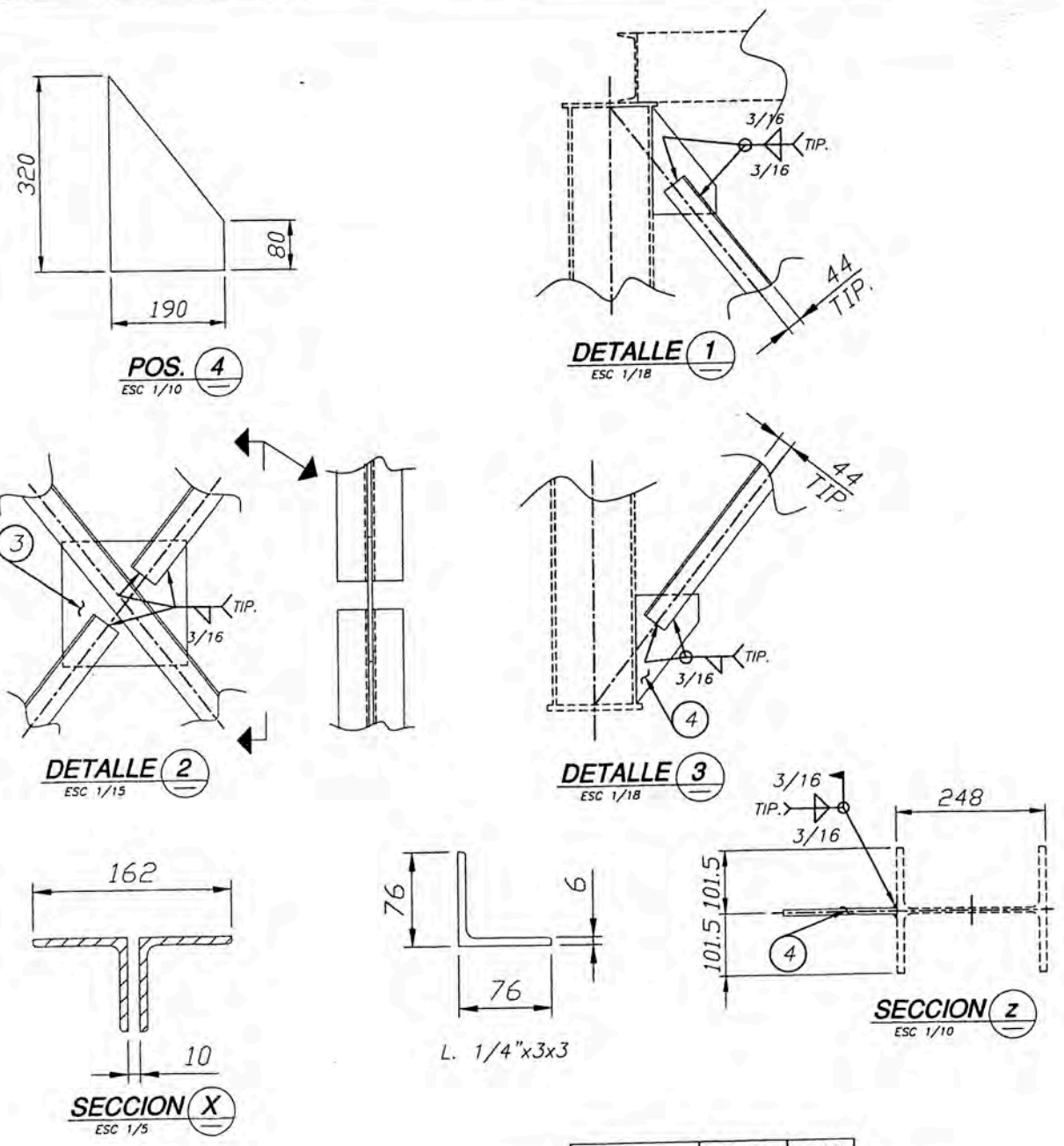
AFE-014-05



DISERO : ARMANDO VEGA	 UNIVERSIDAD NACIONAL DE INGENIERIA	TITULO
DIBUJO : ARMANDO VEGA		COLECTOR DE POLVO
REVISO : ARMANDO VEGA	FACULTAD DE INGENIERIA MECANICA	ARREGLO GENERAL
ESCALA : INDICADA		PLANO N°:
FECHA : 05/09/13		GA-001



MK-P39713
CANT.04 CONJ.
 ESC 1/20



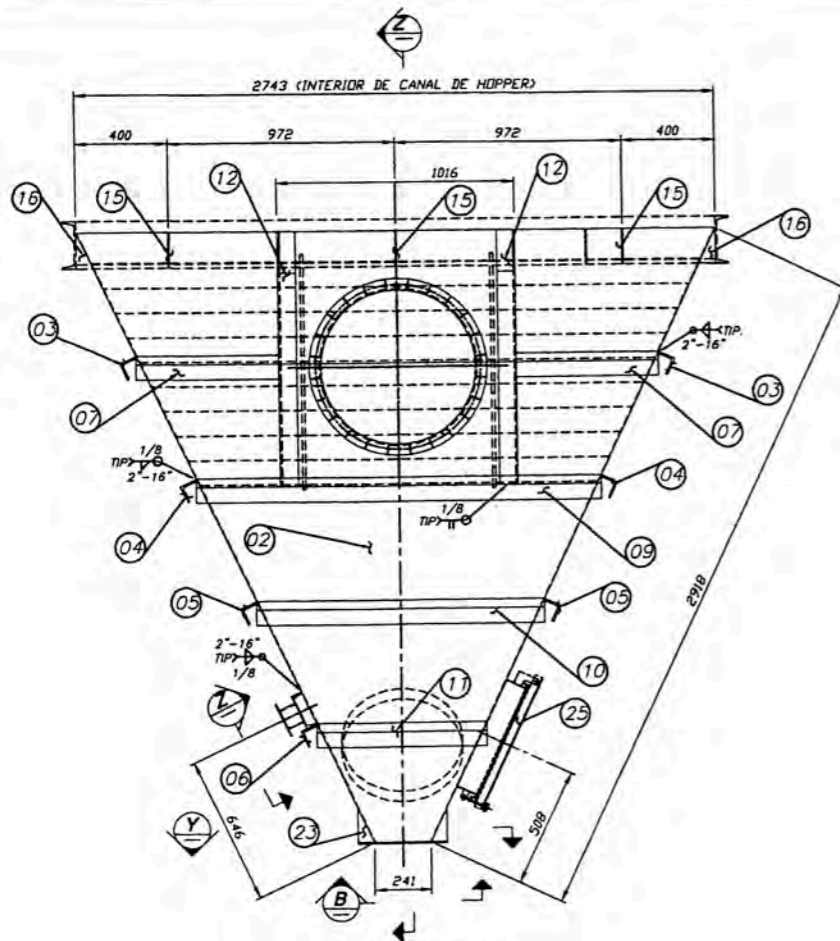
POS.	DESCRIPCION	LONG.	CANT.	UNIT. PESO (Kg)	TOTAL	AREA (m ²)	MATERIAL	OBSERVACION
4	PL. 3/8"x190	320	04	4.49	17.94	0.48	A-36	
3	PL. 3/8"x300	310	01	7.18	7.18	0.19	A-36	
2	L. 1/4"x3"x3"	1930	04	14.07	28.15	1.16	A-36	
1	L. 1/4"x3"x3"	4000	02	29.27	58.34	2.40	A-36	
TOTAL					111.61	4.23		
TOTAL					446.44	16.92		

MK- P3 9713. CANT. 04 CONJ.

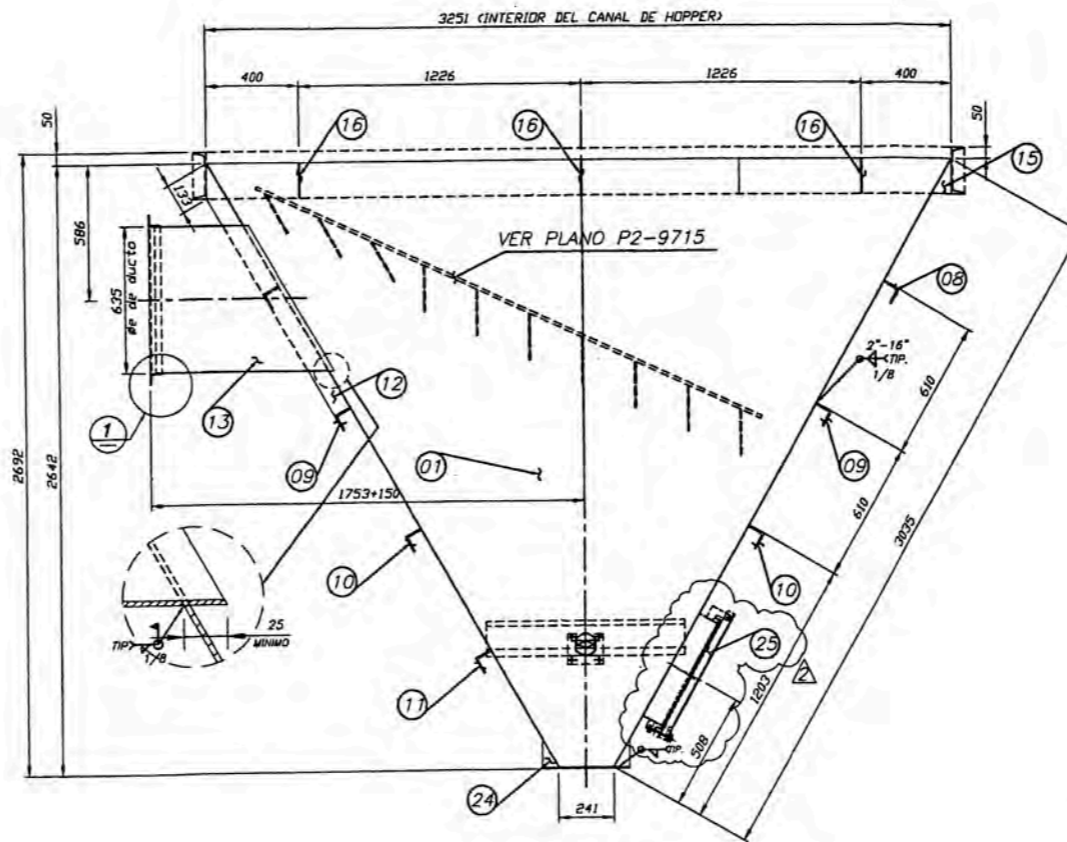
DISEÑO : ARMANDO VEGA
 DIBUJO : ARMANDO VEGA
 REVISO : ARMANDO VEGA
 ESCALA : INDICADO
 FECHA : 06/09/13

UNIVERSIDAD NACIONAL DE INGENIERIA
FACULTAD DE INGENIERIA MECANICA

TITULO
 COLECTOR DE POLVO
 ARRIOSTRE COLUMNA SOPORTE
 PLANO N°: GA-007

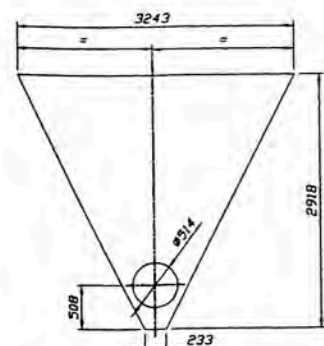


MK- P1 9714
ESC 1/12

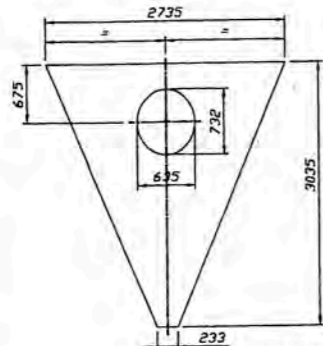


SECCION Z
ESC 1/12

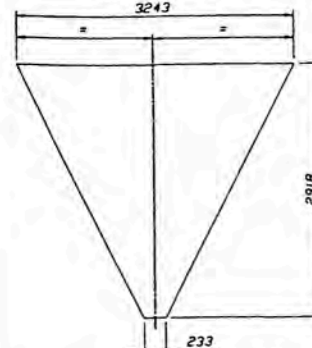
POS.	DESCRIPCION	LONG.	CANT.	UNIT.	TOTAL PESO (Kg)	AREA (m ²)	MATERIAL	OBSERVACION
MK- P1 9714. CANT. 03 CONJ.								
01	PL 4mm x2918	3243	02	353.91	707.83		INOX.316	
02	PL 4mm x2735	3035	02	310.25	620.5		INOX.316	
03	L 3"x3/16"	2644	02	19.28	38.56	1.59	A-36	
04	L 3"x3/16"	2044	02	14.91	29.81	1.23	A-36	
05	L 3"x3/16"	1443	02	10.52	21.05	0.87	A-36	
06	L 3"x3/16"	840	01	6.13	6.13	0.25	A-36	
07	L 3"x3/16"	610	02	4.67	9.33	0.33	A-36	
08	L 3"x3/16"	2238	01	16.32	32.64	1.34	A-36	
09	L 3"x3/16"	1735	02	12.64	25.30	1.04	A-36	
10	L 3"x3/16"	1233	02	8.99	17.98	0.48	A-36	
11	L 3"x3/16"	730	01	5.32	10.65	0.44	A-36	
12	L 3"x3/16"	1223	02	8.92	17.84	0.73	A-36	
13	PL 3mm x795	1986	01	46.85	46.85		INOX. 316	
14	L 2"x2/16"	2105	01	7.64	7.64		A-36	
15	PL 1/4"x87	153	06	8.47	38.83	1.56	A-36	
16	PL 1/4"x72	153	06	5.48	32.85	1.56	A-36	
17	C. 6x8.2	864	01	10.56	10.56	0.40	A-36	
18	TUB. #3"x SCH 80 x 146	01	1.85	1.85	0.04		A-36	
19	PL 1/4"x305	305	01	4.83	4.83	0.19	A-36	
20	PL 3/8"x48	337	02	1.20	2.39	0.06	A-36	
21	PL 3/8"x48	241	02	8.82	1.64	0.04	A-36	
22	PL 5/16"x110	120	16	0.97	15.55	0.42	A-36	PL DOBLADA
23	PL 3/8"x70	146	04	0.75	2.99	2.00	A-36	PL DOBLADA
24	PL 3/8"x70	122	04	5.98	23.93	0.84	A-36	PL DOBLADA
25	MAN HOLE		01					P2-9733
				TOTALES	1726.05	15.21		



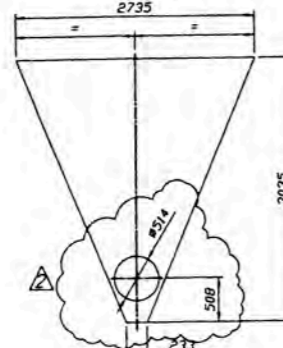
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ESC 1/35



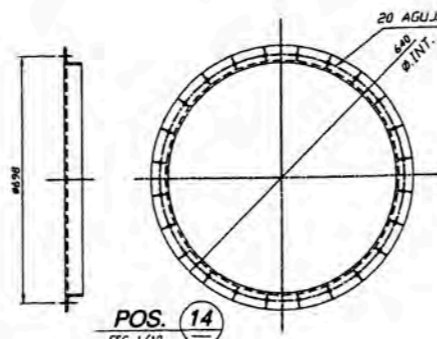
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ESC 1/35



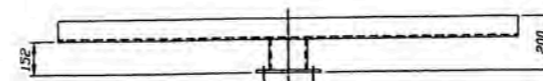
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ESC 1/35



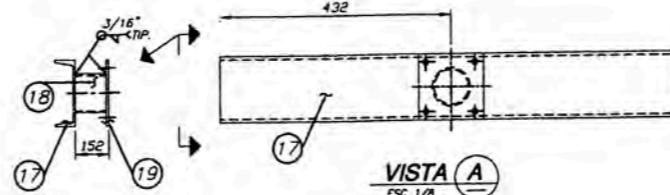
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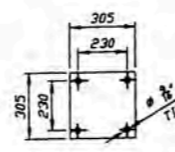
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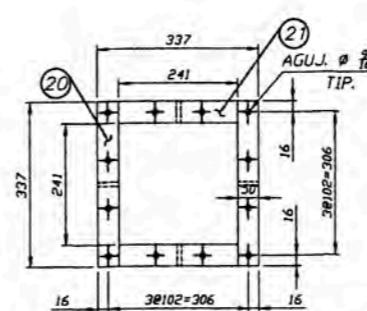
POS. 15
ESC 1/8



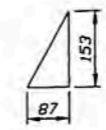
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ESC 1/8



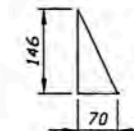
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ESC 1/8



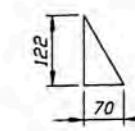
VISTA B
ESC 1/8



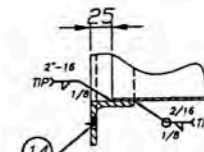
POS. 22
ESC 1/6



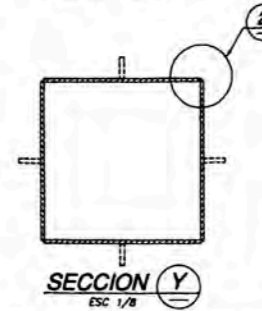
POS. 23
ESC 1/8



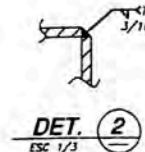
POS. 24
ESC 1/8



DETALLE 1
ESC 1/5



SECCION Y
ESC 1/8

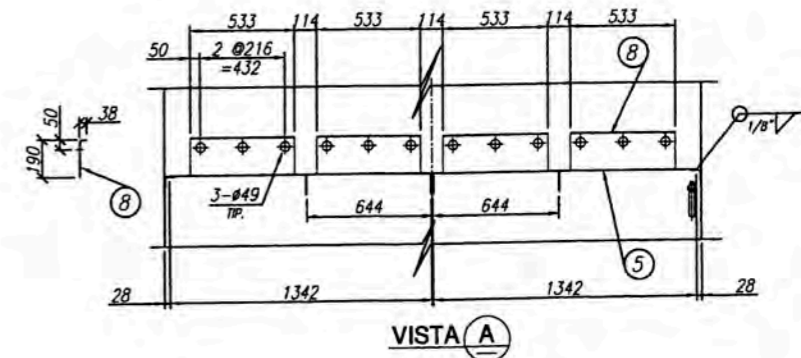
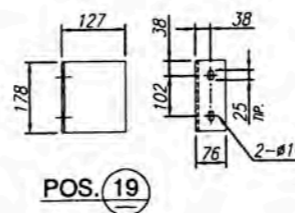
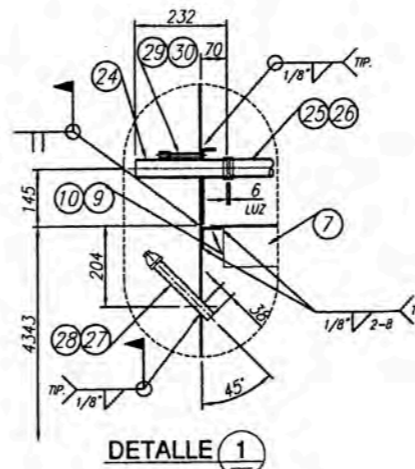
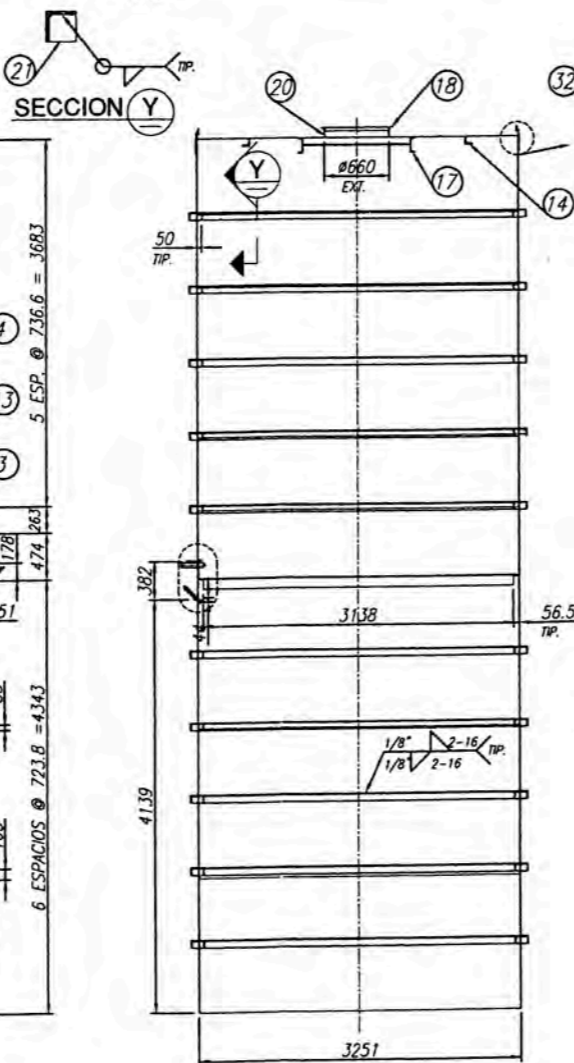
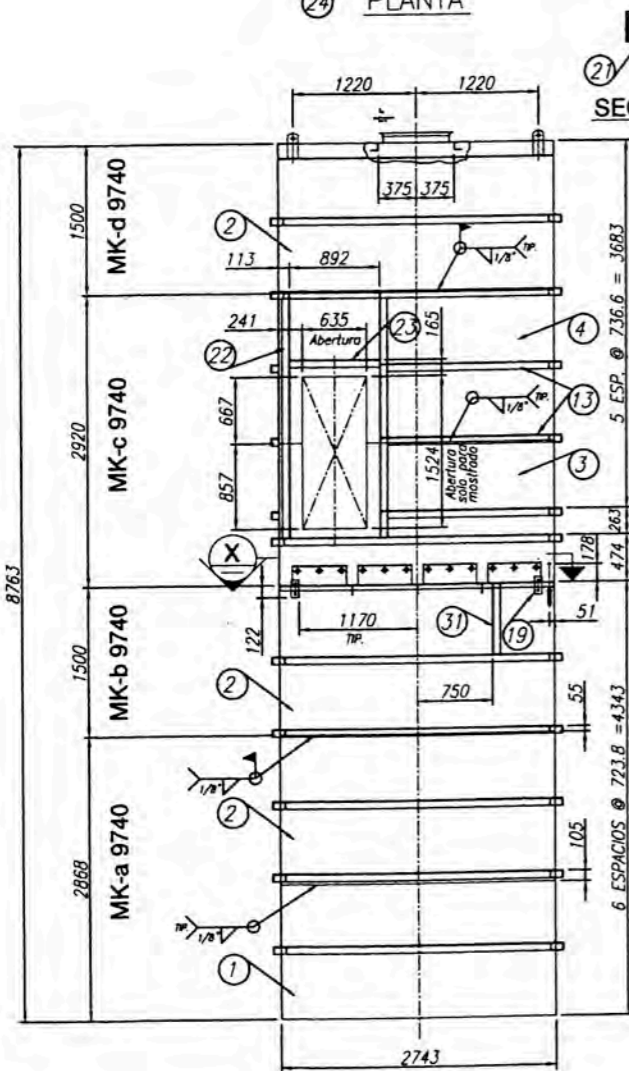
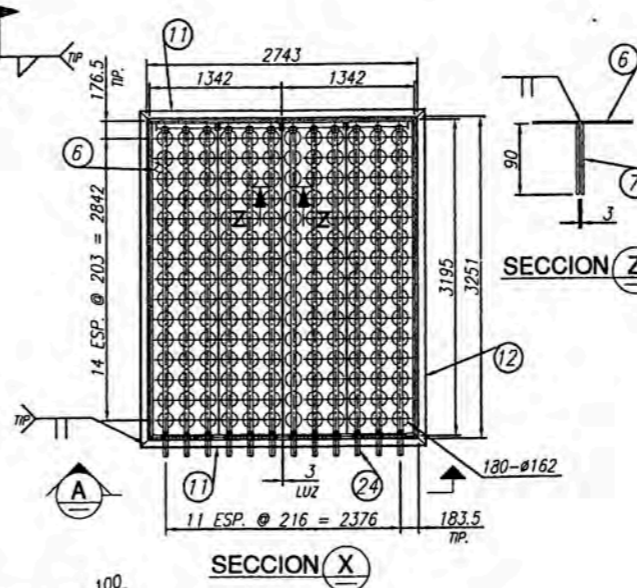
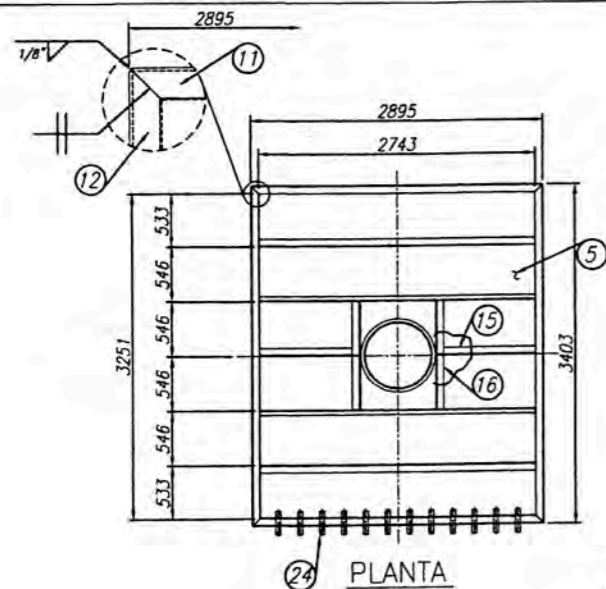


DET. 2
ESC 1/3

DISERO : ARMANDO VEGA
DIBUJO : ARMANDO VEGA
REVISO : ARMANDO VEGA
ESCALA : INDICADO
FECHA : 06/09/13

UNIVERSIDAD NACIONAL DE INGENIERIA
FACULTAD DE INGENIERIA MECANICA

TITULO
COLECTOR DE POLVO
TOLVA INOX.
PLANO N°: GA-009



LISTA DE MATERIALES

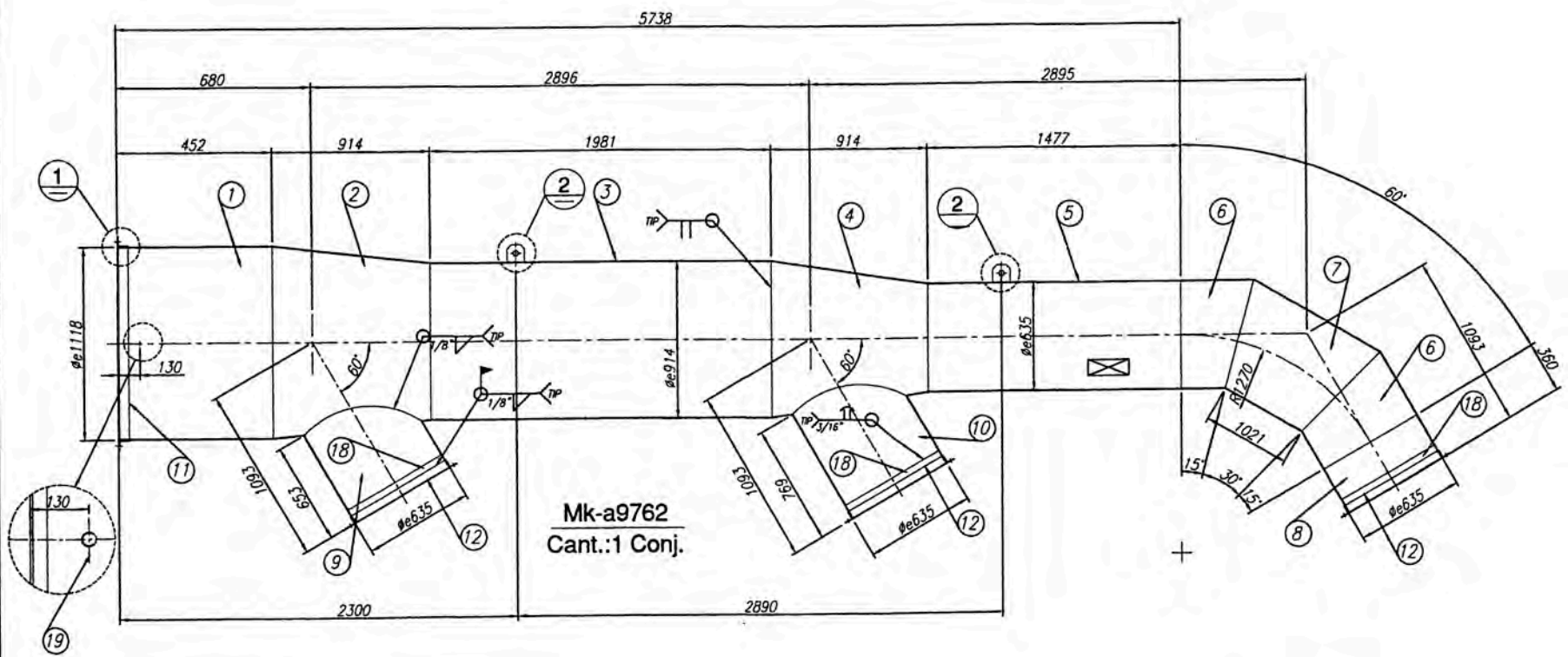
ITEM	CANT.	DESCRIPCION	LONG.	PESO (Kg)		AREA (m ²)	MATERIAL	OBSERVACION
				UNIT.	TOTAL			
1	2	Plancha 1/8"x 1343	5982	200.37	400.74	32.16	A-36	
2	6	Plancha 1/8"x 1500	5982	223.79	249.48	107.77		
3	2	Plancha 1/8"x 1420	5982	211.86	423.73	34.01		
4	2	Plancha 1/8"x 1500	5982	223.79	447.59	35.92	A-36	
5	2	Plancha 1/8"x 2737	3245	221.33	442.66	35.53	Aisi-316	POR DOE RUN
6	2	Plancha 3/16"x 1342	3195	106.85	213.70	17.15	Aisi-316	
7	4	Plancha 3/16"x 90	3138	7.04	28.15	2.26	A-36	
8	4	L 190x38 x PL.1/4"	533	6.06	24.23	0.97	A-36	
9	2	L 2"x 2"x 1/4"	3245	17.78	35.56	1.50	Aisi-316	Plancha doblada
10	2	L 2"x 2"x 1/4"	2737	12.99	25.99	1.09	Aisi-316	Plancha doblada
11	16	L 3"x 3"x 5/16"	2879	26.28	420.49	13.90	A-36	
12	22	L 3"x 3"x 5/16"	3403	30.89	679.64	22.46		
13	2	L 3"x 3"x 5/16"	1807	16.40	32.81	1.08		
14	2	L 3"x 3"x 5/16"	2737	24.83	49.66	1.64		
15	2	L 3"x 3"x 5/16"	993	8.94	17.88	0.59		
16	2	L 3"x 3"x 5/16"	1092	9.91	18.83	0.66		
17	2	Canal 6 x 8.2#	2737	33.42	66.83	2.56		
18	1	L 1 1/2"x1 1/2" 3/16"	2192	5.82	5.82	0.33		
19	2	L 127 x 76 x 1/4"	178	1.80	3.60	0.14		Plancha doblada
20	1	Plancha 3/16"x 102	2058	7.85	7.85	0.42		
21	78	Plancha 1/4"x 68	68	0.23	17.98	0.72		
22	2	L 3"x 3"x 5/16"	2464	22.33	44.66	1.48		
23	1	L 3"x 3"x 5/16"	891	8.09	8.09	0.27	A-36	
24	12	Tubo Ø 1/2" Sch.40	232	0.94	11.28	0.42	A-53	Rosca a 1 lado
25	12	Union Ø 1/2" NPS					A-53	
26	12	Tubo Ø 1/2" Sch.40	3040	12.31	147.74	5.54	A-53	
27	12	Tubo Ø 3/4" Sch.40	190	0.32	3.83	0.19	Aisi-316	
28	12	Reduccion 3/4"-1/8"					A-53	
29	2	Tubo Ø 1/8" Sch.40	90	0.03	0.06	0.01	Aisi-316	
30	2	Union 1/8" NPT					Aisi-316	
31	1	L 3"x 3"x 5/16"	718	6.52	6.52	0.22	A-36	
32	2	Plancha 3/8"x 102	254	1.97	3.94	0.03	A-36	

PESO TOTAL : 4935.60 321.12

DISEÑO : ARMANDO VEGA
 DIBUJO : ARMANDO VEGA
 REVISO : ARMANDO VEGA
 ESCALA : INDICADO
 FECHA : 06/09/13

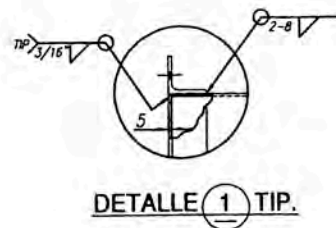
XI UNIVERSIDAD NACIONAL DE INGENIERIA
 FACULTAD DE INGENIERIA MECANICA

TITULO
 COLECTOR DE POLVO
 ARREGLO CAJAS
 COLECTOR DE POLVO
 PLANO N°: GA-012

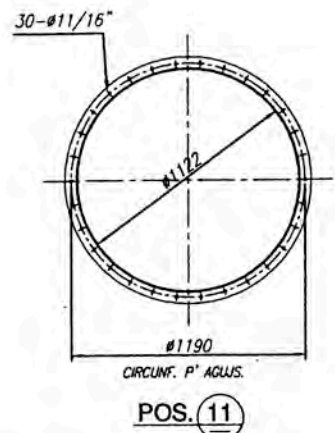


ITEM	N° PIEZAS		DESCRIPCION	LONG.	PESO (Kg)		AREA (m2)	MATERIAL	OBSERVACION
	TOTAL	UNIT.			UNIT.	TOTAL			
	1		DUCTO		1073.19	1073.19			MK-a9767
1	1		Plancha 3/16" x 447	3497	192.79	192.79	5.06	A-36	
2	1		Plancha 3/16" x 1166	3426	76.08	76.08	4.00	A-36	
3	1		Plancha 3/16" x 1981	2856	215.56	215.56	5.65	A-36	
4	1		Plancha 3/16" x 1155	2750	60.44	60.44	1.60	A-36	
5	1		Plancha 3/16" x 1979	2896	218.35	218.35	5.73	A-36	
6	2		Plancha 3/16" x 425	2896	46.89	93.78	2.46	A-36	
7	1		Plancha 3/16" x 850	1979	64.08	64.08	1.68	A-36	
8	1		Plancha 3/16" x 229	1979	17.26	17.26	0.45	A-36	
9	1		Plancha 3/16" x 522	1979	39.35	39.35	1.03	A-36	
10	1		Plancha 3/16" x 638	1979	48.10	48.10	1.26	A-36	
11	1		L 2 1/2" x 2 1/2" x 1/4"	3726	22.80	22.80	0.93	A-36	
12	3		L 2" x 2" x 3/16"	2162	7.93	23.80	1.30	A-36	
13	30		Perno #5/8" NC	1 1/2"				A-325	C/T y A/PR.
14	60		Perno #3/8" NC	1 1/4"				A-325	C/T y A/PR.
15	2		Plancha 3/8" x 102	102	0.80	0.80	0.02	A-36	
	3		CODO		203.08	609.24			MK-b9767
12	2		L 2" x 2" x 3/16"	2162	10.31	20.62	0.86	A-36	
16	2		Plancha 3/16" x 400	1979	30.16	60.32	1.60	A-36	
17	2		Plancha 3/16" x 810	1979	61.07	122.14	3.20	A-36	
18	3		Plancha 3/16" x 121	1979	8.93	26.80	1.43	A-36	
19	1		COPLA 1/8" NPT						

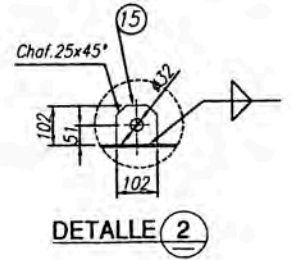
PESO TOTAL : 1708.8



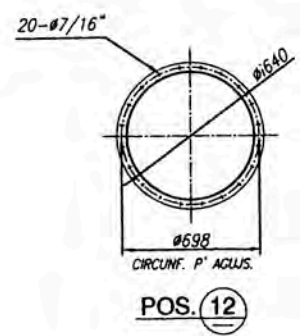
DETALLE 1 TIP.



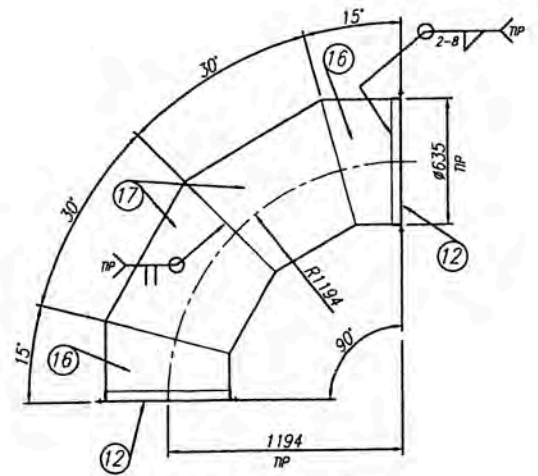
POS. 11



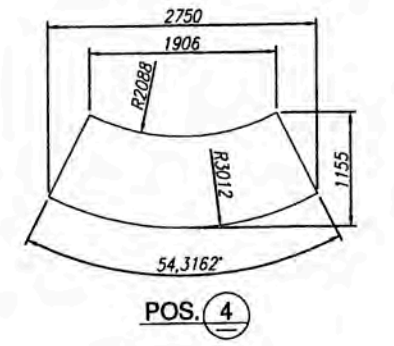
DETALLE 2



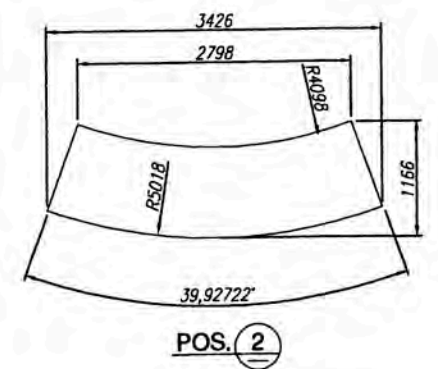
POS. 12



Mk-b9762 Cant.:3 Conj.



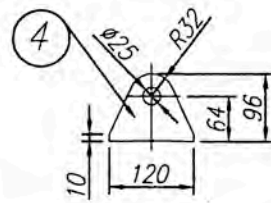
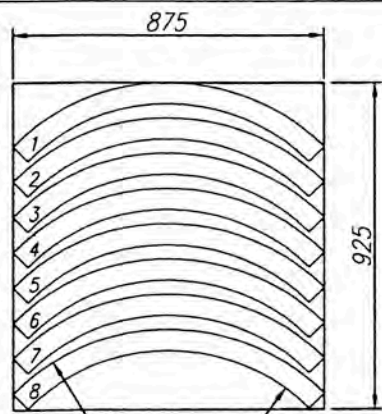
POS. 4



POS. 2

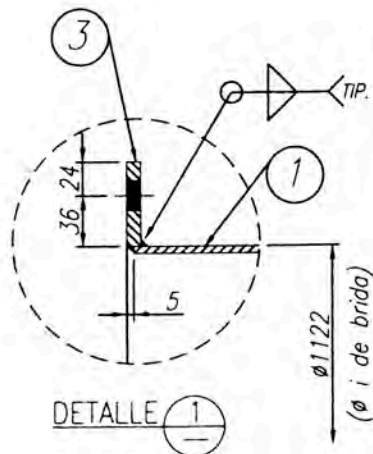
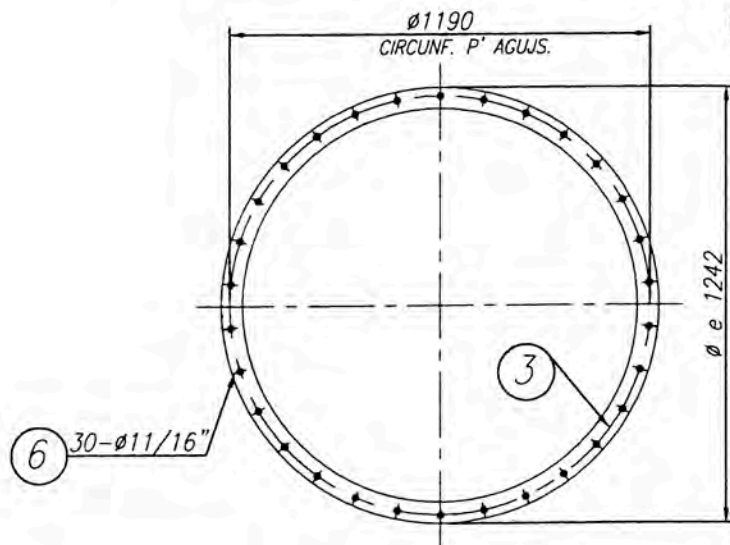
NOTAS:
 1.- LAS COTAS PREVALECN SOBRE EL DIBUJO.
 2.- LAS DIMENSIONES ESTAN EN mm. Y LAS ELEVACIONES EN m.
 3.- EL MATERIAL ES ACERO ESTRUCTURAL ASTM A-36 (SIC).
 4.- LOS PERNOS SERAN A-325 Y GALVANIZADOS (SIC).
 5.- ACABADO.-
 BASE: MACROPOXI 646-10 MILL (DOS CAPAS)
 6.- USAR SILICONA AL EMPERNAR LAS BRIDAS.

DISEÑO : ARMANDO VEGA		TITULO
DIBUJO : ARMANDO VEGA		COLECTOR DE POLVO
REVISO : ARMANDO VEGA		DUCTO INGRESO TOLVA
ESCALA : INDICADO	FACULTAD DE INGENIERIA MECANICA	PLANO N°:
FECHA : 06/09/13		GA-020

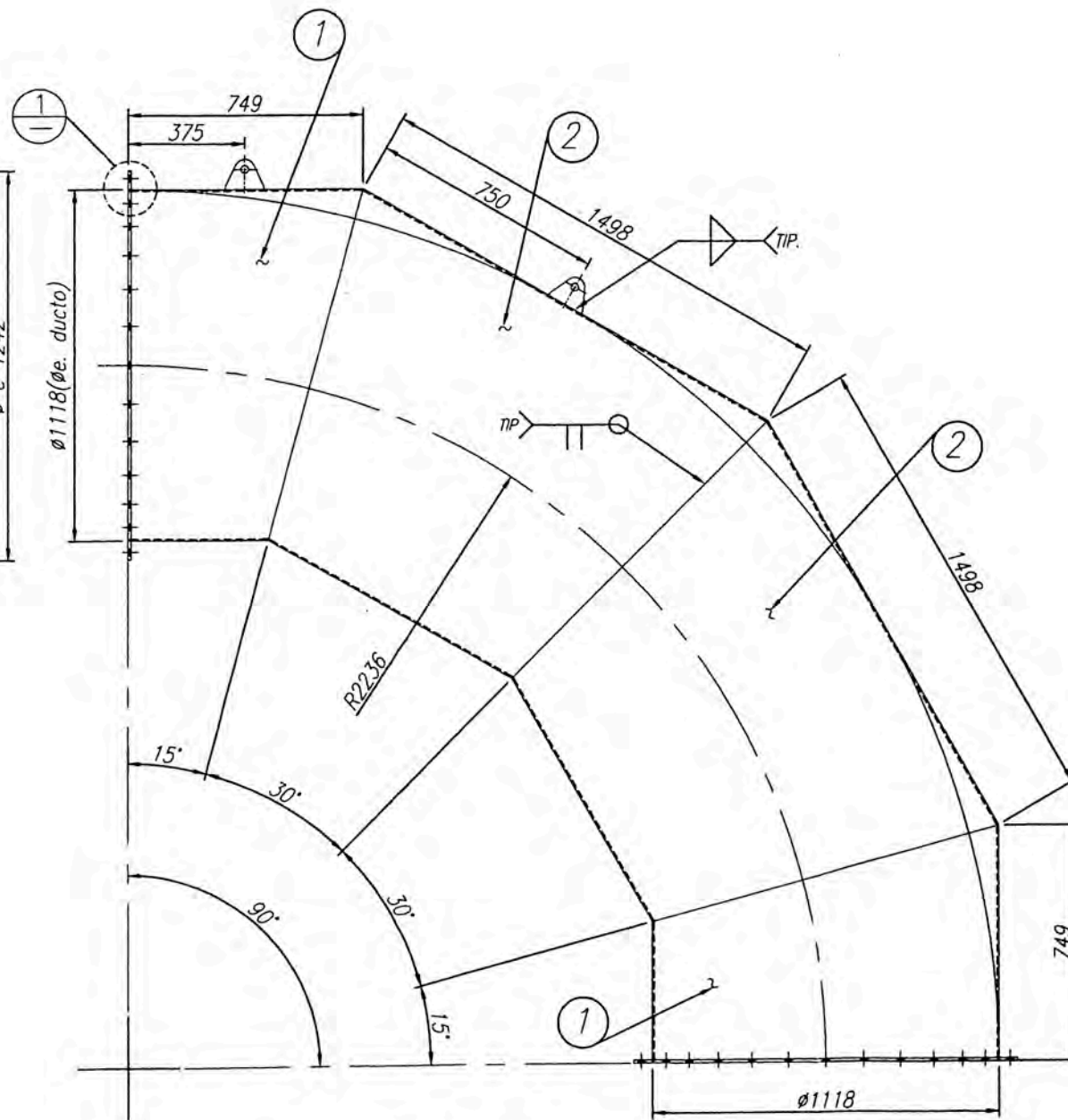


OREJA DE IZAJE

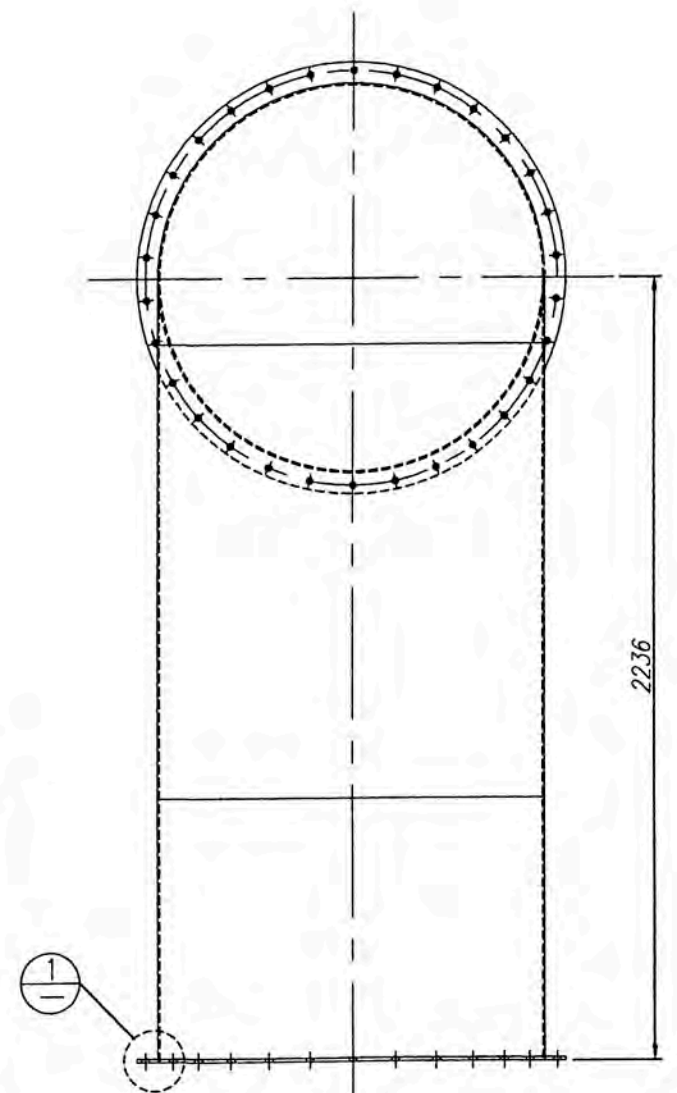
POS. 3



DETALLE 1



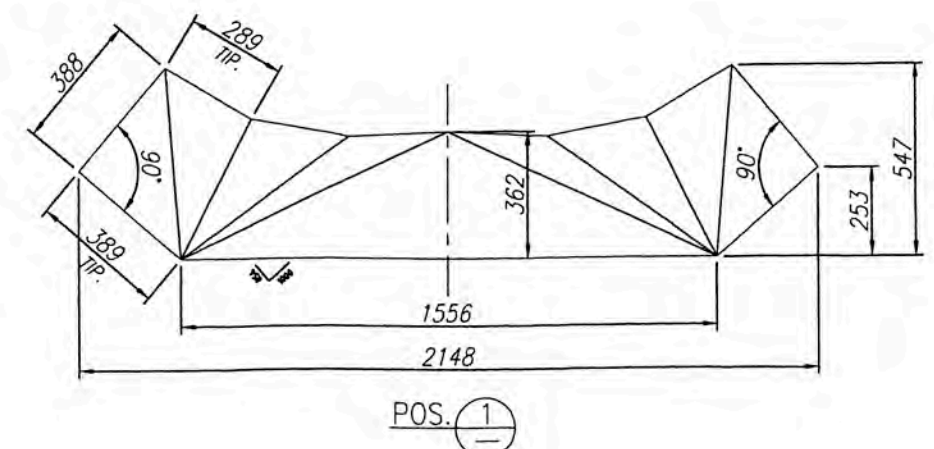
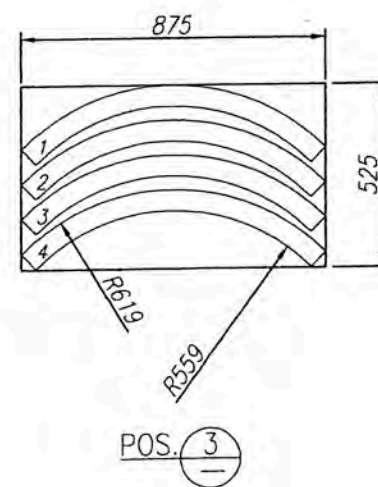
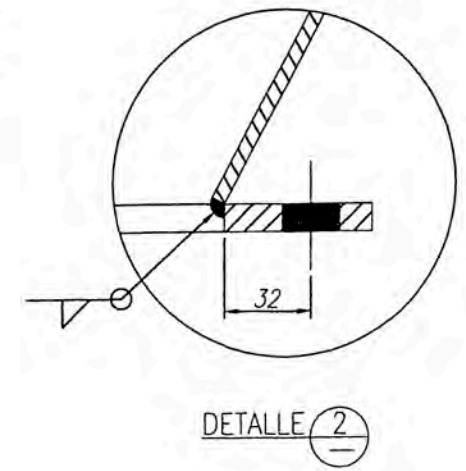
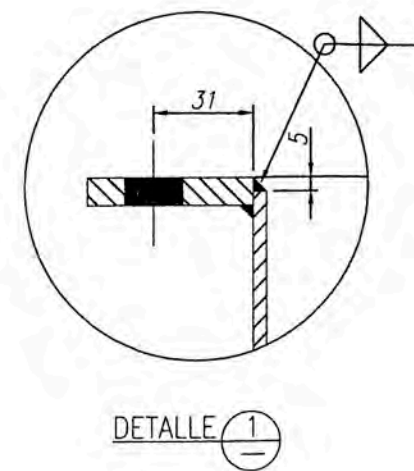
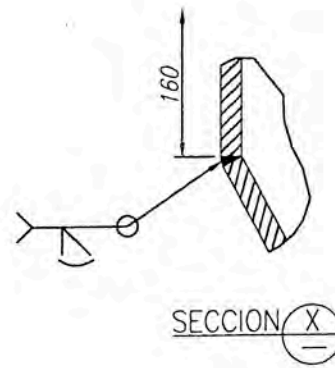
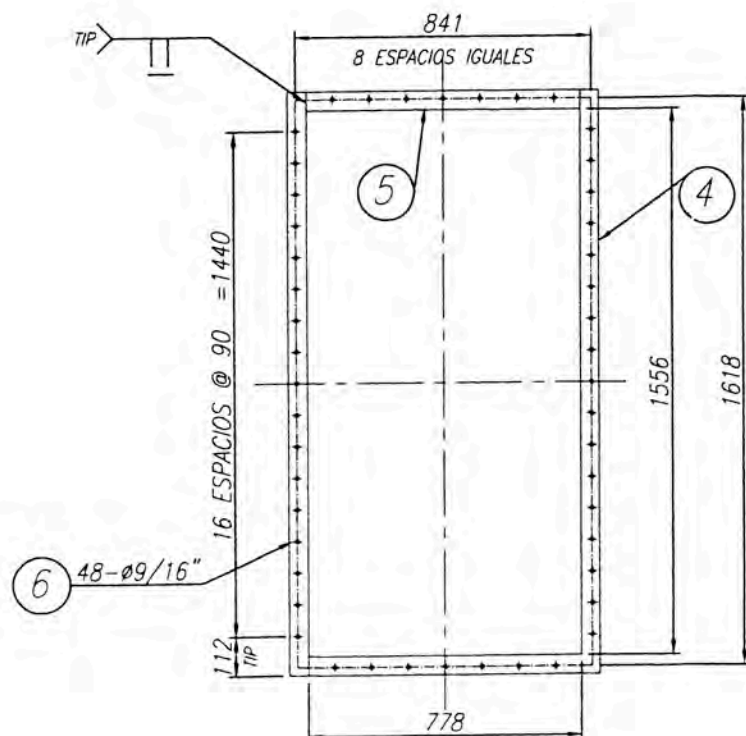
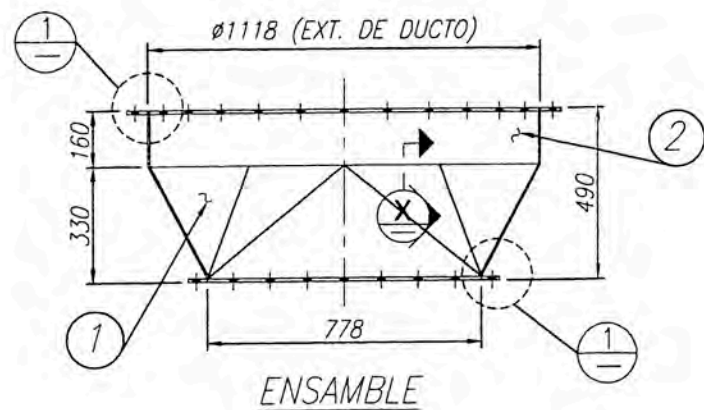
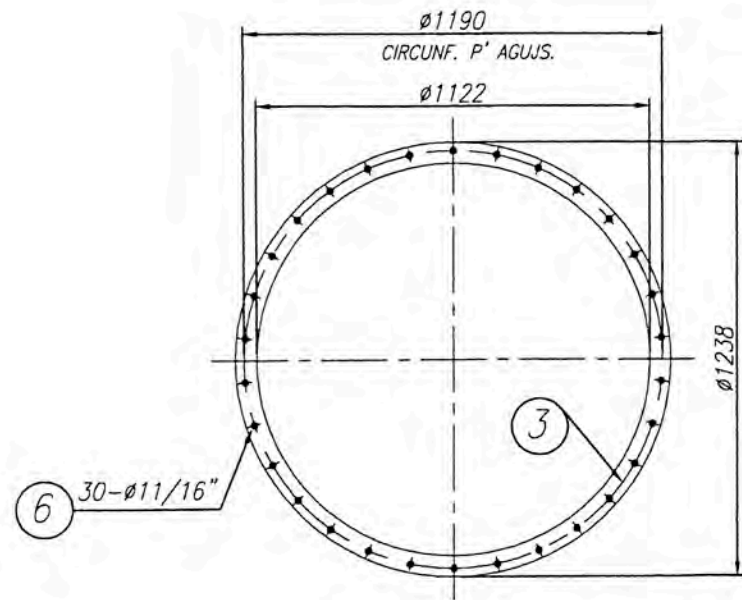
ENSAMBLE



ITEM	DESCRIPCION	LONGITUD	CANT.	PESO		MATERIAL	OBSERVAC.
				UNIT.	TOTAL		
1	Plancha 3/16" x 744	3497	2	99.10	198.20	A-36	
2	Plancha 3/16" x 1498	3497	2	199.58	399.17	A-36	
3	Plancha 3/8" x 60	$\phi e1242/\phi i1122$	2	16.92	33.84	A-36	
4	Plancha 1/2" x 96	120	2	2.34	4.68	A-36	
5	Perno $\phi 5/8$ " NC	1 3/4"	60			Grado 2	C/T y A/Pr.

PESO TOTAL = 836.86

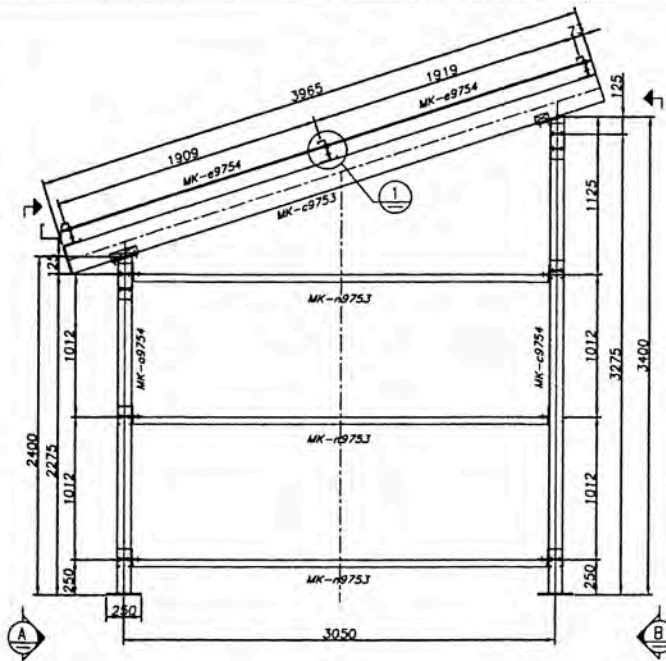
DISERO : ARMANDO VEGA	UNIVERSIDAD NACIONAL DE INGENIERIA FACULTAD DE INGENIERIA MECANICA	TITULO
DIBUJO : ARMANDO VEGA		COLECTOR DE POLVO
REVISO : ARMANDO VEGA		CODO 90°
ESCALA : INDICADO		DUCTO DE SALIDA : 1118
FECHA : 06/09/13		PLANO N° : GA-027



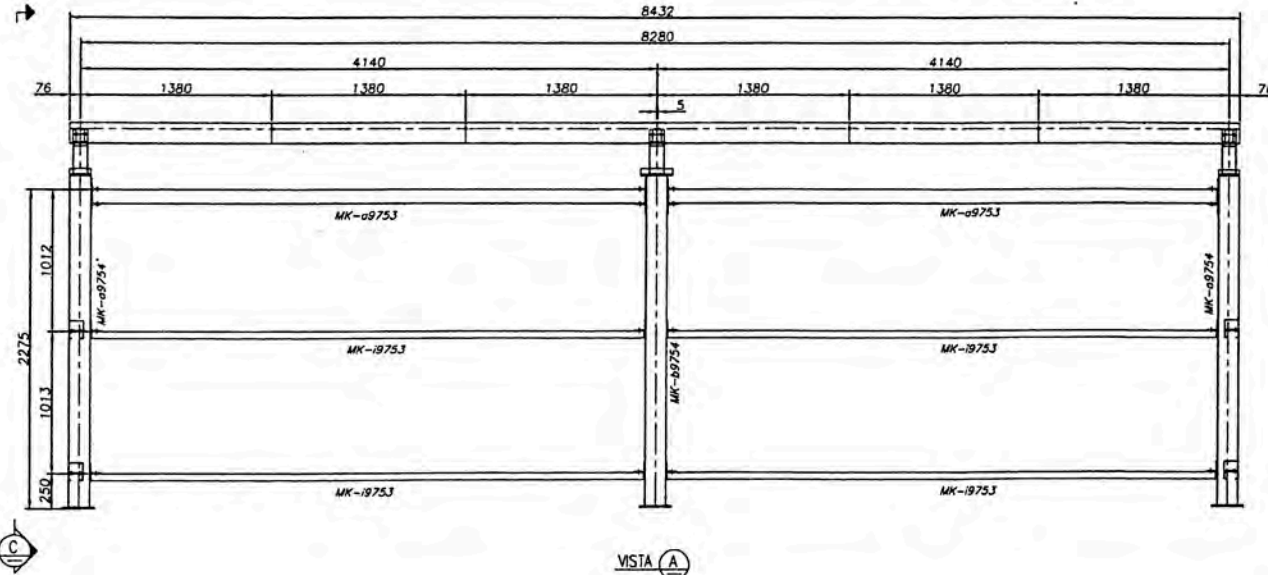
ITEM	DESCRIPCION	LONGITUD	CANT.	PESO		MATERIAL	OBSERVAC.
				UNIT.	TOTAL		
1	Plancha 3/16" x 1100	2150	1	90.10	90.10	A-36	FABRICAR EN 2 PARTES
2	Plancha 3/16" x 155	3498	1	20.64	20.64	A-36	
3	Plancha 3/8" x 60	Øe1240/Øi1122	1	16.92	16.92	A-36	
4	Plancha 3/8" x 62	1680	2	7.93	15.87	A-36	
5	Plancha 3/8" x 62	778	2	3.67	7.35	A-36	
6	Perno Ø3/4" NC	2"	30			Grado 2	C/T y A/Pr. GALVA.
7	Perno Ø1/2" NC	1 1/2"	48			Grado 2	C/T y A/Pr. GALVA.

PESO TOTAL = 150.88

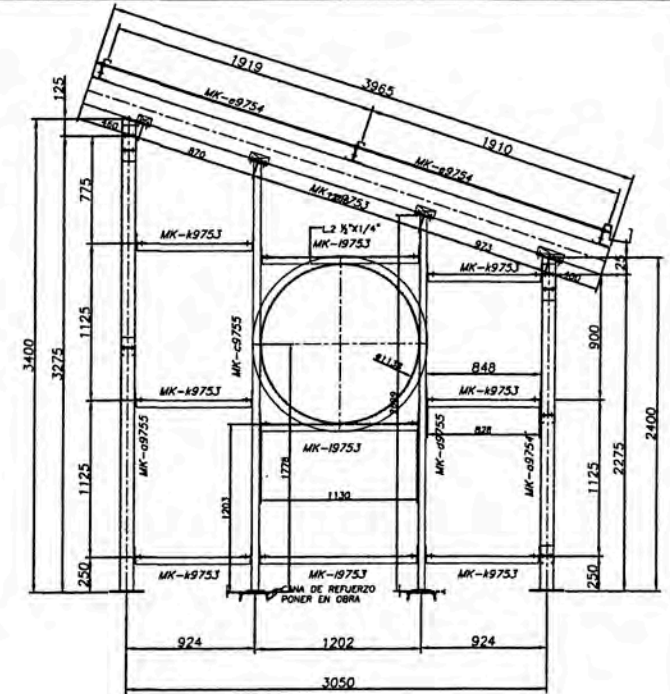
DISEÑO : ARMANDO VEGA DIBUJO : ARMANDO VEGA REVISO : ARMANDO VEGA ESCALA : INDICADO FECHA : 06/09/13	UNIVERSIDAD NACIONAL DE INGENIERIA FACULTAD DE INGENIERIA MECANICA	TITULO COLECTOR DE POLVO TRANSICION ENTRE CHIMENEA Y CAJA PLANO N°: GA-028
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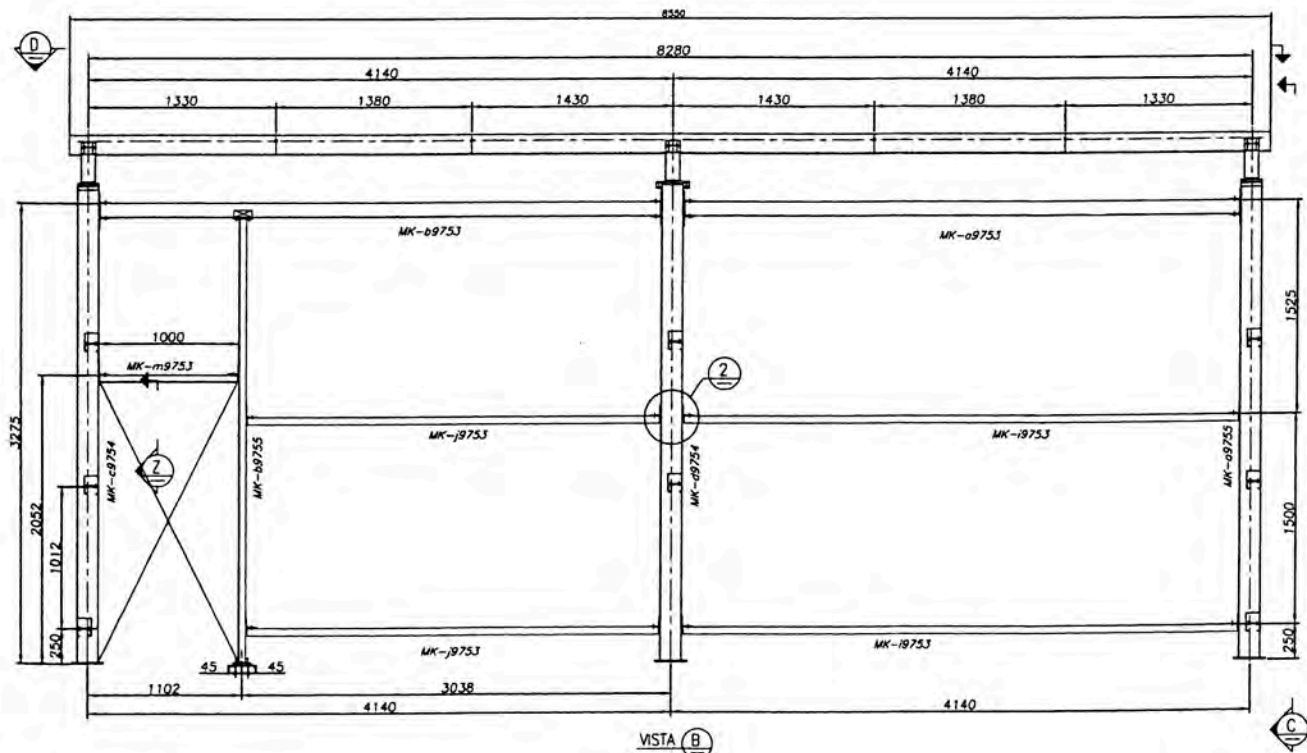
ELEVACION-TECHO METALICO



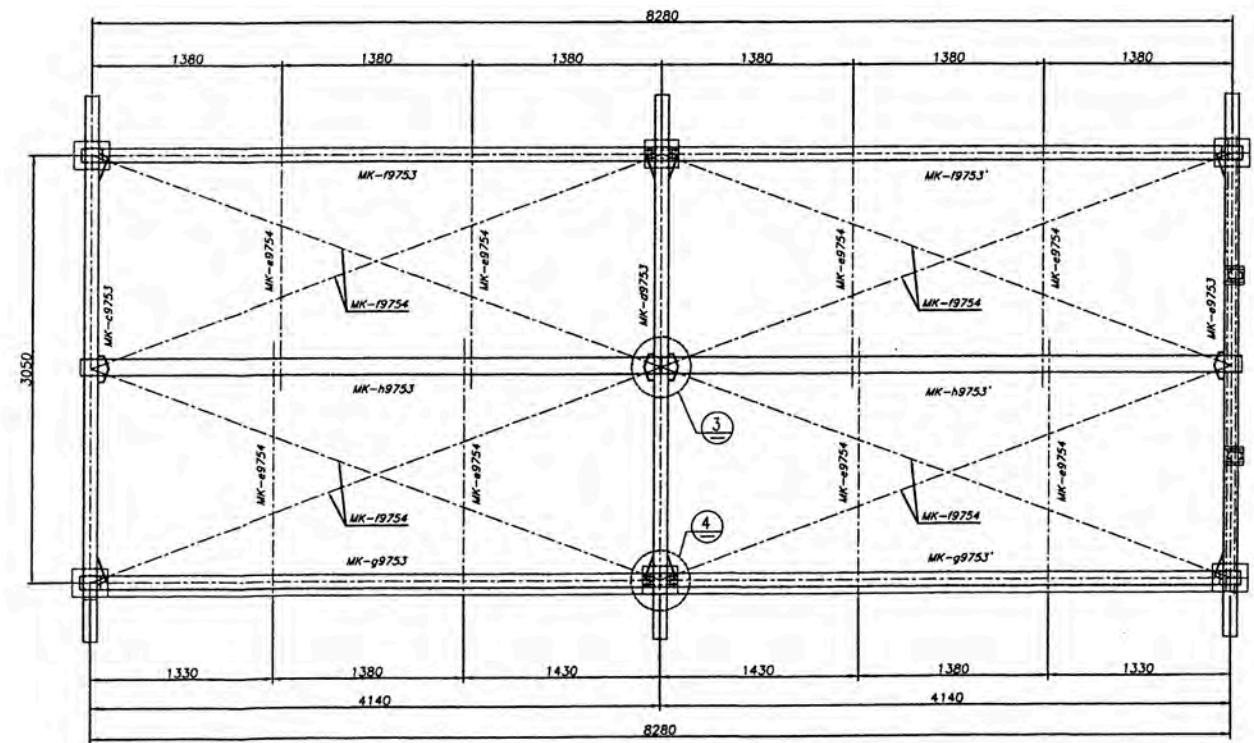
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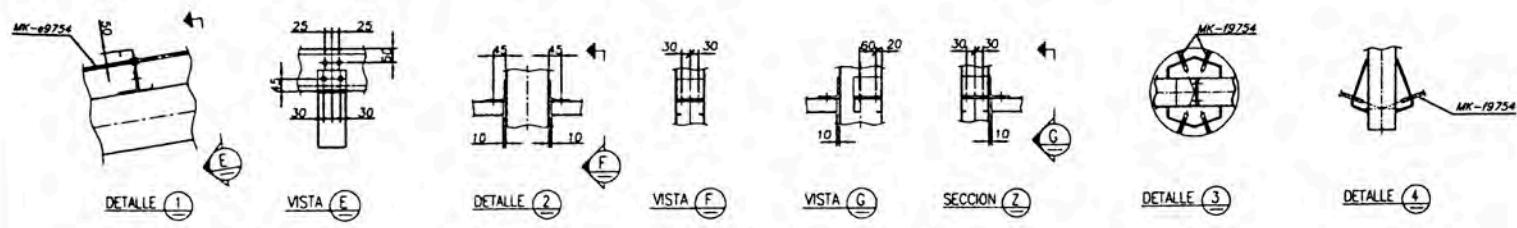
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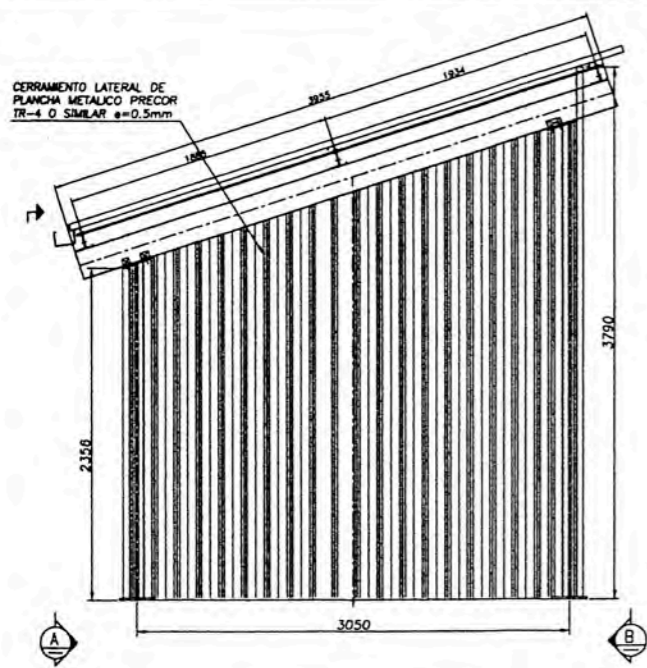
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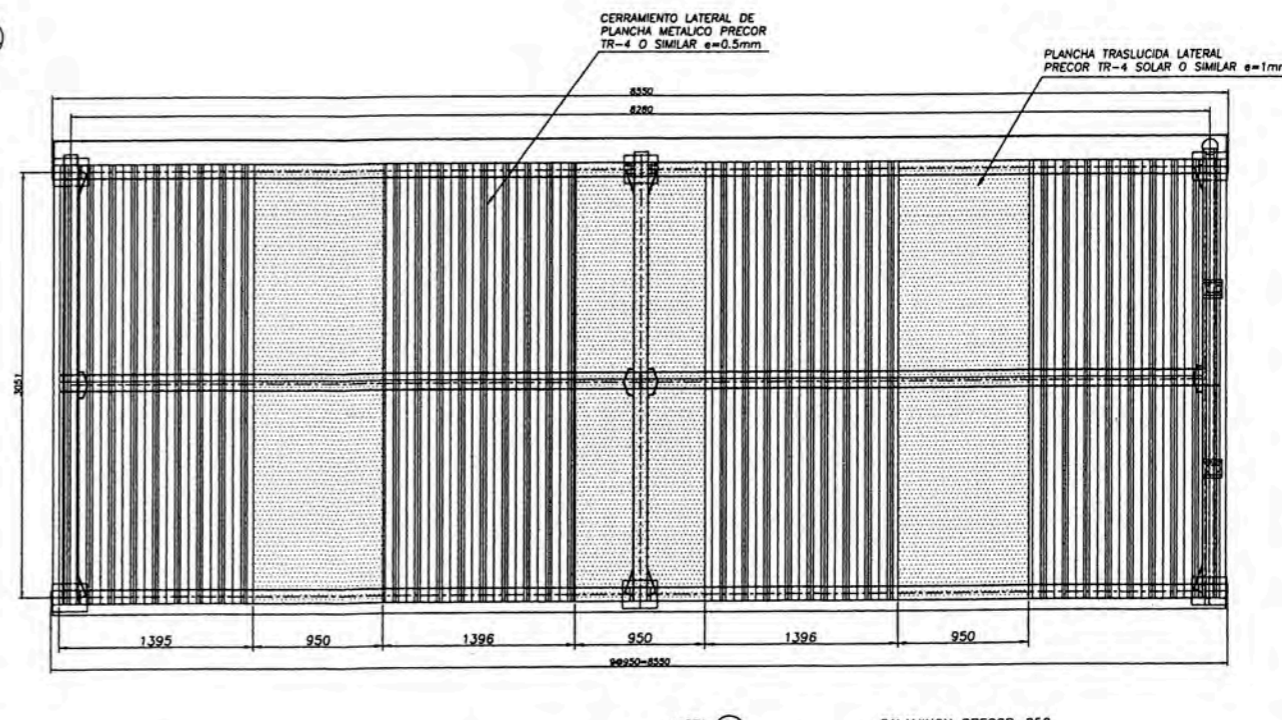
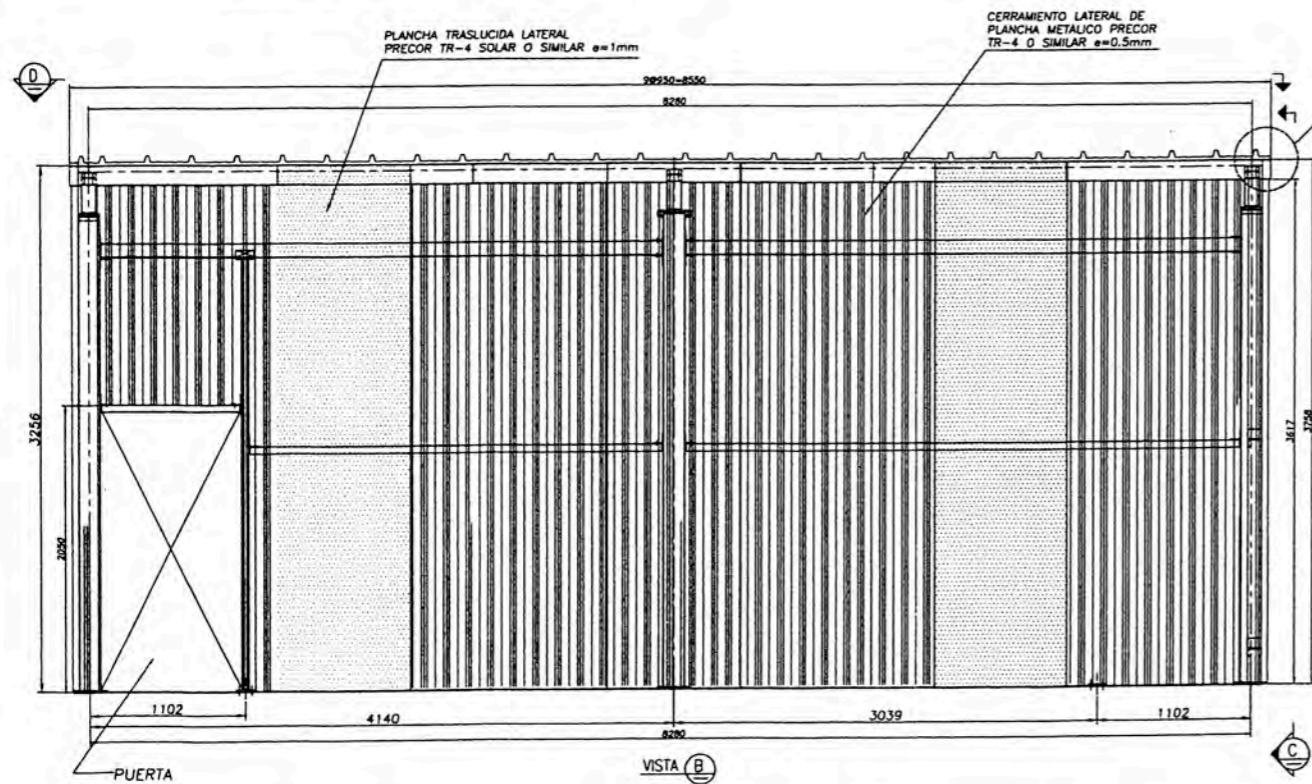
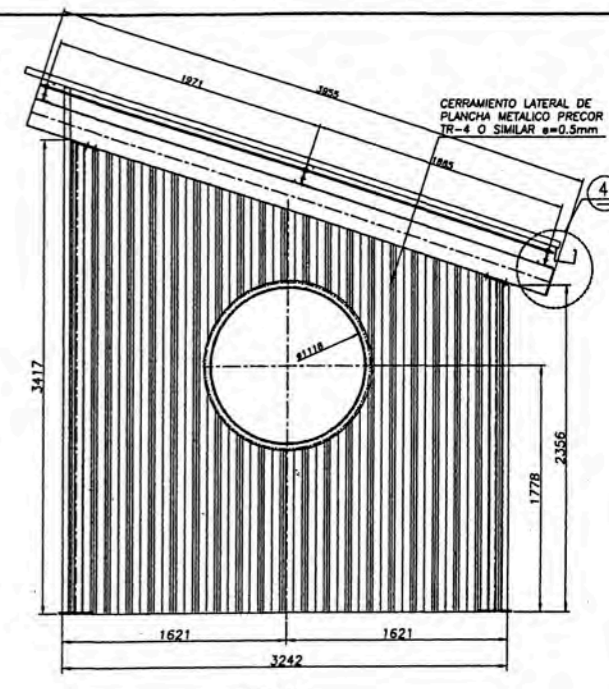
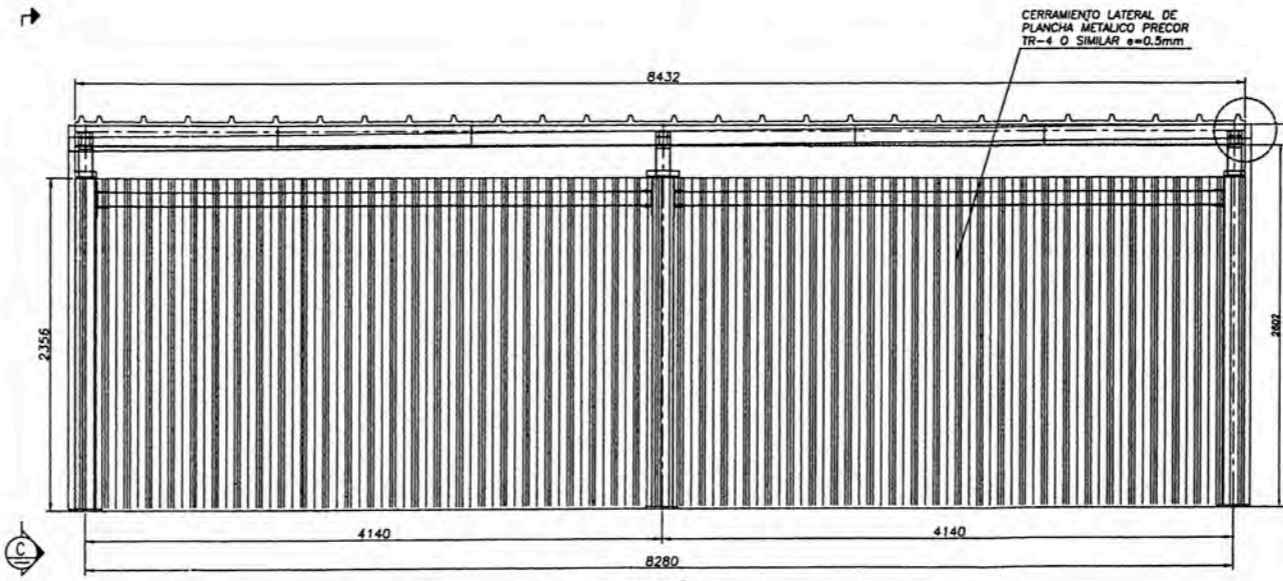
VISTA D



DISERO : ARMANDO VEGA	 UNIVERSIDAD NACIONAL DE INGENIERIA	TITULO
DIBUJO : ARMANDO VEGA		COLECTOR DE POLVO
REVISO : ARMANDO VEGA	FACULTAD DE INGENIERIA MECANICA	TECHO COLECTOR DE POLVO
ESCALA : INDICADO		13.05 X 3.4 X 8.28
FECHA : 06/09/13		PLANO N°: GA-029



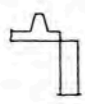
ELEVACION-TECHO METALICO



CALAMINON PRECOR-950



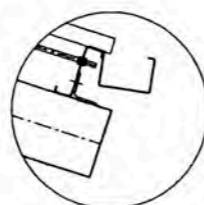
DETALLE 1



DETALLE 2



DETALLE 3

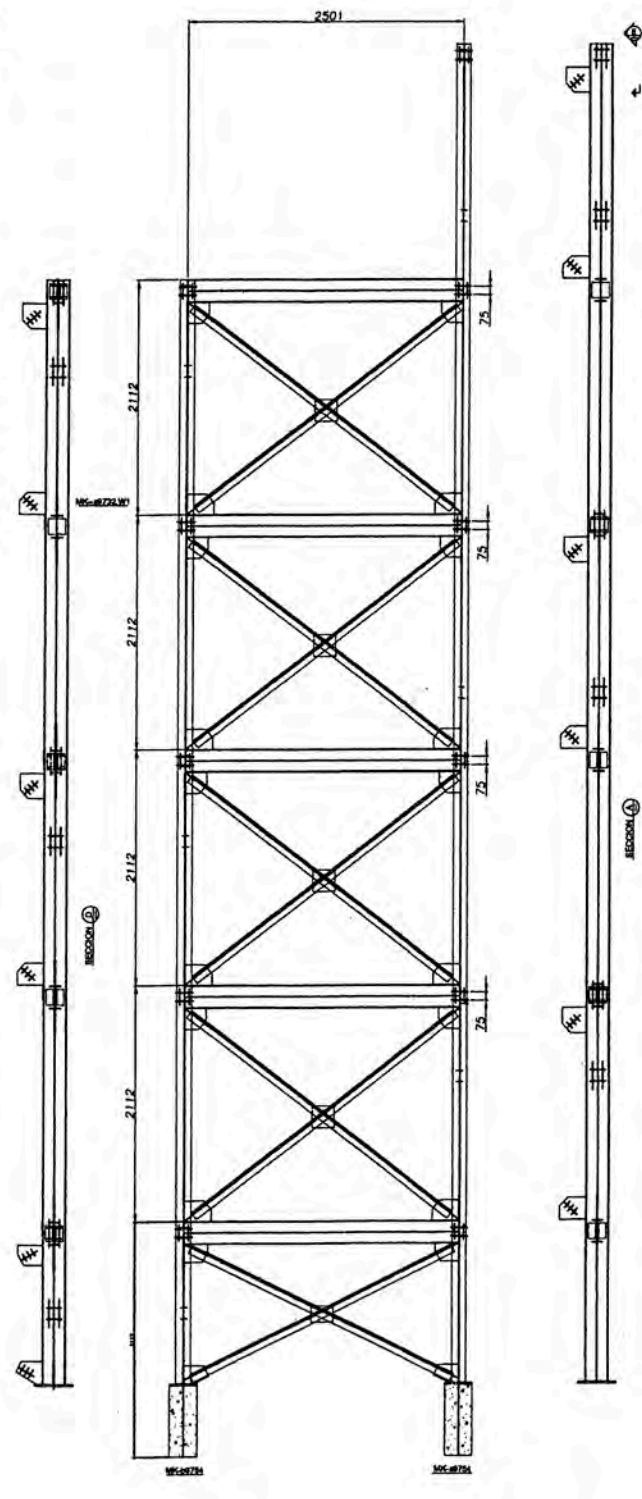
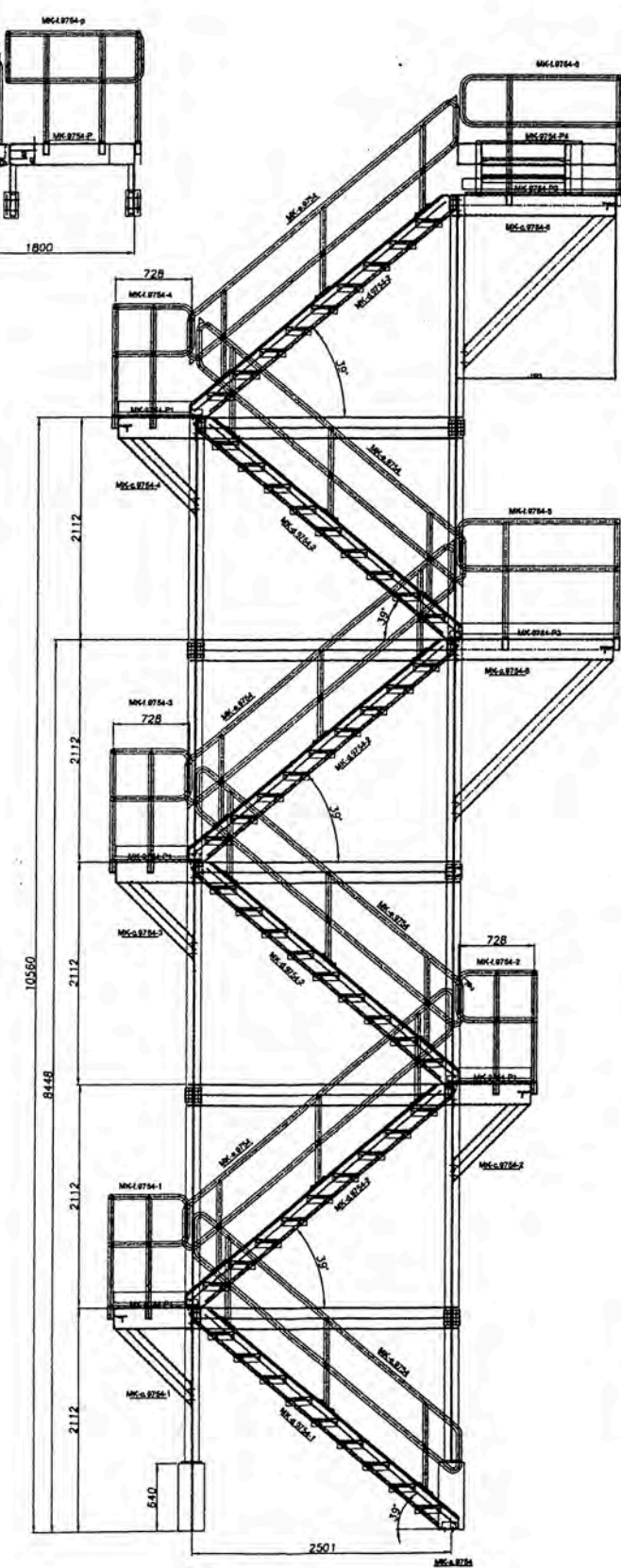
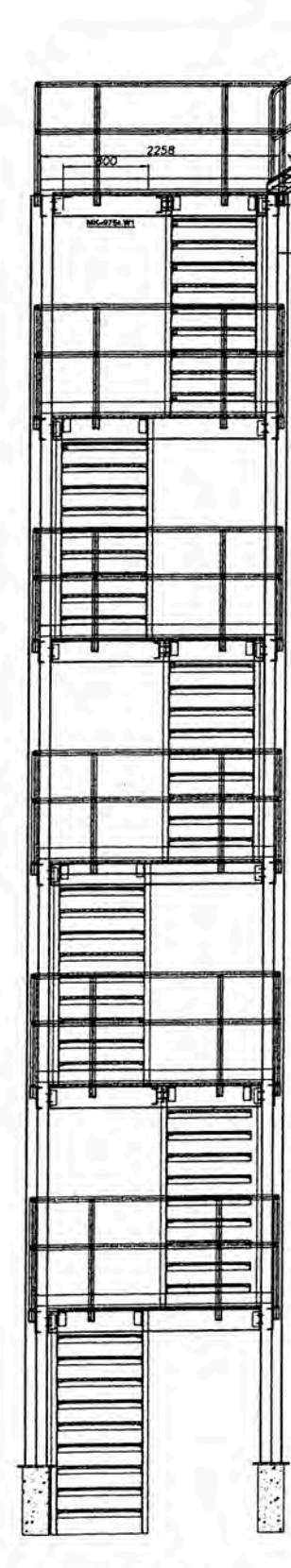
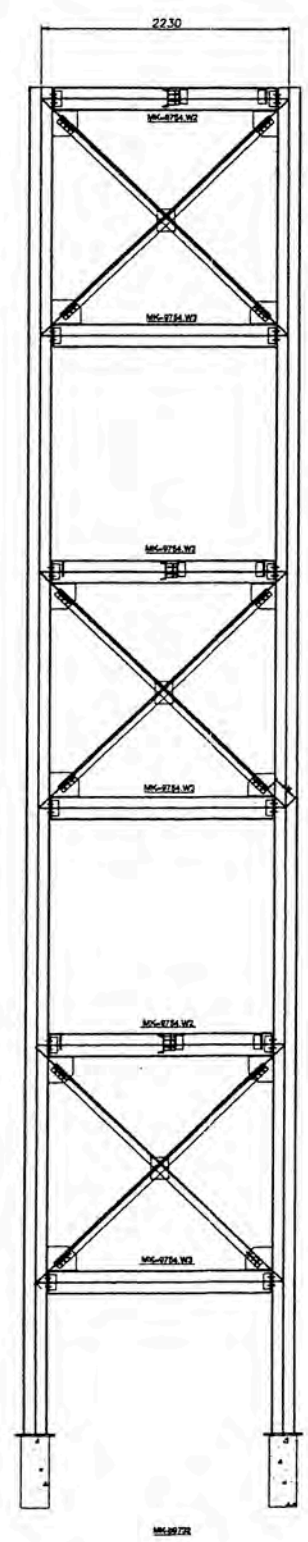
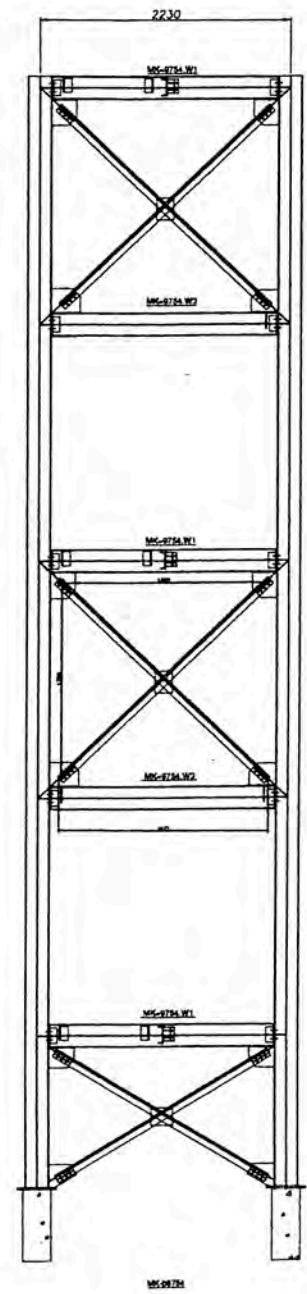
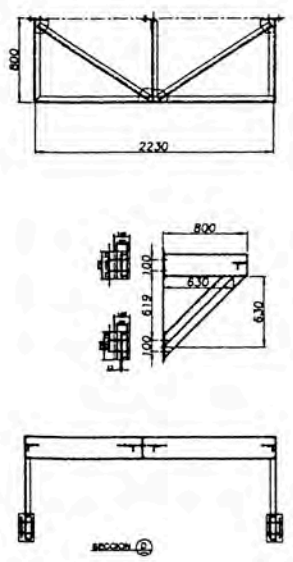
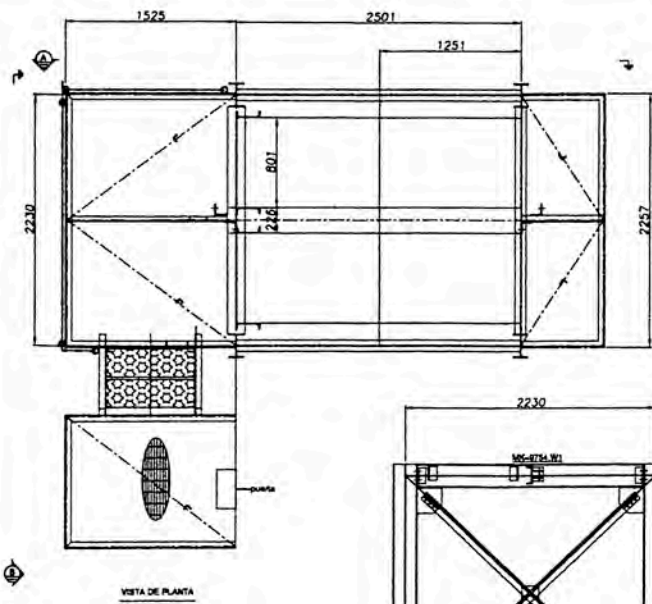


DETALLE 4

DISEÑO : ARMANDO VEGA
 DIBUJO : ARMANDO VEGA
 REVISO : ARMANDO VEGA
 ESCALA : INDICADO
 FECHA : 06/09/13

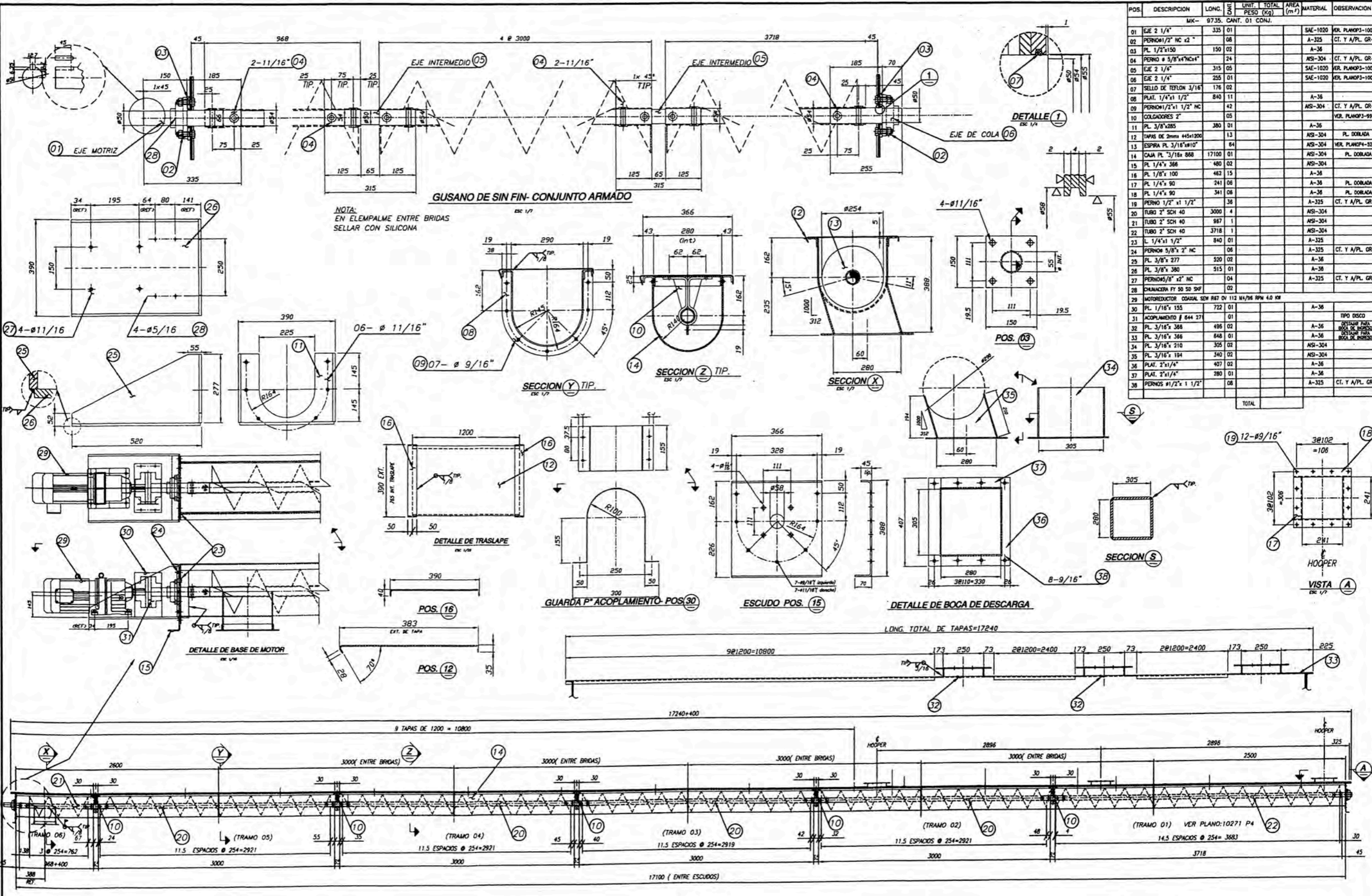
XI UNIVERSIDAD NACIONAL DE INGENIERIA
 FACULTAD DE INGENIERIA MECANICA

TITULO
 COLECTOR DE POLVO
 COBERTURA TECHO
 COLECTOR DE POLVO
 PLANO N°: GA-030



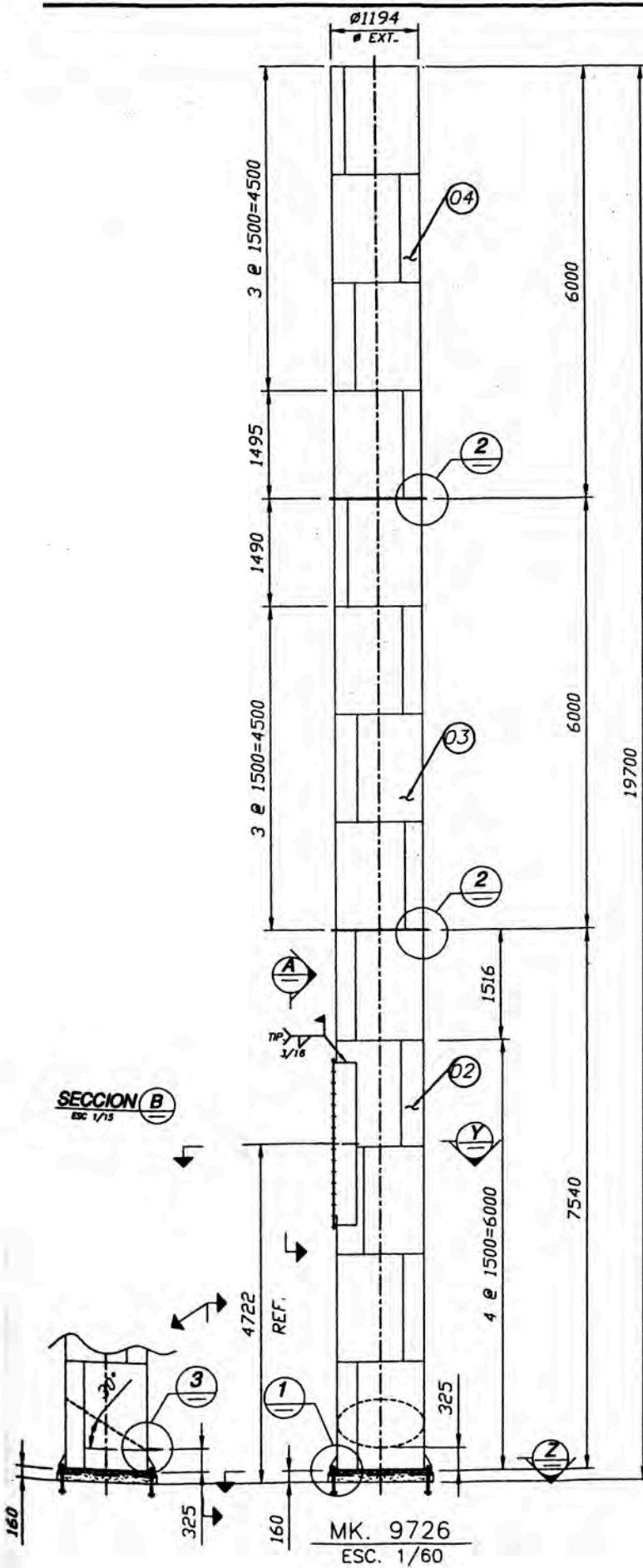
POS.	DESCRIPCION	LONG.	CANT.	UNIT.	TOTAL	AREA	MATERIAL	OBSERVACION
	DISERO : ARMANDO VEGA							TITULO
	DIBUJO : ARMANDO VEGA							COLECTOR DE POLVO
	REVISO : ARMANDO VEGA							COLUMNAS TECHO
	ESCALA : INDICADO							PLANO N°:
	FECHA : 06/09/13							GA-031

UNIVERSIDAD NACIONAL DE INGENIERIA
FACULTAD DE INGENIERIA MECANICA



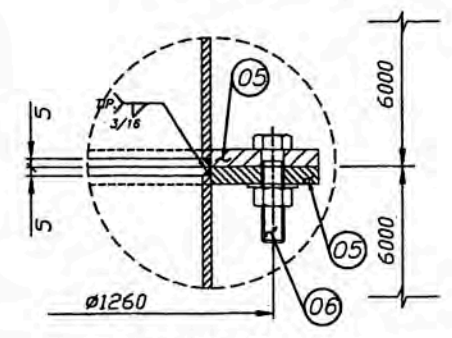
POS.	DESCRIPCION	LONG.	CANT.	UNID.	TOTAL PESO (Kg)	AREA (m ²)	MATERIAL	OBSERVACION
01	EJE 2 1/4"	335	01				SAE-1020	VER PLANO P3-1003
02	PERNO 1/2" x 2" NC x 2 "	08					A-325	CT. Y A/PL. GR-5
03	PL. 1/2"x150	150	02				A-36	
04	PERNO 5/8"x7/16" NC x 4"	24					MSI-304	CT. Y A/PL. GR-5
05	EJE 2 1/4"	315	05				SAE-1020	VER PLANO P3-1003
06	EJE 2 1/4"	255	01				SAE-1020	VER PLANO P3-1003
07	SELLO DE TEFLON 3/16"	176	02					
08	PLAT. 1/4"x1 1/2"	840	11				A-36	
09	PERNO 1/2" x 1 1/2" NC	42					MSI-304	CT. Y A/PL. GR-2
10	COLGADORES 2"	05						VER PLANO P3-9984
11	PL. 3/8"x285	380	01				A-36	
12	TAPAS DE 2mm x 45x1200	13					MSI-304	PL. DOBLADA
13	ESPIRA PL. 3/16"x#10"	64					MSI-304	VER PLANO P4-3291
14	CAJA PL. 3/16"x 868	17100	01				MSI-304	PL. DOBLADA
15	PL. 1/4"x 366	480	02				MSI-304	
16	PL. 1/8"x 100	462	15				A-36	
17	PL. 1/4"x 90	241	06				A-36	PL. DOBLADA
18	PL. 1/4"x 90	341	06				A-36	PL. DOBLADA
19	PERNO 1/2" x 1 1/2"	36					A-325	CT. Y A/PL. GR-2
20	TUBO 2" SCH 40	3000	4				MSI-304	
21	TUBO 2" SCH 40	967	1				MSI-304	
22	TUBO 2" SCH 40	3718	1				MSI-304	
23	L. 1/4"x1 1/2"	840	01				A-325	
24	PERNO 5/8"x 2" NC	06					A-325	CT. Y A/PL. GR-5
25	PL. 3/8"x 277	520	02				A-36	
26	PL. 3/8"x 380	515	01				A-36	
27	PERNO 5/8" x 2" NC	04					A-325	CT. Y A/PL. GR-5
28	CHAMACERA FY 50 50 SF	02						
29	MOTOREDUCTOR COAXIAL SEW REF DV 112 M4/96 RPM 4.0 KW							
30	PL. 1/16"x 155	722	01				A-36	
31	ACOPLAMIENTO # 644 27	01						TIPO DISCO
32	PL. 3/16"x 366	496	02				A-36	DESTINAR PARA BOGA DE INGRESO
33	PL. 3/16"x 366	648	01				A-36	DESTINAR PARA BOGA DE INGRESO
34	PL. 3/16"x 210	305	02				MSI-304	
35	PL. 3/16"x 194	340	02				MSI-304	
36	PLAT. 2"x1/4"	407	02				A-36	
37	PLAT. 2"x1/4"	280	01				A-36	
38	PERNOS #1/2" x 1 1/2"	08					A-325	CT. Y A/PL. GR-2
TOTAL								

DISEÑO : ARMANDO VEGA DIBUJO : ARMANDO VEGA REVISO : ARMANDO VEGA ESCALA : INDICADO FECHA : 06/09/13	UNIVERSIDAD NACIONAL DE INGENIERIA FACULTAD DE INGENIERIA MECANICA	TITULO COLECTOR DE POLVO TRANSP. HELICOIDAL 10" X 17100 INOX PLANO N°: GA-037
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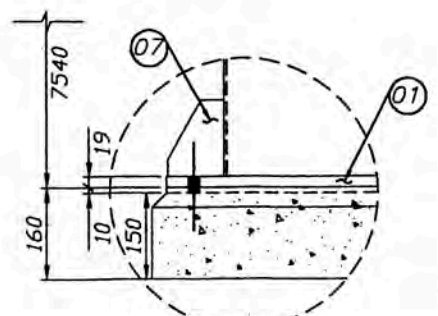


EMPAQUETADURA:

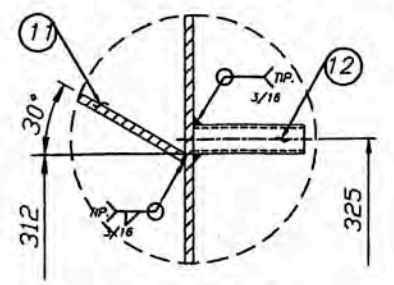
SILICONA PARA ALTA TEMPERATURA O A 100 GRADOS.



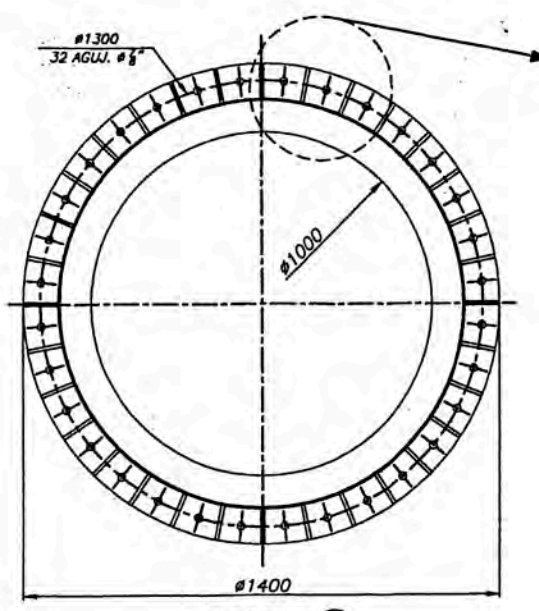
DETALLE 2
ESC. 02/1/8



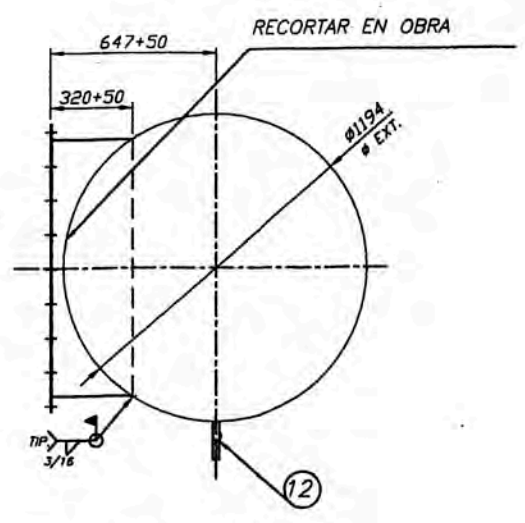
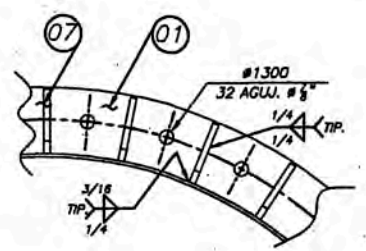
DETALLE 1
ESC. 1/8



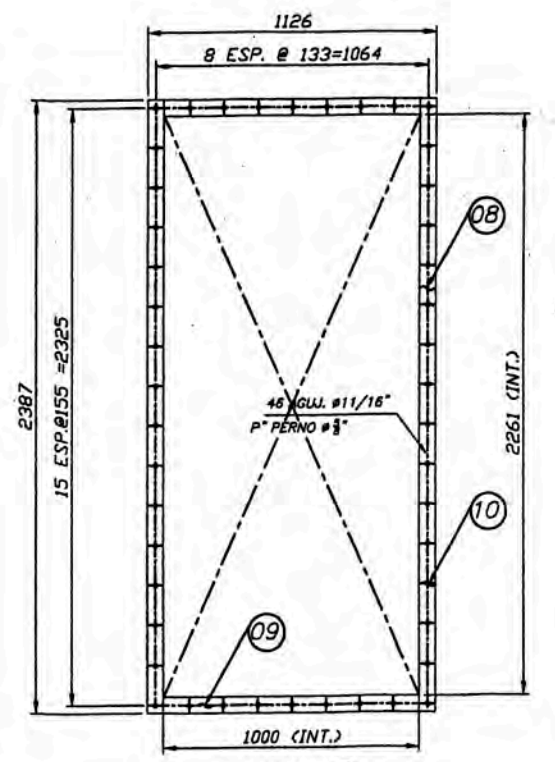
DETALLE 3
ESC. 1/8



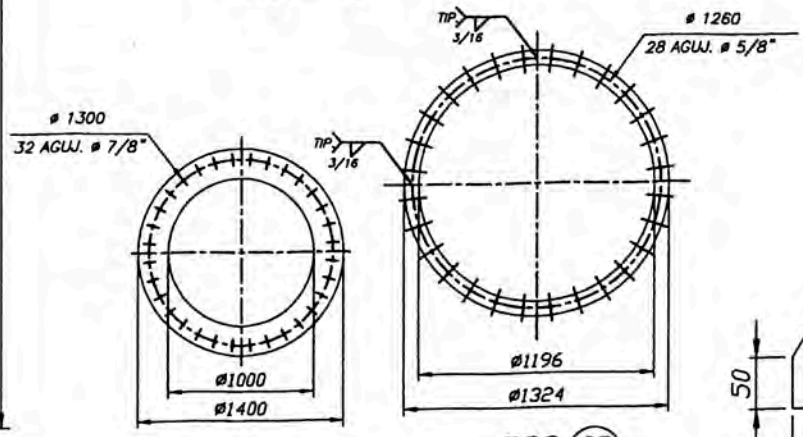
SECCION Z
ESC. 1/15



SECCION Y
ESC. 1/20

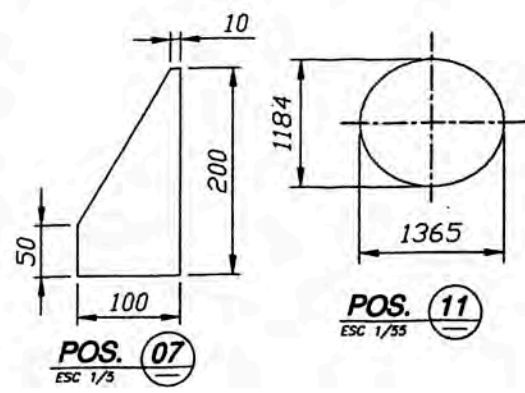


VISTA A
ESC. 1/20



POS. 01
ESC. 1/35

POS. 05



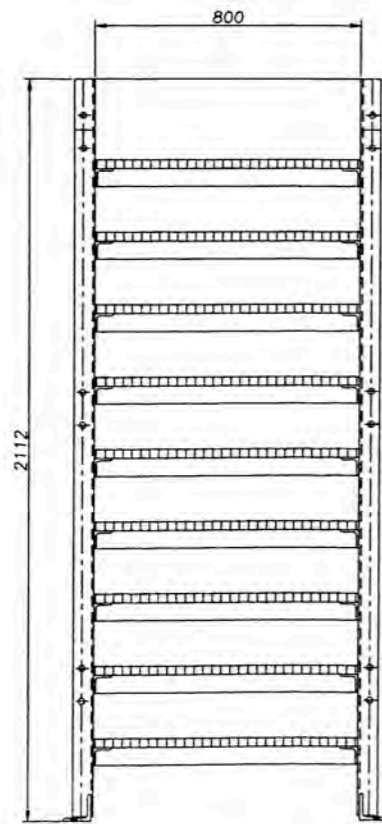
POS. 07
ESC. 1/5

POS. 11
ESC. 1/35

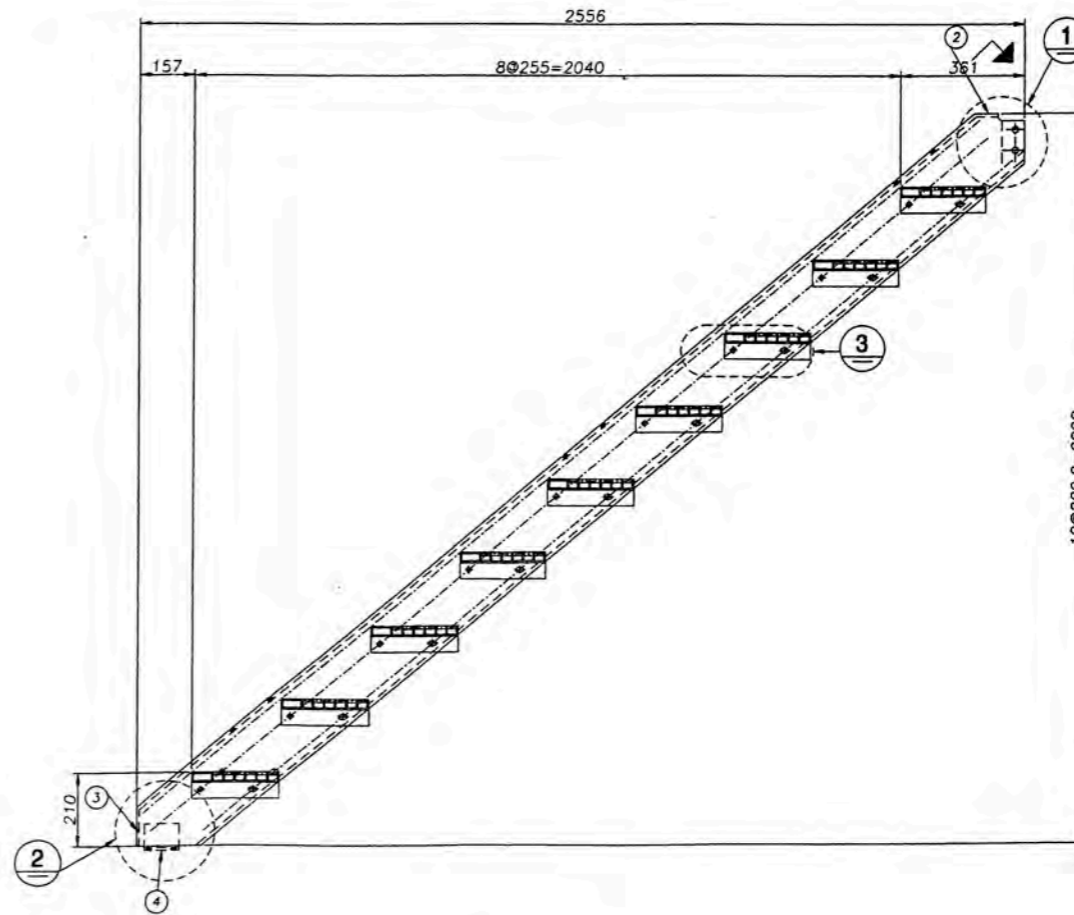
NOTA.
LA POS 1 DEL PLANO P3-9731 PRESENTAR CON LA POS. 3 DEL PLANO P4-9729- REV 1

		TOTAL			
12	COPLA 3/4"x150				C/TAPON M
11	PL. 3/16" x 1184	1365			A-36
10	PERNO #5/8" x 2"	46			GALV.
09	PL. 3/8" x 2 1/2"	1000	02		A-36
08	PL. 3/8" x 2 1/2"	2387	02		A-36
07	PL. 3/8"x100	200	32		A-36
06	PERNO #5/8"x 1 3/4"		56		
05	PL. 3/8"x#e1324/#1196		04		A-36 4 PZAS.
04	PL. 3/16" x 3737	5995	01		A-36
03	PL. 3/16" x 3737	5990	01		A-36
02	PL. 3/16" x 3737	7516	01		A-36
01	PL. 3/4"x#1000x#1400		01		A-36

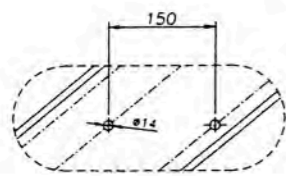
POS.	DESCRIPCION	LONG.	UNT.	UNIT. PESO (Kg)	TOTAL AREA (m ²)	MATERIAL	OBSERVACION
MK- P3 9712. CANT. 01 CONJ.							
DISERO : ARMANDO VEGA		XI UNIVERSIDAD NACIONAL DE INGENIERIA		TITULO COLECTOR DE POLVO CHIMENEA 1194 X 19700			
DIBUJO : ARMANDO VEGA							
REVISO : ARMANDO VEGA							
ESCALA : INDICADO							
FECHA : 06/09/13		FACULTAD DE INGENIERIA MECANICA		PLANO N°: GA-046			



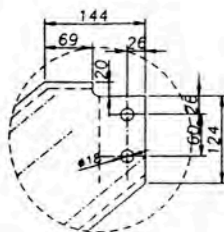
MK-d.9986
CANT. 5 CONJUNTOS



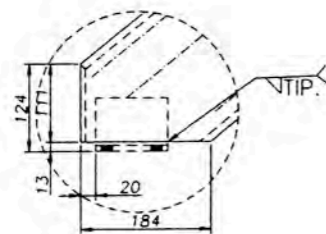
CANT.= 10
5 MOSTRADOS
5 OPUESTOS



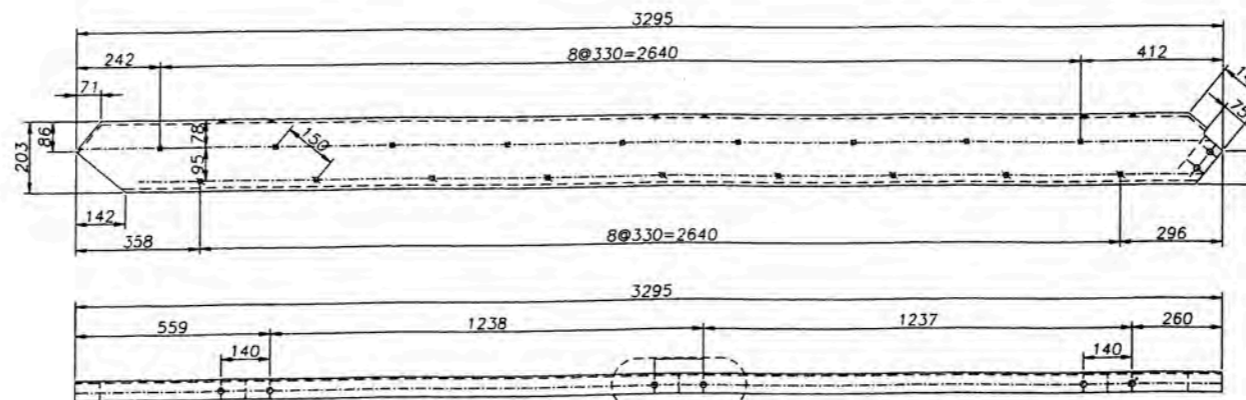
DETALLE 3



DETALLE 1

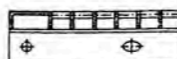
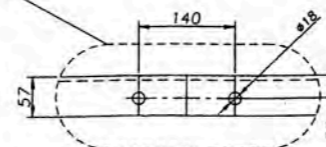


DETALLE 2



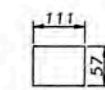
NOTA para trazados de agujeros para colocacion de peldaños

SECCION A



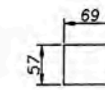
POS. 5

Cant. 09 Conj.
s/g plano. N° 3203-04 Normalizado



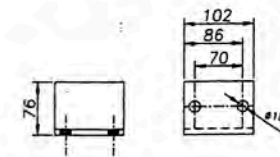
POS. 3

Cant. 08 Conj.



POS. 2

Cant. 08 Conj.



POS. 4

Cant. 08 Conj.

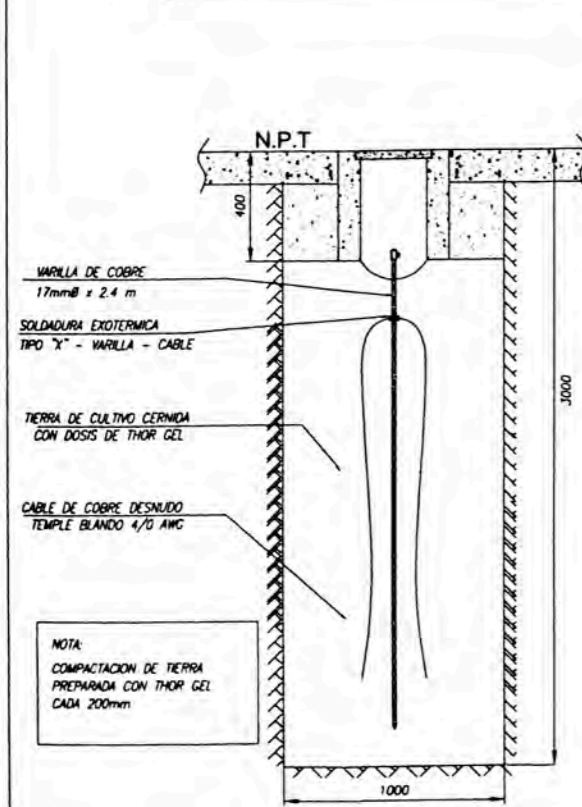
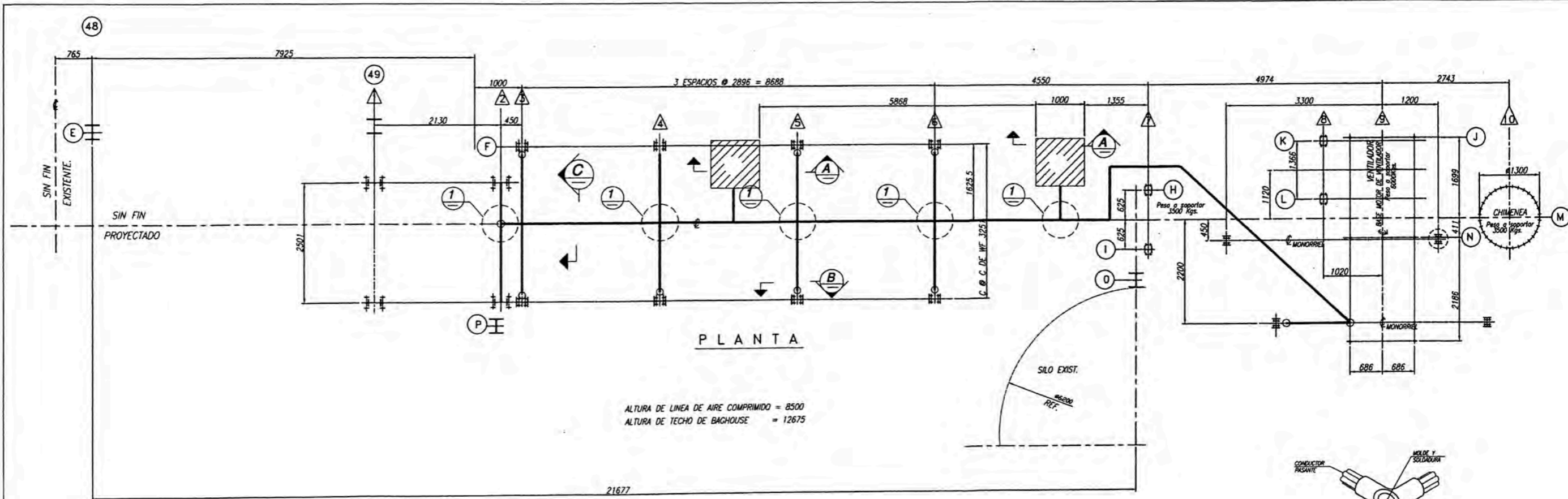
REFERENCIAS	N°	PLANO N°	TITULO
2	P1-9754 REV 0	ESCALERA PARA ESTRUCTURA	
1	PO-9732 REV 3	BACHOUSE-014-05	

1 EMITIDO PARA FABRICACION
0 EMITIDO PARA APROVACION DE DOE RUN

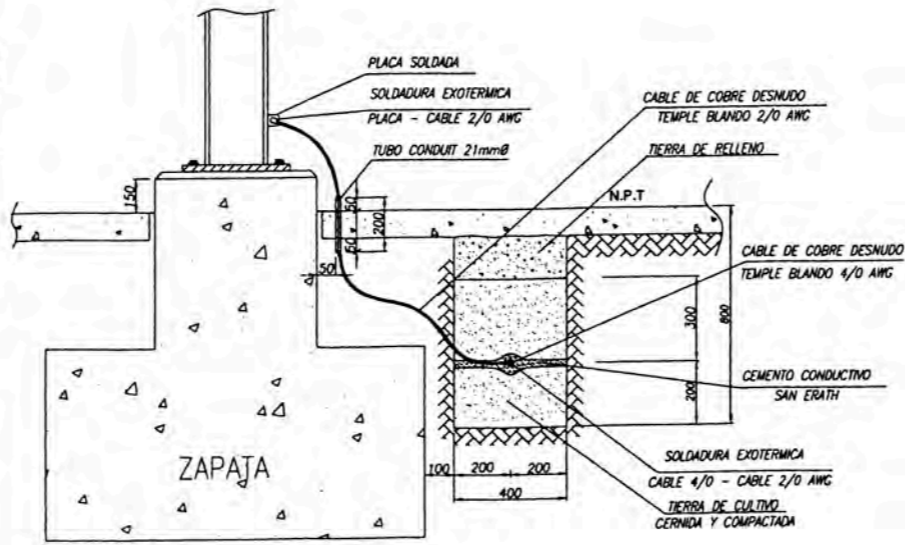
POS.	DESCRIPCION	LONG.	CANT.	UNIT.	TOTAL	AREA	MATERIAL	OBSERVACION
				PESO (Kg)		(m ²)		
5	PERNO DE 5/8"	2'	14	5.33	21.32	0.78	A-53	
4	PERNO DE 1/2"	1 1/2'	36	5.33	21.32	0.78	A-53	
5	PASOS DE 250	800	09	5.33	21.32	0.78	A-53	S/C PLANO N° 3203-04
4	L.3"x3"x3/8"	102	02	5.33	21.32	0.78	A-53	
3	PL.1/4"x57	111	02	4.14	12.42	0.46	A-53	
2	PL.1/4"x57	69	02	1.84	3.28	0.12	A-53	
1	C.8"x 11.5"	3295	02	23.09	23.09	0.85	A-53	Long. total

MK-9754 CANT. 05 CONJUNTOS

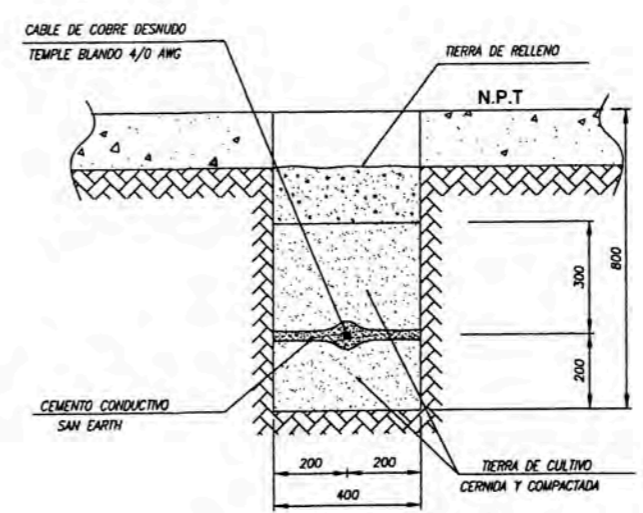
POS.	DESCRIPCION	LONG.	CANT.	UNIT.	TOTAL	AREA	MATERIAL	OBSERVACION
				PESO (Kg)		(m ²)		
DISEÑO : ARMANDO VEGA		UNIVERSIDAD NACIONAL DE INGENIERIA		TITULO		COLECTOR DE POLVO		
DIBUJO : ARMANDO VEGA		FACULTAD DE INGENIERIA MECANICA		ESCALERA INCLINADA :		800 X 2112		
REVISO : ARMANDO VEGA		FECHA : 06/09/13		PLANO N°:		GA-048		



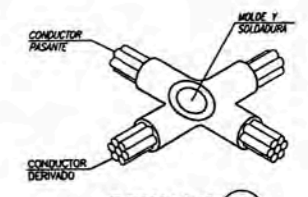
SECCION A
TIP.
SISTEMA DE PUESTA A TIERRA



SECCION B
TIP.
DETALLE SOLDADURA DE CABLE - CABLE Y PLANCHA - CABLE CON SOLDADURA EXOTERMICA



SECCION C
TIP.
DETALLE TENDIDO DE CABLE CON CEMENTO CONDUCTIVO SAN EARTH



DETALLE 1
TIP. EN CRUCE
DETALLE SOLDADURA DE CABLE - CABLE

- NOTAS**
- 1.- LOS MOTORES Y ESTACIONES DE MANEJO QUE NO ESTAN PUESTOS A TIERRA SE REALIZARA SU P.A.T. MEDIANTE UN CONDUCTOR DEL CABLE DE ALIMENTACION A MOTOR Y MEDIANTE UN CONDUCTOR DEL CABLE DE MANEJO.
 - 2.- TODOS LOS EQUIPOS METALICOS, ELECTRICOS COMO MECANICOS, DEBERAN CONECTARSE A TIERRA.
 - 3.- LOS POZOS DE PUESTA A TIERRA SE EJECUTARAN CON UNA SEPARACION MINIMA DE CINCO METROS ENTRE UNA Y OTRA.
 - 4.- EL CABLE DE TIERRA EN SU SALIDA AL EXTERIOR PARA CONERCONADO DEBE SIEMPRE PROTEGIDO CON TUBERIA CONDUIT 1 1/2" 21mmØ.
 - 5.- EL CABLE DE PUESTA A TIERRA ENTERRADO, SE TENDERA DESTENDIDO Y A UNA PROFUNDIDAD MAYOR DE 800mm.
 - 6.- TODOS LOS EMPALMES DE CABLES DE PUESTA A TIERRA, SE EFECTUARAN CON SOLDADURA EXOTERMICA.

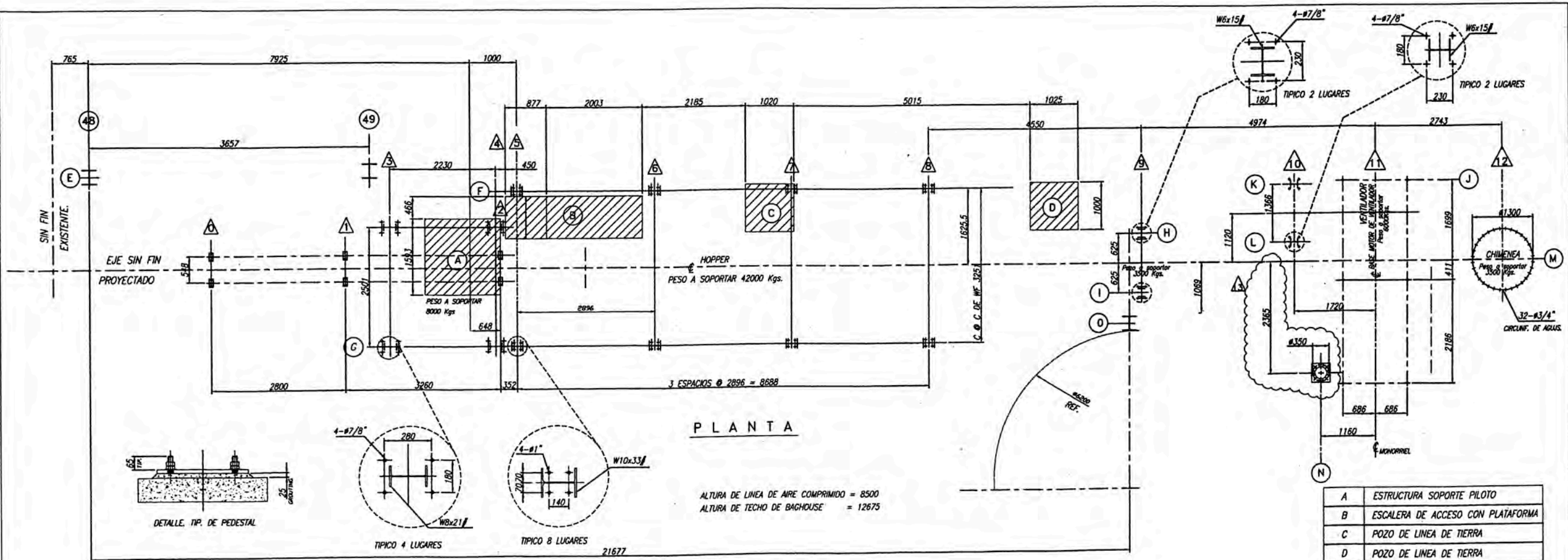
LEYENDA	
SIMBOLO	DESCRIPCION
(E)	POZO A TIERRA - SISTEMA DE PUESTA A TIERRA MOTORES
(E)	POZO A TIERRA - SISTEMA DE PUESTA A TIERRA INSTRUMENTACION
---	MALLA A TIERRA MOTORES - CABLE COBRE DESNUDO 4/0 AWG TEMPLE BLANDO
---	MALLA A TIERRA INSTRUMENTACION
---	CONDENADO A ESTRUCTURA - CABLE COBRE DESNUDO 2/0 AWG TEMPLE BLANDO

DISEÑO : ARMANDO VEGA
 DIBUJO : ARMANDO VEGA
 REVISO : ARMANDO VEGA
 ESCALA : INDICADO
 FECHA : 06/09/13

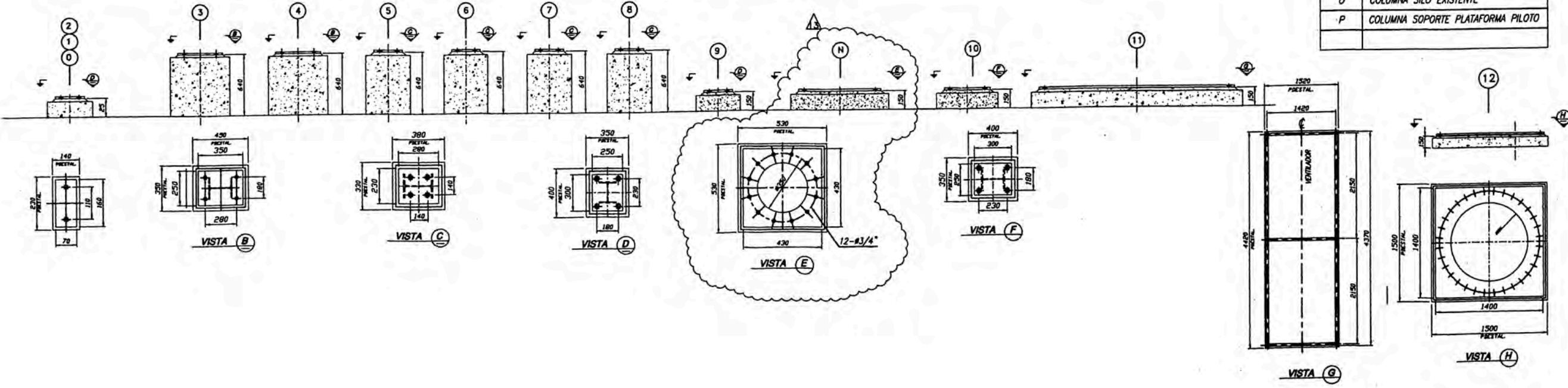
UNIVERSIDAD NACIONAL DE INGENIERIA
 FACULTAD DE INGENIERIA MECANICA

TITULO
 COLECTOR DE POLVO LINEA POZO DE TIERRA
 PLANO N°: GA-060

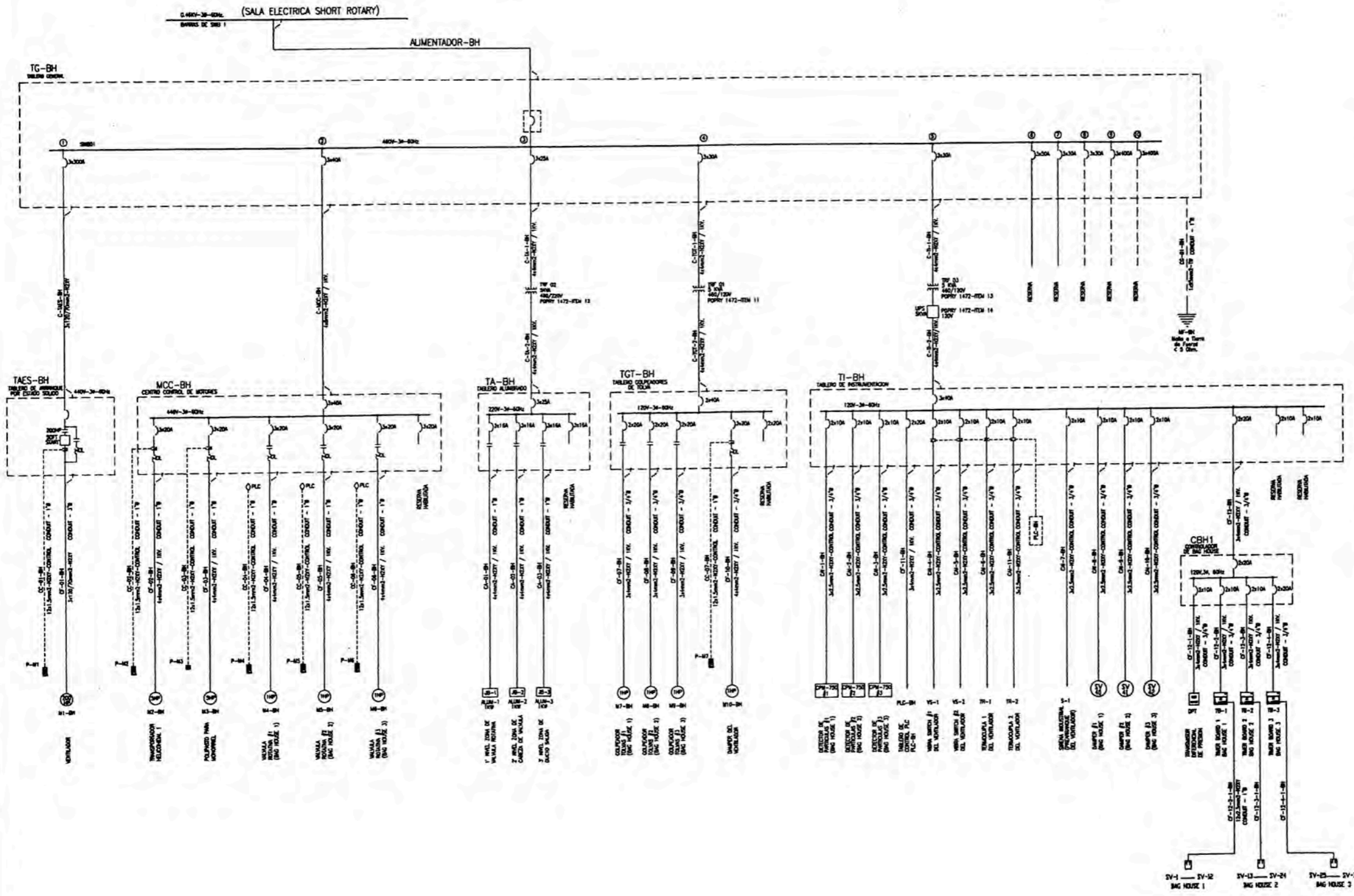
REFERENCIAS



A	ESTRUCTURA SOPORTE PILOTO
B	ESCALERA DE ACCESO CON PLATAFORMA
C	POZO DE LINEA DE TIERRA
D	POZO DE LINEA DE TIERRA
O	COLUMNA SILO EXISTENTE
P	COLUMNA SOPORTE PLATAFORMA PILOTO



DISEÑO : ARMANDO VEGA DIBUJO : ARMANDO VEGA REVISO : ARMANDO VEGA ESCALA : INDICADO FECHA : 06/09/13	UNIVERSIDAD NACIONAL DE INGENIERIA FACULTAD DE INGENIERIA MECANICA	TITULO COLECTOR DE POLVO UBICACIÓN DE ANCLAJES PLANO N°: GA-061
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LEYENDA	
	Transformador de tensión trifásico aislamiento seco.
	Interruptor termomagnético automático
	Motor eléctrico
	Sistema de puesta a tierra.
	Relé de protección térmico
	contactos eléctricos.
	Mando local de campo equipado con Selector manual-OFF-Automático, botones start/stop y lámpara señalización arranque y sobrecarga.
	Pulsador campo start/stop con lámparas on/off para maniobra

CUADRO DE CARGAS					
Código de equipo	Descripción	Potencia Instalada (kW)	Mes. Dem. por Tablero (kW)	Factor Simulacion	Máxima Demanda (kW)
TGCS-BH	Tablero Arranque Estado Sólido	146.20	146.22	0.85	425.17
CCM-BH	Centro Control de Motores	10.70	8.45		
TA-BH	Tablero de Alumbrado	4.00	4.00		
TGT-BH	Tablero de Coletores de Tapa	3.98	3.33		
TI-BH	Tablero Instrumentación	4.00	4.00		
RESERVA	Reserva (Diagrama Original DRP)	355	333		
TOTAL CARGA ELECTRICA (kW)		726.88	-	-	425.17

POTENCIA INSTALADA TOTAL = 726.88 KW.
 MÁXIMA DEMANDA PROYECTADA = 425.17 KW.

DESIGNACION:
 JB : CAJA DE EMPALMES UBICADO EN CAMPO

DISEÑO : ARMANDO VEGA
 DIBUJO : ARMANDO VEGA
 REVISO : ARMANDO VEGA
 ESCALA : INDICADA
 FECHA : 06/09/13



TITULO
 COLECTOR DE POLVO
 DIAGRAMA UNIFILAR
 DEL SISTEMA ELECTRICO
 PLANO N°: GA-071

PLC-BH

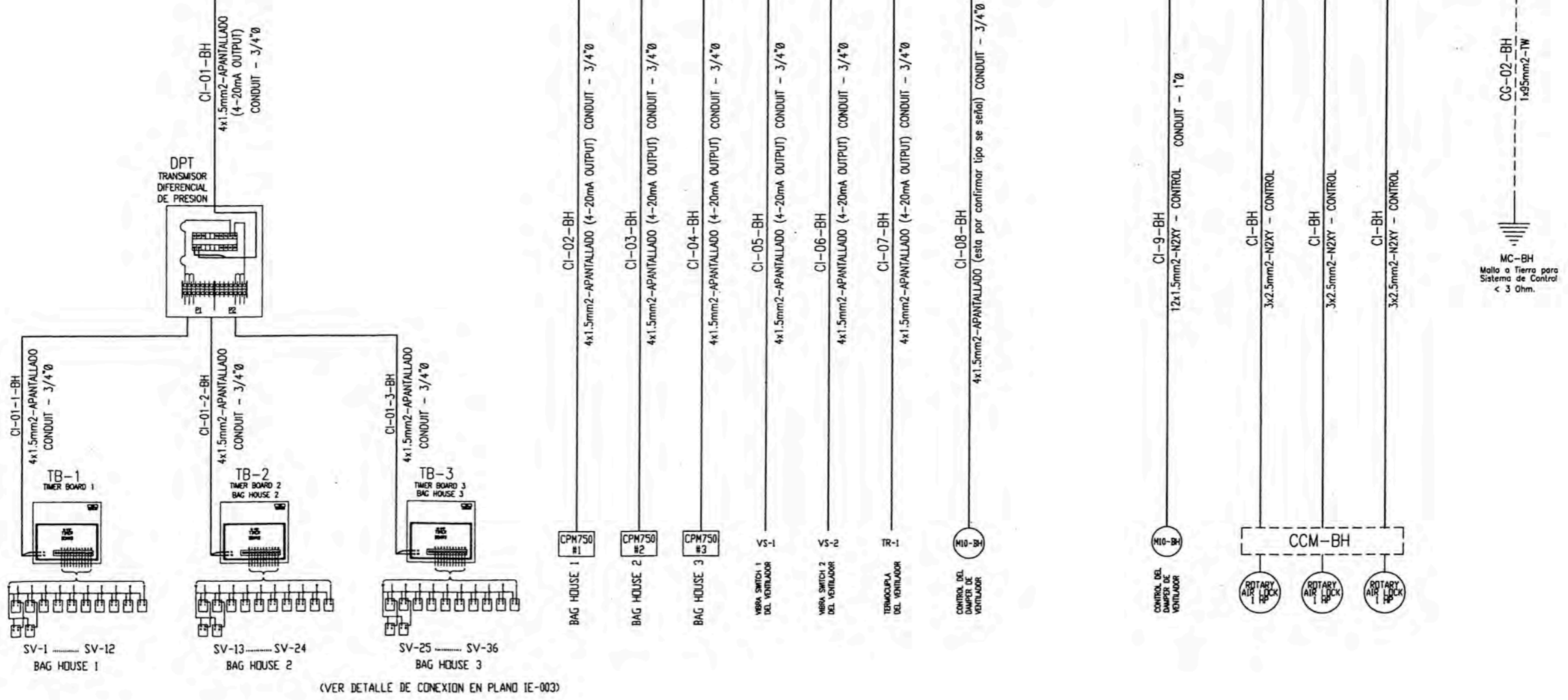
MODULOS DE ENTRADA Y SALIDA

ENTRADAS ANALOGICAS

SALIDAS DIGITALES

RESERVAS

RESERVAS





DESIGNACIONES:

- JD : Caja de conexión digital.
- PLC-BH : Tablero de control con PLC.
- CPM750 : Detector de Partículas.
- SV : Válvula Solenode
- DPT : Transmisor Diferencial de Presión
- VS : Vibra Switch
- TR : Termocupla

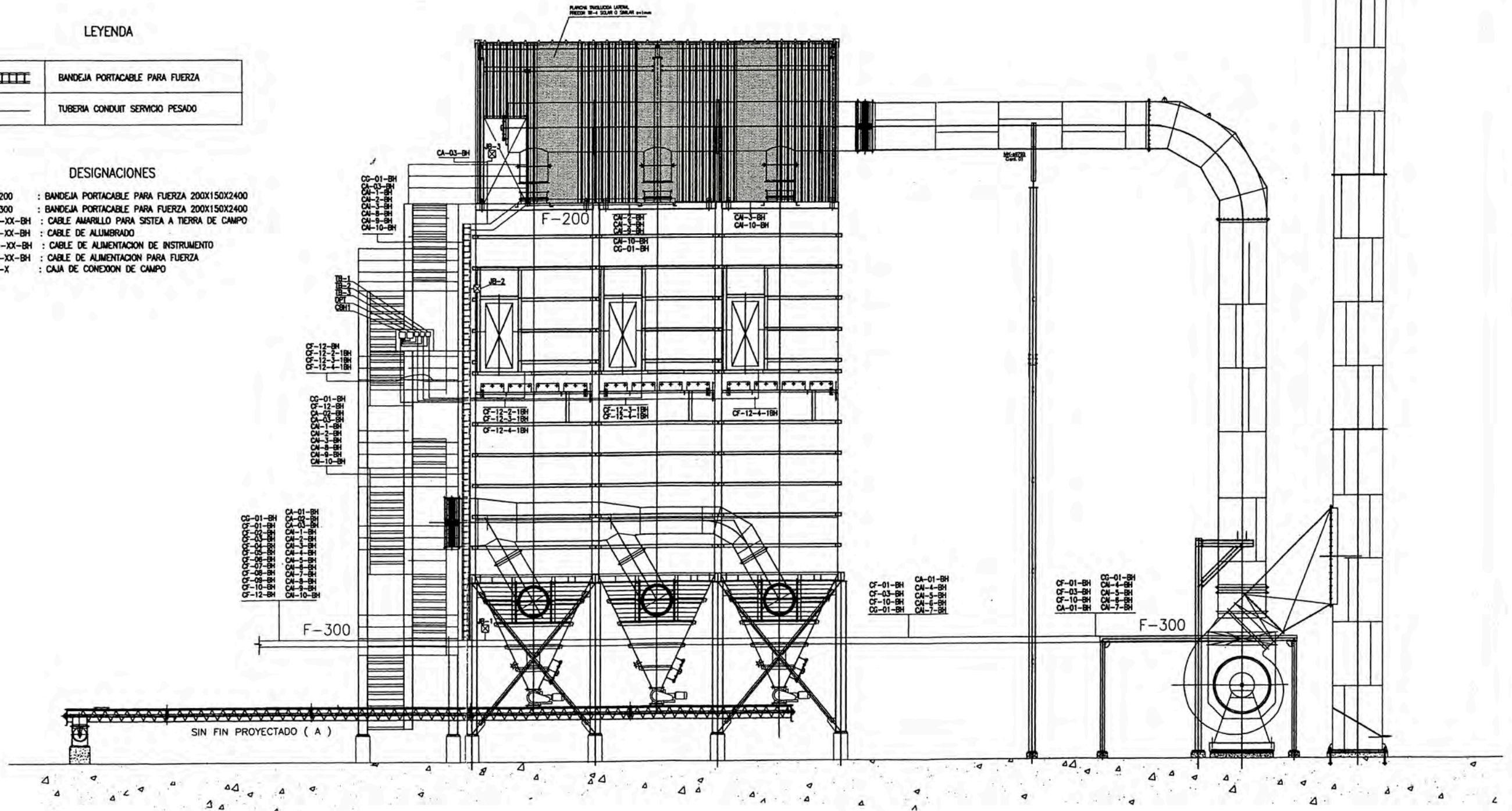
DISEÑO : ARMANDO VEGA DIBUJO : ARMANDO VEGA REVISO : ARMANDO VEGA ESCALA : INDICADA FECHA : 06/09/13	 <p>UNIVERSIDAD NACIONAL DE INGENIERIA</p> <p>FACULTAD DE INGENIERIA MECANICA</p>	TITULO COLECTOR DE POLVO DIAGRAMA UNIFILAR DEL SISTEMA DE CONTROL PLANO N°: GA-072
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LEYENDA

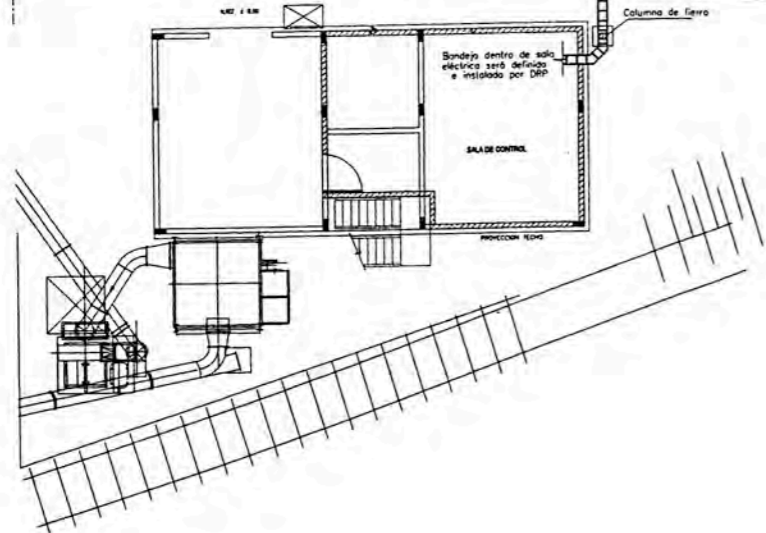
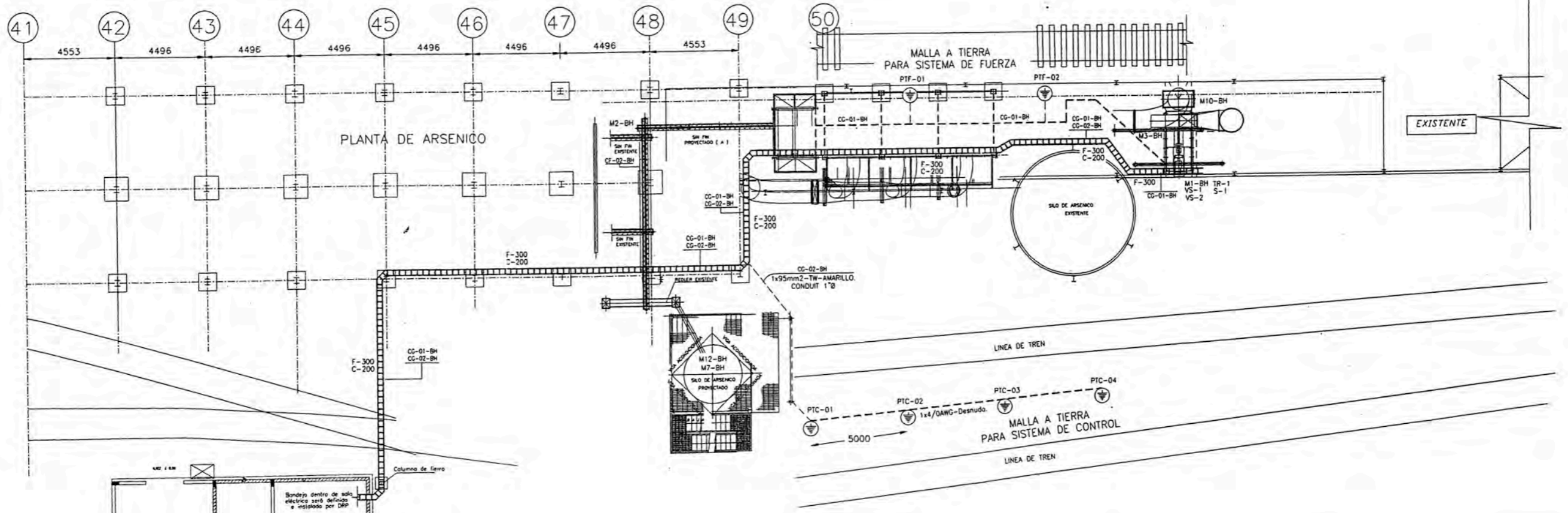
	BANDEJA PORTACABLE PARA FUERZA
	TUBERIA CONDUIT SERVICIO PESADO

DESIGNACIONES

- F-200 : BANDEJA PORTACABLE PARA FUERZA 200X150X2400
- F-300 : BANDEJA PORTACABLE PARA FUERZA 200X150X2400
- CG-XX-BH : CABLE AMARILLO PARA SISTEA A TIERRA DE CAMPO
- CA-XX-BH : CABLE DE ALUMBRADO
- CAI-XX-BH : CABLE DE ALIMENTACION DE INSTRUMENTO
- CF-XX-BH : CABLE DE ALIMENTACION PARA FUERZA
- JB-X : CAJA DE CONEXION DE CAMPO



DISEÑO : ARMANDO VEGA		UNIVERSIDAD NACIONAL DE INGENIERIA	TITULO
DIBUJO : ARMANDO VEGA			COLECTOR DE POLVO RUTA DE LOS CABLES DE FUERZA
REVISO : ARMANDO VEGA	FACULTAD DE INGENIERIA MECANICA		PLANO N°:
ESCALA : INDICADA			GA-074
FECHA : 06/09/13			



ESPECIFICACIONES

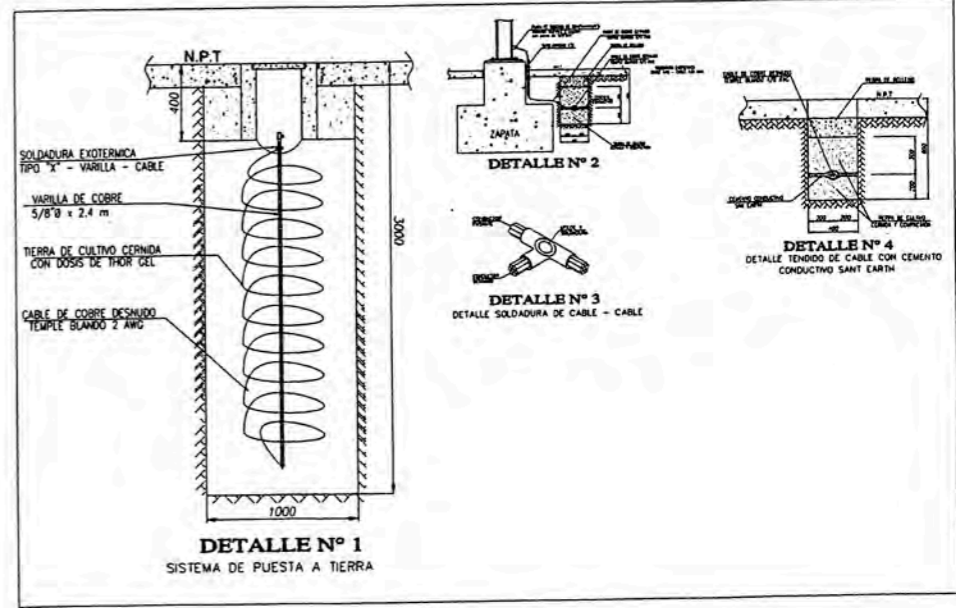
- 1.0 En todo el trayecto de las bandejas ira un cable tierra de 95mm²-TW color amarillo.
- 2.0 Las bandejas portables serán aterradas en cada 10mts en todo su trayecto.
- 3.0 La Resistencia de la Malla a Tierra para Fuerza (PTF) será menor a 5 Ohm.
- 4.0 La Resistencia de la Malla a Tierra para Control (PTC) será menor a 3 Ohm.

DESIGNACIONES

- PTC : Pozo a Tierra de Control.
 PTF : Pozo a Tierra de Fuerza

LEYENDA

SIMBOLO	DESCRIPCION
⊕	POZO A TIERRA - SISTEMA DE PUESTA A TIERRA MOTORES
---	CABLE COBRE DESNUDO 4/0 AWG TEMPLE BLANDO



DISEÑO : ARMANDO VEGA
 DIBUJO : ARMANDO VEGA
 REVISO : ARMANDO VEGA
 ESCALA : INDICADA
 FECHA : 06/09/13

XI UNIVERSIDAD NACIONAL DE INGENIERIA
 FACULTAD DE INGENIERIA MECANICA

TITULO
 COLECTOR DE POLVO RUTA DE LOS CABLES DE FUERZA
 PLANO N°: GA-076