City of Tampa
Jane Castor, Mayor

Contract Administration
Richard Mutterback, Director
306 East Jackson Street, 4N
Tampa, FL 33602

Office (813) 274-8116
Fax: (813) 274-7368

ADDENDUM
Via E-Mail
DATE: April 11, 2025

Contract: 25-C-00024 Howard F. Curren AWTP High Purity Oxygen Generation Facility Replacement Design Build

Submitters on the above referenced project are hereby notified that the following addendum is made to the RFQ. Any submissions shall conform to this notice.

Item 1: Add Existing Oxygen System As-Built Dwgs

Item 2: Add 2016 HFCATWP Master Plan

Item 3: Replace Design Criteria Package title page (PDF pg 3) with the attached.

All other provisions of this RFQ not in conflict with this Addendum shall remain in full force and effect. Questions are to be e-mailed to ContractAdministration@tampagov.net.

Jim Greiner

Jim Greiner, P.E., Contract Management Supervisor

DIVISION 4H-4 YEAR 1973

EAST-WEST PLANT COORDINATE SYSTEM

NORTH-SOUTH BASELINE, PLANT COORDINATE SYSTEM

MARITIME BLVD.

JUNCTION CHAMBER AND METER VAULT NO.1 (DIV 4H-7)

SEE NOTE NO.1

EXISTING GRIT BUILDING

EXISTING PUMPING STATION

EXISTING GRIT CHAMBER

OPERATIONS AND MAINTENANCE BUILDING (DIVISION 4H-5)

EXISTING ADMINISTRATION BUILDING

EXISTING CAR PORT AND SHOP

EXISTING RAILROAD SIDING

EXISTING BYPASS STRUCTURE

EXISTING MAINTENANCE BUILDING

EXISTING EFFLUENT BUILDING

EXISTING SLUDGE PUMPING STATION

JUNCTION CHAMBER NO.3 (DIV 4H-7)

EXISTING PRIMARY SEDIMENTATION TANKS

EXISTING FIELD OFFICE

EXISTING SLUDGE DIGESTION TANKS

EXISTING SLUDGE DIGESTION CONTROL BUILDING NO.1

EXISTING SLUDGE DIGESTION CONTROL BUILDING NO.2

EXISTING SLUDGE DRYING BEDS

EXISTING SLUDGE DRYING BEDS

ADDITION TO EXISTING OVERFLOW STRUCTURE (DIV 4H-7)

EXISTING OVERFLOW STRUCTURE

25' TAMPA ELECTRIC COMPANY EASEMENT

NEW SCREEN AND GRIT BUILDING

NEW PLANT SWITCHGEAR BUILDING

NEW OXYGEN GENERATION EQUIPMENT FOUNDATIONS

RELOCATED NAVIGATION TOWER

NEW LIQUID OXYGEN STORAGE EQUIPMENT FOUNDATION

NEW MAIN PUMPING STATION

NEW JUNCTION CHAMBER NO.2

NEW METER VAULT NO.2

NEW REACTORS

NO.1 NO.2 NO.3 NO.4 NO.5 NO.6

NEW INTERMEDIATE PUMPING STATION

5+00X EAST-WEST BASELINE PLANT COORDINATE SYSTEM N 87°-41'-22" E

Pipe Bridge

Access Ramp

NEW SLUDGE PUMPING STATION NO.1

NEW SLUDGE PUMPING STATION NO.2

NEW SLUDGE PUMPING STATION NO.3

NEW FINAL SEDIMENTATION TANKS

NO.1 NO.2 NO.3 NO.4 NO.5 NO.6 NO.7 NO.8 NO.9 NO.10 NO.11 NO.12

Cross Collector Channel

NEW METER VAULT

ACCESS BUILDING (DIV 4H-6)

Secondary Treatment Control Area

Pipe Tunnel (Div 4H-6)

Secondary Treatment Control Conduit (Div 4H-6)

Nitrified Effluent Conduit (Div 4H-6)

FILTER BUILDING (DIV 4H-6)

Ramp

FUTURE

DENITRIFICATION FILTERS (DIV 4H-6)

SLUDGE TREATMENT BUILDING (DIV 4H-6)

AEROBIC DIGESTION TANKS (DIV 4H-6)

NO.1 NO.2 NO.3 NO.4

SLUDGE THICKENING TANKS (DIV 4H-6)

NO.1 NO.2

FUTURE

JUNCTION CHAMBER NO.4 (DIV 4H-7)

POST AERATION AND CHLORINATION TANKS (DIV 4H-6)

60' DRAINAGE DITCH EASEMENT

HARBOR BOULEVARD EASEMENT LINE

CURVE "A"

CURVE "A" DATA

Δ = 47°-09'-40"
R = 343.34'
L = 282.61'
T = 149.86'

LEGEND

	EXISTING	PROPOSED	FUTURE
STRUCTURES			
SUPERSTRUCTURE			
TANKS			
PAVEMENT			
CONTOUR	+8	+8	
SPOT ELEVATION	X +8.2	(+8.5)	
GRADED SWALE			
PROPERTY LINE			
DITCH CENTERLINE			
EASEMENT LINE			
FENCE			
RAILROAD TRACKS			
HIGH OR LOW VOLTAGE ELECTRICAL DUCT		HV or LV E/D ℄ 1+00X	
DIRECT BURIAL VALVE			
TREE			
POWER POLE			

GENERAL NOTES

1. Northwest corner of existing plant site = coordinates N1,305,474.13 and E357,512.82 based on the Standard Plane Rectangular Coordinate System (Transverse Mercator) for the West Zone of Florida, and this corner = 0+00X and 0+00Y for Plant Coordinate System.
2. All elevations are referred to City of Tampa Datum, which is 0.65 feet above the Mean Low Water Datum of the U.S. Corps of Engineers and 0.15 feet below the Mean Sea Level Datum of the U.S.C. & G.S.
3. Locations, elevations and dimensions of existing utilities, conduits, process piping, other underground piping, structures and other features are shown according to the best information available at the time of the preparation of these plans but do not purport to be absolutely correct. The Contractor shall verify the locations, elevations and dimensions of all existing utilities, structures and other features affecting his work prior to construction.
4. The Contractor shall provide at least 48 hours notice to the City in order to permit the location of existing underground utilities, conduits, process piping and other underground piping and structures in advance of construction.

NOTE:
ALL ELEVATIONS SHOWN ARE REFERENCED TO CITY OF TAMPA DATUM. TO CONVERT TO NATIONAL OCEAN SURVEY (NOS) DATUM, SUBTRACT 0.15 FEET (0'-1 13/16").

RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION, WITHIN REASONABLE TOLERANCES; BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
ENGINEERS
222 S. RIVERSIDE PLAZA
CHICAGO, ILLINOIS 60606

DESIGNED J.S.
DRAWN I. S.
CHECKED J.S. REB

APPROVED
_____ DATE
SUPT., DEPT. OF SANITARY SEWERS
_____ DATE
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP.	REVISION

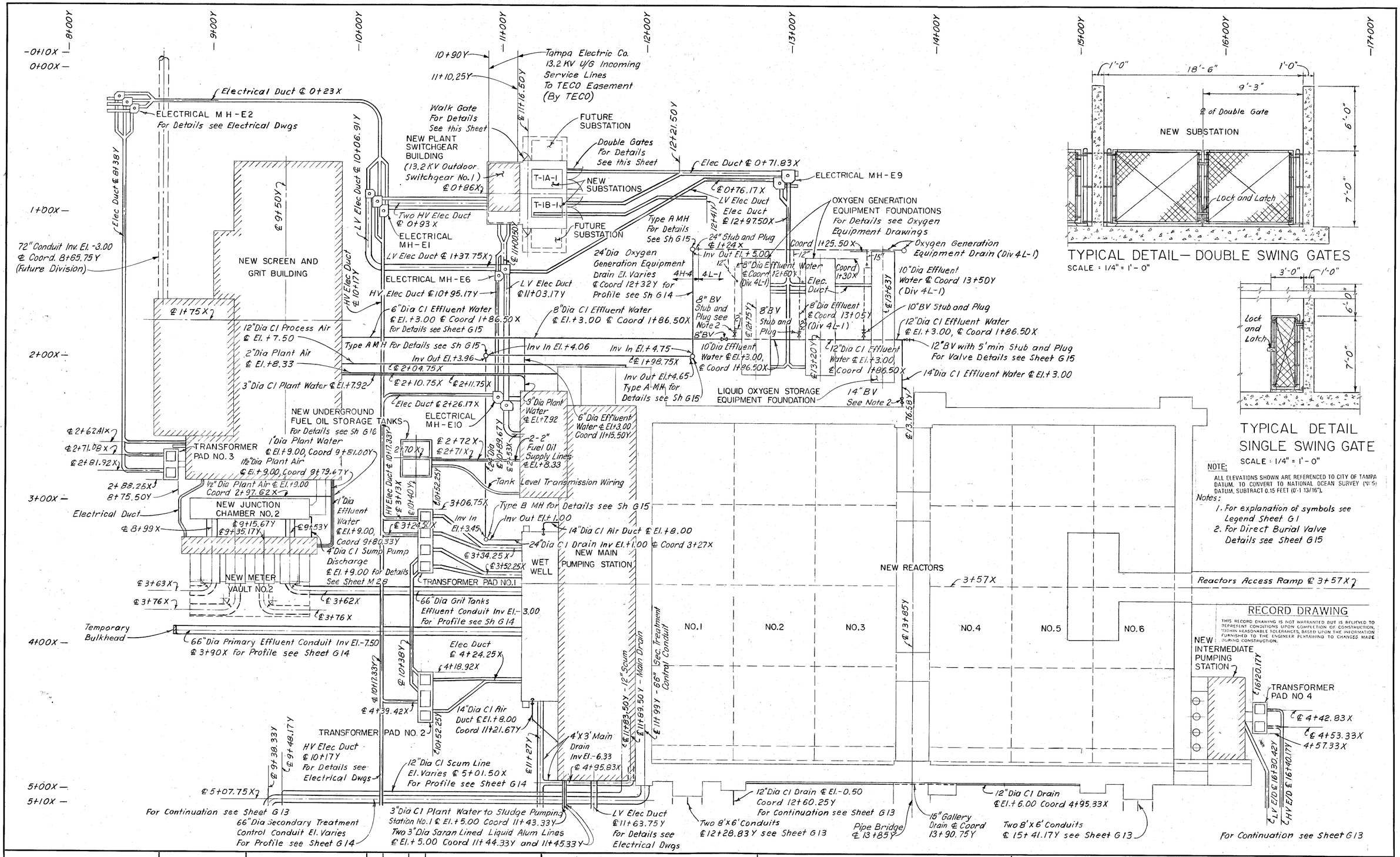
SCALE
100 0 100 200 FT
1" = 100'

CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
HOOKERS POINT SEWAGE TREATMENT PLANT
DIVISION 4H-4
STRUCTURES AND EQUIPMENT

GENERAL
SITE PLAN

PROJ. NO. S 202-70-30 D-
SHEET G1 OF 17
DATE SEPT, 1973 REV. 0

DWG 4 OF 384



TYPICAL DETAIL— DOUBLE SWING GATES

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

TYPICAL DETAIL
SINGLE SWING GATE

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

NOTE:

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Notes:

1. For explanation of symbols see Legend Sheet G1
2. For Direct Burial Valve Details see Sheet G15

RECORD DRAWING

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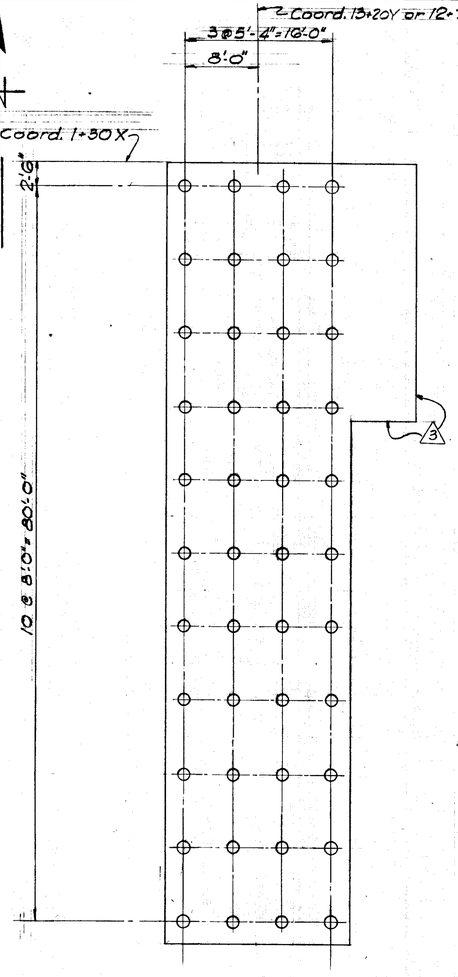
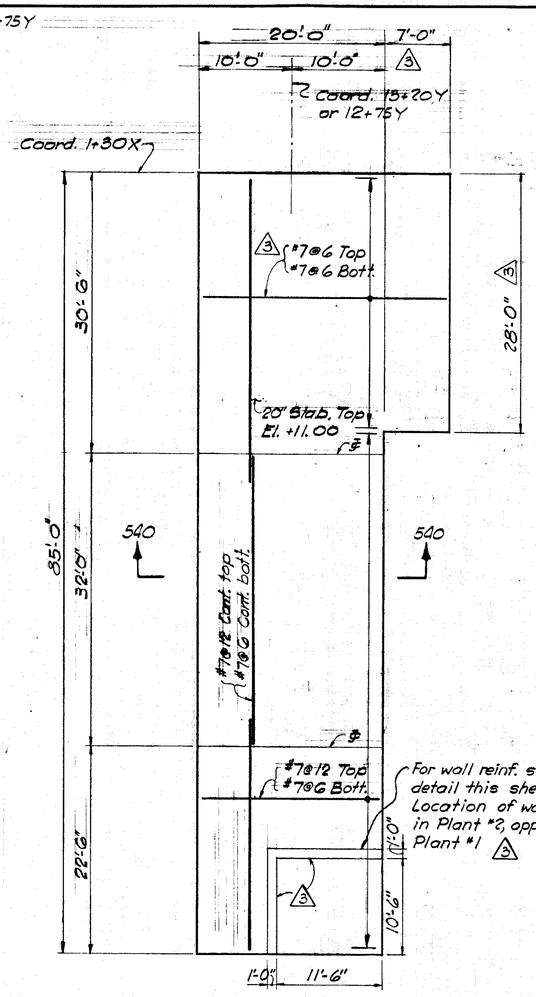
GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED J.S. DRAWN I. S. CHECKED R.C.B. REB	APPROVED _____ DATE _____ SUPT., DEPT. OF SANITARY SEWERS _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	NO.	DATE	APP.	REVISION
SCALE 30 0 30 60 FT 1"= 30'	CITY OF TAMPA, FLORIDA SEWAGE DISPOSAL SYSTEM HOOKERS POINT SEWAGE TREATMENT PLANT DIVISION 4H-4 STRUCTURES AND EQUIPMENT	GENERAL OUTSIDE PIPING PART PLAN	PROJ. NO. S 202-70-30 D- SHEET G12 OF 17 DATE SEPT, 1973 REV. 0			

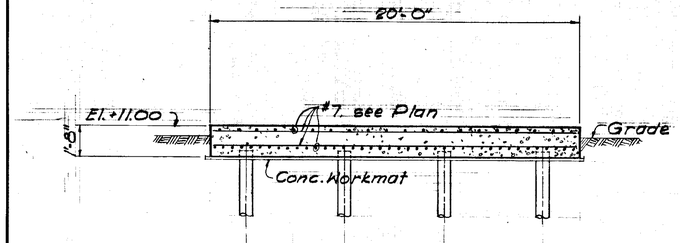


PILE PLAN
Scale: 1/8"=1'-0"

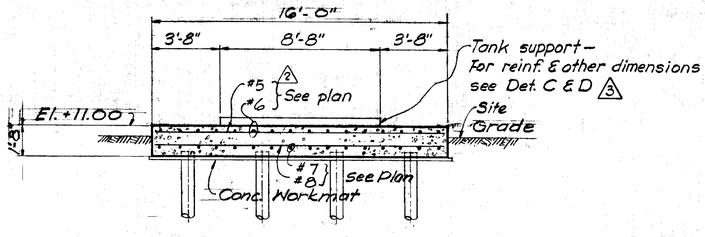


SLAB PLAN
Scale: 1/8"=1'-0"

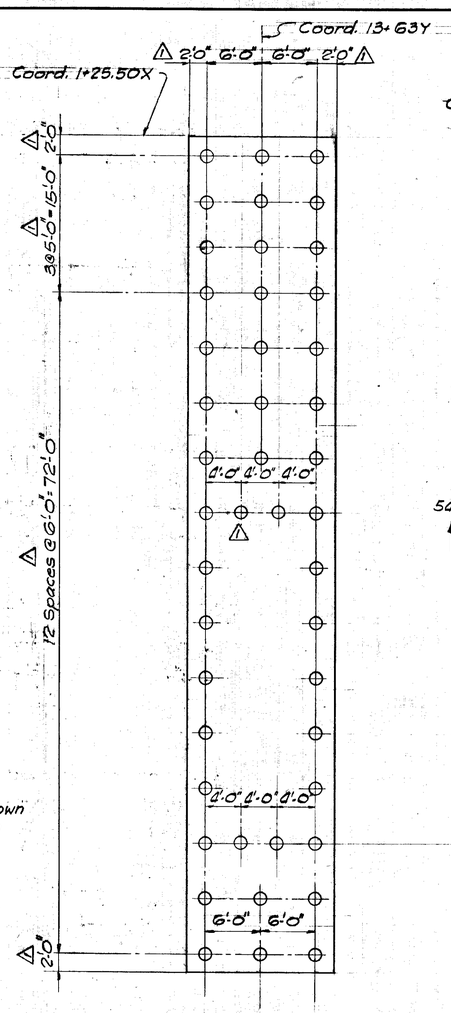
OXYGEN GENERATION EQUIPMENT FOUNDATION
(2- THUS)



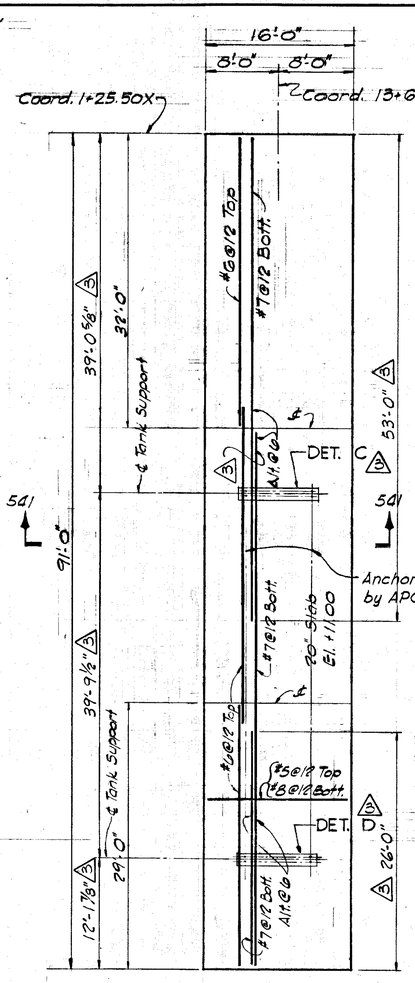
SECTION 540
Scale: 1/4"=1'-0"



SECTION 541
Scale: 1/4"=1'-0"

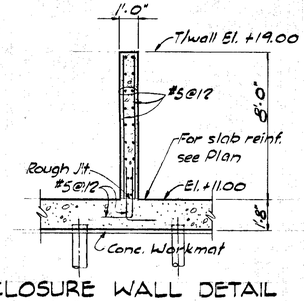


PILE PLAN
Scale: 1/8"=1'-0"



SLAB PLAN
Scale: 1/8"=1'-0"

LIQUID OXYGEN STORAGE EQUIPMENT FOUNDATION
(1- THUS)



ENCLOSURE WALL DETAIL
Scale: 1/4"=1'-0"

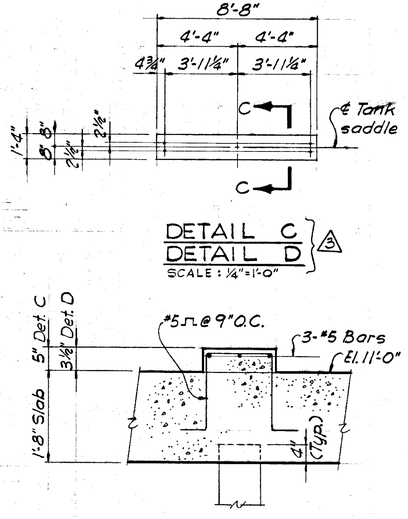
All Piles shown on this sheet to be cutoff at El. +9.67
Top of concrete in piles to be at El. 8.67 1
Total 133 Piles on this sheet.
For Pile Details see Sheet S-8.

No construction of the foundation pads 1 shown on this sheet shall commence until erection drawings indicating weights and dimensions of equipment and final details and locations of inserts and embedded items are issued by the Engineer.

For relationship of work under Divisions 4W-4 and 4L-1 see Mechanical Drawings.

D# denotes dimension to be determined after selection of equipment.
℄ denotes Construction Joint.

For General Notes and Typical Details noted TD-1 see Sheets S-122, 123 & 124.



NOTE:
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RECORD DRAWING

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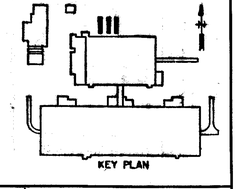

KEY PLAN

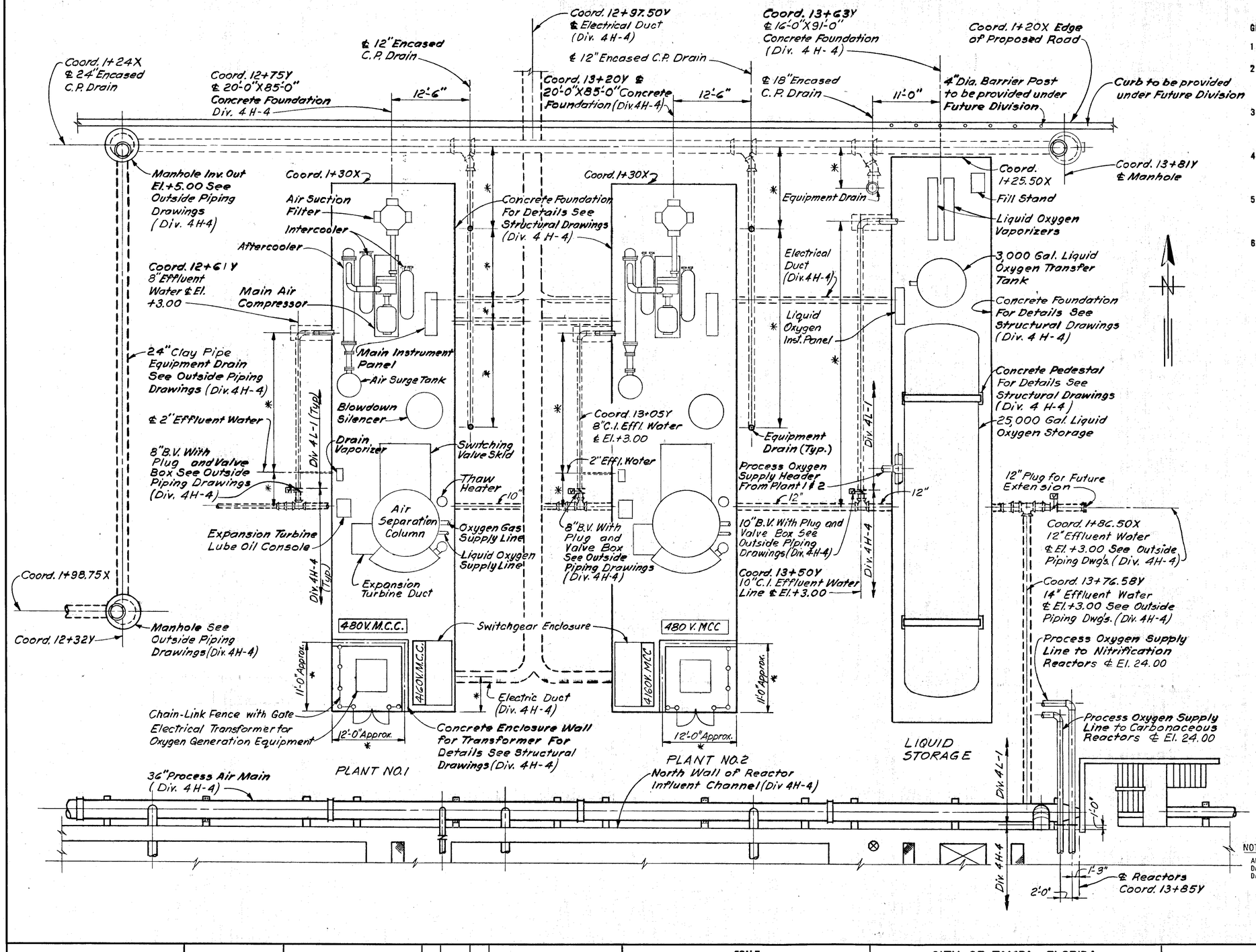
GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED Y.H. DRAWN A.U.; Y.H. CHECKED JJG	APPROVED SUPT., DEPT. OF SANITARY SEWERS DATE GREELEY AND HANSEN, ENGINEERS DATE	3 6-10-75 R.E.B. Revised for APCI 4L-1 Dwgs. 2 7-18-75 J.J.G. Corrected Reinf. Designation 1 4-8-75 R.E.B. Revised as shown NO. DATE APP. REVISION

SCALE
8 0 8 16 FT 1/8"=1'-0"
4 0 4 8 FT 1/4"=1'-0"

CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
HOOKERS POINT SEWAGE TREATMENT PLANT
DIVISION 4H-4
STRUCTURES AND EQUIPMENT

STRUCTURAL
OXYGEN GENERAL EQUIPMENT
PLANS AND SECTIONS

PROJ. NO. S 202-70-30D-
SHEET S70 OF 125
DATE SEPT, 1973 REV. 3



GENERAL NOTES:

1. Oxygen Generation and Storage Equipment to be provided under Division 4L-1, Oxygen Generation Equipment.
2. General arrangement for Oxygen Generating and Storage Equipment to be provided under Division 4L-1 is shown on this sheet. Construction to be furnished under Division 4H-4 is shown on this sheet.
3. All inserts, pipe sections or castings, anchor bolts and other such items to be furnished with equipment to be provided under Division 4L-1 will be issued by the City and shall be installed under Division 4H-4.
4. Final location of electrical ducts, ground connection points, pipelines and other equipment furnished under Division 4H-4 shall be determined after selection of Oxygen Generating and Storage Equipment, furnished under Division 4L-1.
5. No construction of the Oxygen Generation Equipment foundations and appurtenances shall be started until erection drawings showing final details and locations of inserts and embedded and other items are issued by the Engineer.
6. * Indicates dimensions to be determined after selection of equipment.

NOTE:
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RECORD DRAWING

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KEY PLAN

GREELEY AND HANSEN
ENGINEERS
222 S. RIVERSIDE PLAZA
CHICAGO, ILLINOIS 60606

DESIGNED R.C.B.
DRAWN J. P. S.
CHECKED R.C.B. P.E.B.

APPROVED
SUPT., DEPT. OF SANITARY SEWERS DATE
GREELEY AND HANSEN, ENGINEERS DATE

NO.	DATE	APP.	REVISION

SCALE
8 0 8 16 FT
1/8"=1'-0"

CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
HOOKERS POINT SEWAGE TREATMENT PLANT
DIVISION 4H-4
STRUCTURES AND EQUIPMENT

MECHANICAL
OXYGEN GENERATION EQUIPMENT
PLAN AND DETAILS

PROJ. NO. S 202-70-30D-
SHEET M56 OF 79
DATE SEPT, 1973 REV. 0

DWG 224 OF 384

DIVISION 4L-1 YEAR 1976

EAST-WEST PLANT COORDINATE SYSTEM

NORTH-SOUTH BASELINE, PLANT COORDINATE SYSTEM

MARITIME BLVD.

2289.98' N 87°-43'-13"E

50' DRAINAGE EASEMENT

25' TAMPA ELECTRIC COMPANY EASEMENT

60' DRAINAGE DITCH EASEMENT

246.05' S 46°-56'-40"E

344.98'

N 87°-43'-13"E

HARBOR BOULEVARD EASEMENT LINE

CURVE "A" DATA

Δ = 47°-09'-40"
R = 343.34'
L = 282.61'
T = 149.86'

CURVE "A"

S 0°-13'-0" W

HARBOR BOULEVARD

HARBOR BOULEVARD EASEMENT LINE

S 2°-18'-38"E 175'

SEE NOTE NO. 1

99.56'

JUNCTION CHAMBER AND METER VAULT NO.1 (DIV 4H-7)

OPERATIONS AND MAINTENANCE BUILDING (DIVISION 4H-5)

5+36Y

1+72X

EXISTING GRIT BUILDING

EXISTING PUMPING STATION

EXISTING GRIT CHAMBER

EXISTING CAR PORT AND SHOP

EXISTING ADMINISTRATION BUILDING

EXISTING RAILROAD SIDING

EXISTING BYPASS STRUCTURE

EXISTING MAINTENANCE BUILDING

EXISTING EFFLUENT BUILDING

JUNCTION CHAMBER NO.3 (DIV 4H-7)

EXISTING SLUDGE PUMPING STATION

EXISTING PRIMARY SEDIMENTATION TANKS

NO.1 NO.2 NO.3 NO.4

EXISTING FIELD OFFICE

EXISTING SLUDGE DIGESTION TANKS

EXISTING SLUDGE DIGESTION CONTROL BUILDING NO.1

EXISTING SLUDGE DIGESTION CONTROL BUILDING NO.2

NO.5

EXISTING SLUDGE DRYING BEDS

EXISTING SLUDGE DRYING BEDS

S 2°-18'-38"E

ADDITION TO EXISTING OVERFLOW STRUCTURE (DIV 4H-7)

EXISTING OVERFLOW STRUCTURE

NEW SCREEN AND GRIT BUILDING (DIV 4H-4)

℄ 9+50Y

NEW PLANT SWITCHGEAR BUILDING (DIV 4H-4)

℄ 11+16.50Y

℄ 0+86X

1+30X

℄ 12+75Y

NEW OXYGEN GENERATION EQUIPMENT FOUNDATIONS (DIV 4H-4)

℄ 13+20Y

℄ 13+63Y

1+25.50X

0+49.75X

RELOCATED NAVIGATION TOWER

14+92.96Y

℄ 1+75X

NEW MAIN PUMPING STATION (DIV 4H-4)

NEW LIQUID OXYGEN STORAGE EQUIPMENT FOUNDATION (DIV 4H-4)

℄ 13+85Y, Pipe Gallery

℄ 2+40X, Reactors Influent Channel

℄ 11+99Y, Main Pumping Station Discharge Channel

℄ 15+71Y, Intermediate Pumping Station Discharge Channel

NEW JUNCTION CHAMBER NO.2 (DIV 4H-4)

℄ 3+06X

3+37.83X

Below Grade

NEW METER VAULT NO.2 (DIV 4H-4)

Access Ramp ℄ 3+57X2

NEW REACTORS

NO.1 NO.2 NO.3 NO.4 NO.5 NO.6

(DIV 4H-4)

NEW INTERMEDIATE PUMPING STATION (DIV 4H-4)

5+00X EAST-WEST BASELINE PLANT COORDINATE SYSTEM N 87°-41'-22"E

℄ 11+27Y, New Main Drain

Below Grade

Pipe Bridge

Below Grade

℄ 4+87.83X, Reactors Effluent Channel

Access Ramp ℄ 8+85.50Y

Access Ramp ℄ 18+84.50Y

NEW SLUDGE PUMPING STATION NO.1

NEW SLUDGE PUMPING STATION NO.2

NEW SLUDGE PUMPING STATION NO.3

℄ 5+91.67X, New Main Drain

NEW FINAL SEDIMENTATION TANKS (DIV 4H-4)

NO.1 NO.2 NO.3 NO.4 NO.5 NO.6 NO.7 NO.8 NO.9 NO.10 NO.11 NO.12

℄ 7+47.58X Cross Collector Channel

NEW METER VAULT (DIV 4H-4)

ACCESS BUILDING (DIV 4H-6)

℄ 16+93Y Nitrified Effluent Conduit (Div 4H-6)

Secondary Treatment Control Area

℄ 13+85Y, Pipe Gallery

Pipe Tunnel (Div 4H-6)

Secondary Treatment Control Conduit (Div 4H-6)

FILTER BUILDING (DIV 4H-6)

℄ 10+93X Final Effluent Conduit

SLUDGE TREATMENT BUILDING (DIV 4H-6)

SLUDGE THICKENING TANKS (DIV 4H-6)

NO.1 NO.2

℄ 6+88Y

AEROBIC DIGESTION TANKS (DIV 4H-6)

NO. 1 NO. 2 NO. 3 NO. 4

℄ 11+85X

Ramp

FUTURE

FUTURE

DENITRIFICATION FILTERS (DIV 4H-6)

JUNCTION CHAMBER NO.4 (DIV 4H-7)

POST AERATION AND CHLORINATION TANKS (DIV 4H-6)

LEGEND

STRUCTURES	EXISTING	NEW – UNDER CONSTRUCTION	FUTURE
SUPERSTRUCTURE			
TANKS			
PAVEMENT			
FENCE			
RAILROAD TRACK			

GENERAL NOTES

1. Northwest corner of existing plant site = coordinates N1,305,474.13 and E357,512.82 based on the Standard Plane Rectangular Coordinate System (Transverse Mercator) for the West Zone of Florida, and this corner = 0+00X and 0+00Y for Plant Coordinate System.
2. All elevations are referred to City of Tampa Datum, which is 0.65 feet above the Mean Low Water Datum of the U.S. Corps of Engineers and 0.15 feet below the Mean Sea Level Datum of the U.S.C. & G.S.
3. Locations, elevations and dimensions of existing utilities, conduits, process piping, other underground piping, structures and other features are shown according to the best information available at the time of the preparation of these plans but do not purport to be absolutely correct. The Contractor shall verify the locations, elevations and dimensions of all existing utilities, structures and other features affecting his work prior to construction.
4. The Contractor shall provide at least 48 hours notice to the City in order to permit the location of existing underground utilities, conduits, process piping and other underground piping and structures in advance of construction.
5. Oxygen Generation and Storage Equipment shall be located on the foundations shown on this plan which will be provided under another contract.
6. Use only graphic scales for scaling reduced plans.

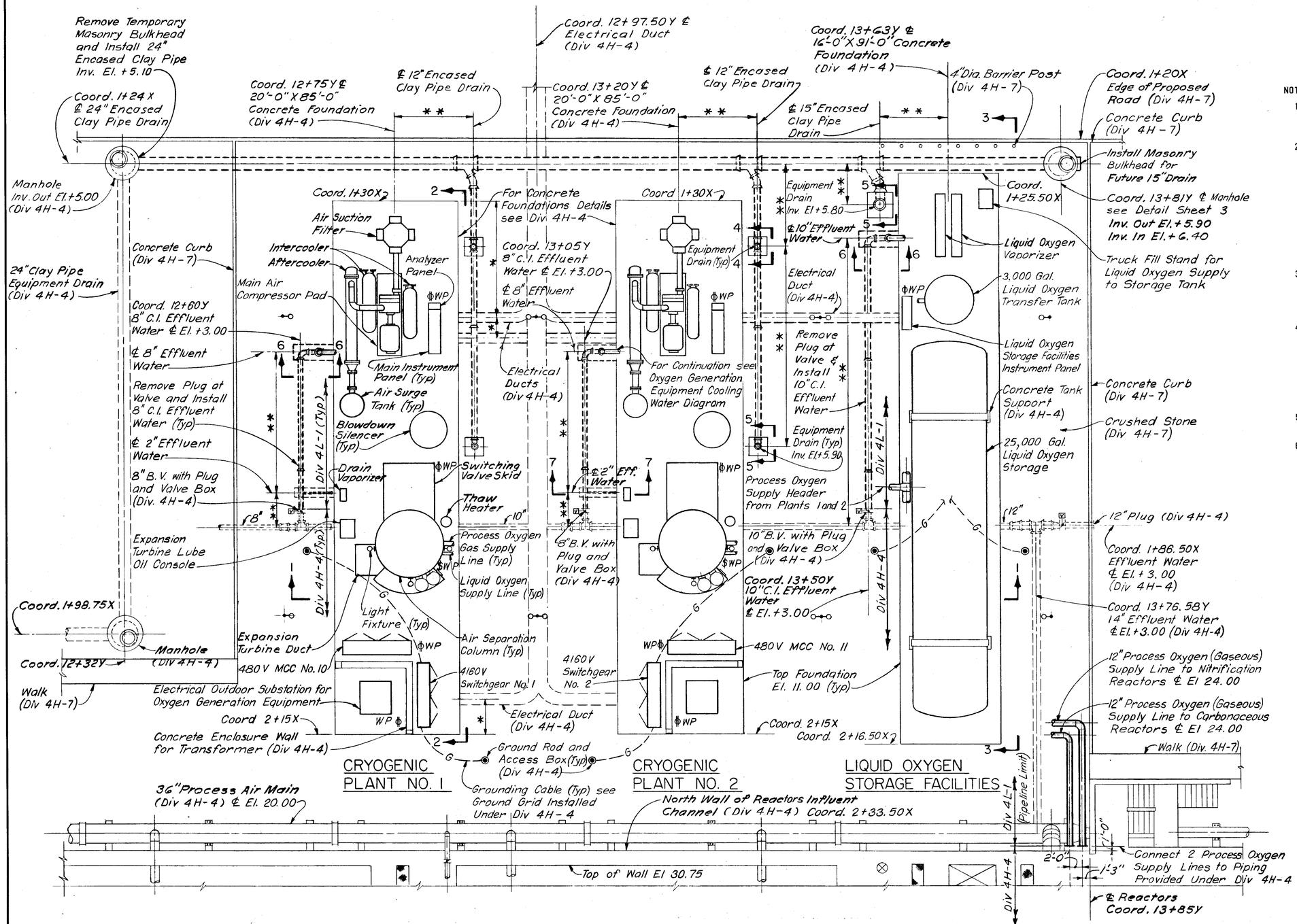
PAUL E. LANGDON, JR. CERTIFICATE No. 15473 STATE OF FLORIDA REGISTERED ENGINEER

GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED J.S. DRAWN I. S. CHECKED J.S. REB	APPROVED SUPT., DEPT. OF SANITARY SEWERS DATE 3-10-75; GREELEY AND HANSEN, ENGINEERS DATE 3-10-75	NO. DATE APP. REVISION	SCALE 100 0 100 200 FT 1"=100'

CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
HOOKERS POINT SEWAGE TREATMENT PLANT
DIVISION 4L-1
OXYGEN GENERATION AND STORAGE EQUIPMENT

SITE PLAN

PROJ. NO. S 202-70-30D-
SHEET | OF 5
DATE SEPT, 1973 | REV. 0



NOTES:

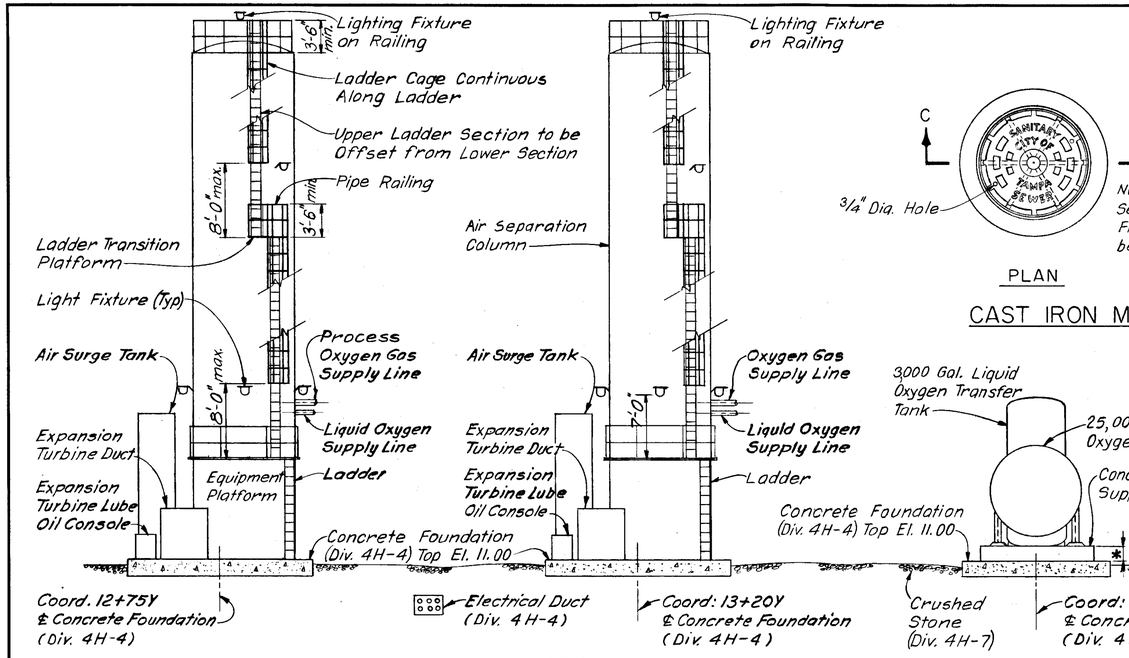
1. Items of construction, piping and equipment not indicated to be provided in another contract division shall be provided under Division 4L-1.
2. The arrangement of items shown to be provided under Division 4L-1 may be modified if required by proposed equipment. Any modifications proposed however, shall not conflict with the arrangements and locations of items shown to be provided under another contract division. The dimensions of the three proposed equipment foundations may be modified also, providing that such modifications do not extend beyond the X-coordinate limits shown, do not conflict with items included in another contract division and do not place adjacent edges of foundations less than 20 feet apart.
3. Supports for oxygen generation equipment piping, electrical conduits and other such items are not shown. Such supports shall be provided as shown on approved shop drawings and as specified and required.
4. Erection drawings showing location for anchor bolts and any other equipment or items to be embedded or to be stubbed up through the concrete foundations shall be provided to the City not later than 120 days after award of contract for Division 4L-1. All such items shall be furnished to the City not later than this date to be issued for installation to the appropriate division contractor.
5. All pipeline sizes shown are minimum permissable shown otherwise on approved shop drawings.
6. * – Indicates dimension to be determined by the contractor for Division 4L-1 and which shall be submitted to the City not later than 120 days after award of the contract for Division 4L-1.
   ** – Indicates dimension to be determined by the contractor for Division 4L-1 as required by approved equipment.
   B.V. – Butterfly Valve.
   ◉ – Ground Rod and Access Box.
   ⌽WP – Outdoor Duplex W.P. Receptacle
   $WP – Outdoor W.P. light switch
   --G-- – Grounding cable
   ⊢○ – Bracket type light fixture shall be equal to Crouse-Hinds VXHBF25GP Series, Vapor Tight, with Gasketed Glass Globe, 150 watt A-21 Incandescent Lamp.
   ○⊢○ – Double arm lighting standard under Future Division.
   •⊢○ – Single arm lighting standard under Future Division.

GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED R.C.B DRAWN J.S. S.K. CHECKED R.E.B.	APPROVED DATE SUPT., DEPT. OF SANITARY SEWERS DATE GREELEY AND HANSEN, ENGINEERS	NO.	DATE	APP.	REVISION	SCALE 8 0 8 16 FT. 1/8" = 1'-0"

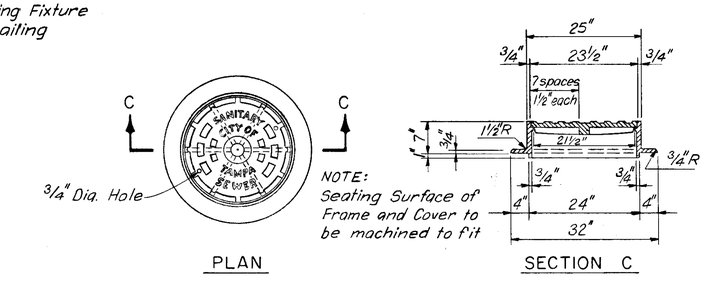
CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
HOOKERS POINT SEWAGE TREATMENT PLANT
DIVISION 4L-1
OXYGEN GENERATION AND STORAGE EQUIPMENT

OXYGEN GENERATION AND STORAGE EQUIPMENT PLAN

PROJ. NO. S 202-70-30D-
SHEET 2 OF 5
DATE SEPT. 1973 REV. 0

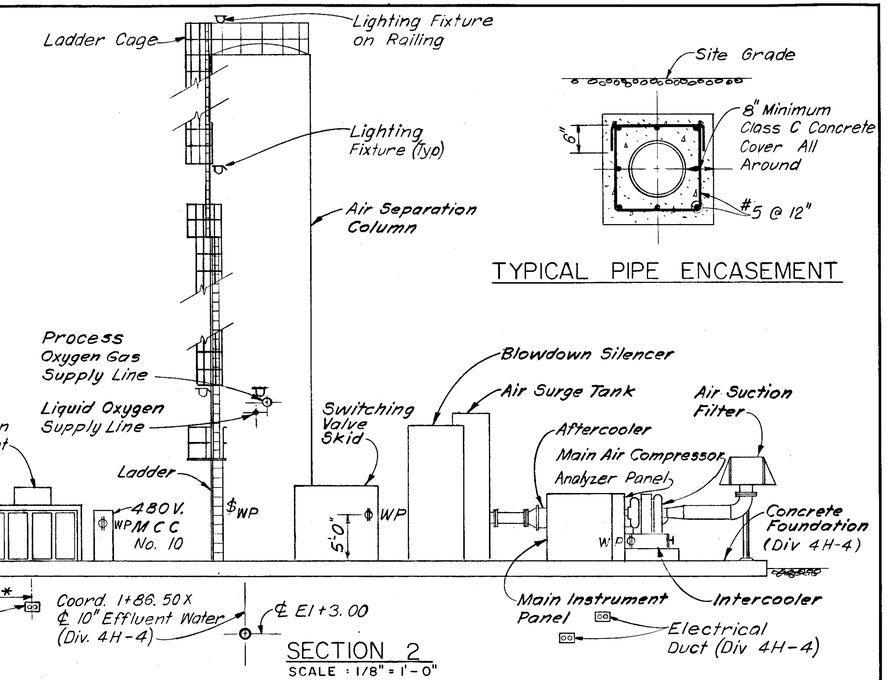


SECTION 1
SCALE : 1/8" = 1'-0"



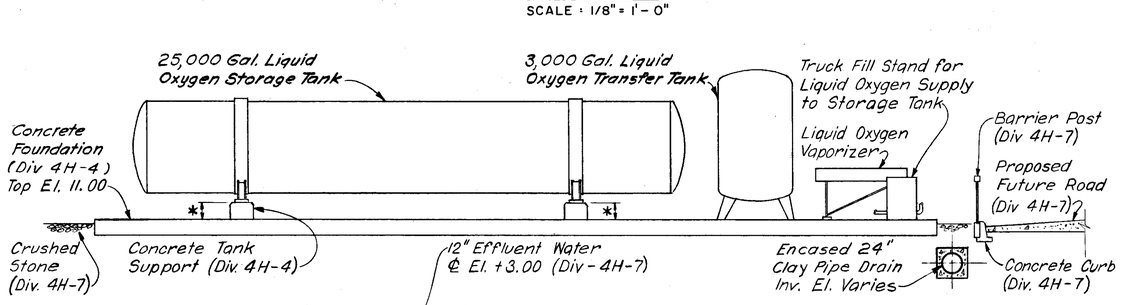
NOTE: Seating Surface of Frame and Cover to be machined to fit

CAST IRON MANHOLE FRAME AND COVER
Approx. Wt. 380#
SCALE : 3/4" = 1'-0"

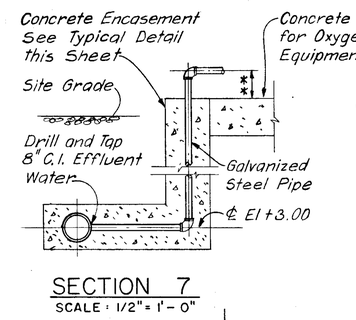


SECTION 2
SCALE : 1/8" = 1'-0"

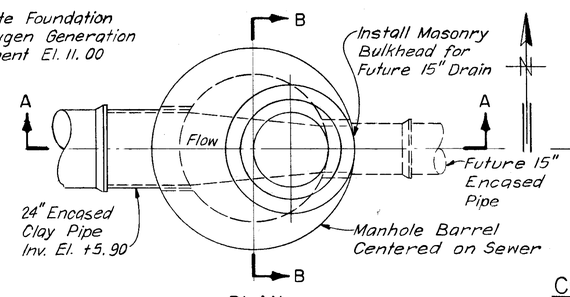
TYPICAL PIPE ENCASEMENT



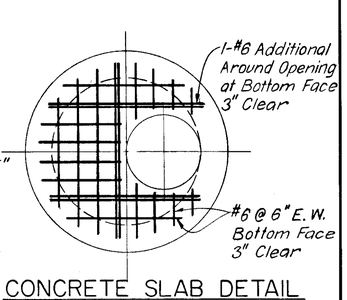
SECTION 3
SCALE : 1/8" = 1'-0"



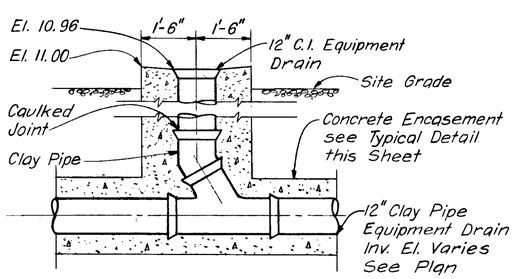
SECTION 7
SCALE : 1/2" = 1'-0"



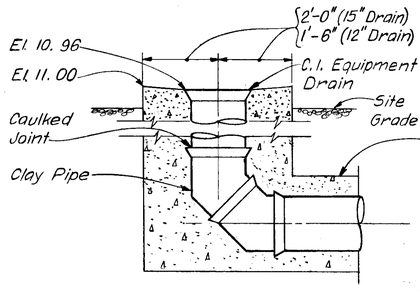
PLAN



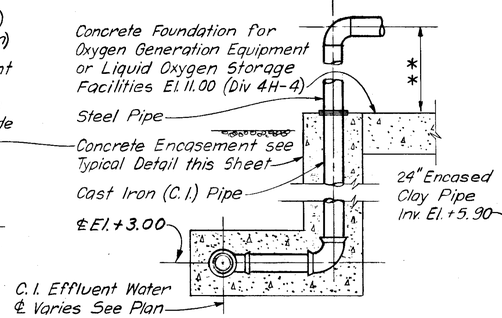
CONCRETE SLAB DETAIL



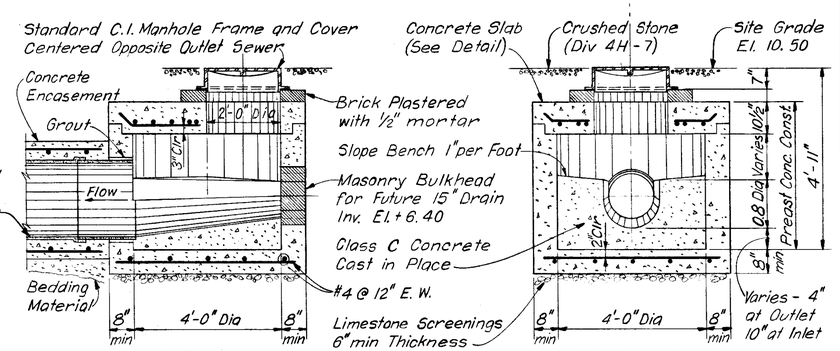
SECTION 4
SCALE : 1/2" = 1'-0"



SECTION 5
SCALE : 1/2" = 1'-0"



SECTION 6
SCALE : 1/2" = 1'-0"



SECTION A

MANHOLE DETAIL
SCALE : 1/2" = 1'-0"

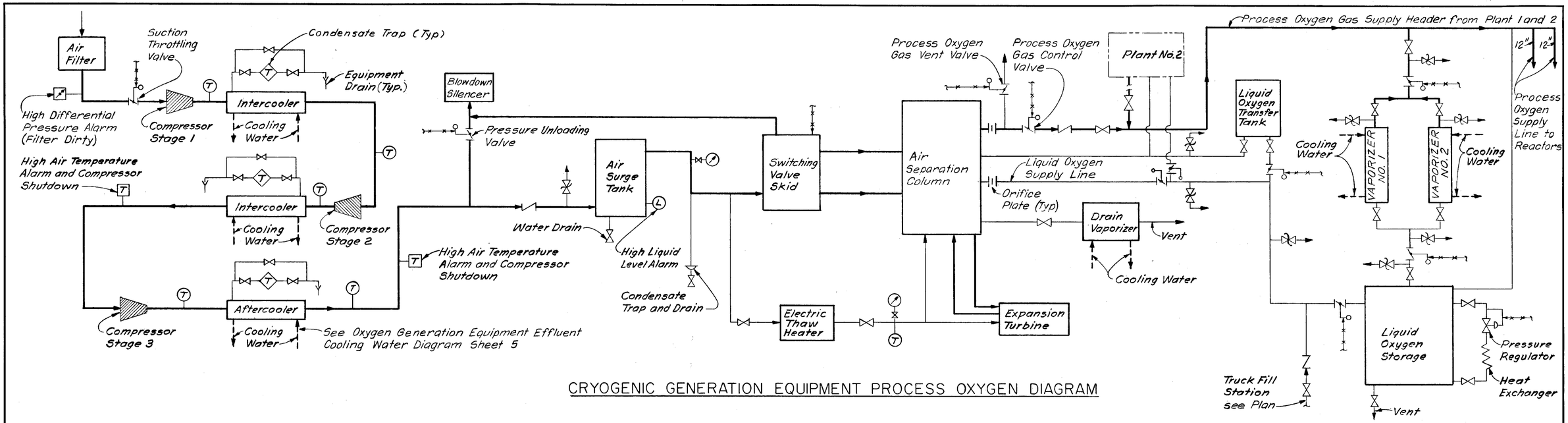
SECTION B

Note: For * and ** symbol indentification see Note 6 Sheet 2

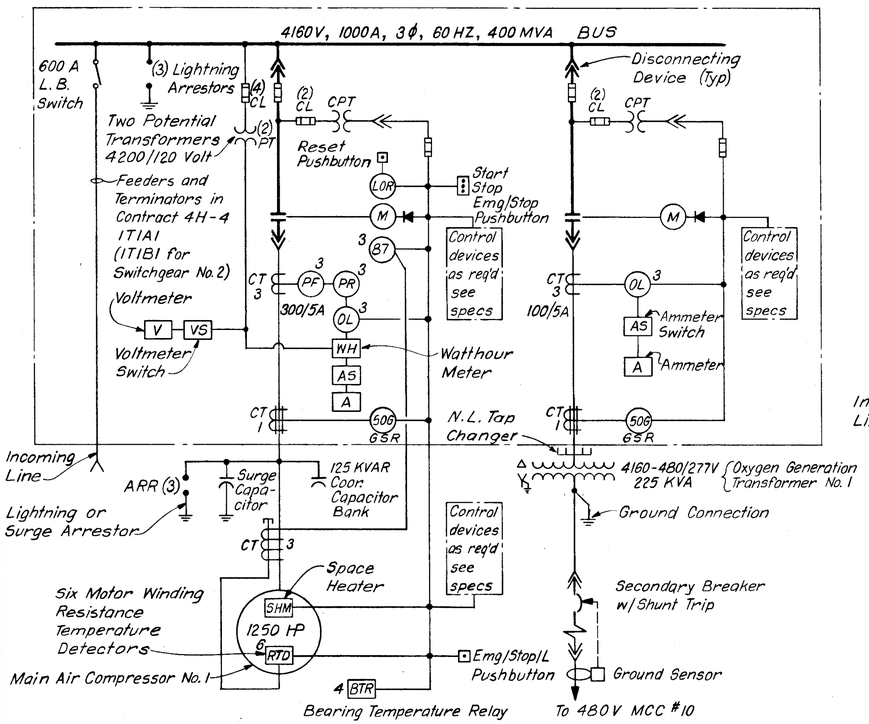
GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED R.C.B DRAWN J.S. S.K. CHECKED R.E.B.	APPROVED DATE SUPT., DEPT. OF SANITARY SEWERS DATE GREELEY AND HANSEN, ENGINEERS	NO. DATE APP. REVISION	SCALE 0 2 3 4 5 FT 1/2"=1'-0"; 0 2 3 FT 3/4"=1'-0"	CITY OF TAMPA, FLORIDA SEWAGE DISPOSAL SYSTEM HOOKERS POINT SEWAGE TREATMENT PLANT DIVISION 4L-I OXYGEN GENERATION AND STORAGE EQUIPMENT

OXYGEN GENERATION AND STORAGE EQUIPMENT SECTIONS AND DETAILS

PROJ. NO. S 202-70-30D-
SHEET 3 OF 5
DATE SEPT, 1973 REV. 0

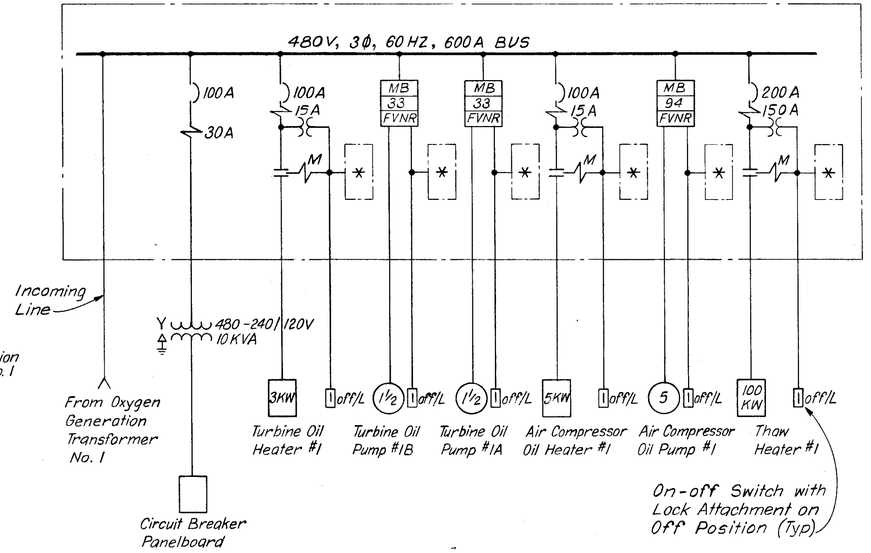


CRYOGENIC GENERATION EQUIPMENT PROCESS OXYGEN DIAGRAM



CRYOGENIC PLANT NO. 1 4160V SWITCHGEAR NO. 1

(Switchgear No. 2 is the same for Cryogenic Plant No. 2)



480V MOTOR CONTROL CENTER NO. 10 CRYOGENIC PLANT NO. 1

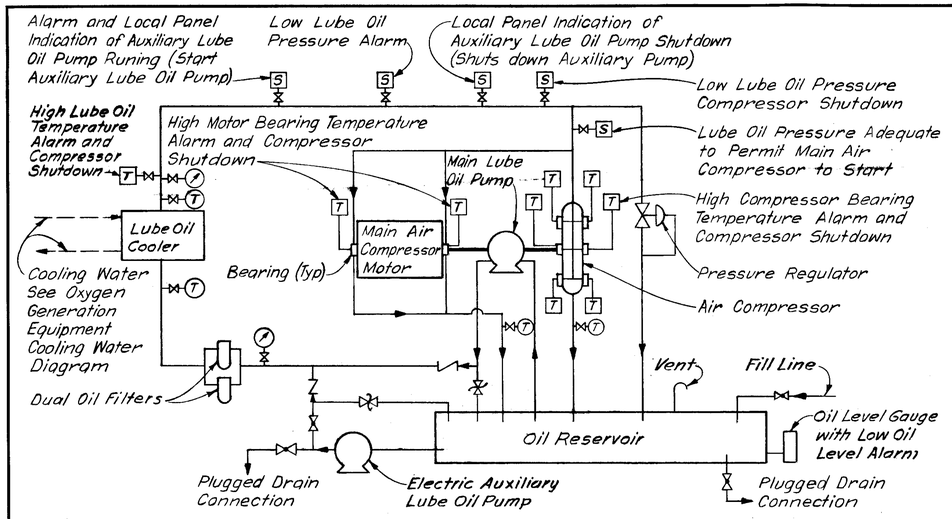
(MCC No. 11 is the same for Cryogenic Plant No. 2)

* Control Devices located in Starter Cubicle as required by Specifications

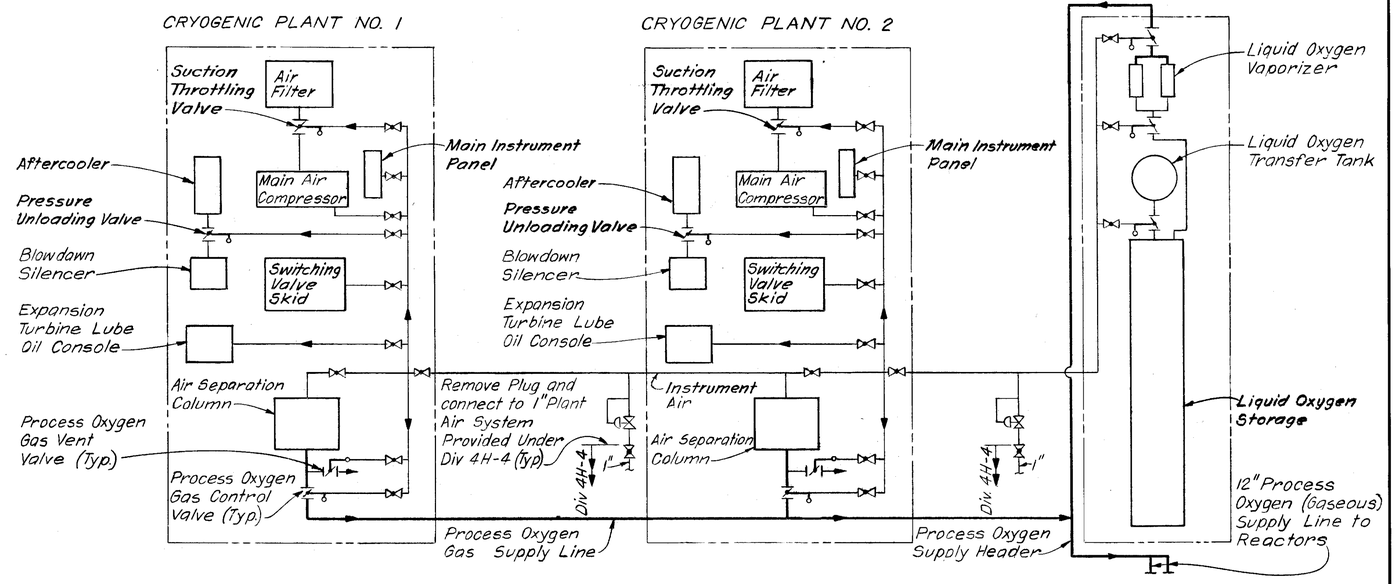
LEGEND

- Conductor connected
- Fuse (CL Indicates Current Limiting)
- 225A/125A — Low Voltage Air Circuit Breaker with 225A Frame and 125A Trip
- Low Voltage Drawout Type Air Circuit Breaker with Ground Sensor and Shunt Trip
- M — Combination Thermal Magnetic Breaker and Magnetic Contactor without Overload Protection (M-Operating Coil)
- MB / 33 / FVNR — Combination Starter with Control Transformer and Overload Relays Magnetic Breaker
  - 33 - Trip Setting
  - FVNR - Full Voltage Non Reversing
  - Control Line
  - Power Line
- Power Transformer with Winding Connections Indicated
- CPT — Control Power Transformer
- CT 3 — Current Transformer - 3 units - one per phase
- CT 1 — Current Transformer - 3 Phase Window Type
- CT 3 — Current Transformer - Window Type - 3 units - line and neutral conductors
- (5) — Squirrel Cage Motor (Indicated horsepower)
- (50) — Protective Relay
  - 50 - Instantaneous Overcurrent
  - 87 - Differential Current
  - G - Device in Ground Circuit
  - GSR - Ground Sensing Relay
  - PF - Phase Failure
  - PR - Phase Reversal
  - OL - Overload
  - LOR - Lock Out Relay

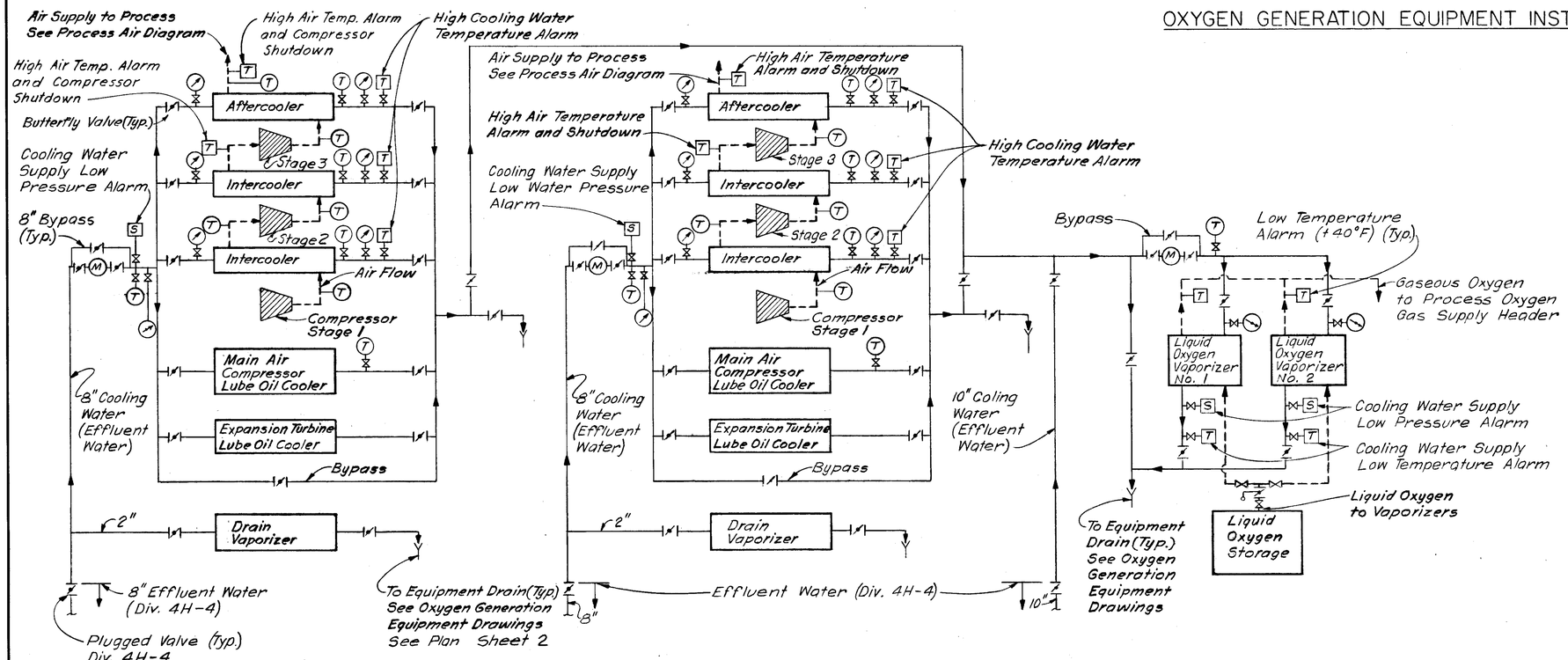
GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED R.A.W. R.C.B. DRAWN J.S. S.K. CHECKED R.E.B	APPROVED ____ DATE ____ SUPT., DEPT. OF SANITARY SEWERS ____ DATE ____ GREELEY AND HANSEN, ENGINEERS	NO. DATE APP. REVISION	SCALE NO SCALE	CITY OF TAMPA, FLORIDA SEWAGE DISPOSAL SYSTEM HOOKERS POINT SEWAGE TREATMENT PLANT DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT	PROCESS OXYGEN AND ELECTRICAL SINGLE LINE DIAGRAMS	PROJ. NO. S 202-70-30D-; SHEET 4 OF 5; DATE SEPT, 1973; REV. 0



OXYGEN GENERATION MAIN AIR COMPRESSOR (MAC) LUBRICATION OIL DIAGRAM



OXYGEN GENERATION EQUIPMENT INSTRUMENT AIR DIAGRAM



OXYGEN GENERATION EQUIPMENT EFFLUENT COOLING WATER DIAGRAM

LEGEND

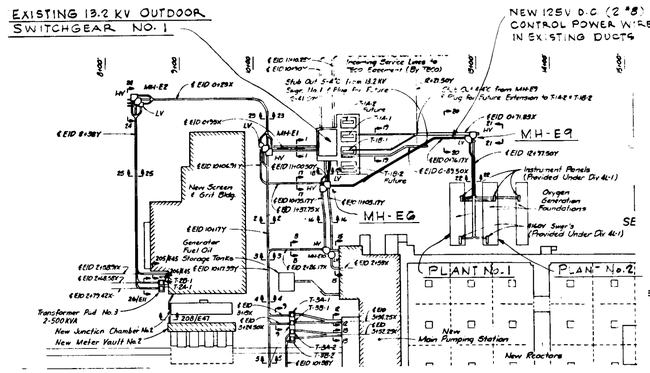
- Pressure Indicator
- Temperature Indicator
- Pressure Alarm
- Temperature Alarm
- Flow Meter
- Butterfly Valve
- Globe Valve
- Check Valve
- Pressure Relief Valve
- Pneumatic Operated Butterfly Valve
- Pressure Regulator
- Equipment Drain
- Instrument Air Supply

GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED R.C.B. DRAWN J.S. S.K. CHECKED R.E.B.	APPROVED _____ DATE _____ SUPT., DEPT. OF SANITARY SEWERS _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	NO.	DATE	APP.	REVISION	SCALE NO SCALE

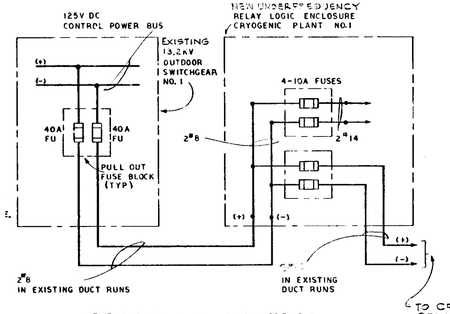
CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
HOOKERS POINT SEWAGE TREATMENT PLANT
DIVISION 4L-I
OXYGEN GENERATION AND STORAGE EQUIPMENT

OXYGEN GENERATION EQUIPMENT DIAGRAMS

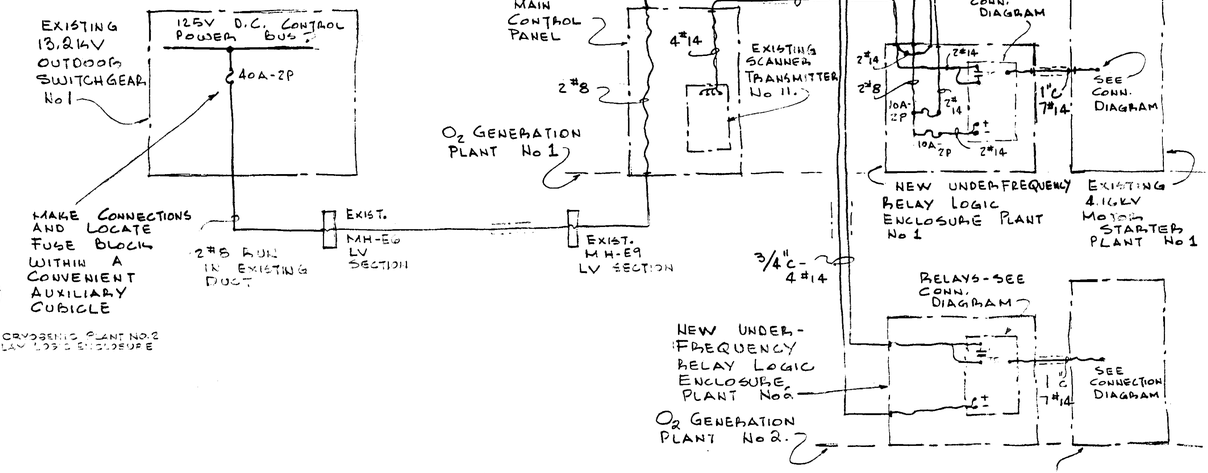
PROJ. NO. S 202-70-30D-
SHEET 5 OF 5
DATE SEPT, 1973 REV. 0



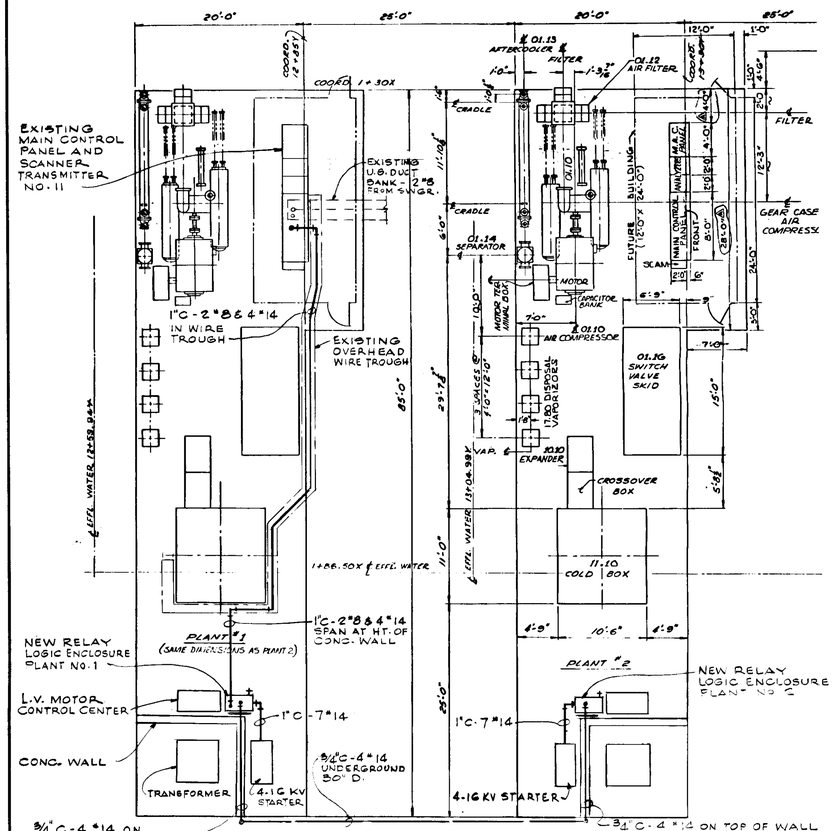
SITE PLAN
NOT TO SCALE



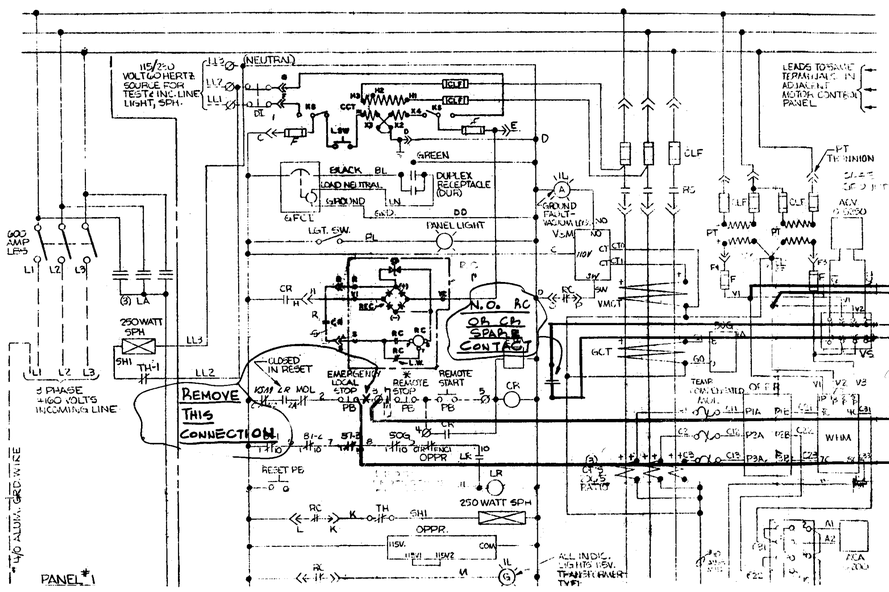
125 VOLT D.C. CONTROL POWER SCHEMATIC



WIRING ONE LINE DIAGRAM



PLAN CRYOGENIC PLANTS No. 1 & 2
NOT TO SCALE

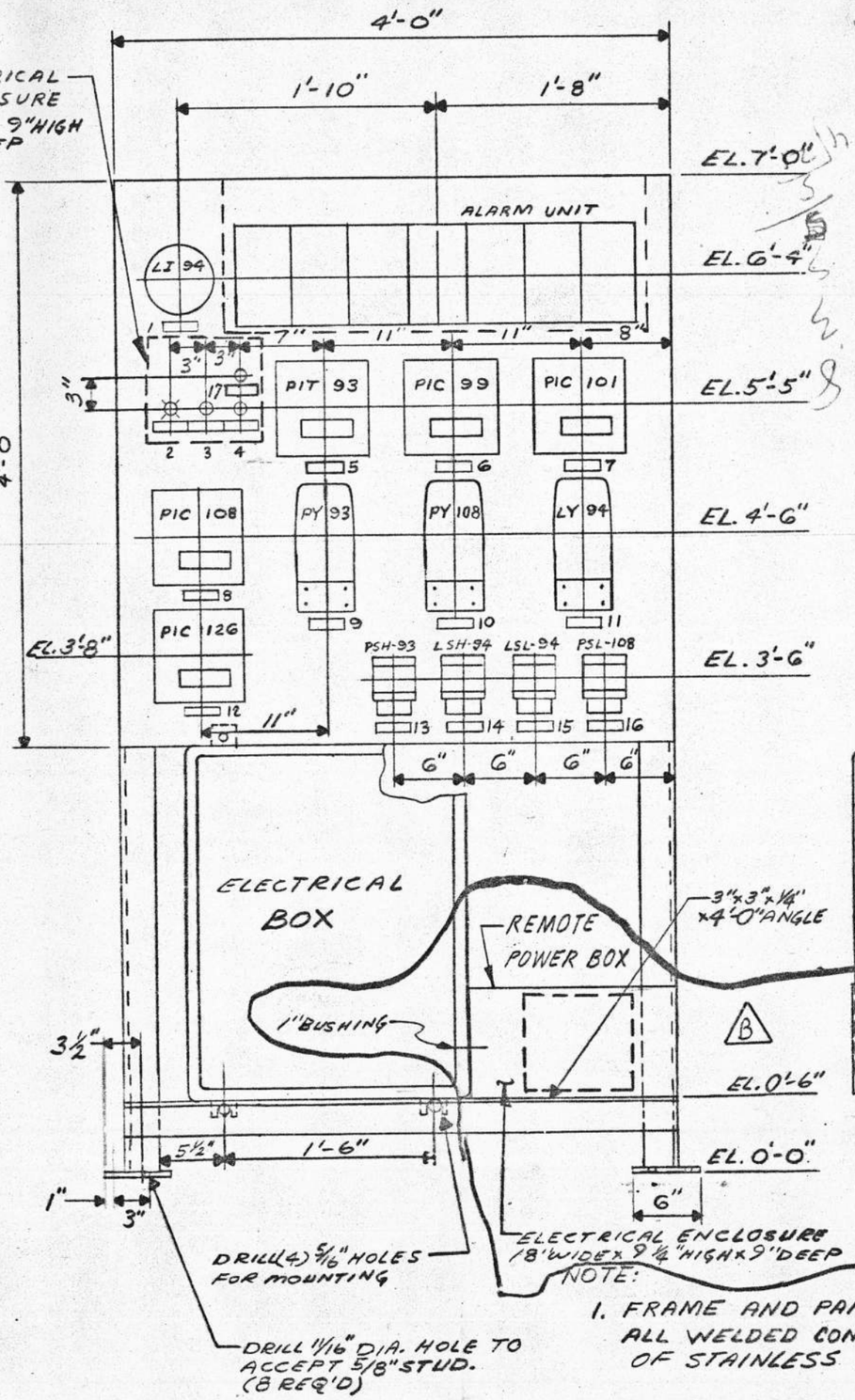


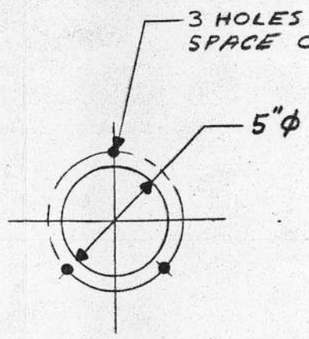
PLANT SCHEMATIC DIAGRAM MAIN AIR COMPRESSOR
4.16 KV 3 PHASE
(TYPICAL FOR EACH OF TWO UNITS - REFER TO AIR PRODUCTS & CHEMICALS FOR EQUIPMENT AVAILABLE AT THIS SITE)

RELAY CONNECTION DIAGRAM
(TYPICAL FOR EACH OF TWO UNITS)

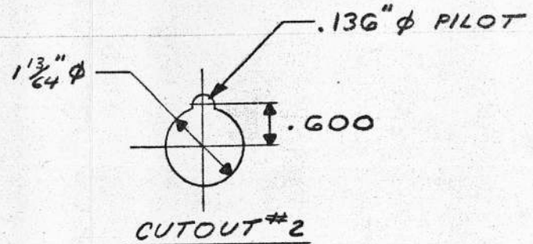
GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED RAW DRAWN CHECKED RAW	APPROVED DATE SUPT., DEPT. OF SANITARY SEWERS DATE GREELEY AND HANSEN, ENGINEERS	1 2-8-82 CHANGE TO LATER MODEL RELAY NO. DATE APP. REVISION
SCALE: NO SCALE	CITY OF TAMPA, FLORIDA SEWAGE DISPOSAL SYSTEM HOOKERS POINT SEWAGE TREATMENT PLANT OXYGEN GENERATION AND STORAGE EQUIPMENT	ELECTRICAL RECLOSING CYCLE PROTECTIVE RELAYING FOR TWO MAIN AIR COMPRESSOR DRIVE MOTORS	PROJ. NO. S 202-70-30D SHEET E-1 OF 1 DATE 2-11-80 REV. 0 DWG OF

R 6 1 06

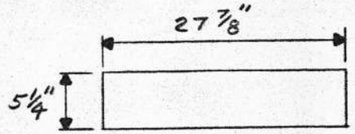




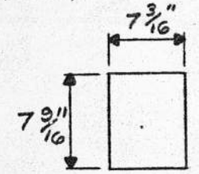
CUTOUT #1
RECEIVER GAUGE



CUTOUT #2
PUSHBUTTONS & LIGHT



CUTOUT #3
ALARM UNIT



CUTOUT #4
CONTROLLERS

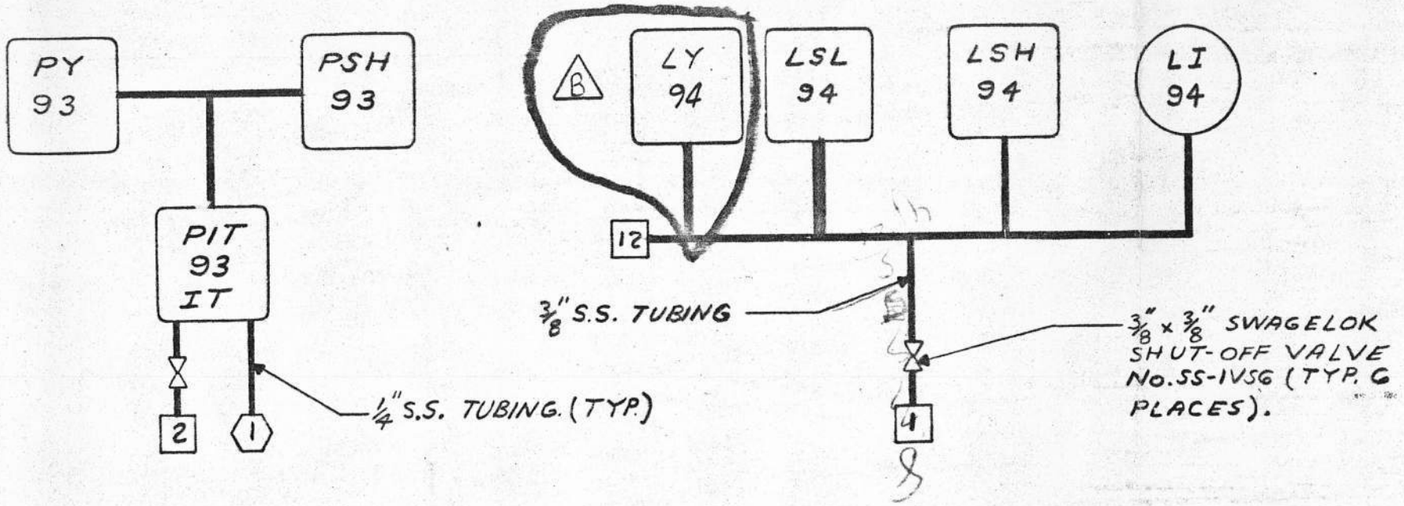
NO.	LET	REVISION	DATE	BY	APP'D
E-5386	A	SEE ECN	24MAY 1976	L.C. mohr	EJC
E-5992	B	SEE ECN	23SEP 1976	JJG	EJC

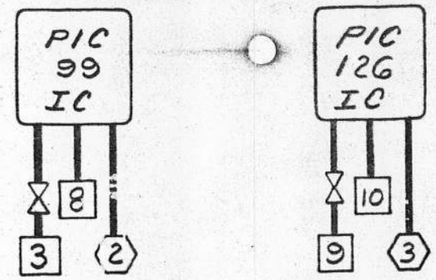
INSTRUMENT CONTROL PANEL SPEC.
16.20 LOX BACK-UP
STORAGE PANEL
TAMPA, FLORIDA

Air Products and Chemicals INC.
ALLENTOWN, PENNSYLVANIA, U. S. A.

DATE 3-11-76	JOB NO. 00-5-3555
DWN. BY R. T. KULBABA	
CHK'D BY L. C. Mohr	DWG NO. 5-3555-1200-02B
APP'D BY E. J. Conley	SHT. 1 OF 4

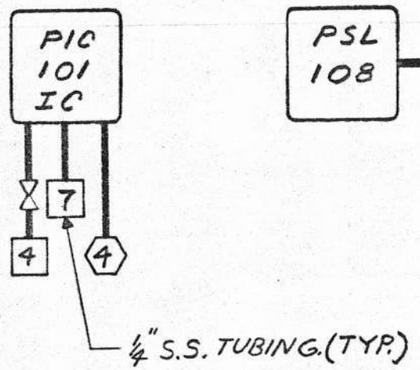
4L1_1200-028

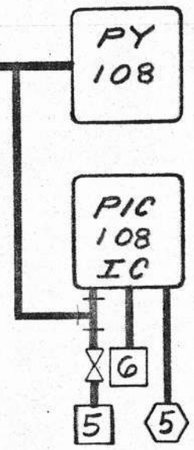


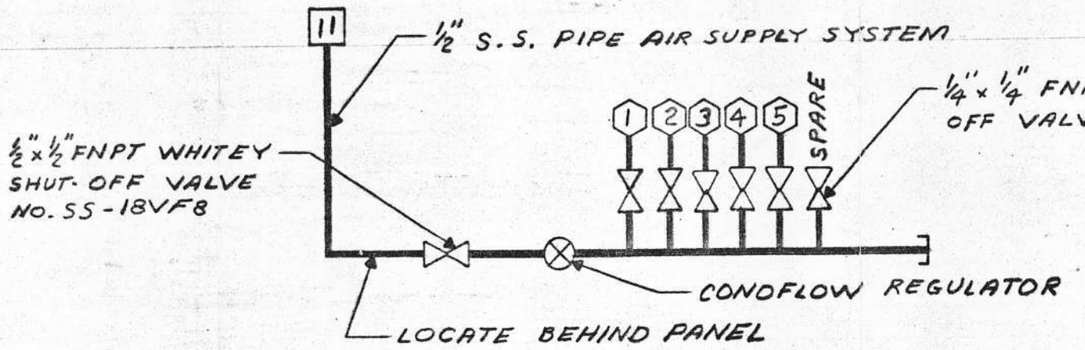


BULKHEAD CONNECTION

AIR SUPPLY







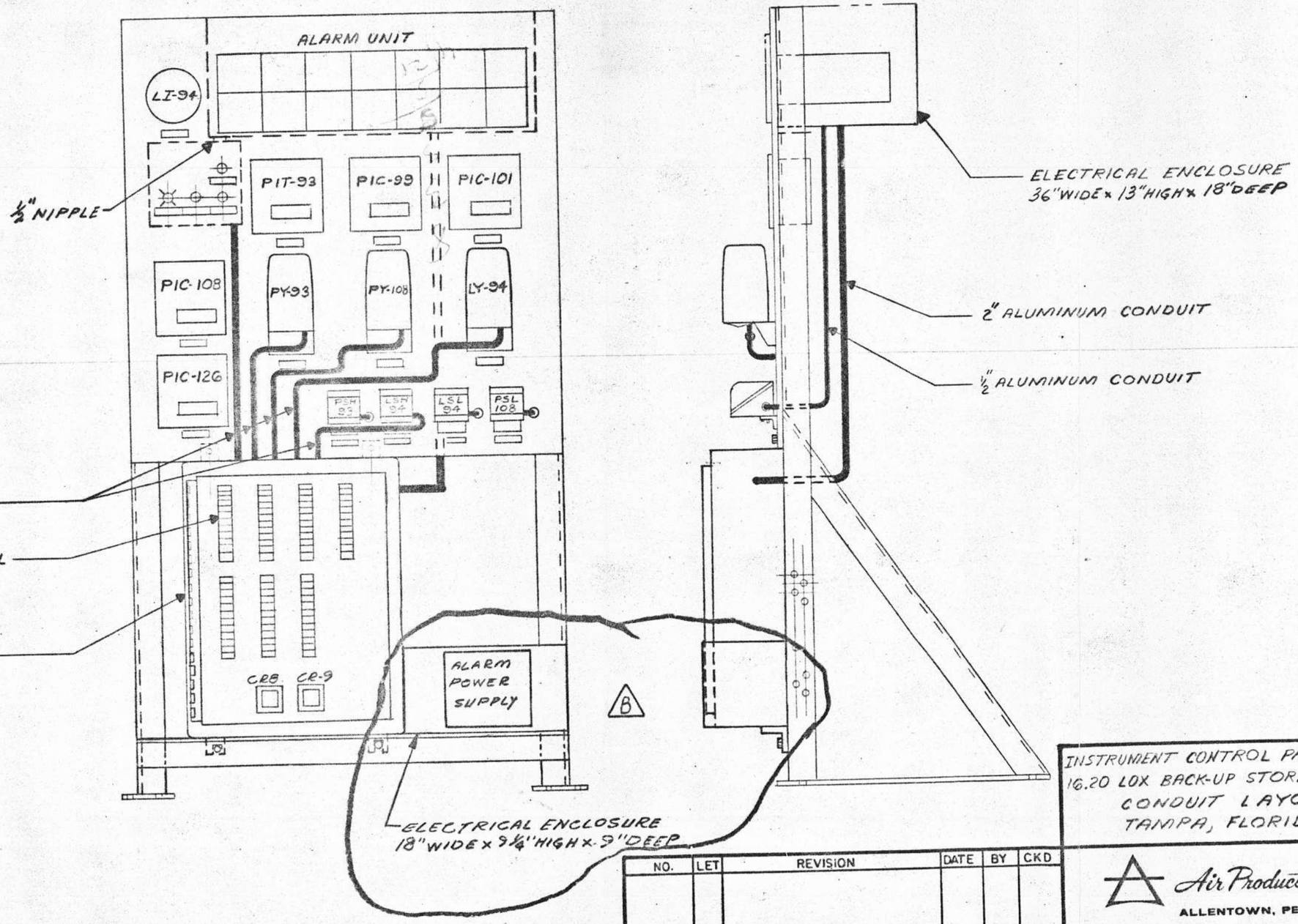
INSTRUMENT CONTROL PANEL SPEC.
PNEUMATIC HOOK-UP
16.20 LOX BACK-UP STORAGE PANEL
TAMPA, FLORIDA

NO.	LET	REVISION	DATE	BY	CKD

Air Products and Chemicals INC.
ALLENTOWN, PENNSYLVANIA, U. S. A.

DATE 3-15-76	JOB NO. 00-5-3555
DWN. BY R. KULBABA	
CHK'D BY	DWG NO. 5-3555-1200-02B SHT. 2 OF 4
APP'D BY	

4L1_1200-028A



NO.	LET	REVISION	DATE	BY	CKD

INSTRUMENT CONTROL PANEL SPECIFICATION
16.20 LOX BACK-UP STORAGE PANEL
CONDUIT LAYOUT
TAMPA, FLORIDA

Air Products and Chemicals INC.
ALLENTOWN, PENNSYLVANIA, U. S. A.

DATE 5-13-76	JOB NO. 00-5-3555
DWN. BY R.T. KULBABA	
CHK'D BY R.L. MOYER	DWG NO. 5-3555-1200-028B SHT. 3 OF 4
APP'D BY G.J. GOOSEY	

4L1_1200-028B

1-7 1-6 1-5 1-4 1-3 1-2 1-1

2-7 2-6 2-5 2-4 2-3 2-2 2-1

HORN RELAY

4 6 7 8 9 10

CN R 1 2

HORN

CN — ½"C-5#14

TEST

T — CN

ACK

C

"FIRST" OUT RESET

K

3 R 2

1

½"C-3#14

PSL-108

13 — 14

LSL-94

16 — 17

PSH-93

19 — 20

LSH-94

1 — 4

½"C-2#14

½"C-2#18

½"C-2#18

½"C-2#18

32#18

(+) -HV CN (-) LC L2 L1

REMOTE POWER SUPPLY

LC CN (-) (+) -HV (-) L2 (+) L1

(120V PWR)

LY-94

(+) 71 — 72 (-)

½"C-2#14 #(1) 2/C #16 SHD

(120V PWR)

PY-108

(+) 73 — 74 (-)

½"C-2#14 #(1) 2/C #16 SHD

(120V PWR)

PY-93

(+) 75 — 76 (-)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46

47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70

71 72 SHD 73 74 SHD 75 76 SHD

3 — CR8 — 2 — CR9 — 4

44 — 45 — 50 — 51

46 — 47 — 52 — 53

48 — 49

INSTRUMENT CONTROL PANEL SPECIFICATION
WIRING DIAGRAM
16.20 LOX BACK-UP STORAGE PANEL
TAMPA, FLORIDA

Air Products and Chemicals INC.
ALLENTOWN, PENNSYLVANIA, U. S. A.

DATE 22 MAY 85	JOB NO. 00-5-3555
DWN. BY L. MOYER	
CHK'D BY L. C. Moyer	DWG NO. 5-3555-1200-02B
APP'D BY E. Conway	SHT. 4 OF 4

4L1_1200-028C

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE

CONTD. ON SHT. 2

CONTD. ON SHT. 2

ELECTRICAL ENCLOSURE

RECYCLE MODULE

KE-53

211A

211N

211

RESET

LY

START TIMING

A

KE-131

322

300

211

211N

KE-132

326

T2

213K

213N

213H

213M

213B

213J

CONTROL

ON-OFF

ADVANCE

CYCLE

213G

RECYCLE MODULE

BYPASS SWITCH VALVE

201N

201A

ON

OFF

210N

210A

XV-71

RESET

210E

01.10 MAIN AIR COMPRESSOR

START

STOP

210N

15

16

13

9

11

10

01.01 LUBE OIL HEATER

52

53

50

51

01.10K AUX. LUBE OIL PUMP

43

44

45

41

42

40

A-O-M

08.23 REACT HTR

64

65

62

61

60

15.50A

15.50B

74

75

84

85

DEFROST HTRS

70

71

73

80

81

83

212N

212J

212

IL-76

LSL-75

LSH-75

306

316

300

LSL-71

LSH-71

307

465

315

212

314

LSH-76-1

467

466

EXPANDER

LSH-71 BYPASS

5

3

13

XY-53-CVS

211A

211N

AY-52

FY-53-4

LY-71

LSH-76

LSH-70

210D

210C

726

PSH-70

300

TO MAIN BUS TERMINALS FOR ALARM PANEL

MAIN BUS TERMINALS

CONTACT FOLLOWERS

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D APP'D
—	C		AS-BUILT	2FEB78		
E6771	B		SEE ECN	1APR77		
E-5960	A		SEE ECN	9/13/76	D.F.T.	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±
FIRST USED ON

D.F. TRINKLE DRAFTSMAN 7/19/76
CHECKED 15 SEP 1976
APP'D

TITLE
INST. CONTROL PANEL SPECIFICATION
WIRING DIAGRAM
MAIN CONTROL PANEL
HOOKERS POINT
TAMPA, FLORIDA

SCALE NONE WT.

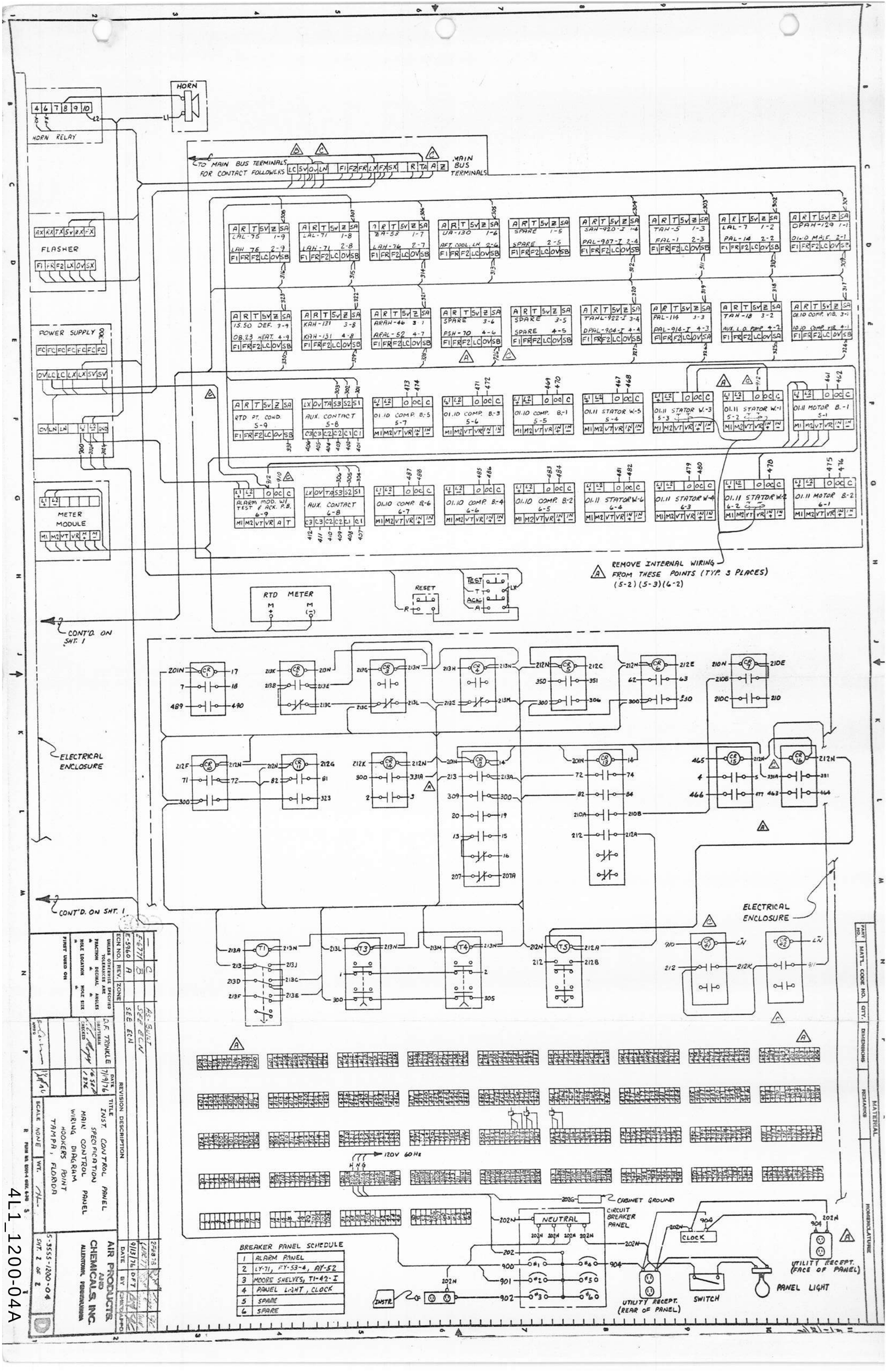
AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-1200-04
SHT. 1 OF 2
D

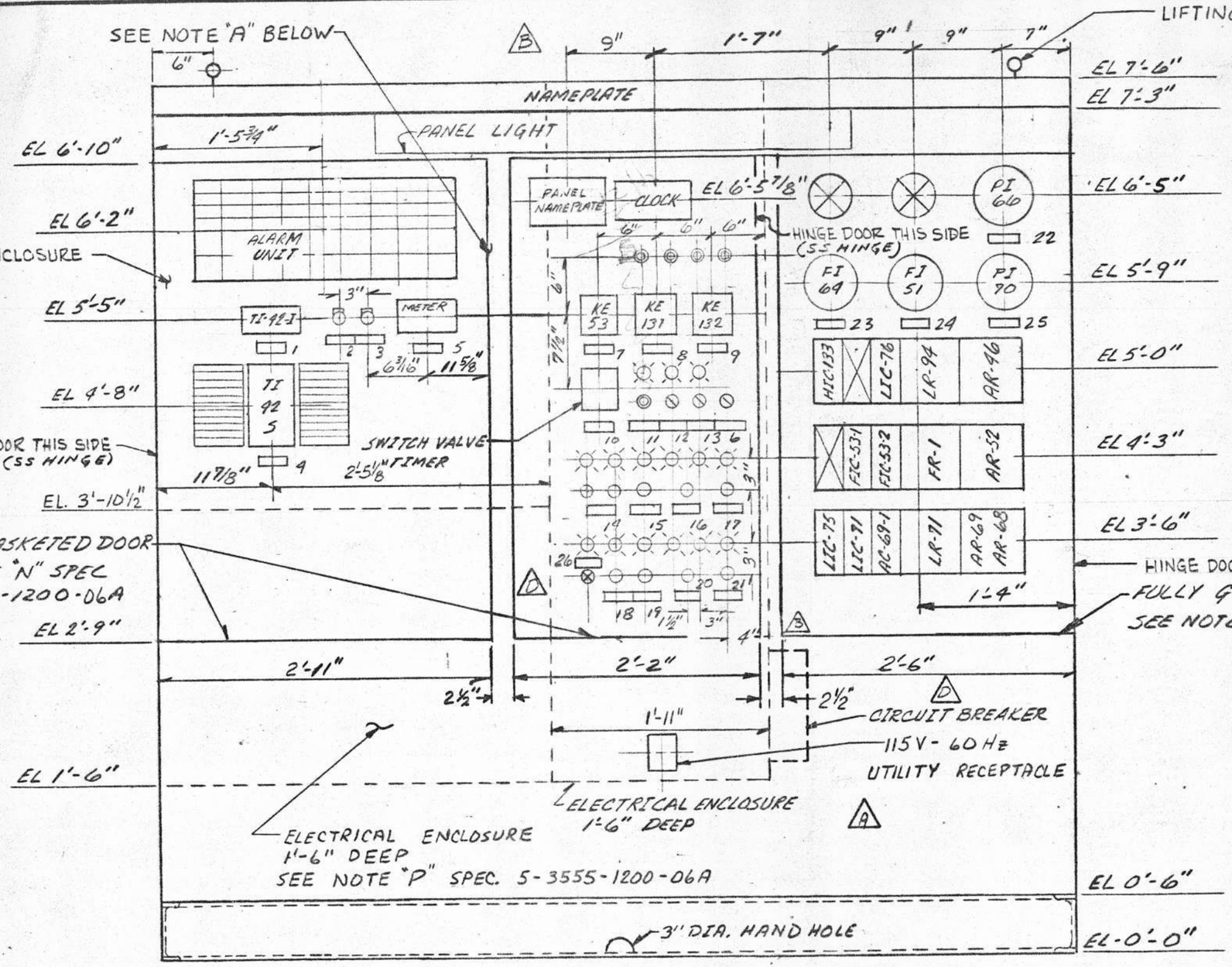
5-3555-1200-04
SHT. 1 OF 2
D

FORM NO. 6309-4 REV. 4-78

4L1_1200-04


HORN
HORN RELAY
TO MAIN BUS TERMINALS FOR CONTACT FOLLOWERS
MAIN BUS TERMINALS
FLASHER
POWER SUPPLY
METER MODULE
RTD METER
RESET
TEST
ACK
REMOVE INTERNAL WIRING FROM THESE POINTS (TYP. 3 PLACES) (5-2) (5-3) (6-2)
CONT'D. ON SHT. 1
ELECTRICAL ENCLOSURE
CONT'D. ON SHT. 1
ELECTRICAL ENCLOSURE
120V 60Hz
CABINET GROUND
CIRCUIT BREAKER PANEL
NEUTRAL
CLOCK
SWITCH
PANEL LIGHT
UTILITY RECEPT. (REAR OF PANEL)
UTILITY RECEPT. (FACE OF PANEL)
INSTR.
BREAKER PANEL SCHEDULE
1 ALARM PANEL
2 LY-71, FY-53-4, AY-52
3 MOORE SHELVES, TI-42-I
4 PANEL LIGHT, CLOCK
5 SPARE
6 SPARE
AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA
TITLE
INST. CONTROL PANEL SPECIFICATION
MAIN CONTROL PANEL WIRING DIAGRAM
HOOKERS POINT
TAMPA, FLORIDA
SCALE NONE
WT.
5-3555-1200-04
SHT. 2 OF 2
REVISION DESCRIPTION
AS-BUILT
SEE ECN
E-6771
E-5960
A
B
C
D
J.F. TRAWICK
7/8/76
7/8/76
9/13/76
DFT
PART NO.
MAT'L. CODE NO.
QTY.
DIMENSIONS
MATERIAL
REMARKS
NOMENCLATURE

4L1_1200-04A



FRONT VIEW

NOTES:

A. PANEL VENDOR TO MOUNT ALARM HORN, FLASHER, ANNUNCIATOR POWER SUPPLY, & METER MODULE IN THIS AREA.

REFERENCE PANEL SPEC.

INST. CONTROL PANEL - 5-3555-1200-06A SPEC. (WRITTEN PORTION)

INST. CONTROL PANEL - 5-3555-1200-05A SPEC. (LAYOUT & CONSTR. DETAILS)

INST CONTROL PANEL 5-3555-1200-04D SPEC. (ELEC. DIAGRAM)

NO.	LET	REVISION	DATE	BY	CKD
E-5960	A	ADDED RECEPTACLE	9/13/76	DFT	[illegible]
E-6145	B	SEE ECN	11/8/76	DRC	[illegible]
E-6495	C	SEE ECN	26 JAN 1977	LCM	[illegible]
E-6577	D	SEE ECN	3 MAR 1977	DRC	[illegible]
E-6771	E	SEE ECN	1 APR 1977	DRC	[illegible]

INSTRUMENT CONTROL PANEL

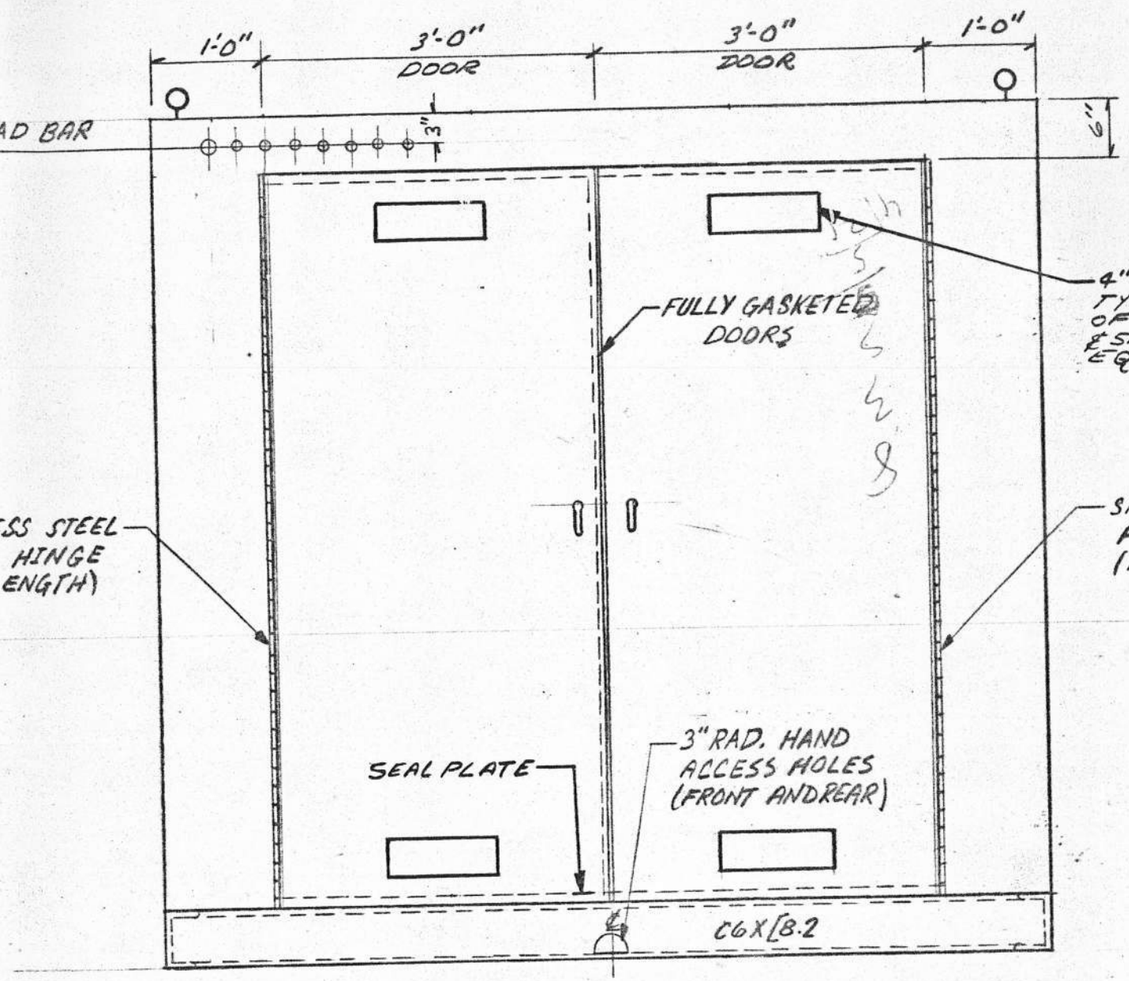
SPECIFICATION

Air Products and Chemicals INC.
ALLENTOWN, PENNSYLVANIA, U. S. A.

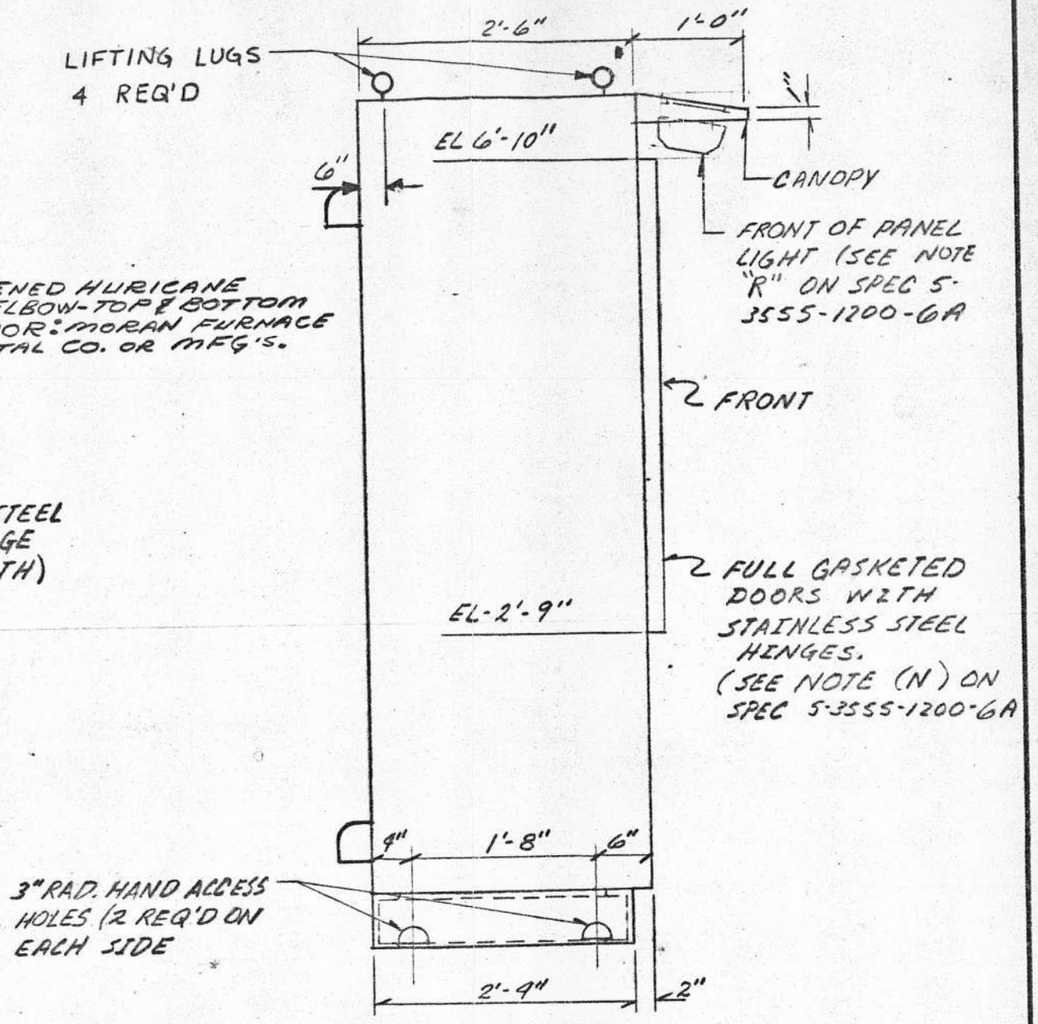
DATE 20 July 76
DWN. BY R.C. MICHAEL
CHK'D BY [illegible]
APP'D BY [illegible]

JOB NO. 00-5-3555
DWG NO. 5-3555-1200-5B SHT. 1 OF 4

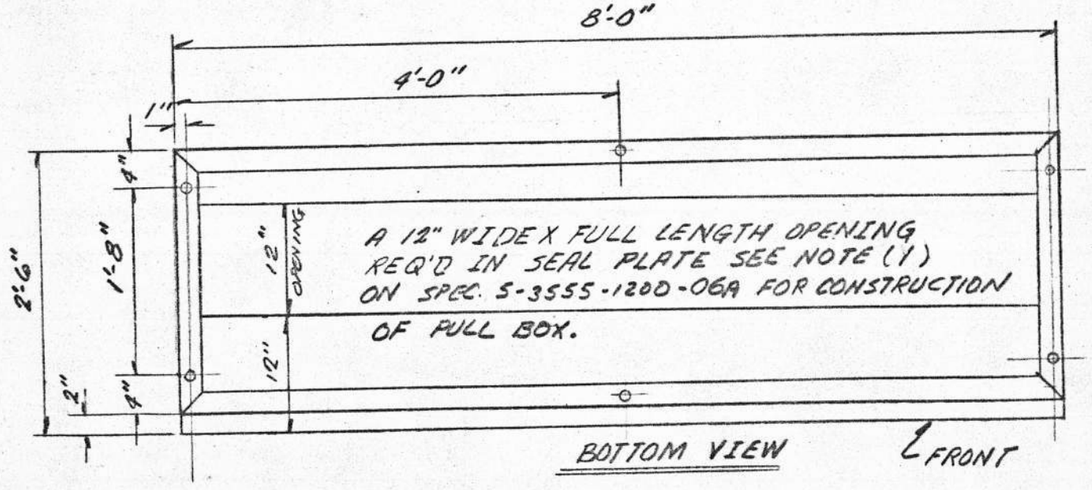
4L1_1200-58



REAR VIEW



SIDE VIEW



BOTTOM VIEW ℄ FRONT

NO.	LET	REVISION	DATE	BY	CKD

INSTRUMENT CONTROL PANEL SPECIFICATION

Air Products and Chemicals INC.
ALLENTOWN, PENNSYLVANIA, U. S. A.

DATE 20 July 76	JOB NO. 00-5-3555
DWN. BY R.C.MICHAEL	DWG NO. 5-3555-1200-05B
CHK'D BY K.E. Moyer	SHT. 2 OF 4
APP'D BY	

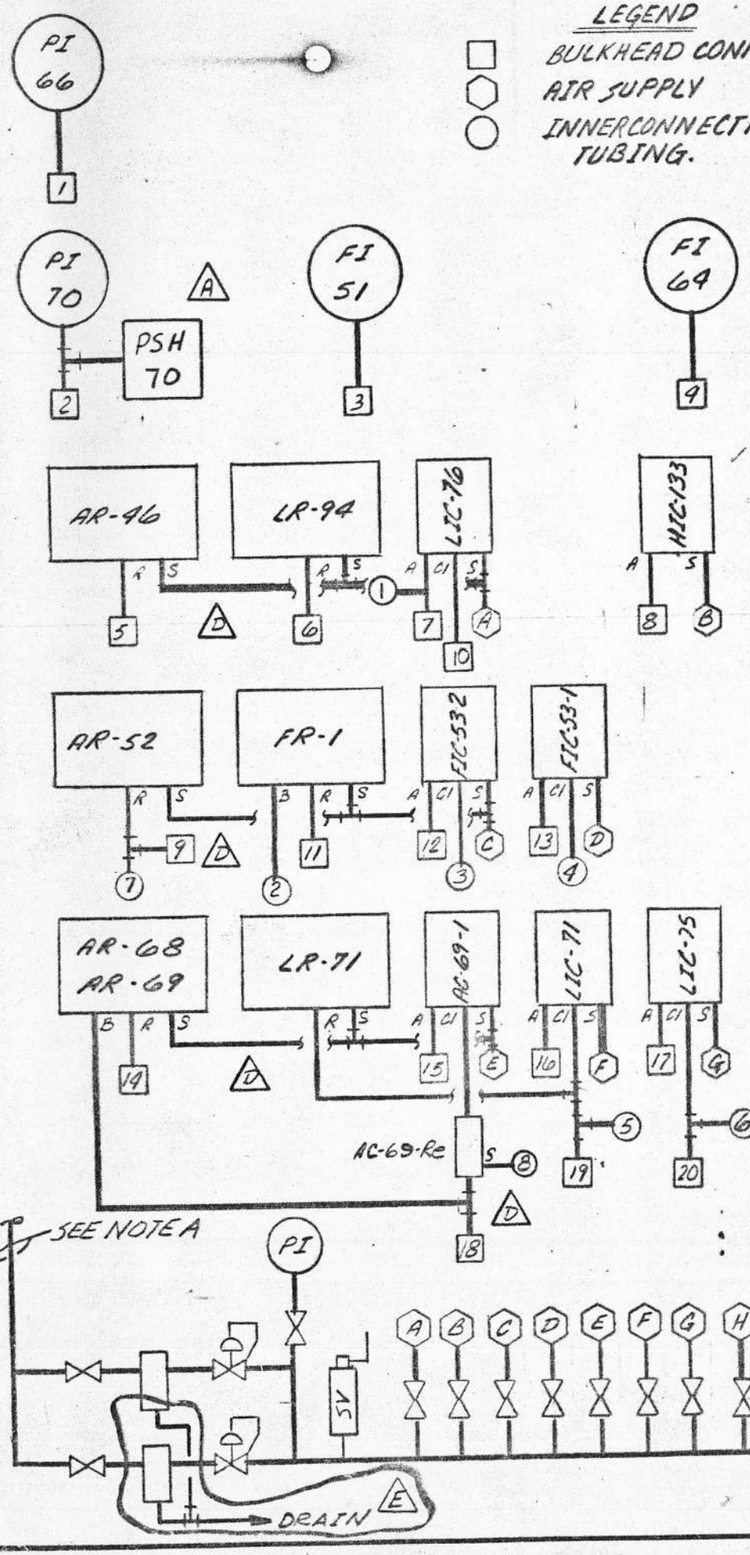
4L1_1200-58A

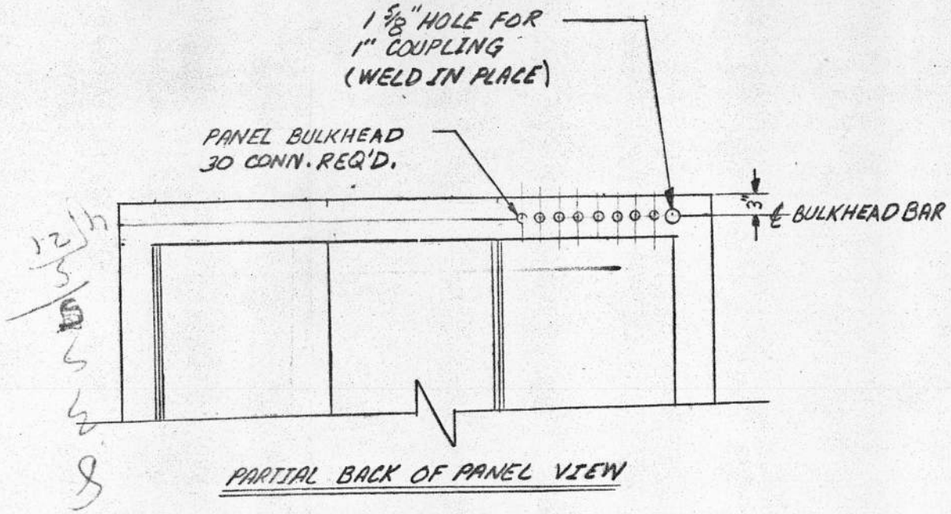
LEGEND

BULKHEAD CONN.

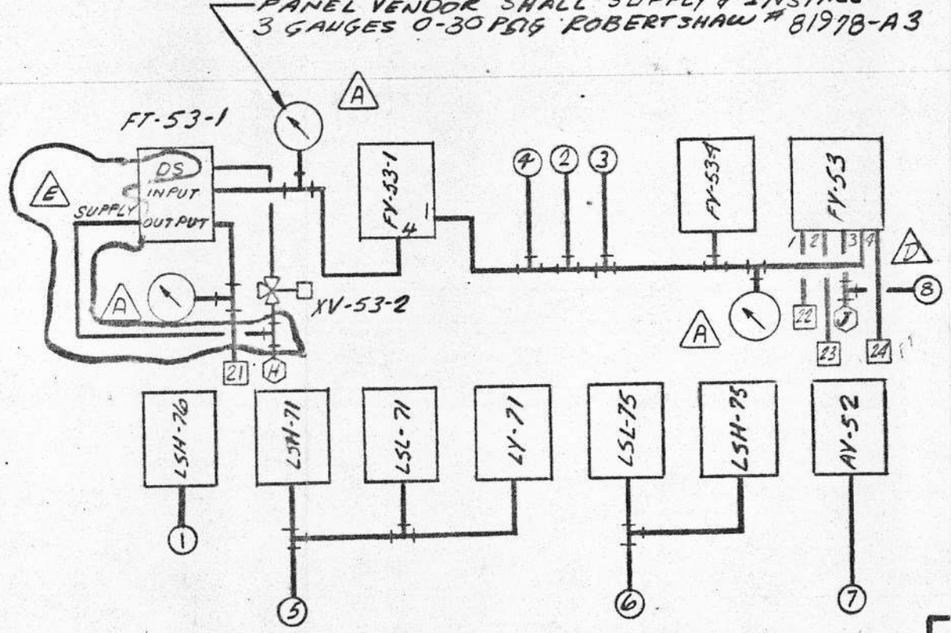
AIR SUPPLY

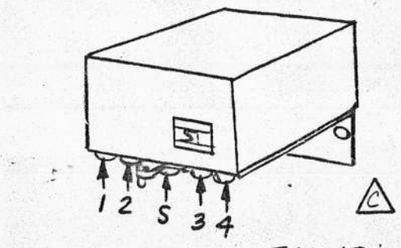
INNERCONNECTING TUBING.





PARTIAL BACK OF PANEL VIEW





PORT LOCATIONS

FY-53

BULKHEAD Nº	DESCRIPTION
1	PI-66
2	PI-70
3	FI-51
4	FI-64
5	AR-46
6	LR-94
7	LV-76-1&2
8	HV-133
9	AR-52
10	LIC-76
11	FR-1
12	FV-53-2
13	FV-53-1
14	AR-68
15	ACV-69
16	LV-71-1&2
17	LV-75
18	AR-69
19	LIC-71
20	LIC-75
21	FY-53-2
22	IT-53
23	PT-53
24	FT-53
25	1'-IASI.5

NOTES

A.) AIR HEADER SHALL BE 1" O.D X.065 WALL SEAMLESS STAINLESS STEEL TUBING

B.) ALL TUBING FROM BULKHEAD CONN. TO INSTR. AND ALL INNER-CONNECTING TUBING SHALL BE ¼" O.D. X.049 WALL SEAMLESS STAINLESS STEEL

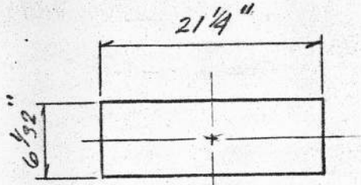
C.) ALL REQ'D FITTING AND VALVES SHALL BE STAINLESS STEEL

INSTRUMENT CONTROL PANEL SPECIFICATION

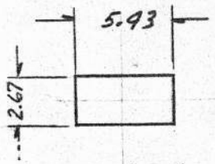
Air Products and Chemicals INC.
ALLENTOWN, PENNSYLVANIA, U. S. A.

DATE 20 July 76	JOB NO. 00-5-3555
DWN. BY R.C MICHAEL	
CHK'D BY R.C Michael	DWG NO. 5-3555-1200-05B
APP'D BY	SHT. 3 OF 4

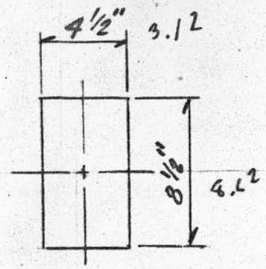
4L1_1200-58B



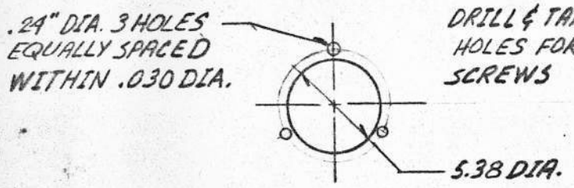
CUTOUT #1
CONTROLLERS AND RECORDERS



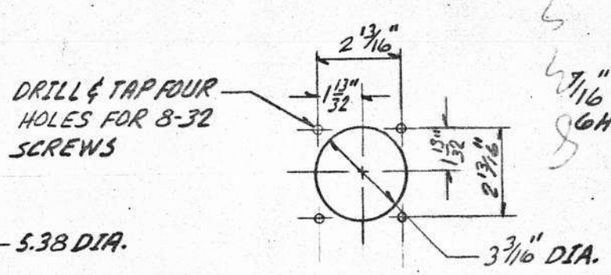
CUTOUT #5
TI-42-I



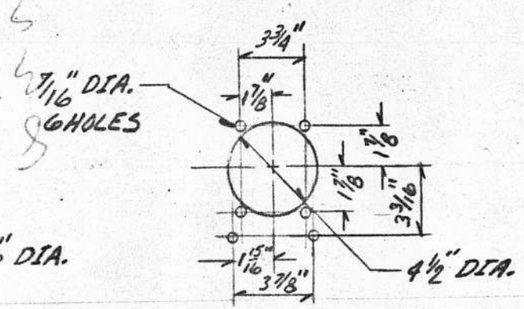
CUTOUT #9
TI-42-S.



CUTOUT #2
RECIEVER GAUGE

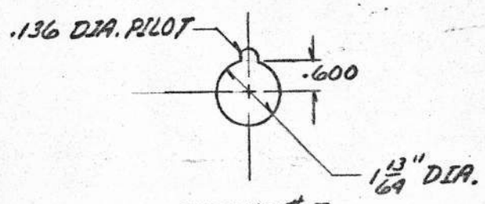


CUTOUT #6
SWITCH VALVE TIMER AND KE-53

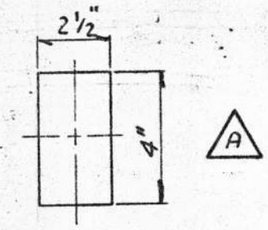


CUTOUT #10
KE-131 AND KE-132

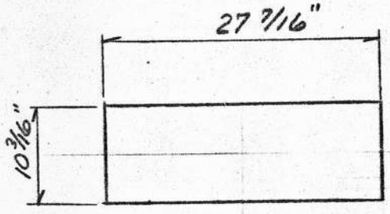
CUTOUT #3
CLOCK



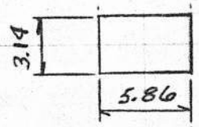
CUTOUT #7
PUSHBUTTONS, LIGHTS SELECTOR SWITCHES



CUTOUT #11
UTILITY RECEPTACLE



CUTOUT #4
ALARM UNIT



CUTOUT #8
METER

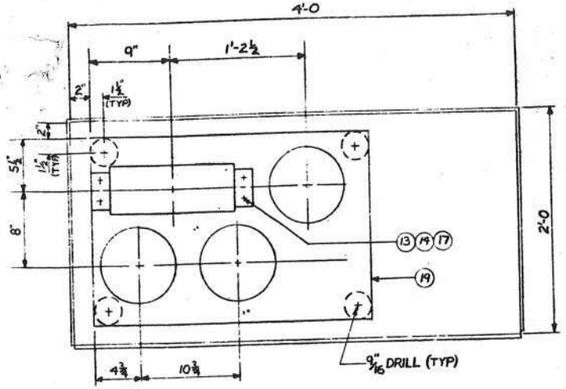
INSTRUMENT CONTROL PANEL
SPECIFICATION

NO.	LET	REVISION	DATE	BY	CKD

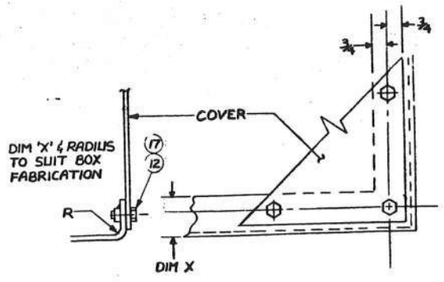
Air Products and Chemicals INC.
ALLENTOWN, PENNSYLVANIA, U. S. A.

DATE 20 July 76	JOB NO. 00-5-3555
DWN. BY R.C. MICHAEL	
CHK'D BY L.E. Mowry	DWG NO. 5-3555-1200-05 B
APP'D BY	SHT. 4 OF 4

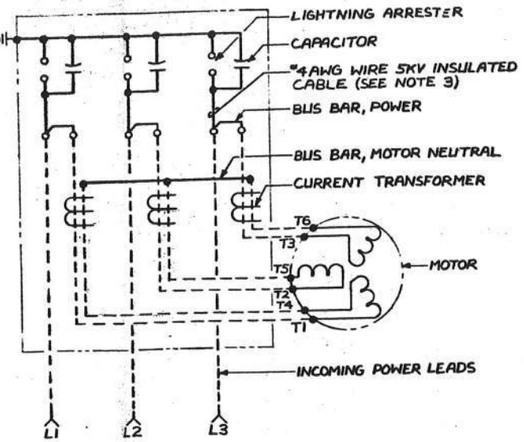
4L1_1200-58C



SECTION B-B

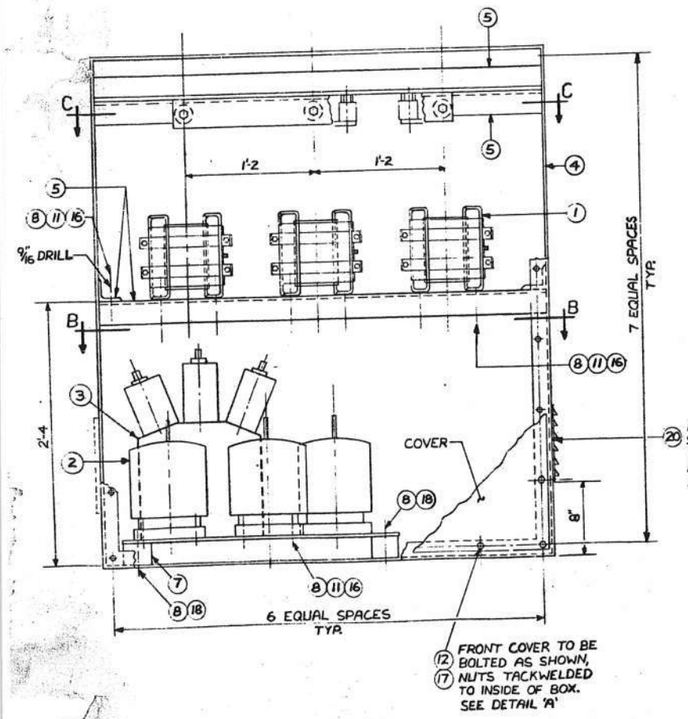


DETAIL 'A'

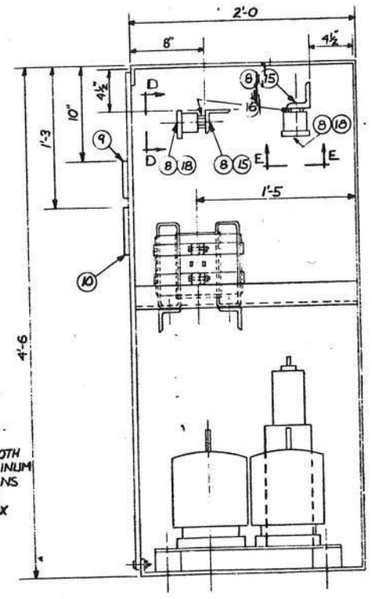


WIRING DIAGRAM

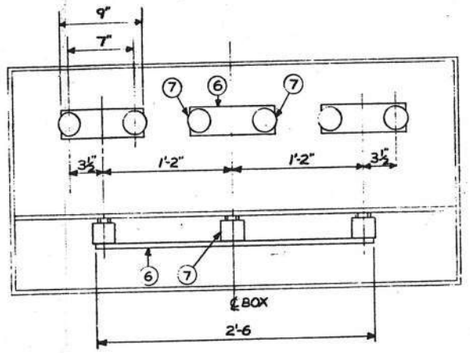
PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL NOMENCLATURE
1		3	CURRENT TRANSFORMER, 50/5 RATIO, WESTINGHOUSE BYZ STYLE
			#592C102G01
2		3	LIGHTNING ARRESTER, INDOOR, 3 KV, GENERAL ELECTRIC #9L11MGB003
3		1	CAPACITOR, 3 POLE, 0.5 MFD, 4160V, GENERAL ELECTRIC #9L18BCG301
4		1	ENCLOSURE - 54" HIGH, 48" WIDE & 24" DEEP, STEEL, 10GA WITH DRIPSHIELD
			FOR NEMA 3, BOLTED FRONT DOOR
5		3	ANGLE, STL HR, 2½ × 2½ × ⅛ × 10'-0 LG (CUT AS REQUIRED)
6		1	BUS BAR, COPPER, ⅜" × 3" × 6'-6 LG (CUT AS REQUIRED)
7		13	INSULATOR, FIBERGLASS, DELTA STAR ELECTRIC DIV. #88677
8		47	LOCKWASHER, STL, ½"
9		1	NAMEPLATE, MARKED "1250 HP MOTOR", APCI #342018-2
10		1	NAMEPLATE, 4 LINES MARKED, "THIS CABINET TO BE OPENED
			ONLY BY AUTHORIZED ELECTRICAL PERSONNEL / MOTOR CAPACITOR
			REMAINS CHARGED / FOR 15 MINUTES", 3" × 5" APCI #342018-4
11		25	BOLT, HEX HEAD, STL, ½"-13NC × 1¼" LG.
12		26	BOLT, HEX HEAD, STL, ⅜"-16NC × ¾" LG.
13		4	BOLT, HEX HEAD, STL, ⅜"-16NC × 1" LG.
14		4	LOCKWASHER, STL, ⅜"
15		9	BOLT, HEX HEAD, STL, ½", 13NC × 1½" LG.
16		34	NUT, HEX, STL, ½"-13NC
17		30	NUT, HEX, STL, ⅜"-16NC
18		13	BOLT, HEX HEAD, STL, ½"-13NC × 1" LG.
19		1	PLATE, CR STL, ¼" × 1'-8 × 2'-6 LG.
20		2	LOUVER PLATE KIT, 6 LOUVERS, 8 3/16" × 9½", HOFFMAN "A-VK86 OR
			APPROVED EQUAL
21		6	T&B CAT. Nº 54440 TERMINAL LUG - FOR 4GA CABLE.
22		6	Nº 54409 — 1/0
23		3	Nº 54460 — 2/0
24		12	⅜"-16 NC BOLT × 1½" LG - HEX HEAD - DURIUM
25		12	LOCKNUT FOR ⅜" BOLT - HEX HEAD - DURIUM
26		12	BELLEVILLE WASHER FOR ⅜" BOLT
27		12	FLAT WASHER FOR ⅜" BOLT - DURIUM
28		3	½ - 13 NC BOLT × 1½" LG - HEX HEAD - DURIUM
29		3	LOCKNUT FOR ½" BOLT - HEX HEAD - DURIUM
30		3	BELLEVILLE WASHER FOR ½" BOLT
31		3	FLAT WASHER FOR ½" BOLT - DURIUM



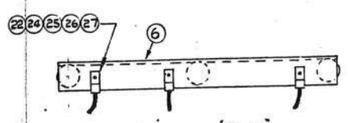
FRONT SECTION



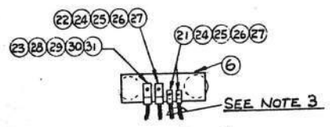
SIDE SECTION



SECTION C-C



SECTION D-D
MOTOR NEUTRAL BUS



SECTION E-E
POWER BUS (TYP. 3)

NOTES:

1. ALL MOUNTING HOLES ARE TO BE LOCATED USING EQUIPMENT AS TEMPLATES.
2. ALL PARTS TO BE FURNISHED BY TERMINAL BOX FABRICATOR.
3. FURNISH & CONNECT #4 AWG 5KV INSULATED CABLE FROM POWER BUS BAR TO ARRESTERS & CAPACITOR. GROUND ARRESTERS & CAPACITOR TO ITEM 19 GROUND ITEM 19 TO ITEM 4.
4. MINIMUM CLEARANCE LIVE PARTS TO METAL SHALL BE 3½"
5. PAINTING (INSIDE & OUTSIDE):
   A. AFTER COMPLETION OF WELDING, REMOVE ALL WELD SPLATTER & SLAG
   B. SURFACE PREPARATION SHALL BE NEAR WHITE BLAST CLEANING (SSPC SP10) OR PICKLING PER APCI DESIGN ENGINEERING STANDARD 583.3
   C. SPRAY PAINT AS FOLLOWS:

COAT / DATA	PRIMER	INTERIOR FINISH	EXTERIOR FINISH
KOPPERS	PUG PRIMER	PONKOTE ENAMEL Nº 300	GLAMOR-GLAZ Nº 200 EPOXY
COLOR	RED	WHITE NO. 311	BATTLESHIP GREY Nº 331
KOPPERS THINNER	Nº 2000	Nº 4000	Nº 10,000 SPRAY TYPE
Nº COATS	1	2	2
DRY FILM THICKNESS PER COAT	1.5 MIL	1.5 MIL	1.5 MIL

   D. WORKMANSHIP SHALL CONFORM APCI DESIGN ENGINEERING STANDARD 583.3.

5-3555-13.20-03 DWG. SIZE D

NOTICE

THIS DRAWING IS THE PROPERTY OF AIR PRODUCTS AND CHEMICALS, INC. AND MUST BE RETURNED, WITHOUT REPRODUCTION OR DUPLICATION, AT ANY TIME UPON REQUEST, BUT IN ANY EVENT AS SOON AS IT HAS SERVED THE PURPOSES FOR WHICH IT IS FURNISHED. WHILE IN THE POSSESSION OF THE RECIPIENT, IT MUST BE PROPERLY SAFEGUARDED AGAINST DISCLOSURE TO ANY ONE EXCEPT THOSE EMPLOYEES WHO REQUIRE IT FOR THE WORK OR JOB. THE RECIPIENT MUST KEEP CONFIDENTIAL AND REQUIRE HIS (ITS) EMPLOYEES TO KEEP CONFIDENTIAL THE INFORMATION CONTAINED HEREON.

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± DECIMAL ± ANGLES ± ; HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON: 00-5-3555

D.J. HUTH, DRAFTSMAN, 10-16-75
CHECKED
ENGINEER, 10-20-75
J. Anderson, APPRD, 10-24-75

TITLE: MOTOR TERMINAL BOX 4160V 600A

SCALE N.T.S. WT.

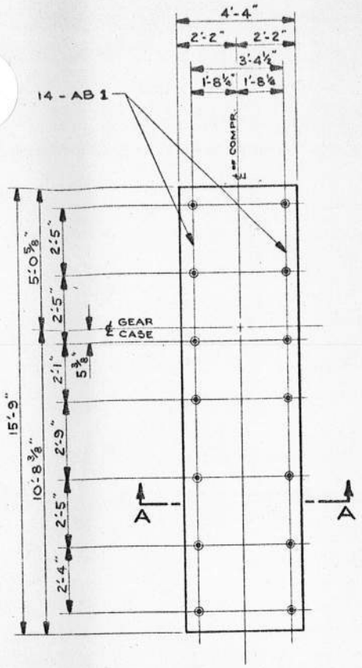
AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

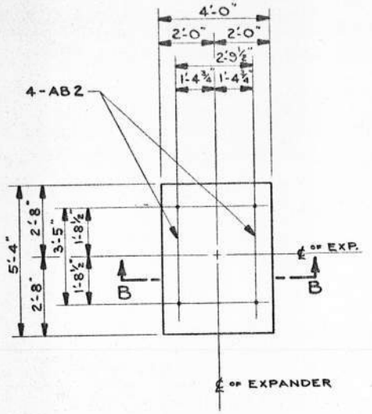
5-3555-13.20-03 D

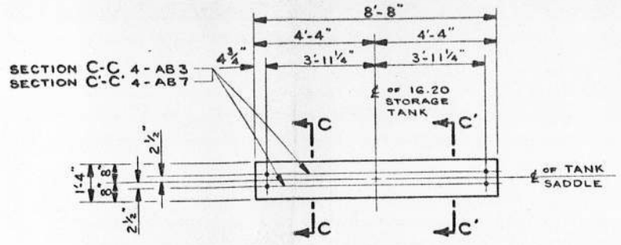
FORM NO. 8309-4 (REV. 6-74)

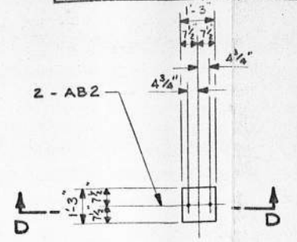
4L1_13.20-03 (M)

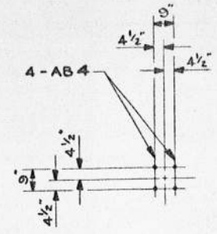
MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE



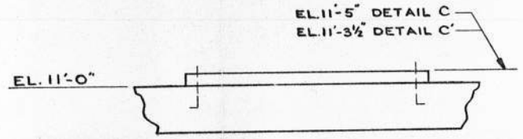




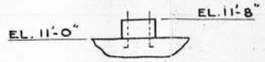




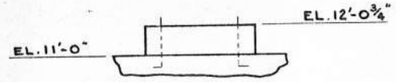
DETAIL E
MAC INLET AIR FILTER AND AFTERCOOLER
A



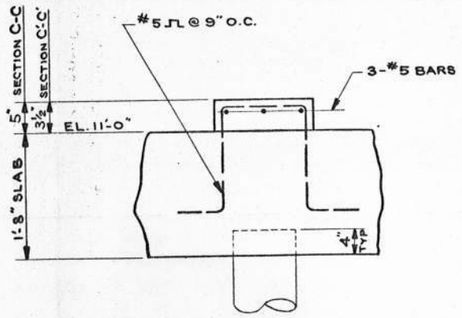
DETAIL C
DETAIL C'



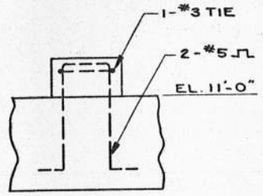
DETAIL D
LOX VAPORIZER ON LOX TANK FDN.
A



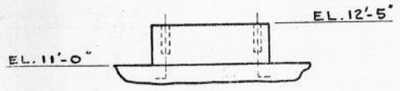
DETAIL B



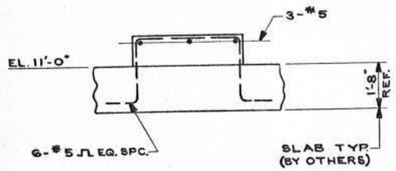
SECTION C-C
SECTION C'-C'
LOX TANK BY 4H-4
A



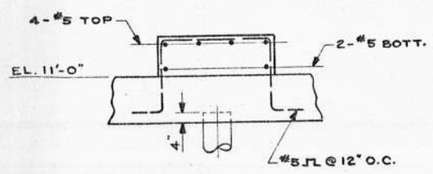
SECTION D-D



DETAIL A



SECTION B-B
EXPANDER
A



SECTION A-A
MAIN AIR COMPRESSOR
A

5-3555-4001 DWG SIZE D A

CITY OF TAMPA, FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

NOTICE

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ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D/APPD
E5921	A	~	ADDED NOTES TO DETAILS	8-19-76	WAV	Crowell

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±
FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	G. MIHALCHIK	3-30-76
CHECKED	P. EVERS	5-3-76
ENGINEER	J. Sullivan	5-14-76
PYRD	L. Newen	8-25-76

TITLE
FOUNDATION SECTIONS & DETAILS (2) 60 T/D O_2 GENERATORS FOR HOOKERS PT. TAMPA, FLA.

SCALE: ⅜"=1'-0" WT.

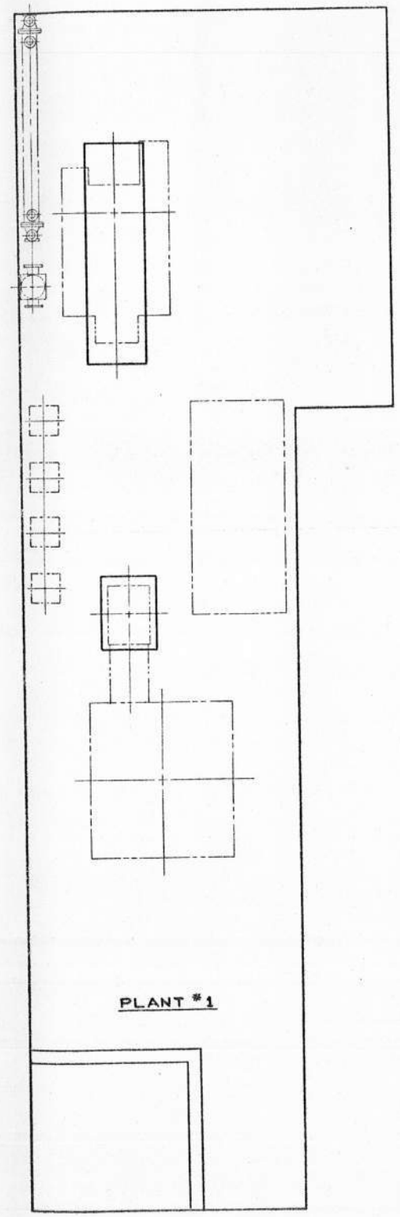
AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

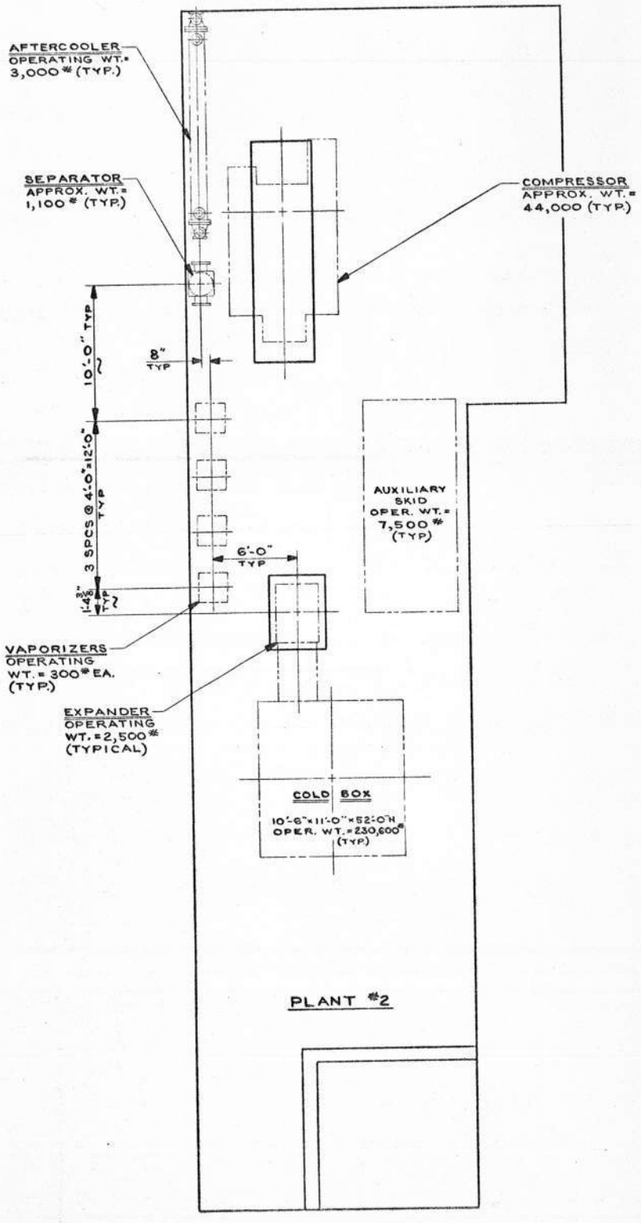
5-3555-4001 D

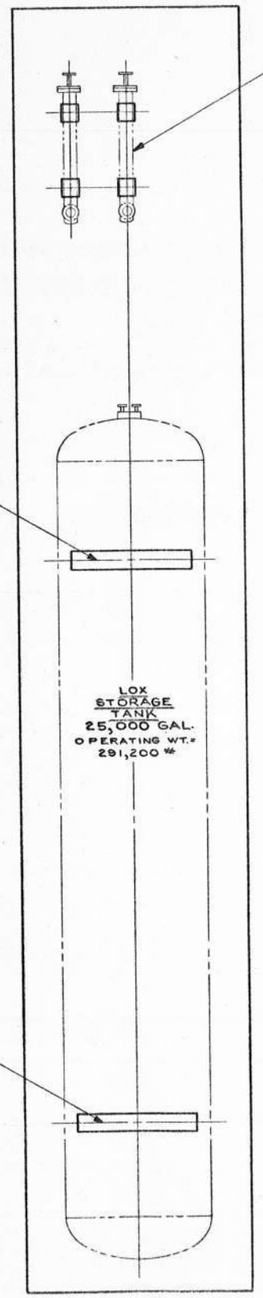
FORM NO. 6309-4 (REV. 6-70)

4L1_4001

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE







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5-3555-4002 DWG SIZE D

NOTE:
FOR LOCATING DIMENSIONS & ELEV. NOT SHOWN
SEE FOUNDATION DWG. NO. 5-3555-4000 D.

CITY OF TAMPA, FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION
AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON
00-5-3555

G. MIHALCHIK DRAFTSMAN 4-28-76
O. EVERS CHECKED 5-3-76
J. SULLIVAN ENGINEER 5-14-76
APP'D

TITLE
FOUNDATION LOADINGS
MAJOR EQUIPMENT
FOR
HOOKERS PT. TAMPA, FLA.

SCALE: 3/16"=1'-0" WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-4002 D

FORM NO. 8309-4 (REV. 6-74)

4L1_4002

PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

MANHOLE BY OTHERS

12+32Y

OTHERS APCI

INV EL 15'-0" CONNECT TO EXISTING MANHOLE AS REQ'D.

12+57.42Y

12+63.92Y

12+75Y

"Y" BRANCH 24"x24"x12"x60°

24" DIA. CLAY PIPE - BY OTHER - COD G12 (GREELEY & HANSEN)

(2) 12"-30° ELL

12" CLAY PIPE (ENCASED)

1+30X

1+38.50X

1+41.75X

12"-45° ELL

1+47.50X

MECH. JT.

INV. EL. +5.25'

12+69.17Y

MECH. JT. RESTRAINED (TYP)

8" CEMENT-MORTAR LINED CI PIPE. ℄ EL +3'-0" WRAP IN POLYETHYLENE. SEE SPEC. SEC. W22.03 (TYP)

A.P.C.I. OTHERS

EXISTING MJ

8"

1+86.50X

8" MJ & BUTTERFLY VALVE & VALVE BOX (BY OTHERS)

12+59.94Y

LOX GENERATION PLANT #1
HP OF FOUNDATION EL. 11'-0"

ELECTRICAL DUCT

"Y" BRANCH 24"x24"x12"x60°

12+87.50Y

13+02.42Y

13+08.92Y

13+20Y

INV EL +5.35'

12"-30° ELL

1+30X

1+38.50X

12" CLAY PIPE (ENCASED)

12"-45° ELL

1+41.75X

1+47.50X

MECH. JT.

INV. EL +5.49'

13+08.17Y

MECH JT. RESTRAINED (TYP)

8" CEMENT-MORTAR LINED CI PIPE. ℄ EL +3'-0"

A.P.C.I. OTHERS

EXISTING MJ

10"

13+04.69Y

8" MJ & BUTTERFLY VALVE & VALVE BOX (BY OTHERS)

LOX GENERATION PLANT #2
HP OF FOUNDATION EL. 11'-0"

24" CLAY PIPE (ENCASED)

"Y" BRANCH 24"x24"x12"x60°

13+52Y

13+53.83Y

13+63Y

INV EL +5.60'

12" CLAY PIPE (ENCASED)

12"-30° ELL

1+30X

1+34.50X

1+38.23X

MECH. JT.

MECH. JT. RESTRAINED (TYP)

10" CEMENT-MORTAR LINED CI PIPE. ℄ EL +3'-0"

A.P.C.I. OTHERS

EXISTING MJ

10" MJ & BUTTERFLY VALVE & VALVE BOX (BY OTHERS)

13+49.94Y

LOX STORAGE
HP OF FOUNDATION EL. 11'-0"

1+25.50

MANHOLE

12+81.41Y

13+76.58Y

12"

COD G12 (GREELEY & HANSEN)

12" CI PIPE (BY OTHERS)

℄ EL. +3'-0"

5-3555-1005 D C

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ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
—	C	11-D	(2) 12"-30° ELL WAS 1 REQ'D	5-18-76	LEJ		
E-5928	B		CHANGED 15" CLAY PIPE TO 12".	5-21-76	EVERY	D.E.	
E-5821	A	~	SEE ECN	5-19-76	WAV		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	WATTERS	5-19-76
CHECKED	G. MIHALCHIK	5-18-76
ENGINEER		
APP'D	J.P. Sullivan	5-18-76

TITLE
UNDERGROUND PLAN & DETAILS
O_2 GENERATING AREA
2-60 T/D O_2 GEN.
HOOKERS PT. TAMPA, FLA

SCALE 1/16" = 1'-0" WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

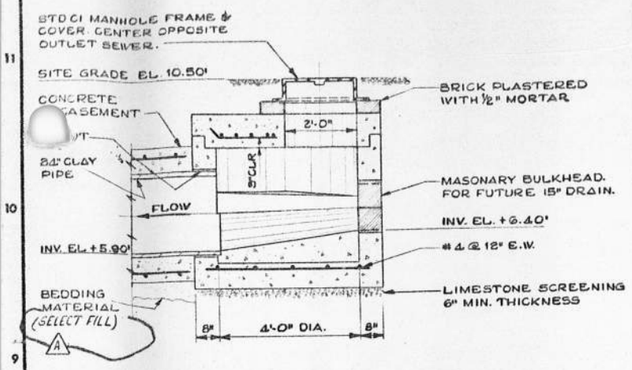
5-3555-1005 D

CITY OF TAMPA, FLA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION
AND STORAGE EQUIPMENT

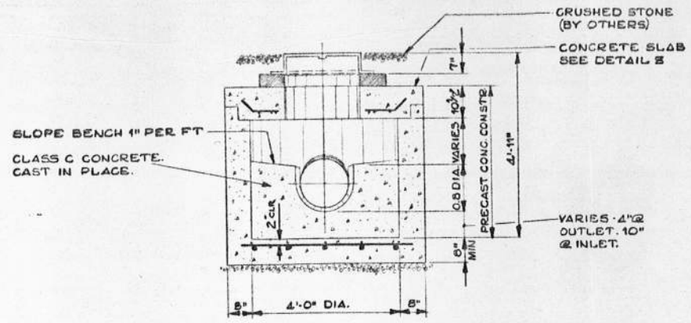
FORM NO. 8309-4 (REV. 6-74)

4L1_4005

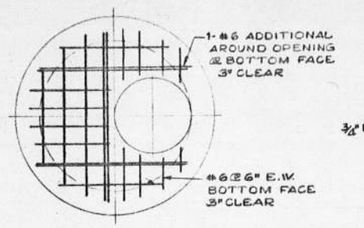
PART NO.	MATERIAL: MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE



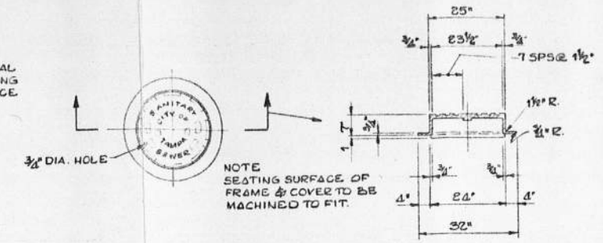
SECTION A



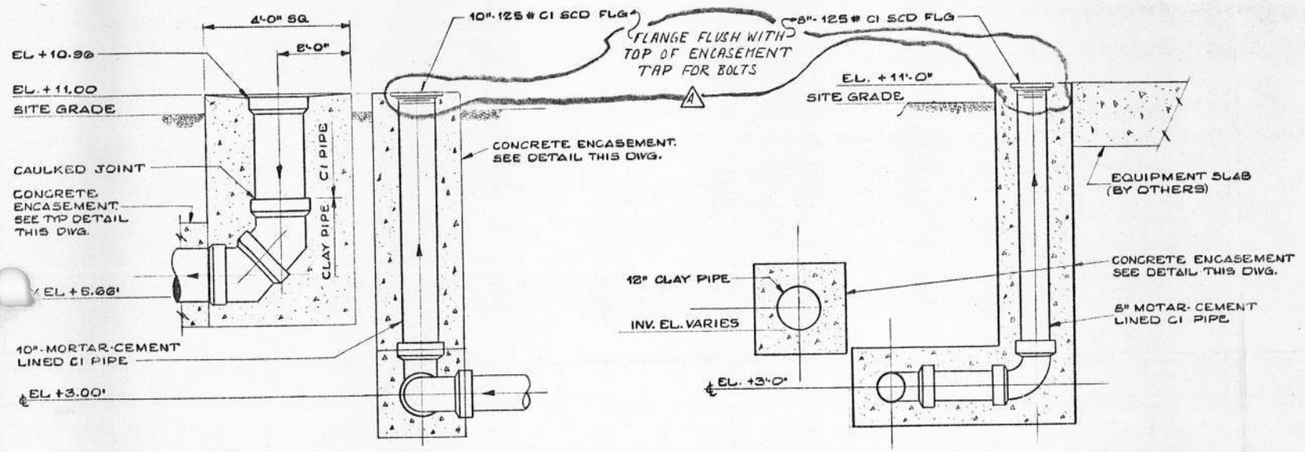
SECTION B



DETAIL Z

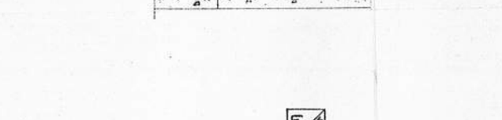


CAST IRON MANHOLE FRAME AND COVER
APPROX. WT. 380#

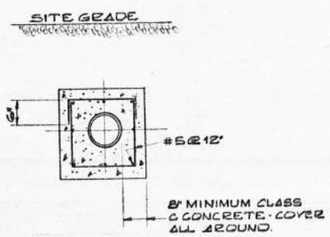


SECTION C

SECTION D



SECTION E



TYPICAL PIPE ENCASEMENT

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CITY OF TAMPA, FLA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E-5821	A	~	SEE ECN	8-19-76	WAV		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ☆ DECIMAL ☆ ANGLES ☆
HOLE LOCATION ☆ HOLE SIZE ☆

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	WITTER	5-13-76
CHECKD	G.M. HALCHIK	5-18-76
ENGINEER		
APPRD		5-18-76

TITLE
UNDERGROUND
SECTIONS & DETAILS
O_2 GENERATING AREA
2-60 T/D O_2 GENS
HOOKERS PT. TAMPA, FLA

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

SCALE ½" = 1'-0" | WT.

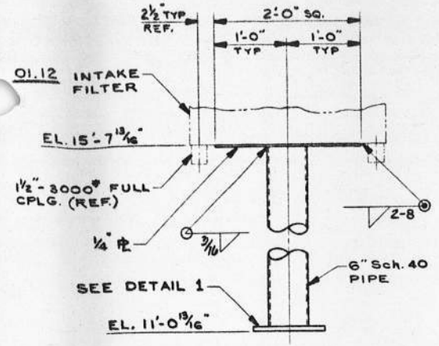
5-3555-4006 D

DWG SIZE D A

FORM NO. 8309-4 (REV. 6-74)

4L1_4006

MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

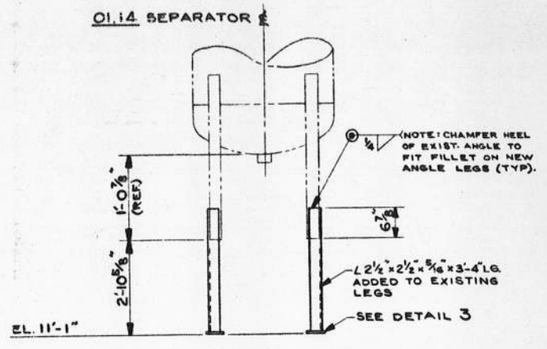


EQUIPMENT SUPPORT [1] 40S0D TWO REQ'D

01.12 INTAKE FILTER

REF. DWG. 5-3555-6201 D

REF. DWG. 5-3555-6202 D

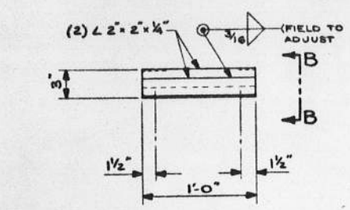


EQUIPMENT SUPPORT [2] 40S0D 8 LEGS REQ'D

01.14 SEPARATOR

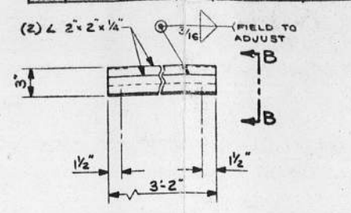
REF. DWG. 5-3555-6205D

REF. DWG. 5-3555-6202D



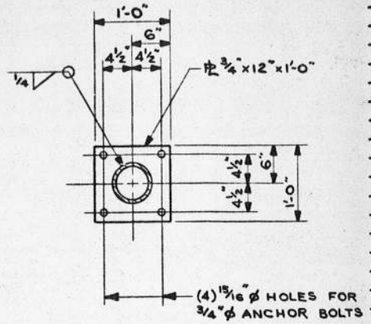
PIPE SUPPORT [4] 40S0D TWO REQ'D

REF. DWG. 5-3555-6203D

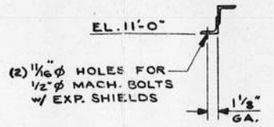


PIPE SUPPORT [5] 40S0D THREE REQ'D

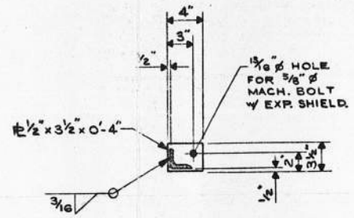
REF. DWG. 5-3555-6204D



DETAIL 1



VIEW B-B



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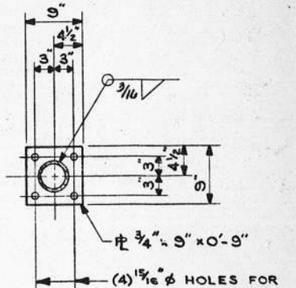

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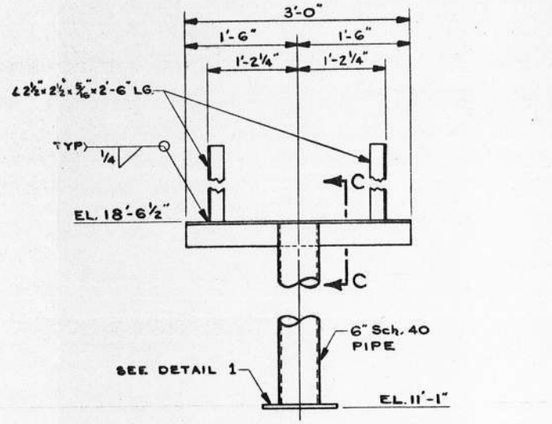
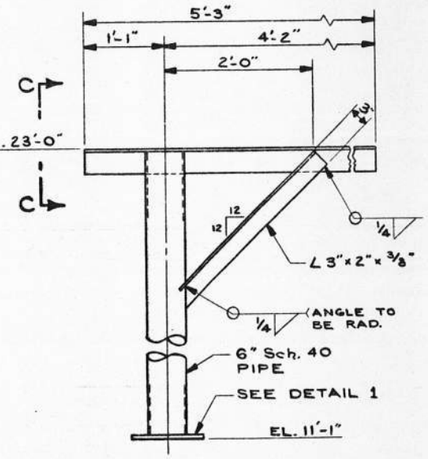


EQUIPMENT SUPPORT [7] 40S0D TWO REQ'D

01.17 AFTERCOOLER

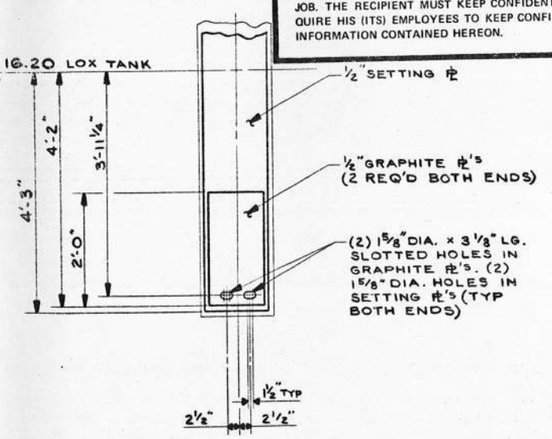
REF. DWG. 5-3555-6201D

REF. DWG. 5-3555-6202D

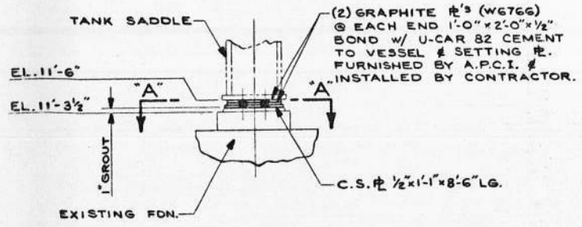


PIPE SUPPORT [6] 40S0D ONE REQ'D

REF. DWG. 5-3555-6204D



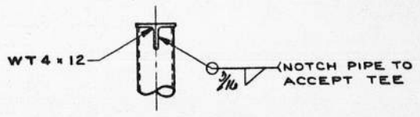
SECTION A-A



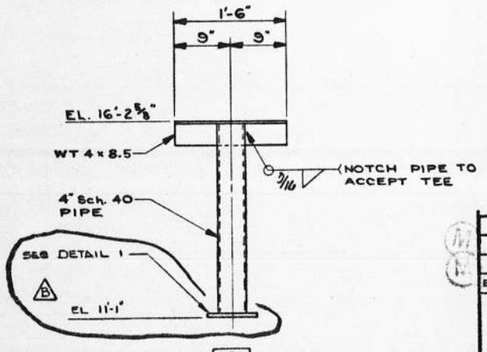
EQUIPMENT SUPPORT [3] 40S0D ONE REQ'D

16.20 LOX TANK

REF. DWG. 5-3555-6204D



VIEW C-C



PIPE SUPPORT [8] 40S0D TWO REQ'D

REF. DWG. 5-3555-6201D

REF. DWG. 5-3555-6202D

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5-3555-4050 DWG. SIZE D B

GENERAL NOTES:

(1) FABRICATION & ERECTION OF SUPPORTS TO BE IN ACCORDANCE w/ THE LATEST A.I.S.C. SPECIFICATIONS.
(2) FOR ORIENTATION & LOCATION OF SUPPORTS SEE REFERENCE DRAWINGS.
(3) FOR DETAILS NOT SHOWN SEE DWG. 5-3555-4051 D, 4052 D & 4053 D.
(4) ALL MATERIAL TO BE A36 CARBON STEEL UNLESS NOTED. BOLTS SHALL MEET REQUIREMENTS OF ASTM DES: A325.
(5) GRATING SHALL BE ALUMINUM 6063-T6. HANDRAILS & TOE ℄'S SHALL BE ALUMINUM 6061-T6. GRATING CLIPS TO BE STAINLESS STEEL.
(6) EXPANSION SHIELDS & MACH. BOLTS SHALL BE PHILLIPS "STAINLESS STEEL WEDGE ANCHOR" OR EQUAL.
(7) FOR PAINTING PROCEDURES SEE A.P.C.I. SPECIFICATIONS.

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
—	B	2L	REVISED PIPE SUPPORT #8 (ADDED DET #1) & EL. 11'-1" WAS 14'-2 7/8"	24 FEB 78	LES	Crowell	
	A		ADDED & REVISED GENERAL NOTES	9-1-76	EVERS		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± DECIMAL ± ANGLES ± ; HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON: 00-5-3555

		DATE
DRAFTSMAN	G. MIHALCHIK	4-21-76
CHECKED	B. EVERS	7-20-76
ENGINEER		
APP'D		7/21/76

TITLE: STRUCTURAL MISC. EQUIPMENT & PIPE SUPPORTS

SCALE: FULL WT.

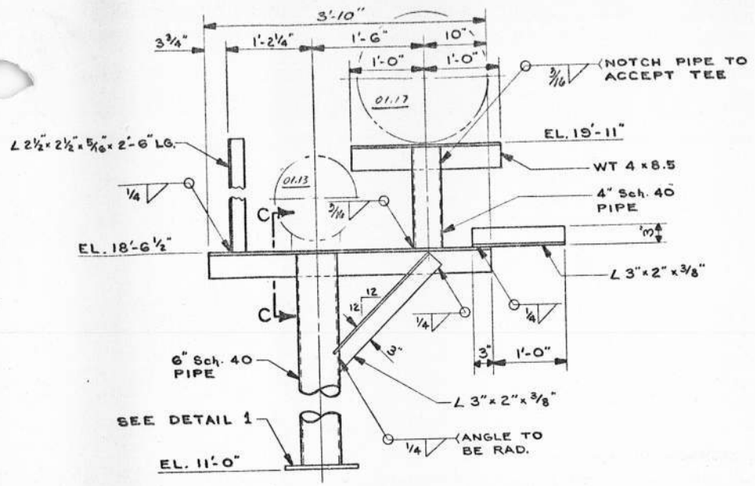
AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-4050 D

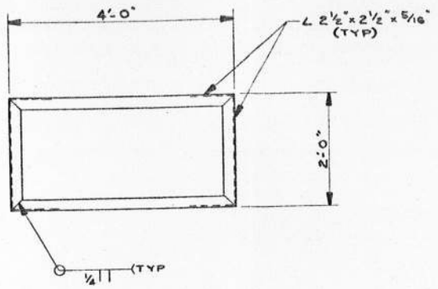
FORM NO. 8309-4 (REV. 6-74)

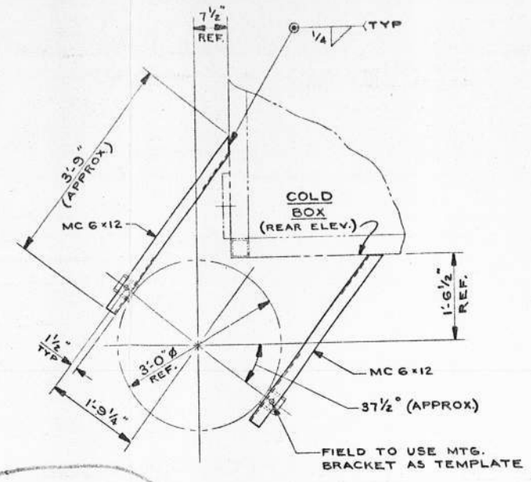
4L1_4050

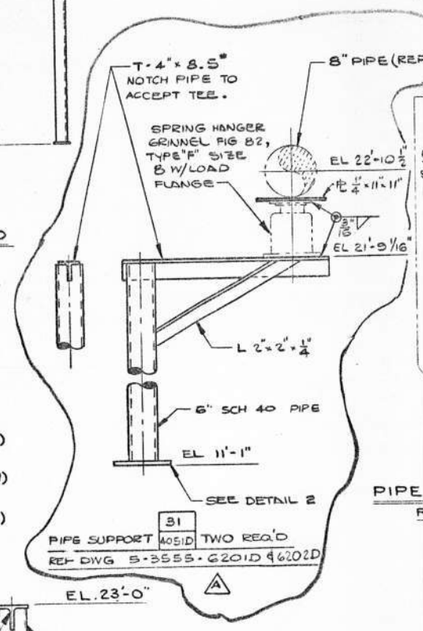
PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE



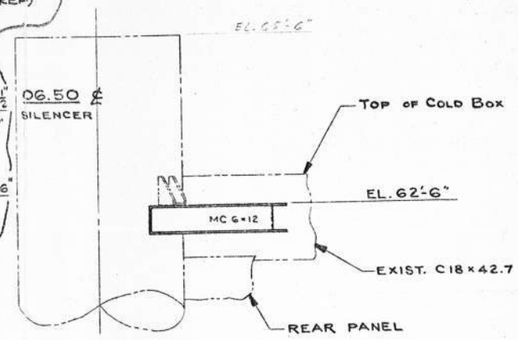
EQUIPMENT SUPPORT 9 40510 TWO REQ'D
01.13 & 01.17 AFTERCOOLER
REF. DWG. 5-3555-6201D
REF. DWG. 5-3555-6202D



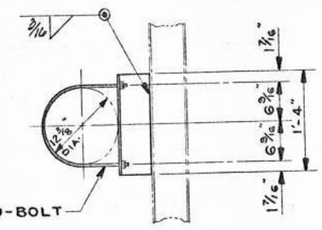




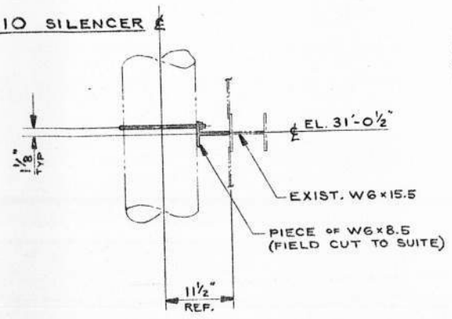
PIPE SUPPORT 31 40510 TWO REQ'D
REF DWG 5-3555-6201D & 6202D



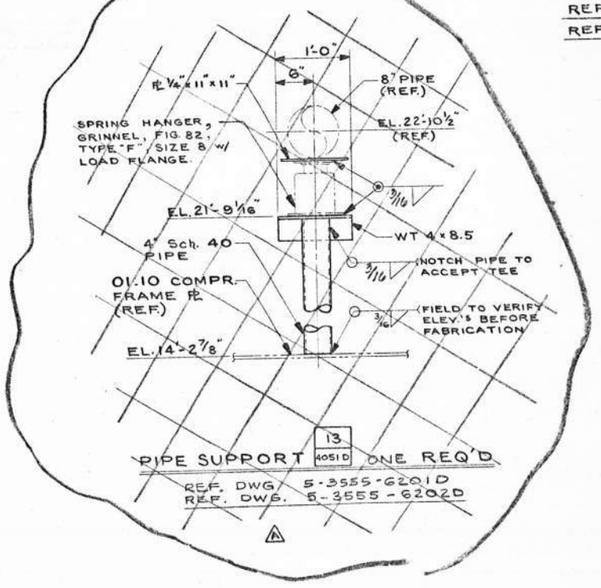
PIPE SUPPORT 12 40510 TWO REQ'D
REF. DWG. 5-3555-6208D



10.10 SILENCER

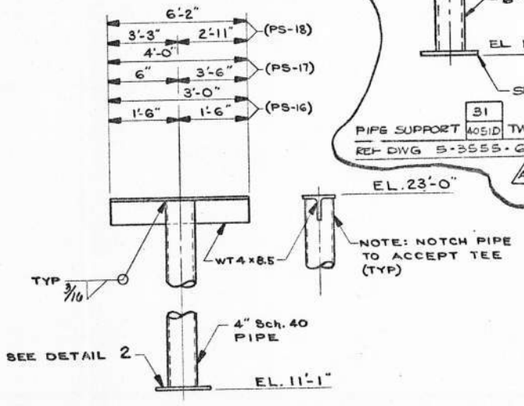


PIPE SUPPORT 11 40510 TWO REQ'D
REF. DWG. 5-3555-6208D



PIPE SUPPORT 13 40510 ONE REQ'D
REF. DWG. 5-3555-6201D
REF. DWG. 5-3555-6202D

EQUIPMENT SUPPORT 10 40510 TWO REQ'D
MOTOR TERMINAL BOX
REF. DWG. 5-3555-6201D
REF. DWG. 5-3555-6202D



FOR GENERAL NOTES & DETAILS NOT SHOWN SEE DWG. 5-3555-4050 D

NOTICE

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PIPE SUPPORT 16 40510 ONE REQ'D
REF. DWG. 5-3555-6202D

PIPE SUPPORT 17 40510 ONE REQ'D
REF. DWG. 5-3555-6202D

PIPE SUPPORT 18 40510 TWO REQ'D
REF. DWG. 5-3555-6201D
REF. DWG. 5-3555-6202D

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD
—	A	M-5	ADDED PIPE SUPPORT 31 & DELETED PIPE SUPPORT 13.	29 FEB '78	LEJ		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION DECIMAL ANGLES
HOLE LOCATION HOLE SIZE
FIRST USED ON 00-5-3555

G. MIHALCHIK DRAFTSMAN 5-5-76
D. EVERT CHECKED 7-20-76
ENGINEER
APPRD 8/20/76

TITLE: STRUCTURAL MISC. EQUIPMENT & PIPE SUPPORTS

SCALE — WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

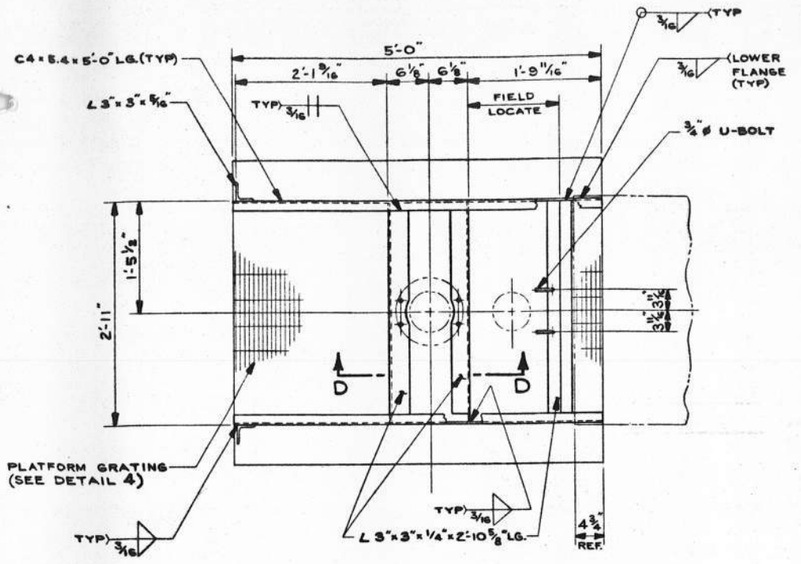
5-3555-4051 D

DWG. SIZE D A

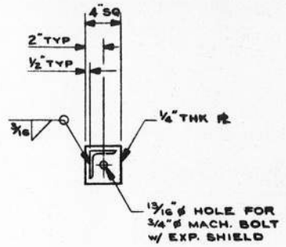
FORM NO. 8009-4 (REV. 6-74)

4L1_4051

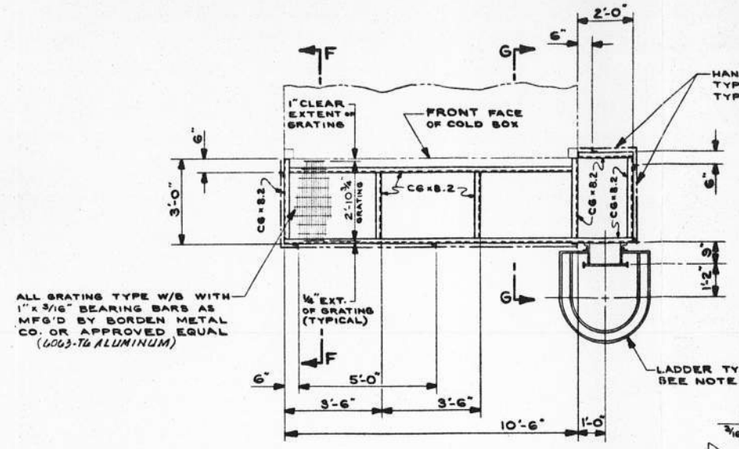
PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE



PLAN

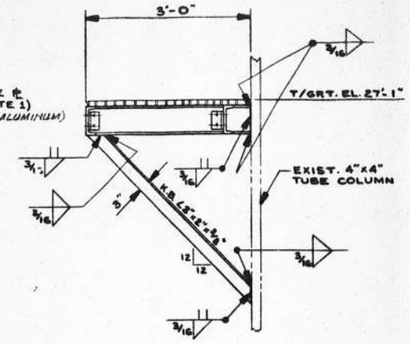


SECTION E-E
(TYP 2 PLACES)
EA. PLANT

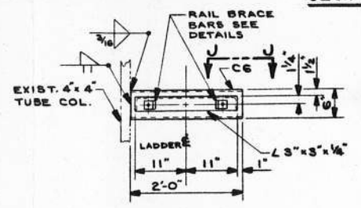


ALL GRATING TYPE W/S WITH 1" x 3/16" BEARING BARS AS MFG'D BY BORDEN METAL CO. OR APPROVED EQUAL (6063-T6 ALUMINUM)

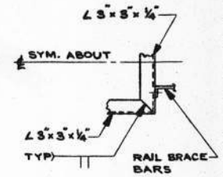
PLAN



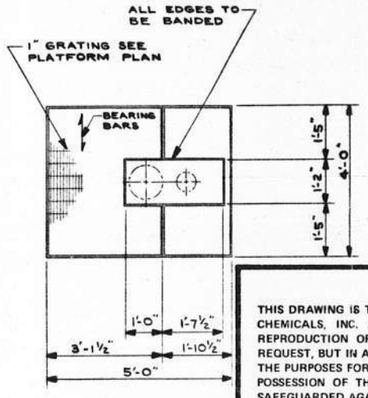
SECTION F-F AS SHOWN
SECTION G-G OPP. HAND



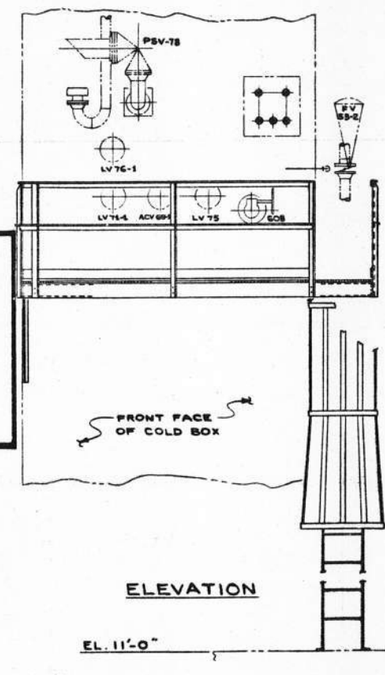
SECTION H-H



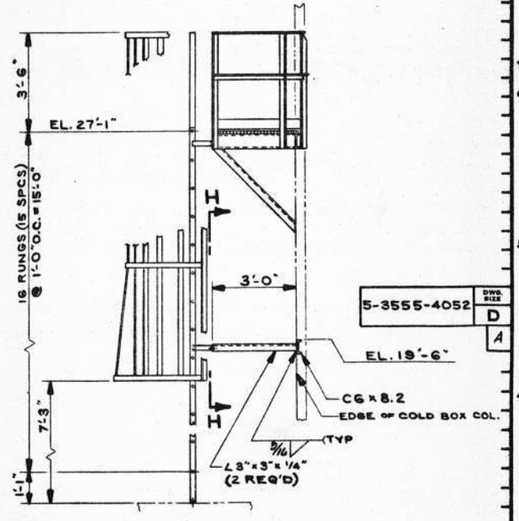
VIEW J-J



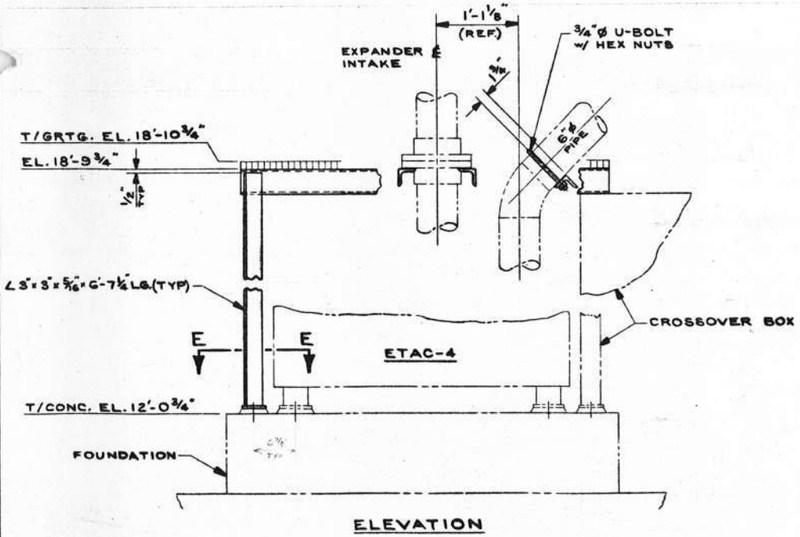
DETAIL 4



ELEVATION

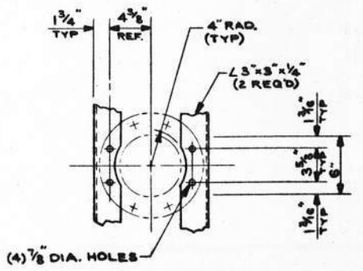


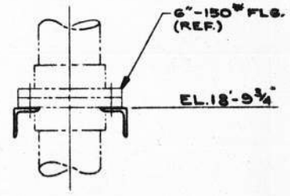
SIDE ELEV.



ELEVATION

PIPE SUPPORT 14 40520 TWO REQ'D
REF. DWG. 5-3555-6208D





SECTION D-D

ACCESS PLATFORM 15 40520 & LADDER DETAILS
REF. DWG. 5-3555-6201 D
2 REQ'D

GENERAL NOTES:
(1) FOR HANDRAIL & TOE PL DETAILS SEE DESIGN ENGINEERING STANDARDS 540.3.2.2 PAGE 1 OF 5.
(2) FOR LADDER DETAILS SEE DESIGN ENGINEERING STANDARDS 540.3.2.1 PAGES 1 & 3 OF 5.
(3) FOR MORE GENERAL NOTES SEE DWG. 5-3555-4050D.
(4) ALL ENDS OF GRATING PANELS & ALL OPENINGS SHALL BE BANDED.
(5) GRATING TO BE ANCHORED WITH STAINLESS STEEL TYPE F9 SADDLE CLIPS & 3/8" STL NELSON STUD BOLTS. MIN. 4 PER PANEL.

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ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
	A		CHANGED GENERAL NOTES & ADDED SPECS FOR HANDRAILS, TOE PL & GRATING.	9-1-76	EVERS		

CITY OF TAMPA, FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± DECIMAL ± ANGLES ± HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON: 00-5-3555

G. MIHALCHIK, DRAFTSMAN, DATE 5-6-76
B. EVERS, CHECKED, 7-20-76
ENGINEER
APPD, 9/21/76
SCALE (NL) WT.

TITLE: COLD BOX LADDER AND PLATFORMS- EXPANDER PLATFORM

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-4052 D

FORM NO. 8209-4 (REV. 6-70)

4L1_4052

PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE	MAT'L
			MATERIAL			
1		2	6'-3 3/4"		L 3x3 x 1/4"	STEEL
2		2	5'-2"		L 3x3 x 1/4"	
3		4	3'-11 1/2"		L 3x3 x 1/4"	
4		4	2'-6"		L 3x3 x 1/4"	
5		1	3'-2"		L 3x3 x 1/4"	
6		2	5'-2 1/4"		BAR, FLAT 2 1/2 x 1/4"	
7		1	3'-0"		BAR, FLAT 2 1/2 x 1/4"	
8		2	4"		BAR, FLAT 4 x 1/4"	
9		1	3'-8" x 4'-10"		SHEET H.R. #12 GA. (.1046)	
10		1	3'-7 1/2" x 4'-9 1/2"		SHEET H.R. #12 GA. (.1046)	
11		2	2'-7 1/2" x 3'-7 1/2"		SHEET H.R. #12GA. (.1046)	
12		32			CAPSCREW, HEX. HD TAPTITE 1/4 x 3/4" LG FULL THD.	STEEL
13		1	33 FT.		PUTTI ROPE	
14		1			ADAPTER PL APCI DWG.# 98267C	STEEL
15		28			CAPSCREW, HEX HD. 3/8-16 NC x 1" LG	STEEL
16		1	2'-6"		BAR, FLAT 4" x 1/4"	STEEL
17		1	4 3/4" x 2'-7 1/2"		SHEET H.R. #12GA. (.1046)	STEEL

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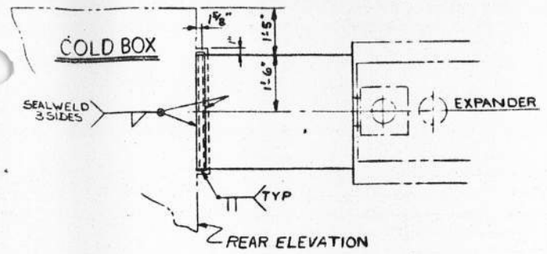


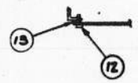
PLAN VIEW

SUGGESTED ERECTION PROCEDURE

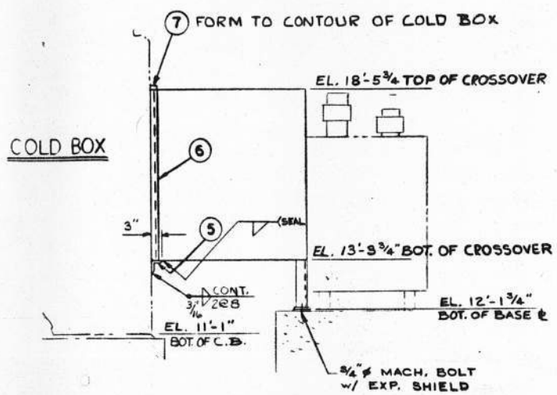
1. REMOVE SHIPPING PANEL FROM COLD BOX.
2. PROVIDE WEATHER PROTECTION FOR EXPOSED ROCKWOOL.
3. WELD PART No. (5) IN POSITION.
4. INSTALL CROSSOVER FRAME.
5. INSTALL CROSSOVER PIPING.
6. WELD PARTS (6) & (7) & SIDE & BOTT. PANELS IN POSITION.
7. FILL CROSSOVER WITH ROCKWOOL.
8. WELD PART No. (11) (TOP PANEL) IN POSITION.

SECTION C-C

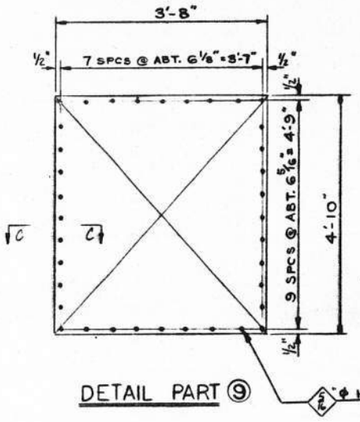
SECTION E-E



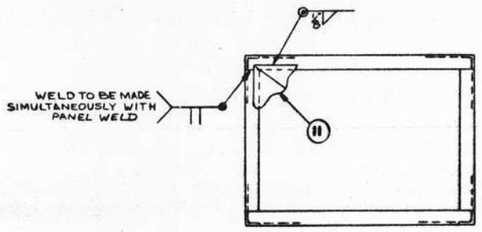
SECTION D-D



RIGHT ELEVATION

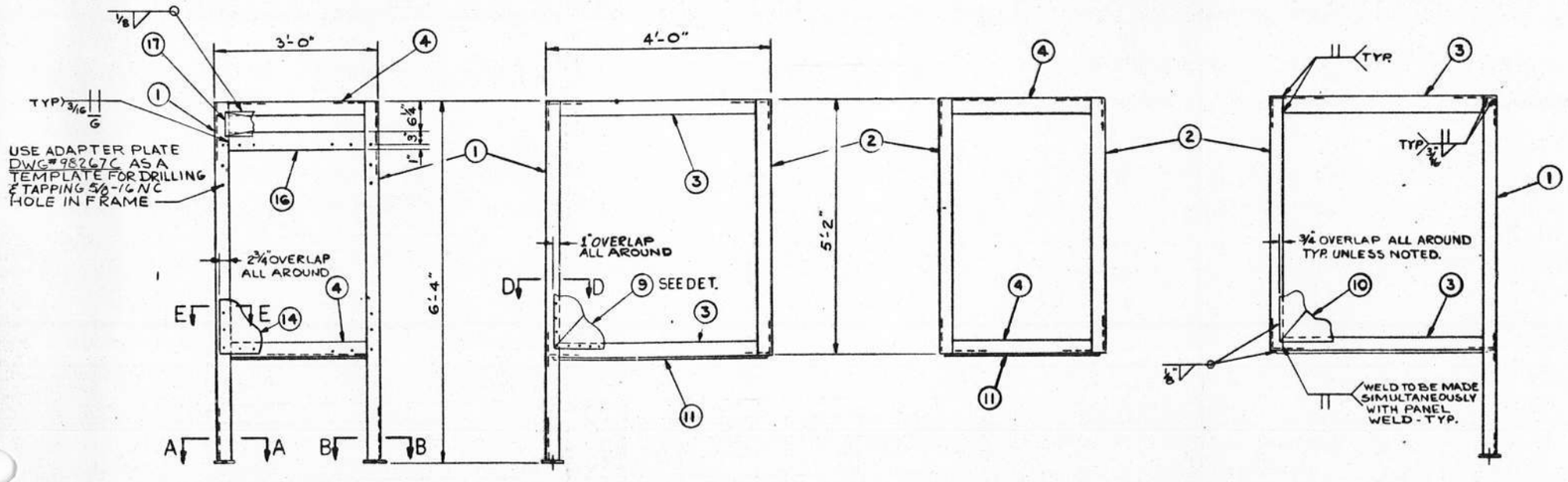


DETAIL PART (9)

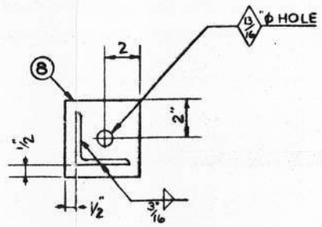


GENERAL NOTES:

1. FOR GENERAL NOTES SEE DWG. NO. 5-3555-4050D.
2. CROSSBREAK PARTS Nº (9) (10) (11) & (17) FROM CORNER TO CORNER WITH APPROX. 3/16" CROWN AT CENTER.
3. GRIND OUTSIDE WELDS AS REQ'D. TO INSURE GOOD PANEL FIT.
4. USE PART Nº (9) AS A TEMPLATE FOR DRILLING HOLES IN FRAME TO ACCOMMODATE CAPSCREWS REQ'D. PART Nº (12).



REAR ELEVATION | LEFT ELEVATION | FRONT ELEVATION | RIGHT ELEVATION



SECTION A-A (AS SHOWN)
SECTION B-B (OPP. HAND)

5-3555-4053 DWG SIZE D A

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
	A		CHANGED GENERAL NOTES & ERECTION PROCEDURES	9-1-76	EVERS		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± DECIMAL ± ANGLES ± HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON: 00-5-3555

G. MINALCHIK, DRAFTSMAN, DATE 5-11-76
J. EVERS, CHECKED, 7-20-76
ENGINEER
APPR'D, 9/24/76

TITLE: CROSSOVER ASSEMBLY & DETAILS COLD BOX TO EXPANDER GOT/D O_2 GENERATORS

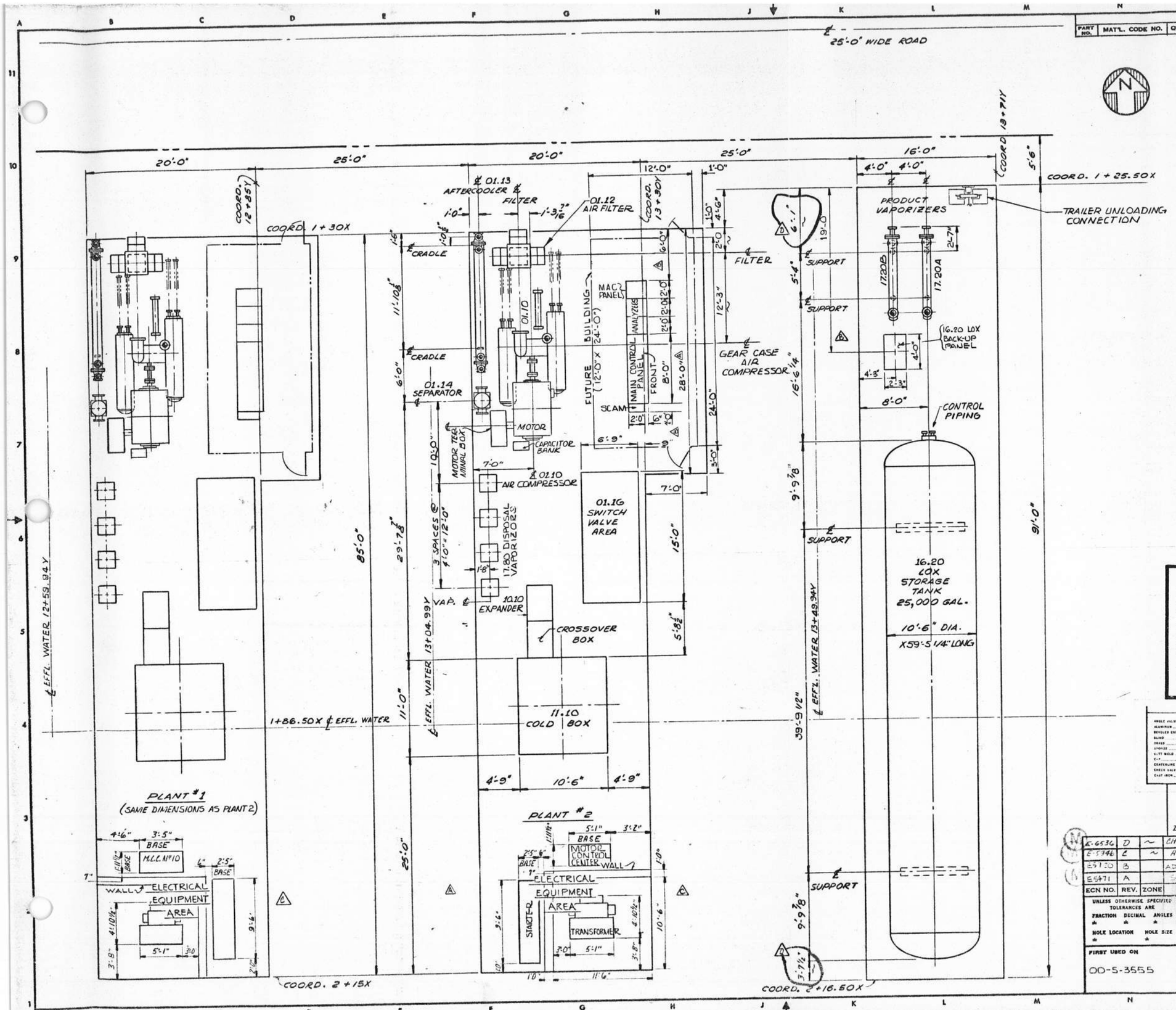
AIR PRODUCTS AND CHEMICALS INC. ALLENTOWN, PENNSYLVANIA

SCALE NONE | WT.

5-3555-4053 D

FORM NO. 5809-4 REV. 6-70 S

4L1_4053



PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	MATERIAL REMARKS	NOMENCLATURE

GENERAL NOTES:

1. ALL ELEVATIONS ARE TO ℄ UNLESS OTHERWISE NOTED.
2. ALL BUTT WELD ELBOWS TO BE LONG RADIUS; ALL WROUGHT COPPER ELBOWS TO BE SHORT RADIUS UNLESS OTHERWISE NOTED.
3. BOLT HOLES TO STRADDLE VERTICAL AND HORIZONTAL CENTER LINES UNLESS NOTED OTHERWISE.
4. ALL EQUIPMENT, PIPE, TUBE AND FITTINGS MUST BE KEPT CLEAN, DRY, AND OIL FREE DURING ASSEMBLY.
5. ALL FLANGE JOINTS ARE TO BE PREPARED IN ACCORDANCE WITH APCI DESIGN ENGR. STD. 579.2.2 AND 579.2.3.
6. ALL FLANGE FACINGS ARE TO BE PROVIDED WITH SUITABLE COVERING IN ORDER TO PROTECT THE FINISH UP TO THE FINAL ASSEMBLY.
7. FLANGE FACINGS AT 10.10 EXP. ARE TO HAVE AN RMS-126-250 SMOOTH FINISH.
8. ALL FLANGE BOLT HOLES ARE TO STRADDLE THE CENTERLINE IN ALL DIRECTIONS.
9. ALL PIPING TO BE CLEANED IN ACCORDANCE WITH CONTRACT SPECIFICATIONS.
10. ALL COPPER TUBE AND FITTINGS ARE TO BE SILVER BRAZED.
11. ALL REDUCERS ARE TO BE CONCENTRIC UNLESS NOTED OTHERWISE.
12. ALL BRANCH CONNECTIONS ARE TO BE WELDED IN STRICT ACCORDANCE WITH USASI B31 1966 FIG. 504.3.1.
13. BRANCH CONNECTIONS ARE NOT TO INTERSECT THE LONGITUDINAL SEAM OF WELDED PIPE HEADERS.
14. AA1.5/CS1.5 INDICATED A JOINT OF MATERIAL TRANSITION.
15. ALL VALVES WITH SOFT SEATING (KEL-F OR TEFLON DISC INSERTS) MUST BE FULLY OPENED BEFORE THEY ARE WELDED OR BRAZED INTO THE PIPING.
16. ALL EXTENDED BONNET VALVES AND VALVES USED FOR OXYGEN SERVICE MUST BE HYDROCARBON DECONTAMINATED IN ACCORDANCE WITH OCL-117F.
17. INSTALL CHECK VALVE 134 WITH PIN IN HORIZONTAL POSITION AND VALVES 327 AND 319 WITH PIN IN VERTICAL POSITION.
18. WELDING RINGS MUST BE REMOVED FROM ALL ORIFICE RUNS AND I.D. OF PIPE GROUND SMOOTH.
19. USE 5/8" O.D. x .040" WALL TYPE "L" ASTM B-88 FOR ALL 1/2" CT2 LINES.
20. PIPING TO BE INSULATED IN ACCORDANCE WITH APCI SPEC. ~~ETON~~ ENTIRE LENGTH OF LINE TO BE INSULATED UNLESS OTHERWISE NOTED.
21. PIPING TO BE INSULATED IN ACCORDANCE WITH APCI SPEC. 270.09A IF APPLICABLE WITH SECT. INSUL. SHALL BE 1" THK (NOT 2") ENTIRE LENGTH OF LINE TO BE INSULATED.
22. ALL DIMENSIONS ARE TO BE VERIFIED BY CONTRACTOR IN THE FIELD.
23. ALL FABRICATION OF PIPING TO BE IN ACCORDANCE WITH SECTION 203-0 OF CONTRACT SPECIFICATION.
24. NON CRITICAL LINES 2" AND UNDER WHICH HAVE NOT BEEN INDICATED AS HAVING PIPE SUPPORTS SHALL BE FIELD SUPPORTED BY THE CONTRACTOR AS SEEN NECESSARY BY A.P.C.I. CAUTION SHOULD BE USED IN WELDING SUPPORTS TO THE (11.10) COLD BOX STRUCTURE (ESPECIALLY TO PANELS ONLY) AS NOT TO BURN THRU THEM. SUGGESTED TYPE OF WELD 3/16" FILLET (NO GREATER).
25. DO NOT USE WELD RINGS ON ALL OXYGEN PIPING CSD1.5.
26. USE INERT GAS WELDINGS ON ALL ST. STL. PIPING.
27. COLD BOX TO BE ERECTED PLUMB TO WITHIN ± 1/8" AS DETERMINED BY COLD BOX FIELD ALIGNMENT LUGS.
28. PIPING AND EQUIPMENT SUPPORTS ARE DESIGNATED IN THE FOLLOWING METHOD: 2B / 6261D — SUPPORT NO. / LAST FOUR DIGITS AND LETTER OF DWG. NO.
29. CONTRACTOR TO FIELD CHECK THESE DIMENSIONS. IF FOUND INCORRECT, DO NOT INSTALL EXPANDER UNTIL PIPING CONNECTIONS HAVE BEEN CORRECTLY ALIGNED BY REPOSITIONING EXPANDER WITH APPROVAL OF APCI SUPERINTENDENT.
30. COAT INSIDE OF AIR COMPRESSOR INLET PIPING WITH AN EPOXY COATING TO AN 8 MIL. THICKNESS OF PLACITE NO. 7111 MADE BY WISCONSON PROTECTIVE COATING CO.
31. EXPANSION SHIELD & MACH BOLTS SHALL BE PHILLIPS "STAINLESS STEEL WEDGE ANCHOR" OR EQUAL.

REFERENCE DRAWINGS:

FOUNDATIONS, PLAN, SECTIONS AND DETAILS 5-3555-4000D

VALVE SUMMARY 5-3555-55.10-038

NOTICE

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5-3555-6200 DWG. SIZE D

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E-6536	D	~	CHANGED DIM NOW 3'-7½" WAS 2'-4, DIM NOW 6'-1" WAS 7'-0½"	1-28-77	WAV	GROMER	
E-5946	C	~	ADDED LOCATION OF ELECT. EQUIP.; REVISED NOTE NO. 20; ADDED NOTE NO. 31	3-8-76	WAV	GROMER	
E5730	B		ADDED NOTES AND LOCATED NEW CONTROL PANELS	3 MAY	JAF	EAF	
E5471	A		SEE ECN	17 MAY	JAF	EAF	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ♣ DECIMAL ♣ ANGLES ♣; HOLE LOCATION ♣ HOLE SIZE ♣

FIRST USED ON 00-5-3555

LEW JONES, DRAFTSMAN, DATE 8 MAR 76

CHECKED — DATE 5 MAY 76

ENGINEER

APPROVED A. Sullivan, DATE 5 MAY 76

TITLE: EQUIPMENT ARRANGEMENT -PLAN- (2) 60 T/D O2 GENERATORS FOR CITY OF TAMPA, FLORIDA

SCALE 3/16"=1'-0" WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-6200 D

CITY OF TAMPA, FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTEWATER TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

4L1_6200

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EDGE OF CONCRETE PAD, MATCHLINE COD. 5-3555-G202D

MATERIAL

PART NO.	MATL. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

MATCHLINE COD. 5-3555-G202D

M.A.C. PANEL | ANALYZER | ANALYZER | MAIN CONTROL PANEL | SCAM

MAX ALLOWANCE FOR INBOARD BUILDING LOCATION

CONTROL BUILDING
(12'-0" X 24'-0" MAX.)

EDGE OF PROPOSED BUILDING

SWITCH VALVE AREA
SEE DWG Nº 301238 D

FIELD SUPPORT

PLANT 1 FE53

TYP EACH INTER SUPPT.
6"-O-141-CS01.5
1"-O-178-CT2

1"-AIR (BY OTHERS)
4"-O-134-CS01.5
2"-O-234-CT2
6"-N-139-CS1.5
1"-N-340-IAS1.5

WELD CHANNEL TO PIPE @ EA. INTER SUPPT.

Typ. 5 LINES @ 6'-8" = 20'-0" INTERMEDIATE SUPPORTS (3 REQD)

3" URETHANE (SEE NOTE 20)

01.50 SILENCER

11.10 COLD BOX
(SEE SECTIONS FOR CONT OF BOX PIPING)

10.10 SILENCER

10.10 EXPANDER

AIR FILTER

OIL BREATHER (SUPPLIED WITH 10.10)

01.10 OIL

01.10 COMPRESSOR

01.11 MOTOR

01.10 B MOTOR TERMINAL BOX

01.12 FILTER

01.13 AFTERCOOLER

01.14 SEPARATOR

01.17 SILENCER

10" GUIDE VANE CONTROL DRIVE ASSY

CAPACITOR BANK

17.80 DISPOSAL VAPS.

GEAR CASE
1"-A-110-IAS1.5
1½"-A-124-IAS1.5
3"-CW-272-CS1.5
3"-CW-273-CS1.5

6"-CW-273-CS1.5
3"-CW-106-CS1.5
3"-CW-105-CS1.5
10"-A-100-CS1.5
SEE NOTE Nº 30
EPOXY COAT (TO 8 MIL. THICK) THE INSIDE OF PIPE

8"-A/N-129-CS1.5
8"/10-N-140-CS1.5
8"-A/N-130-CS1.5
1"-A-IAS1.5
8"-A-112-CS1.5
1"-N-117-IAS1.5

4"-N-144-SS2.7
3/4"-N-274-IAS1.5
6"-A-154-CS1.5
6"-A-267-SS2.7
6"-N-157-SS2.7
½"-CW-168-CS1.5
½"-CW-169-CS1.5
2"-O-165-CT-2
2"-O-166-CT-2
2"-O-165-CT-2

2"-O-234-CT2
8"-A-112-CS1.5
8"-A-102-CS1.5
6"-CW-273-CS1.5

2"THK. URETHANE (SEE NOTE 20)

3"-A-107-CS1.5 | 6"-CW-272-CS1.5
8"-A-101-CS1.5 | 6"-CW-273-CS1.5
3"-CW-109-CS1.5 | 3"-CW-108-CS1.5

FOR GENERAL NOTES & REFERENCES SEE DWG 5-3555-G200D

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D APP'D
—	B	D-3 P-3	REMOVED PV-2 VALVE & ADDED 10" GUIDE VANE CONTROL DRIVE ASSY AS SHOWN. REVISED M.A.C. PANEL & CS-1.5 & PIPE SUPPORT DETAILS.	2 FEB '76	L.E.J.	
E6027	H	—	REMOVED LINE # 1"-A-314-IA1.5 & UPDATED DRAWING.	10-5-76	W.A.V.	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± | DECIMAL ANGLES ± | HOLE LOCATION | HOLE SIZE

FIRST USED ON: 00-5-3555

FRANKENFIELD DRAFTSMAN 4-8-76 | R. GRONER CHECKED | ENGINEER | APPD 9/24/76

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

PLANT Nº. 1

TITLE: EQUIPMENT AND PIPING ARRGT PLAN COLD BOX & COMPRESSOR AREA (2) 60 T/D O2 GENERATORS TAMPA, FLORIDA

SCALE ½" = 1'-0" | WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-G201 | DWG SIZE D

FORM NO. 8309-4 (REV. 6-70)

4L1_6201

NOTICE

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MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

CONTROL BUILDING (12'-0" X 24'-0" MAX.)

MATCHLINE COD 5-3555-6203D

MATCHLINE COD. 5-3555-6203/6204D

MATCHLINE COD 5-3555-6201D

MAIN CONTROL PANEL

M.A.C. ANALYZER PANEL

ANALYZER

SCAM

MAX ALLOWANCE FOR INBOARD BUILDING LOCATIONS

EDGE OF PROPOSED BUILDING

SWITCH VALVE AREA SEE DWG. No. 301238D

FIELD SUPPORT

FROM PLT 1

FROM PLANT 1

FROM PLANT #2

FROM PLANT #1

SEE NOTE No. 30

EPOXY COAT INSIDE OF PIPE TO 8 MIL THICKNESS

01.10 OIL BREATHER

01.10D

01.10 SILENCER

01.10 EXPANDER

01.10 COLD BOX (SEE SECTIONS FOR CONT OF BOX PIPING)

10" GUIDE VANE CONTROL DRIVE ASSY

01.10 COMPRESSOR

GEAR CASE

01.11 MOTOR

MOTOR TERMINAL BOX

CAPACITOR BANK

01.12 FILTER

01.13 AFTER COOLER

01.14 SEPARATOR

01.17 SILENCER

19.80 DISPOSAL VAPS

VAP

3" URETHANE (SEE NOTE 20)

2" THK URETHANE (SEE NOTE 20)

OIL BREATHER (SUPPLIED WITH 10.10)

AIR FILTER

BUSH TO SUIT

SEE SECT

TYP. 6 LINES

ONLY

TACK WELD

APPLIES TO

FOR GENERAL NOTES & REFERENCES SEE DWG 5-3555-G201D

6"-CW-273-CS1.5
3"-CW-106-CS1.5
3"-CW-105-CS1.5
10"-A-100-CS1.5

3"-A-107-CS1.5
8"-A-101-CS1.5
3"-CW-109-CS1.5
6"-CW-272-CS1.5
6"-CW-273-CS1.5
3"-CW-108-CS1.5

8"-A/N-129-CS1.5
8"/10"-N-140-CS1.5
8"-A/N-130-CS1.5
1"-A-1A31.5
8"-A-112-CS1.5
1"-N-117-1AS1.5

4"-N-144-SS2.7
3/4"-N-274-1AS1.5
6"-A-154-CS1.5
6"-A-267-SS2.7
6"-N-157-SS2.7
1/2"-CW-168-CS1.5
1/2"-CW-169-CS1.5
2"-O-165-CT-2
2"-O-166-CT-2
2"-O-165-CT-2

6"-O-141-CS01.5
6"-O-141-CS01.5
1"-O-178-CT2

1"-AIR (BY OTHERS)
4"-O-134-CS01.5
2"-O-234-CT 2
6"-N-139-CS1.5
1"-A-340-1AS1.5

1"-O-178-CT-2
1½"-CS1.5

1"-AIR (BY OTHERS)
1"-N-341-1AS1.5

1"-O-178-CT 2
4"-O-134-CS01.5
6"-O-141-CS01.6

2"-O-234-CT2
8"-A-112-CS1.5
8"-A-102-CS1.5
6"-CW-273-CS1.5

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
—	B	D-5	REMOVED 4" VALVE & ADDED 10" GUIDE VANE CONTROL DRIVE ASSY AS SHOWN. ADDED PIPE 6" & CW-273-CS1.5 & ADDED TO 1¼" TO 6"-O-141-CS01.5 PER SHEET 5 WAS 1.5.	2-6-78	LEJ		
5-6027	A	~	REMOVED LINE "1"-A-314-1AS1.5 & UPDATED DRAWING	10-5-76	WAV		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± | DECIMAL ± | ANGLES ± | HOLE LOCATION ± | HOLE SIZE ±

FIRST USED ON: 00-5-3555

DRAFTSMAN: FRANKENFIELD 4-8-76 | CHECKED: E. PROMER | ENGINEER | APPD: 7/4/76

TITLE: EQUIPMENT & PIPING ARRG'T PLAN COLD BOX & COMPRESSOR AREA (2) GOT. D O_2 GENERATORS TAMPA, FLORIDA

SCALE ½"=1'-0" | WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-6202 D

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

PLANT No. 2

4L1_6202

PART NO.	MATL. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE
				MATERIAL	

6" FOAMGLAS INSUL. SEE NOTE 20 — 3" URETHANE NOTE 20

TANGENT OF TANK HEAD

51'-4"

22'-8⅜"

9'-9⅞"

¢ STORAGE TANK SUPPORT

LINE Nº 188

LINE Nº 141

4'-8½"

COORD 14+76.53X

COORD 14+25.50X

5'-2½"

0'-1½"

9" 1'-3½" 2'-0" 10½" 5'-4" (BETWEEN SUPPORTS) 1'-9¼"

1'-6⅜" 3" 5'-3" 6" 6'-0" 5'-9" 6'-0"

½"-CS01.5 (FOR VA'S)

T-1"x1"x½" WITH ½"-552.7 x 3" LG-TOE

1'-6½" 1½" ¾" 7" 10" 2'-9½" 8" 6'-0"

3'-4" 5'-5½" 6" 2⅛" PV-108 1'-11½" PT 108 5"

6"-0-141-CS01.5

MATCH LINE COD 5-3555-6204D

1"-A-127-552.7

½"-CS01.5 x 3"LG-TOE

RED. 8"x6"

1½"-0-189-CT2

17 6261D

T-1½"x1⅝"x⅝"-ODFS-WC

11 6261D

3" URETHANE & FOAMGLAS INSUL. SEE NOTE 20

2"-0-187-CT2

8"-0-188-552.7

COORD 13+63Y

16'-0"

T-1"x1"x⅛" WITH ⅛" 1A51.5 x 3" LG-TOE

L 3"x2"x⅛"-WELD TO 8" PIPE. WITH DET'L 4 DWG 5-3555-6201D

PSV-92

TV 102A

TV 102B

2"-0-187A-CT2

2"-0-187B-CT2

6"-150# RF SO FLG

17.20A VAPORIZER

PSV-104A

PSV-105

PSV-104B

17.20B VAPORIZER

6"-150# RF SO FLG

8"-CW-185-CS1.5

(PLANT 1)

(PLANT 2)

6"-CW-186A-CS1.5

16.20 LOX BACK-UP PANEL

6"-CW-185B-CS1.5

6"-CW-185A-CS1.5

6"-CW-273-CS1.5

6"-CW-186B-CS1.5

8"-CW-BYPASS-CS1.5

10" CI PIPE COD 5-3555-4005D

8"-CW-186-CS1.5

FE-106 WITH 8"x6"x 1½" THREDOLET

15" CLAY PIPE COD 5-3555 4005D

3'-0" 3'-6" 1'-4" 2'-5 1/16" 2'-0" 1'-8¾" 1'-9" 1'-2" 19'-0"

25'-0"

CONTRACTOR TO INSTALL UNDER PHASE B

9'-0" 2'-0"

MATCH LINE COD 5-3555-6202D

CONTROL PIPING END OF TANK

16.20 LOX STORAGE TANK

T-1½"x1⅝"x⅝"-ODFS-WC

3" URETHANE INSUL SEE NOTE 20

1"-0-190-CT2

1½"-0-189-CT2

2"-0-187-CT2

CP-2⅛"-ODFS x 1⅝"-ODFS-WC

1"-0-178-CT2

1"-0-190-CT2

1"-A-127-552.7

8"-0-188-CS01.5

3" URETHANE INSUL. SEE NOTE 20.

T-1"x1"x½"

½"-552.7 x 3" LG-TOE

½"-CS01.5 x 3" LG-TOE

LOCATE PIN IN HORIZ RED 8"x6"

8"-0-141-CS01.5 PLANT 1

1"-N-340-1A51.5

6" 45° ELL

LOCATE PIN IN HORIZ

½"-CS01.5

FV-53-1

PHASE A (LOX TK) PHASE B (O2 PLANT)

MATCH LINE COD 5-3555-6202D

5-3555-6203 D C

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CITY OF TAMPA, FLA.
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E-6536	C	~	CHANGED DIMENSIONS AND ADDED A PIPE SUPPORT	1-28-77	W.A.Y.	Brouner	
E-6235	B	~	RELOCATED FE16G FROM TOP OF PIPE INST AIR LINE WAS 1A51.5 IS NOW 552.7	12-2-76	JAF	Brouner	
E-6021	A	~	CHANGED 14"-N-340-1A51.5 TO 1"-N-340-1A51.5	10-5-76	W.A.Y.	Brouner	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ★ DECIMAL ★ ANGLES ★; HOLE LOCATION ★ HOLE SIZE ★

FIRST USED ON: 00-5-3555

DRAFTSMAN: J. Sullivan — DATE 3-24-76

CHECKED: F. Brouner — 3/24/76

ENGINEER:

APPD: J. Sullivan — 3/24/76

TITLE: EQUIPMENT & PIPING ARRGT - PLAN - LOX STORAGE AREA (2) 60 T/D O_2 GEN. HOOKERS PT. TAMPA, FLA

SCALE: ½" = 1'-0" WT.

FORM NO. 2309-4 (REV. 6-74)

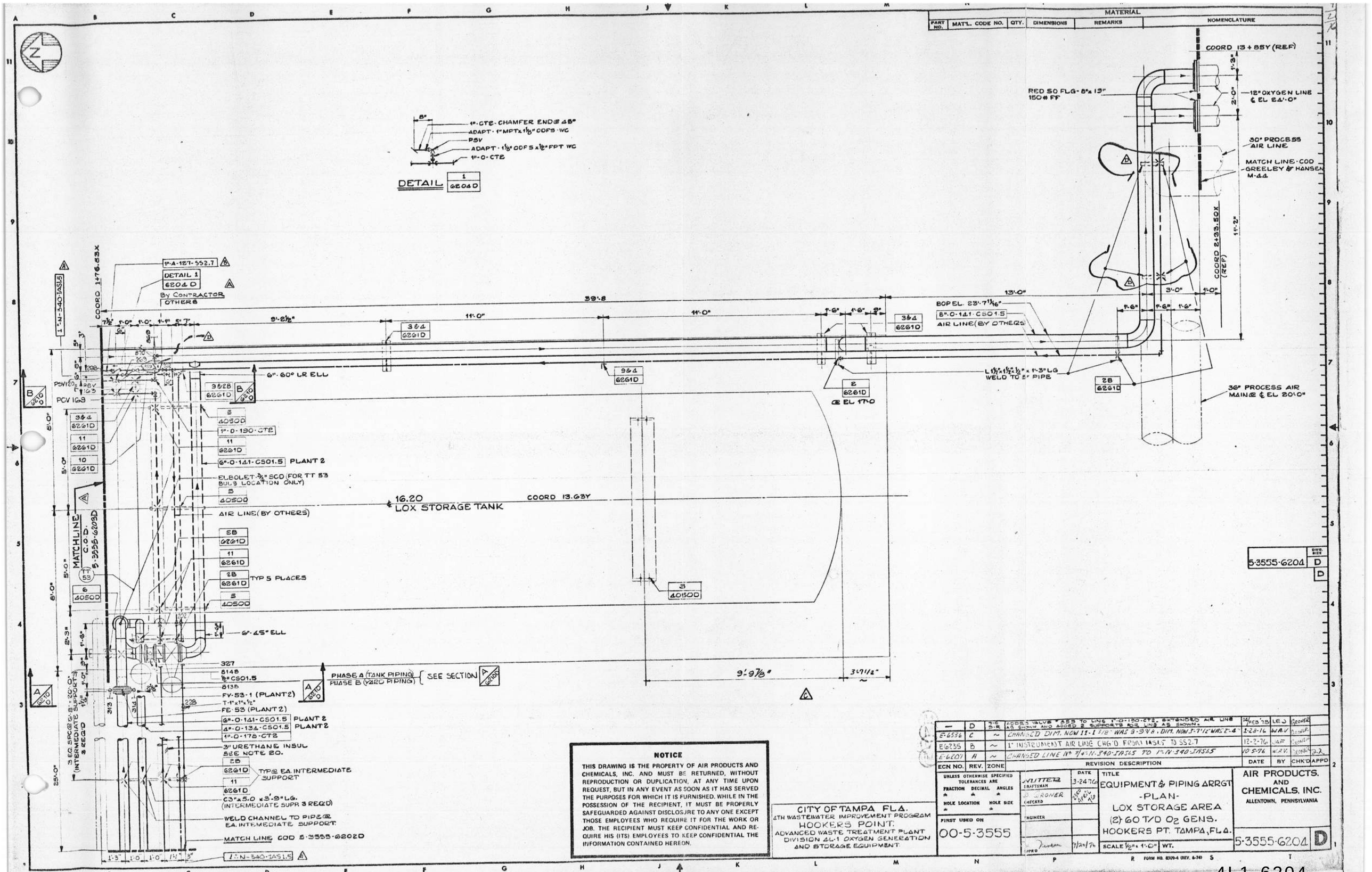
AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-6203 D

4L1_6203

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE

DETAIL 1 / 6204D



3&4 / 6261D	5 / 40500D	11 / 6261D	28 / 6261D
9&4 / 6261D	2 / 6261D @ EL 17'-0	28 / 6261D	3 / 40500D
11 / 6261D	1"-0-190-CT2	6"-0-141-CS01.5 PLANT 2	ELBOLET-¾" SCD (FOR TT 53 BULB LOCATION ONLY)
10 / 6261D	6 / 40500D	5 / 40500D	

—	D	T-E S-R	ADDED VALVE *A53 TO LINE 1"-0-150-212, EXTENDED AIR LINE AS SHOWN AND ADDED 2 SUPPORTS FOR LINE AS SHOWN.	3/4 FEB '76	LEJ	GROVER
E-6536	C	~	CHANGED DIM. NOW 11-1 3/8" WAS 9-9⅛, DIM. NOW 3-7 1/2" WAS 2-4	3-28-76	W.A.V.	GROVER
E6235	B	~	1" INSTRUMENT AIR LINE CHG'D FROM 1A51.5 TO SS2.7	12-2-76	JAP	GROVER
E-6207	A	~	CHANGED LINE No 3/4"-N-340-1A51.5 TO 1"-N-340-1A51.5	10 5-76	W.A.V.	JONES
ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D APP'D

NOTICE

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CITY OF TAMPA FLA.
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT.

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

DRAFTSMAN WITTER 3-24-76
CHECKED J. GRONER
ENGINEER
APPRD Jensen 7/20/76

TITLE
EQUIPMENT & PIPING ARRGT
-PLAN-
LOX STORAGE AREA
(2) 60 T/D O2 GENS.
HOOKERS PT. TAMPA, FLA.

SCALE ½"=1'-0" WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-6204 D

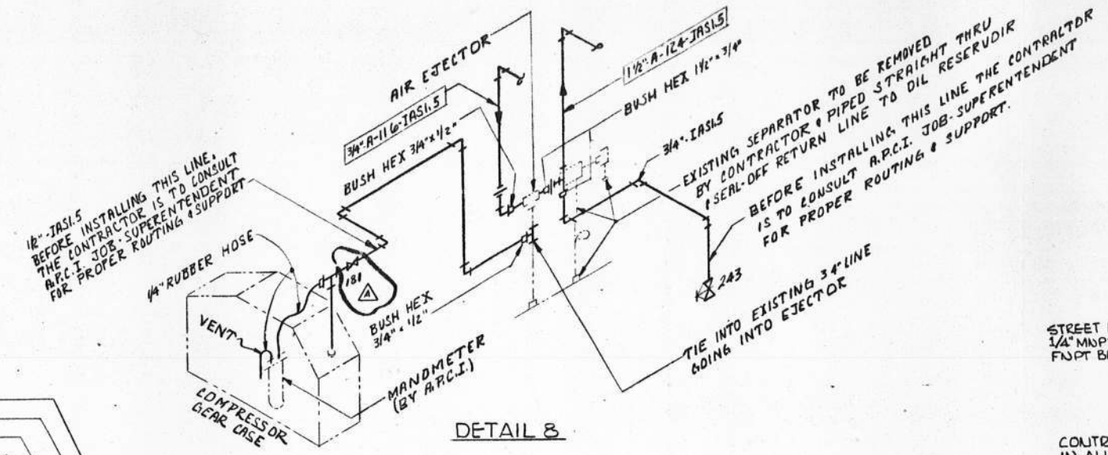
DWG. SIZE D

5-3555-6204 D

FORM NO. 8209-4 (REV. 6-74)

4L1_6204

PART NO.	MATERIAL MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

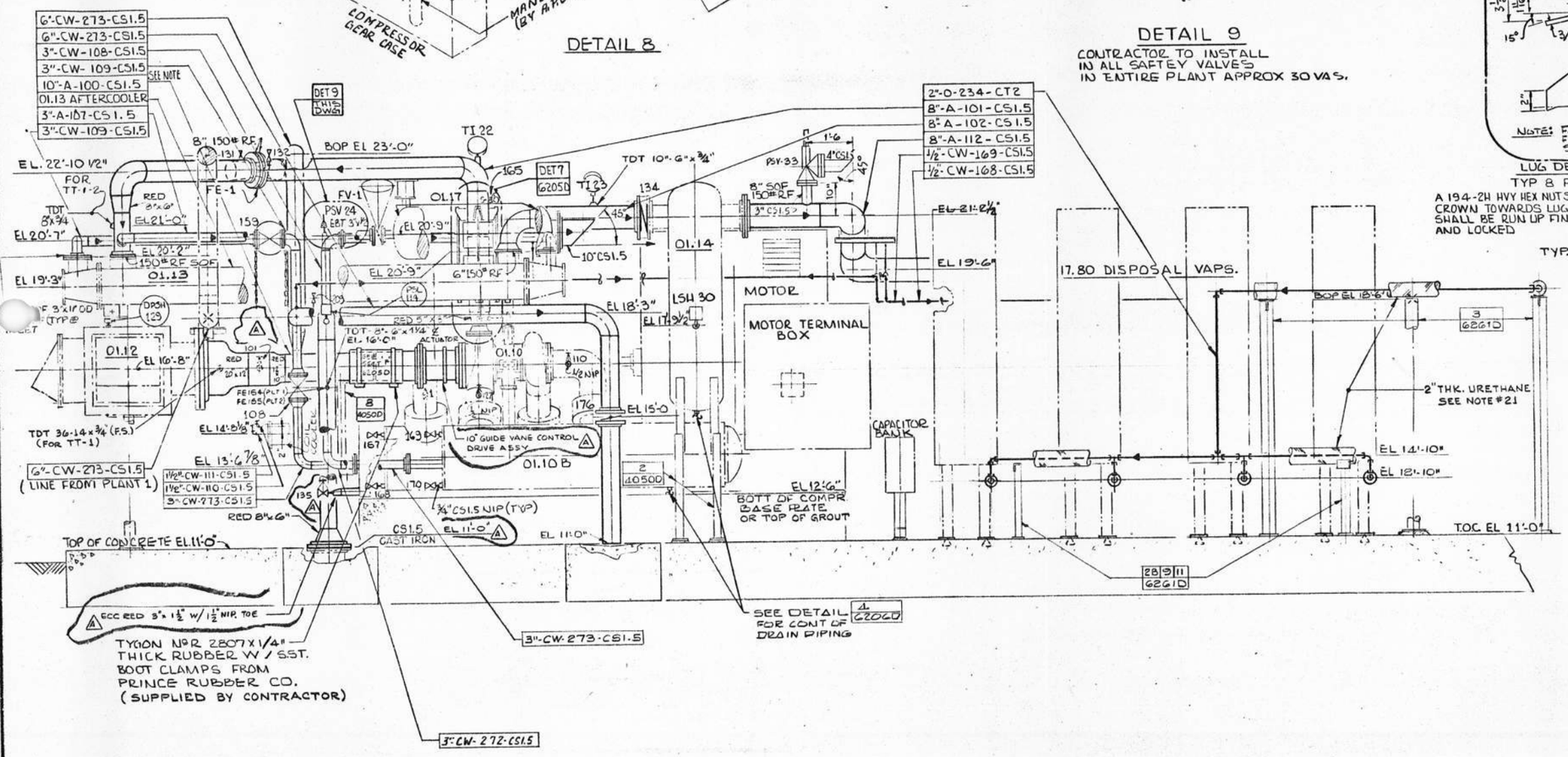


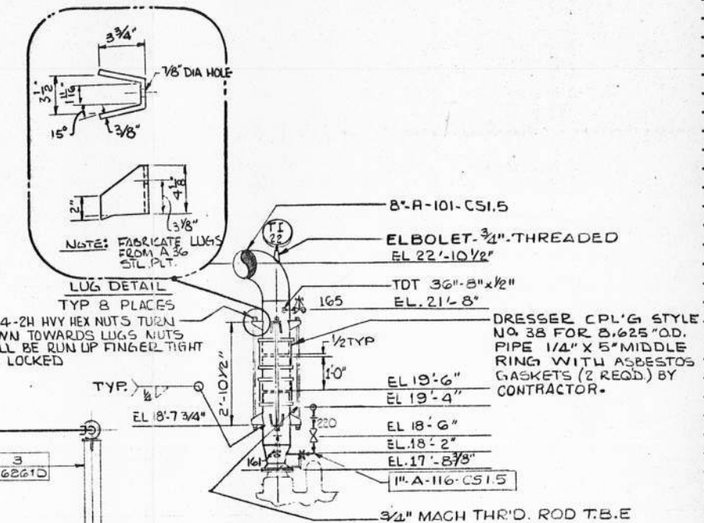
DETAIL 8

STREET ELL 1/4" MIPTx1/4 FNPT BRONZE

DETAIL 9

CONTRACTOR TO INSTALL IN ALL SAFTEY VALVES IN ENTIRE PLANT APPROX 30 VAS.





DETAIL 7

SECTION F/62060

PHANTOM LINING PIPING APPLIES TO SECTION WHEN VIEWING PLANT NO. 2

FOR GENERAL NOTES & REFERENCES SEE DWG. 5-3555-6200 D

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
—	A	E-6	REMOVED SV-2 VALVE & ADDED 10" GUIDE VANE CONTROL DRIVE ASSY AS SHOWN. ADDED DWG. 181 (INST. UNIT, ECNIP GEAR CASE). EL 11'-0" WAS EL 11'-4" P.O.E.	2/28/78	LEJ	GRONER	
—	—	—	3"-CW-272-CS1.5 LINE ADDED ECCRED 3"x1 1/2" w/1 1/2 NIP TOE FOR VALVE 135	—	—	—	—

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE FRACTION DECIMAL ANGLES ± ± ± HOLE LOCATION HOLE SIZE ±

FIRST USED ON 00-5-3555

FRANKENFIELD DRAFTSMAN 9-5-76

D. GRONER CHECKED 10/27/76

ENGINEER

J. Zeman APPD 9/27/76

TITLE EQUIPMENT & PIPING ARRGT SECTIONS COMPRESSOR & VAPORIZOR AREA (2) 60 T/D O_2 GENERATORS TAMPA FLORIDA

SCALE 1/8" 1'-0" WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-6205 D

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

DWG SIZE D A

5-3555-6205

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FORM NO. 8309-4 (REV. 6-74)

4L1_6205

PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE
					MATERIAL

NOTICE

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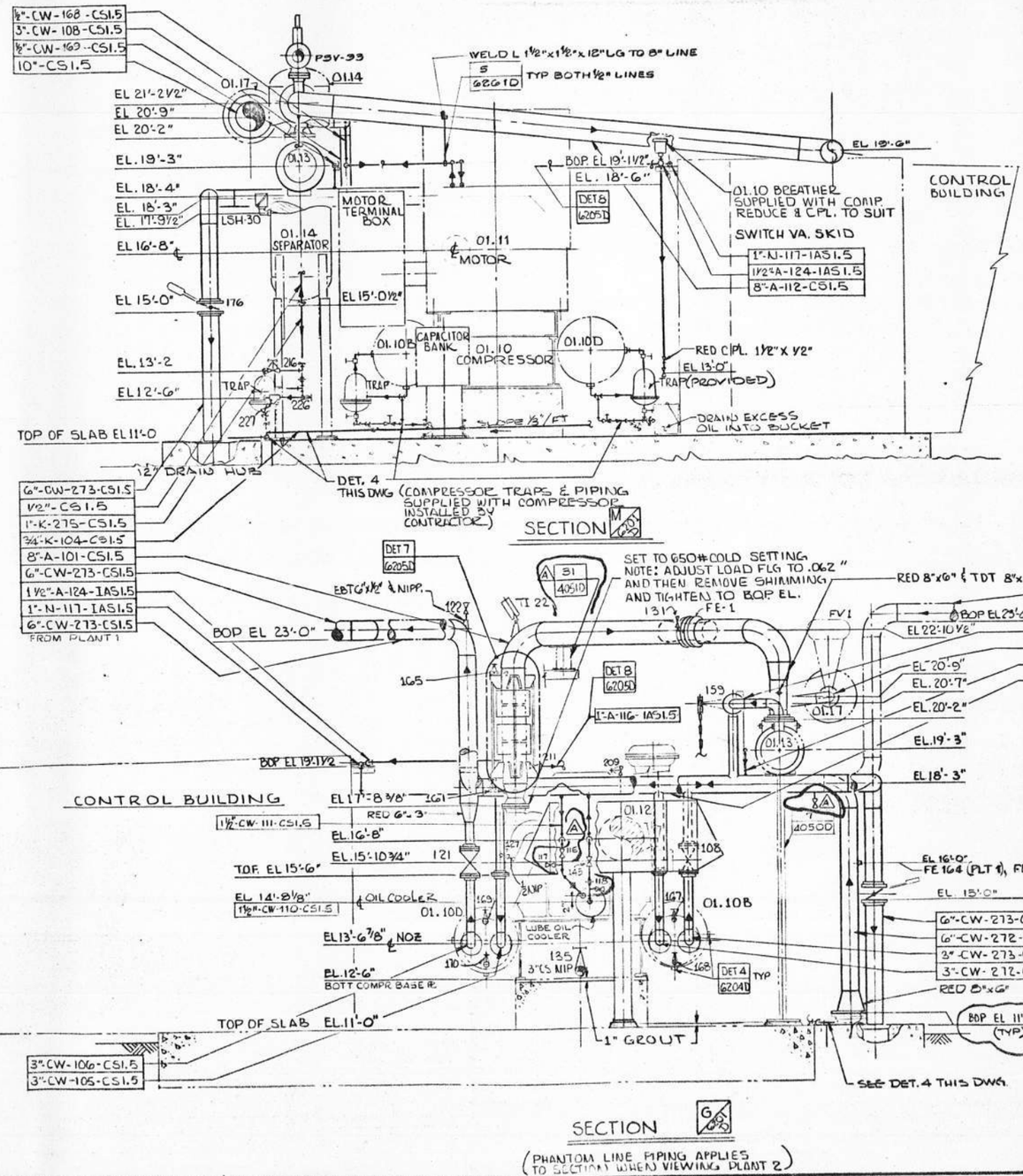

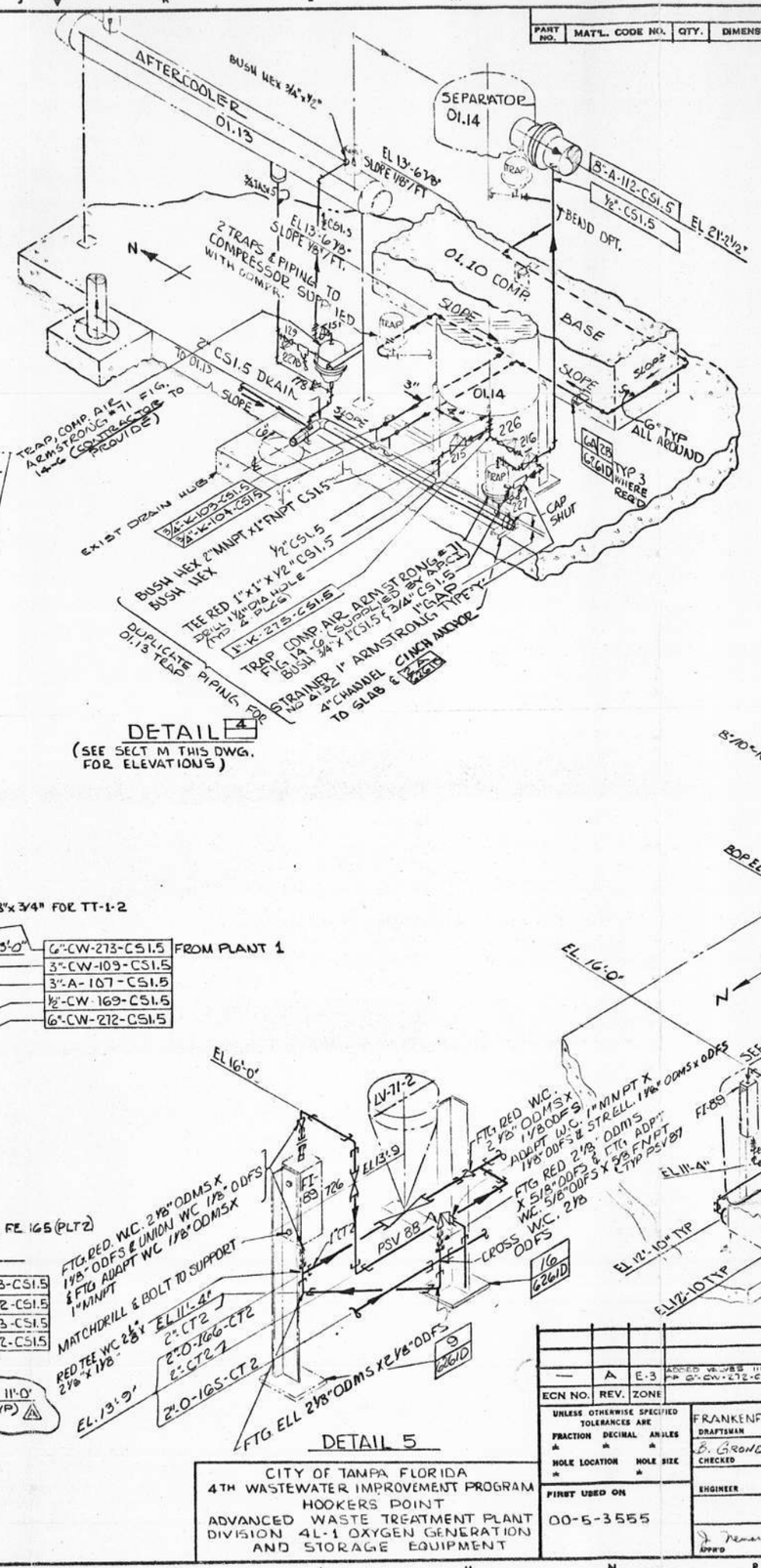

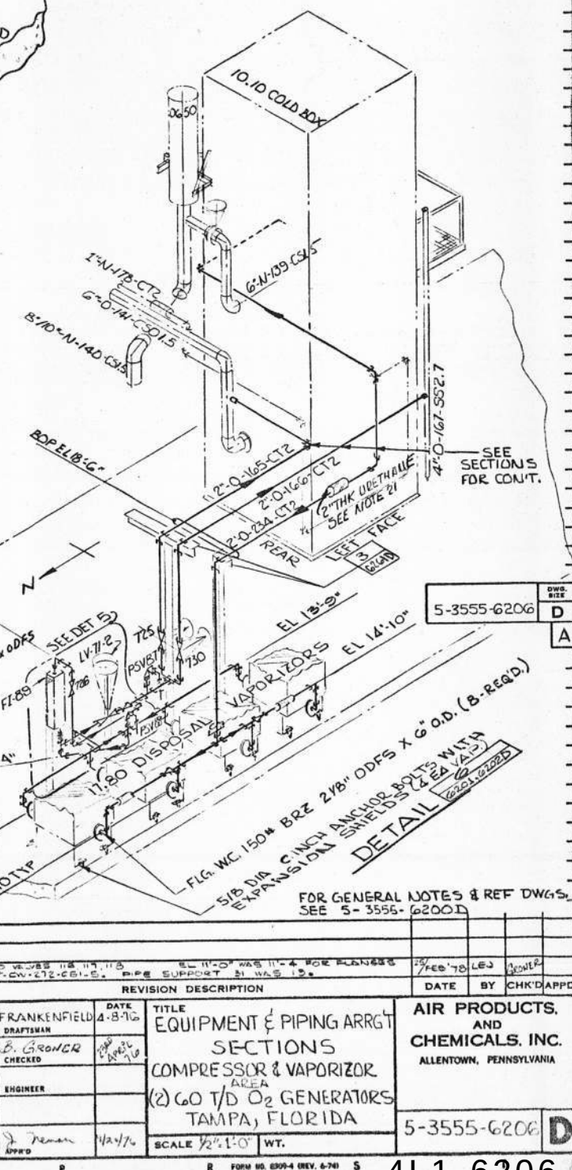

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD
—	A	E-3	ADDED VALVES 118 119, 118 EL 11'-0" WAS 11'-4 FOR FLANGES FP 8"-CW-272-CS1.5. PIPE SUPPORT 31 WAS 12.	25 FEB '78	LEJ		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± , DECIMAL ± , ANGLES ± ; HOLE LOCATION ± , HOLE SIZE ± ; FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	FRANKENFIELD	4-8-76
CHECKED	B. GROVER	
ENGINEER		
APPD		4/24/76

TITLE: EQUIPMENT & PIPING ARRG'T SECTIONS COMPRESSOR & VAPORIZOR AREA (2) 60 T/D O_2 GENERATORS TAMPA, FLORIDA

SCALE 1/2"=1'-0" WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-6206 D

DWG SIZE D A

FORM NO. 6309-4 (REV. 6-74)

4L1_6206

NOTICE

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PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	MATERIAL REMARKS	NOMENCLATURE

SEE PARTIAL ROOF PLAN

4"-CS1.5

EL. 63'-6½"
EL. 63'-1"

1 | GC | 6261D

PSV-73 SHIPPED SEPARATELY TO FIELD. CONTRACTOR TO INSTALL.

8"-CS1.5 WITH 150# SOF

6"-150# FF WNF-ST. STL

6"-150# RF WNF-ST. STL. @ 6" 20°LRE-ST. STL.

VAREC RELIEF VALVE. SHIPPED LOOSE TO FIELD. CONTRACTOR TO MOUNT AS SHOWN.

2 | GC | 6261D

EL. 33'-5"
CONTRACTOR TO WELD 12.20 TO COLD BOX

12.20

6"-N-223-SS2.7
EL. 31'-9"

½"-0-211-CT2

EL. 31'-0½"

LV 76-1 | ACV 63-1 | LV 75

28 | GA | 6261D

6"-9"

EL. 27'-1"-TOP OF GRATING

CAGED LADDER

6B | 2B | 6261D

4"-0-167-SS2.7
2"-0-175-CT2

T-2⅛"x2⅛"x1⅛" ODFS-WC (TYP 8 PLCS)
EL. 19'-4"
EL. 18'-11½"

2B | GA | 6261D

ADAPT-⅝" ODFS x½" MPT (TYP 7 PLCS)
EL. 16'-11"

ADAPT-⅝" ODFS x½" MPT-WC (TYP 7 PLCS)

½"-CT2

FTG RED 6"x2" ODMS x1⅛" ODFS-WC

1"-0-175-CT2

EL. 13'-8
08.23

EL. 12'-3"
1"-N-122-1AS1.5
BOTT OF STL
EL. 11'-1"

EL. 18'-2"
1½"-N-120-1AS1.5

EL. 11'-0"
TOP OF SLAB
GRADE

SECTION J 6261D
FRONT SIDE OF COLD BOX

INTERNALLY MOUNTED COLD BOX VALVING INDICATED ON THIS FACE IS SUPPLIED & INSTALLED WITH COLD BOX.

3'-0" 3'-4"
4"-CS1.5
FRONT
2'-0"
6"

PARTIAL ROOF PLAN

01.50

EL. 37'-1"

1 | GC | 6261D

EL. 35'-0"
6"-150# FF WNF

6"-558.7

FV 53-2

EL. 32'-2"

RED 6"x4"
EL. 31'-0½"
4"-150# RF

2"
552.7
C501.5

HV 133

CONTRACTOR TO MOUNT VALVE BETWEEN FLANGES IN COLD BOX-REPACK ROCKWOOL & REINSTALL PATCH PANEL SEE NOTE ⁂

EL. 28'-1"

4" FOAMGLAS SEE NOTE 20

2" URETHANE

EL. 27'-7"
EL. 27'-1"
TOP OF GRATING

4'-0"

T-2⅛"x2⅛"x1⅛" ODFS-WC

EL. 26'-0"
1"-0-234-CT2

EL. 25'-0"
2"-0-254-CT2

4"-0-134-C501.5

3" URETHANE SEE NOTE 20

6C | 11 | 6261D

TOS EL. 23'-0"

6"-N-139-CS1.5
2"-0-234-CT2
1"-N-178-CT2
4"-0-134-C501.5
6"-0-141-C501.5
FROM PLANT 1
6"-0-141-C501.5
APPLICABLE ONLY TO PLANT 2.
1" AIR LINE (BY OTHERS)
1"-A-340-1AS1.5
EL. 21'-9"
BOP EL. 21'-5⅜"
EL. 20'-11"
6"-N-139-CS1.5
1"-A-314-1AS1.5

1"-N-341-1AS1.5
1"-A-340-1AS1.5
1"-T REQ'D ONLY @ PLANT-2
EL. 120'-5"

1" AIR LINE TO HOSE CONN. (BY OTHERS)
(TYP 3-LINES) 1 | 6A | 6261D

½"-N-197-1AS1.5
1½"-N-117-1AS1.5
BUSH. 1½"x½"

2B | GC | 6261D
2B | GA | 6261D

EL. 18'-11½"
1½"-N-120-1AS1.5

⅜"-N-121-1AS1.5

EL. 15'-10"
1"-0-204-CT2
EL. 15'-3"
1"-A-164-CT2
EL. 14'-8"
1"-0-236-CT2
EL. 14'-1"
1"-0-254-CT2
EL. 13'-3"
T-2⅛"x2⅛"x1⅛" ODFS-WC
FTG. RED. 2⅛"ODMS x 1⅛" ODFS-WC
EL. 12'-3"
1"-N-122-1AS1.5

BOTT OF STL EL 11'-1"

1 | 6261D

T-1½"x1½"x¾"
T-1½"x1½"x½"
PCV 1G5 (PLANT 1)
PCV 1G7 (PLANT 2)
1½"-N-117-1AS1.5
1"-N-341-1AS1.5

BUSH 1"x¾" (TYP)

T-1½"x1½"x¾"

BUSH 1"x¾"
ADAPT-1⅛" ODMS x½" MPT-WC

2B | GA | 6261D

15 | 4051D

TIS-81
TSH-82
FE-83

PSV-60

PCV-47

PI-48

EL. 15'-9"
EL. 15'-1"

½"-A-1AS1.5
TO VA 204

EL. 19'-6"
½"-A-314-1AS1.5
BOP EL. 18'-6"

TOPWORKS OF VALVE TO BE FIELD INSTALLED BY CONTR. SEE NOTE ⁂
INSULATE WITH 1" THK. FIBERGLAS. SEE NOTE 21.

RED. 10"x8"

EL. 14'-11"
8"-N-140-CS1.5
8"-A/N-130-CS1.5
EL. 13'-4"
8"-A/N-129-CS1.5
INSULATE WITH 1" THK. FIBERGLAS. SEE NOTE 21.

FIELD ERECTED SWITCH VALVE AREA

NOTE: TIS-81 & TSH-82 TO BE FIELD INSTALLED BY CONTRACTOR

SECTION K 6261D
RIGHT SIDE OF COLD BOX
TYP. PLANT 1 & 2 EXCEPT WHERE NOTED

INTERNALLY MOUNTED COLD BOX VALVING INDICATED ON THIS FACE IS SUPPLIED & INSTALLED WITH COLD BOX.

1:A-340-1AS1.5
1" AIR LINE (BY OTHERS)
FED. TEE ¾"x¾"x½"
¾"-N-341-1AS1.5
EL. 22'-0"
EL. 19'-6"
EL. 19'-6"
EL. 18'-11½"
½"-A-1AS1.5
BUSH. HEX 1"x¾"
PLT #1 PLT #2
2½
2½
1½"-N-117-1AS1.5
BUSH. HEX 1½"x¾"
270
270 TO VA 204
1:N-341-1AS1.5
1:A-314-1AS1.5
1" AIR LINE TO HOSE CONN.
COLD BOX
BOP EL. 21'-5⅜"
EL. 20'-5"
RIGHT FACE

DETAIL OF INST. AIR PIPING BELOW

5-3555-6207 D B

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
—	B	3M	ADDED PRESSURE TAP TO PCV-47	3/FEB'78	LEJ		
E-6021	A	~	REMOVED LINE # 1:A-314-1AS1.5 #ADDED ½"-A-1AS1.5 TO GO TO VA 204	10-5-76	WAV		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE FRACTION ★ DECIMAL ★ ANGLES ★ HOLE LOCATION ★ HOLE SIZE ★

FIRST USED ON 00-5-3555

DRAFTSMAN J. STETTER 4-8-76
CHECKED B. GRONER
ENGINEER
APPD J. Brown 7-21-76

TITLE: EQUIP. & PIPING ARRGT. -SECTIONS- COLD BOX AREA (2) 60 T/D O2 GENS. HOOKERS PT. TAMPA, FLA

SCALE ½"=1'-0" WT.

5-3555-6207 D

FORM NO. 8309-4 (REV. 6-74)

CITY OF TAMPA, FLA.
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1. OXYGEN GENERATION AND STORAGE EQUIPMENT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

4L1_6207

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PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE
				MATERIAL	

EL. 68'-6" BOTTOM OF SUPPORT LUG

12 4051D

06.50

EL. 57'-6" FIELD TO INSTALL TO SUIT 06.50 NOZZLE ORIENTATION

2B 6C 6261D

HV 133

EL. 31'-0½"

12⅛"

INSULATE WITH 1" THK FIBERGLAS - SEE NOTE 21.

EL. 28'-3"

FE-51

BUSH-½"x⅜" (TYP)

324

325

10.10 SILENCER

EL. 28'-9"

OIL BREATHER

1½"-LO-CS1.5
6"-A-154-CS1.5
6"-O-141-CS01.5
2"-O-234-CT2

APPLICABLE ONLY @ PLANT 2.

1"-O-178-CT2

1" AIR LINE (BY OTHERS)

6"-O-141-CS01.5

6" LINE PLANT 2 2B 6261D 6C 6261D

INSUL LINES PLANT 1 11 6B 6261D 6B 6261D

4'-6" 8" 1'-3"

EL. 25'-0"
2"-O-834-CT2
6"-N-139-CS1.5
4"-O-134-CS01.5

TOS EL. 23'-0"
1¼"-340-1A51.5
T-1" REQ'D ONLY @ PLANT 2.
BOP. 21'-5⅜"

EL. 20'-11"
1"-O-178-CT2
1" AIR LINE TO HOSE CONN.
1"-A-1A51.5
TO VA. 204
EL. 119'-6"

10"-A-140-CS1.5
6"-O-141-CS01.5
RED 10"x8
EL. 15'-1"
EL. 14'-11
8"-N-140-CS1.5
8"-A/N-130-CS1.5
EL. 13'-4"
8"-A/N-129-CS1.5
⅜" CS1.5

BOTT OF STL EL. 11'-1" GRADE

18 4051D (BY OTHERS)

9"

INSUL LINES 11 6261D

1"-N-117-1A51.5

1" LINES 2B 6261D

6'-0"

3" 9"

2B 6B 6261D

ADAPT-2⅜" ODFS x 2" FPT-IWC

310 312

316 (WITH ⅛" CS1.5) FOR A1-52-1

6B 6261D WELD TO SUPPORT POST

FS

SECTION L 6261D

REAR OF COLD BOX

TYP FOR PLANTS 1 & 2 EXCEPT WHERE NOTED

CONTRACTOR MUST FIRST REMOVE SHIPPING PANEL BEFORE PIPING UP CROSS-OVER BOX LINES.

REAR FACE OF COLD BOX

7" 4½"

BOP EL. 23'-0"

6" FOAMGLAS

EL. 21'-9"

3" URETHANE

1½"-LO-CS1.5
6"-A-154-CS1.5
1"-O-178-CT2
2"-O-234-CT2

SECTION H1 6261D

APPLICABLE ONLY TO PLANT 1.

CONTRACTOR TO CONSULT APCI JOB SUPERINTENDENT BEFORE MAKING THIS WELD TO ORIENT VENT HOOD.

1'-0"

45°

EL. 51'-0"

2B 6B 6261D

EL. 49'-8"

EL. 43'-1½"

2 6B 6261D

EL. 37'-1"

4"-O-167-552.7

EL. 31'-0½"

11 4051D

10.10 SILENCER

EL. 28'-9"

OIL BREATHER SUPPLIED WITH 10.10

EL. 27'-9"

1 6A 6261D 3 PLACES WELD ∠ TO 6" PIPE

618

EL. 27'-1" TOP OF GRATING.

1½"-LO-CS1.5
6"-A-154-CS1.5
1"-O-178-CT2
2"-O-234-CT2
4"-O-134-CS01.5
6"-O-141-CS01.5

17 4051D

TOS EL. 23'-0"
1"-A-314-1A51.5
1" AIR LINE (BY OTHERS)
6"-N-144-552.7
6" STRAIN-BY APCI DWG 328950-6

10.10 FILTER EL. 18'-5¾"

7" 4½" 3" 9" 2"

3" URETHANE
6" FOAMGLAS

3¼"-N-340-1A51.5
3" URETHANE, SEE NOTE
6" FOAMGLAS) 20

6B 11 6261D

801 802

½"-A-150-CT2
ADAPT-⅝" ODFS x ½"-MPT-IWC

PSV PSV PSV
45 134 41 EL. 19'-7"

2B 6A 6261D

621 306 305 611 ADAPT ⅝" ODFS x ½" MPT-IWC

639

NV-921

1 6A 6261D

420 516 513 512 647 511 425

PSV-43

434

FTG ADAPT-1⅛ ODMS x 1½" MPT-IWC

STRAINER-ARMSTRONG #FSC-1½" OR EQUAL - BY CONTRACTOR

2B 6A 6261D

9" 6"

THIS PORTION OF SECT. H-H APPLICABLE ONLY TO PLANT 2. SEE SECT. H1-H1, THIS DWG. FOR VIEW @ PLANT 1.

1"-O-178-CT2

T-1⅛"x1⅛"x⅝" ODFS-IWC
APCI STD. 579.13.2.4
EL. 22'-9"
ADAPT-1¼" ODFS x 1" MPT-IWC
ADAPT-1⅛" ODFS x ½" FPT-IWC
EL. 21'-9"

T-2½"x2⅓"x⅝" ODFS-IWC
2"-O-166-CT2
APCI STD 579.13.2.7
2"-O-175-CT2
EL. 19'-4"
EL. 18'-11½"
BOP EL. 18'-6"

1 6C 6261D

O2 CYL. FTG BY APCI
FTG ADAPT-⅝" ODFS x ¼" FPT-IWC
PSE 143
FTG ADAPT-⅝" ODFS x ½" FPT-IWC

DET L 12 6209D

½"-O-260-CT2
FTG ADAPT-⅝" ODMS x ½" MPT-IWC
½"-N-120-1A51.5

EL. 13'-8"
EL. 13'-3"
EL. 12'-2"
BOTT. OF STL EL. 14'-1"

DWG. SIZE 5-3555-6208 D B

1½"-LO-CS1.5
6"-A-154-CS1.5
6"-O-141-CS01.5
2"-O-234-CT2

APPLICABLE ONLY @ PLANT 2.

1"-O-178-CT2

1" AIR LINE (BY OTHERS)

6"-O-141-CS01.5

SOF-6"-150# FLG

BOP EL. 18'-6"

½"-CW-168-CS1.5
½"-GW-163-CS1.5
2"-O-165-CT2
2"-O-166-CT2

FOF EL. 18'-10¾"

11 2B 6261D

BOP EL. 18'-6"
2"-O-166-CT2
2"-O-165-CT2
EL. 16'-11¾"
4"-N-144-552.7

17 4051D APPLICABLE ONLY @ PLANT 2. SEE GEN. NOTE 29

EL. 14'-11"
6"-N-157-552.7

PSV-43
ADAPT-2⅜" ODFS x 2" MPT-IWC
2" CTB
ADAPT-1⅛" ODFS x 1½" FPT-IWC
1½"-N-120-CTB

EL. 12'-0¾" BOTT OF STL.
½"-CW-168-CS1.5
½"-GW-163-CS1.5

WNF-4"-150# FP 126/250 RMS FINISH
WNF-3"-150# FP 126/250 RMS FINISH

CONTRACTOR TO MOUNT AIR OPERATOR IN FIELD
CONTRACTOR TO MOUNT VALVES BETWEEN FLANGES IN COLD BOX - REPACK ROCKWOOL & REINSTALL PATCH PANEL. SEE NOTE.

NOTE: CONTR TO FABRICATE & INSTALL CROSSOVER PER APCI DWG 3-3555-4053 O AND TO PACK WITH GRANULATED MINERAL PER APCI STD 270N TO A DENSITY OF 12 TO 15 LBS/CU FT

INTERNALLY MOUNTED COLD BOX VALVING INDICATED ON THIS FACE IS SUPPLIED & INSTALLED WITH COLD BOX UNLESS OTHERWISE NOTED.

BOP EL. 18'-6"
1½"-CW-168-CS1.5
½"-GW-163-CS1.5
2"-O-165-CT2
2"-O-166-CT2

FOF EL. 18'-10¾"

6"-A-267-552.7
EL. 17'-7½"
EL. 17'-1¼"
EL. 16'-11¾"
EL. 16'-6" PI-43

BUSH-⅜"x½"
EL. 15'-6½"
SEE GENERAL NOTE 29
EL. 14'-11"

¾"-N-271-1A51.5
EL. 12'-8"
EL. 12'-5"

1½"-CS1.5

RED 6"x4"

RED 4"x3"

12 LATERAL W/PLUG

10.10

EJ-2-O 1'-6" LG

RED 6"x4"

11 6209D

6"-N-157-552.7

402 401 403 427 426 428

SECTION H 6261D

LEFT SIDE OF COLD BOX

TYP FOR PLANT 1 & 2 EXCEPT WHERE NOTED

—	B	SK	ADDED 1½" LATERAL W/PLUG TO 1½" CS1.5 LINE	25/FEB 75	LEJ		
E-6027	H	~	REMOVED LINE # 1"-A-314-1A51.5 (ADDED LINE # 1"-N-117-1A51.5, SEE ECN 10-576	10-576	WAT		
ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE FRACTION ± DECIMAL ± ANGLES ± HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

DRAFTSMAN	DATE	TITLE
P. Stroner	5-26-76	EQUIP. & PIPING ARRGT. -SECTIONS- COLD BOX AREA (2) 60 T/D O2 GENS. HOOKERS PT. TAMPA, FLA
CHECKED		
ENGINEER		
APPR'D	7/30/76	SCALE ½"=1'-0" WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

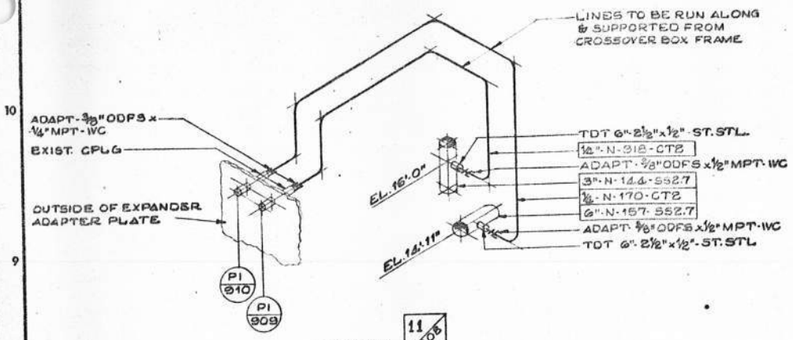
5-3555-6208 D

CITY OF TAMPA, FLA.
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

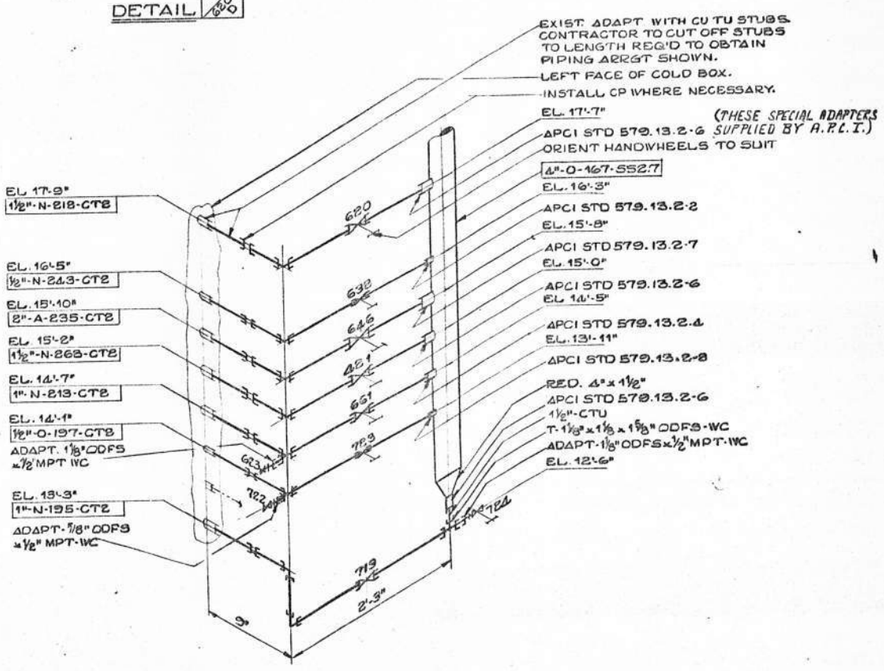
FORM NO. 6309-4 (REV. 6-70)

4L1_6208

MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE



DETAIL 11 6209 D



DETAIL 12 6209 D

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	NUTTER	4-4-76
CHECKED	D. GRONER	7/20/76
ENGINEER		
APPD		7/20/76

TITLE
EQUIP & PIPING ARRGT
DETAILS
COLD BOX AREA
(2) 20 T/D O2 GENS
HOOKERS PT. TAMPA, FLA

SCALE | WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-6209 D

FORM NO. 5009-4 (REV. 6-74)

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CITY OF TAMPA, FLA.
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L1 OXYGEN GENERATION AND STORAGE EQUIPMENT

4L1_6209

PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	MATERIAL REMARKS	NOMENCLATURE

NOTICE

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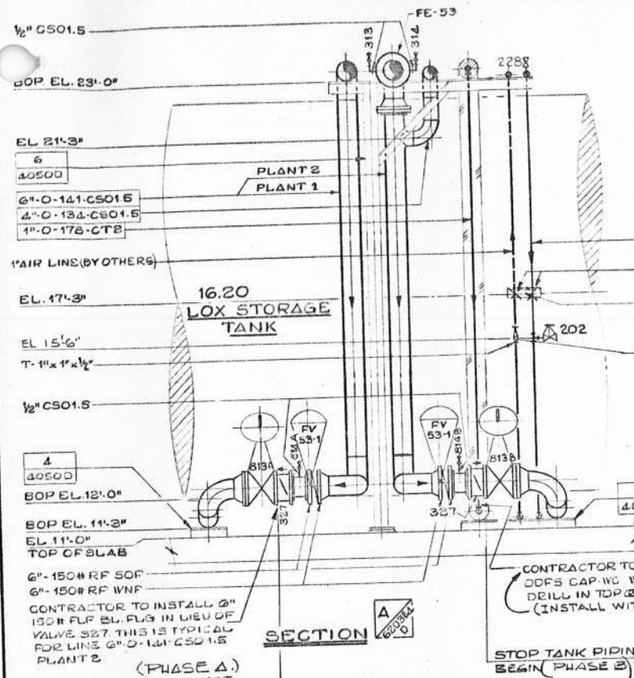
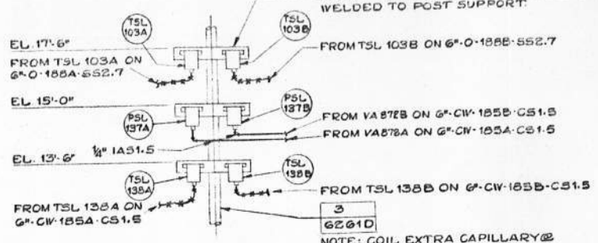
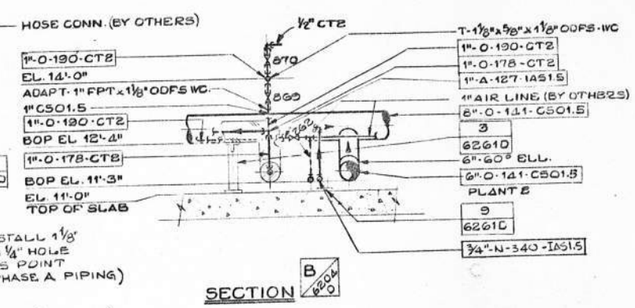


SECTION A 6200



DETAIL 2 6210D



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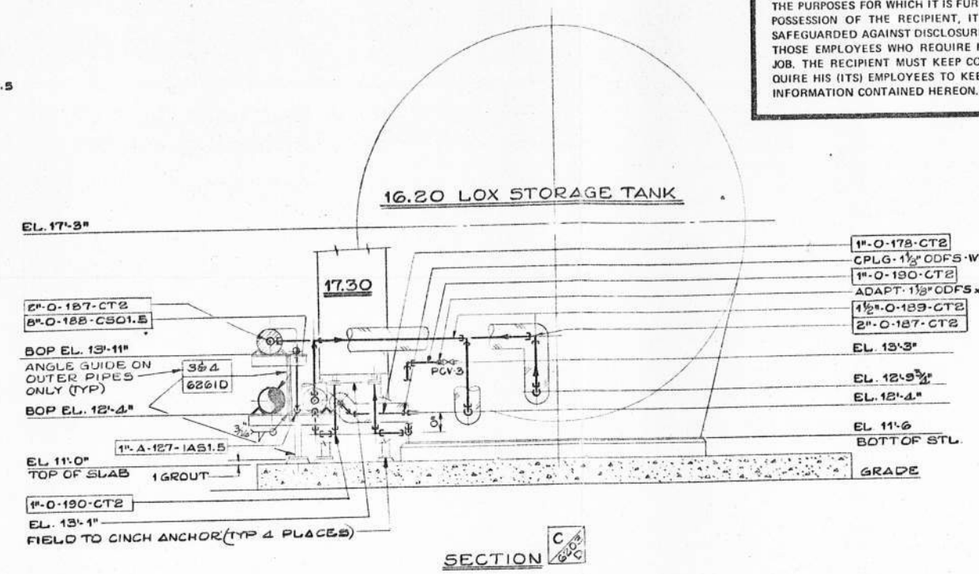
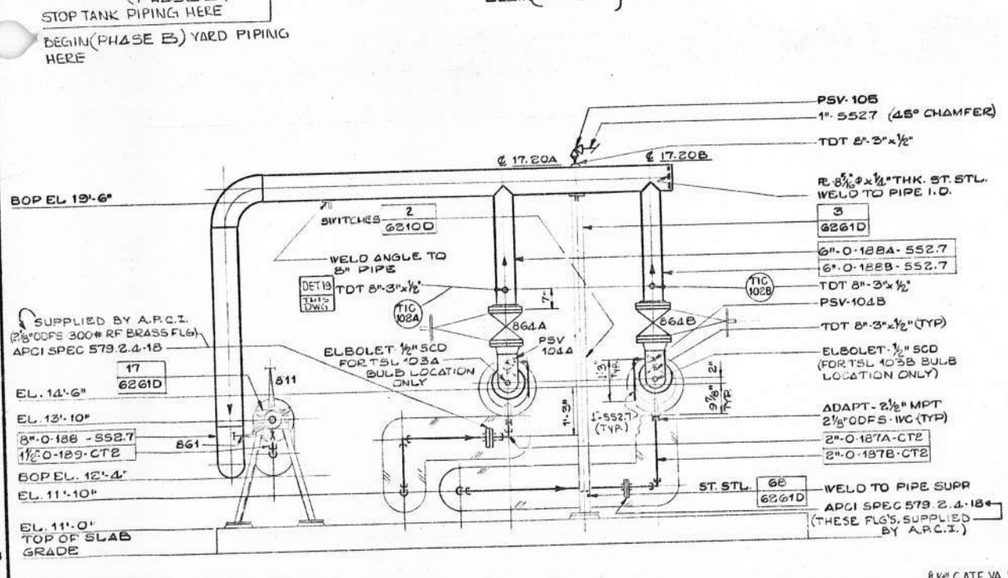


SECTION C 6206



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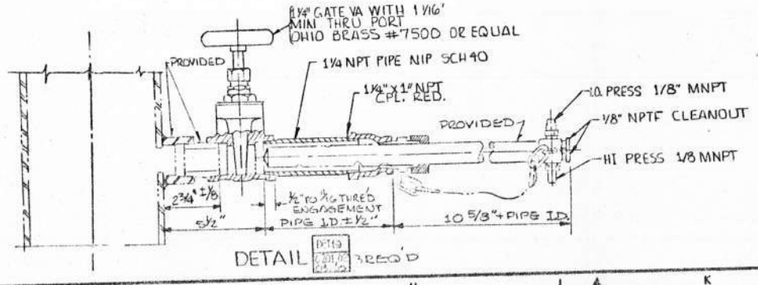

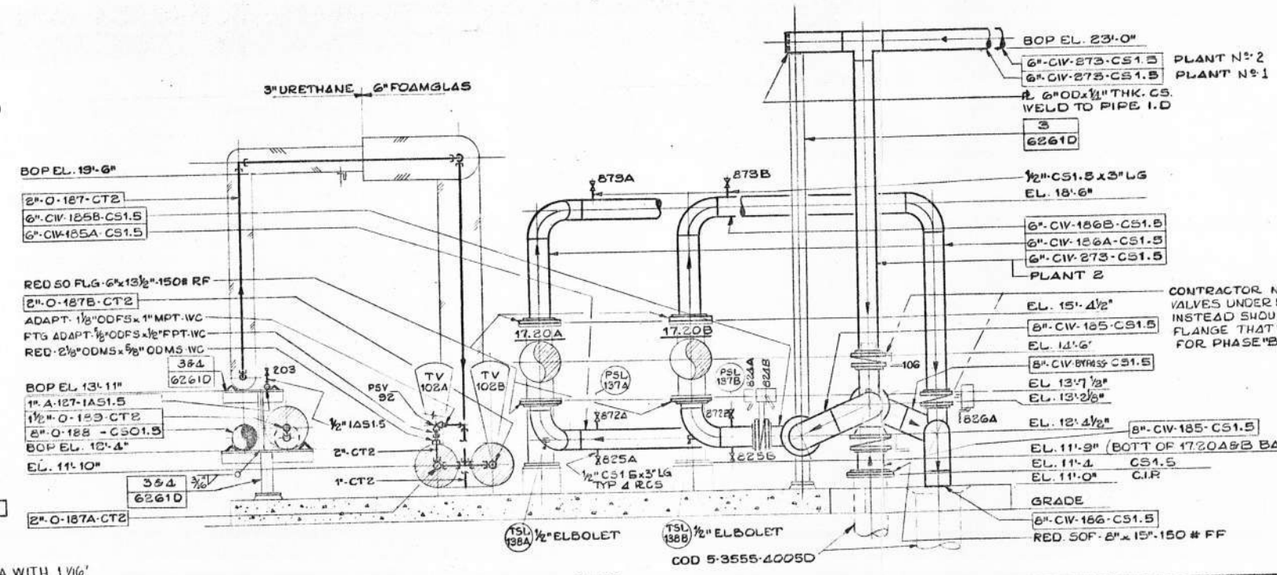

SECTION E 6203

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	NUTTER	3 15 76
CHECKED	R. GRONER	5-25-76
ENGINEER		
APPD	G. Allison	5-25-76

TITLE
EQUIPMENT & PIPING ARRGT - SECTIONS - LOX STORAGE AREA (2) 60 T/D O2 GENS HOOKERS PT. TAMPA, FLA

SCALE WT.

CITY OF TAMPA, FLA.
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-6210 D

DWG SIZE D

5-3555-6210 D

FORM NO. 8309-4 (REV. 6-70)

4L1_6210

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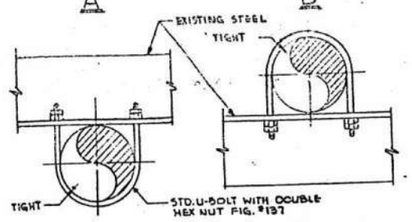
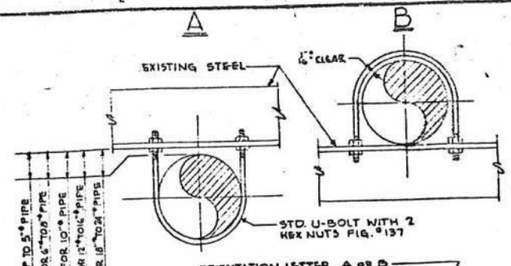
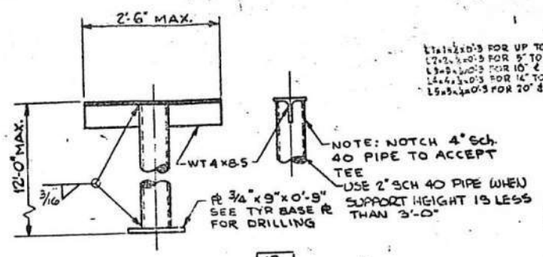


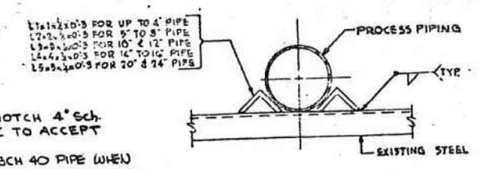
U-BOLT PIPE ANCHOR 1 / 6261D



U-BOLT PIPE GUIDE 2 / 6261D

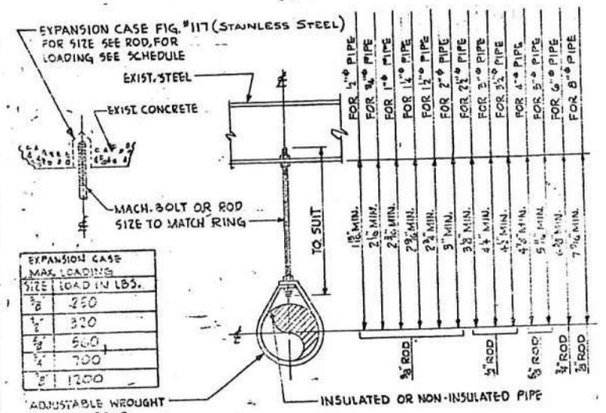


PIPE SUPPORT 3 / 6261D



PIPE GUIDE 4 / 6261D

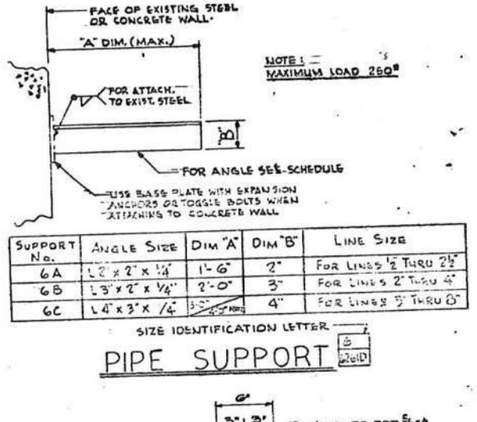
FOR NON-INSULATED PIPE & FOR X-50 FRE-INSULATED PIPE



EXPANSION CASE MAX. LOADING SIZE	LOAD IN LBS.
⅜	250
½	320
⅝	500
¾	700
⅞	1200

FOR USE WITH NON-INSULATED & INSULATED 8" PIPE AND SMALLER

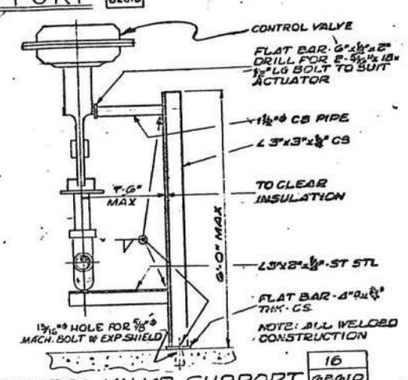
PIPE SUPPORT 5 / 6261D



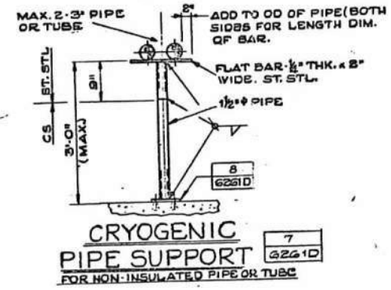
Support No.	Angle Size	Dim "A"	Dim "B"	Line Size
6A	L 2" x 2" x ⅛"	1'-6"	2"	For Lines ½ thru 2½
6B	L 3" x 2" x ⅛"	2'-0"	3"	For Lines 2" thru 4"
6C	L 4" x 3" x ¼"	3'-0"	4"	For Lines 5" thru 8"

SIZE IDENTIFICATION LETTER

PIPE SUPPORT 6 / 6261D

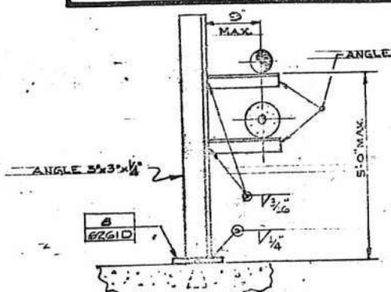


CONTROL VALVE SUPPORT 16 / 6261D

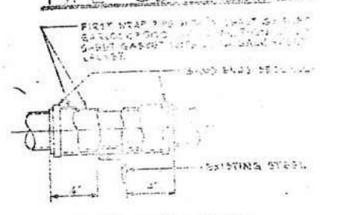


CRYOGENIC PIPE SUPPORT 7 / 6261D

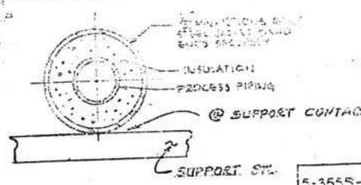
FOR NON-INSULATED PIPE OR TUBE



PIPE SUPPORT 9 / 6261D



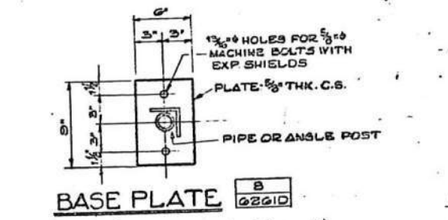
PROTECTIVE COVERING 10 / 6261D



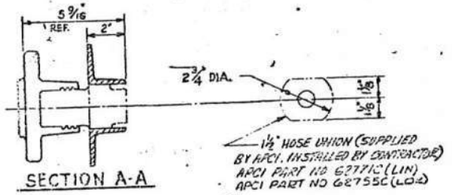
5-3555-6261

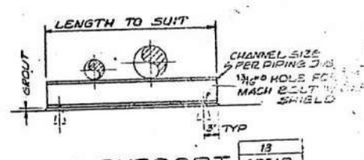
PROTECTIVE COVERING 11 / 6261D

FOR INSULATED LINES ONLY

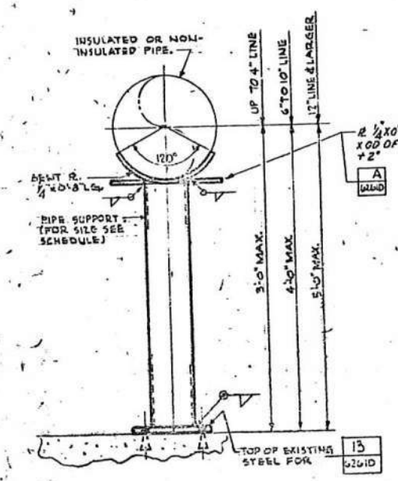


BASE PLATE 8 / 6261D





PIPE SUPPORT 13 / 6261D

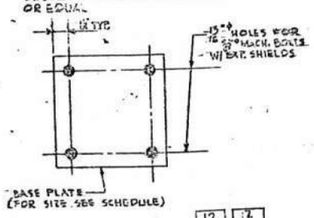


SADDLE PIPE SUPPORT 12 / 6261D

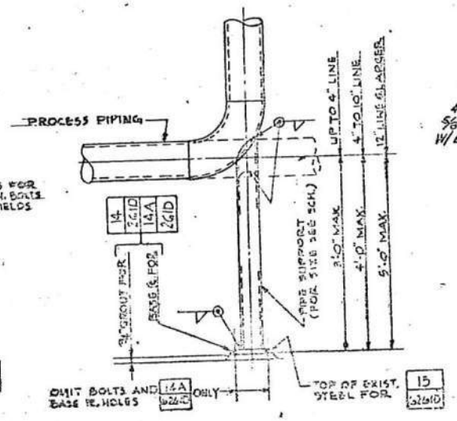
SADDLE PIPE SUPPORT 13 / 6261D

MATERIAL SCHEDULE FOR SUPPORTS			
LINE SIZE INCHES	PIPE SUPPORT	BASE PL SIZE	
UP TO 2	½	6 x 8 x 0'-6	
3	1	7 x 9 x 0'-7	
4	2	7 x 9 x 0'-7	
6	3	8 x 10 x 0'-8	
8	4	9 x 11 x 0'-9	
10	4	9 x 11 x 0'-9	
12	6	10 x 12 x 0'-10	
14	6	10 x 12 x 0'-10	
16 & LARGER	6	10 x 12 x 0'-10	

CS PIPE - A53 GR B STD WT. ST. STL. PIPE - A312 TP 304, SCH 40S OR EQUAL



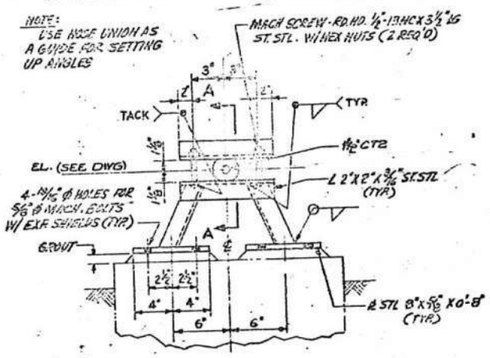
TYPICAL BASE PL FOR 12 / 6261D 12 / 6261D



DUMMY PIPE SUPPORT 14 / 6261D

DUMMY PIPE SUPPORT 15 / 6261D

DUMMY PIPE SUPPORT 15 / 6261D



PIPE SUPPORT 17 / 6261D

NOTES:

1. ALL MANUFACTURED SUPPORTS TO BE BY THE GRINNELL CO. INC. PROVIDENCE, R.I. OR APPROVED EQUAL.
2. ALL SHOP AND FIELD FABRICATED SUPPORT STEEL SHALL BE CARBON STEEL UNLESS OTHERWISE NOTED - ST.STL. S.P.SEC. A.S.T.M.-A36, STAINLESS STEEL SPEC. A240 TYPE 304, ALUMINUM SPEC. B209-5052.
3. ALL CARBON STEEL SUPPORTS SHALL BE PAINTED AS DETAILED IN SECTION 400-0 OF THE SPECIFICATIONS.
4. EXPANSION SHIELDS AND MACHINE BOLTS SHALL BE PHILLIPS "STAINLESS STEEL WEDGE ANCHOR" OR EQUAL.

PART NO.	MAT'L CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ±, DECIMAL ±, ANGLES ±, RUN LOCATION ±, RUN SIZE ±

FRANKENFIELD	5-1-62	
J. GROVER	1-1-62	
	7/1/62	

FIRST USED ON: 00-5-3555

TITLE: PROCESS PIPING STANDARD PIPE SUPPORT DETAILS (2) 60 T/D O_2 GENERATORS TAMPA, FLORIDA

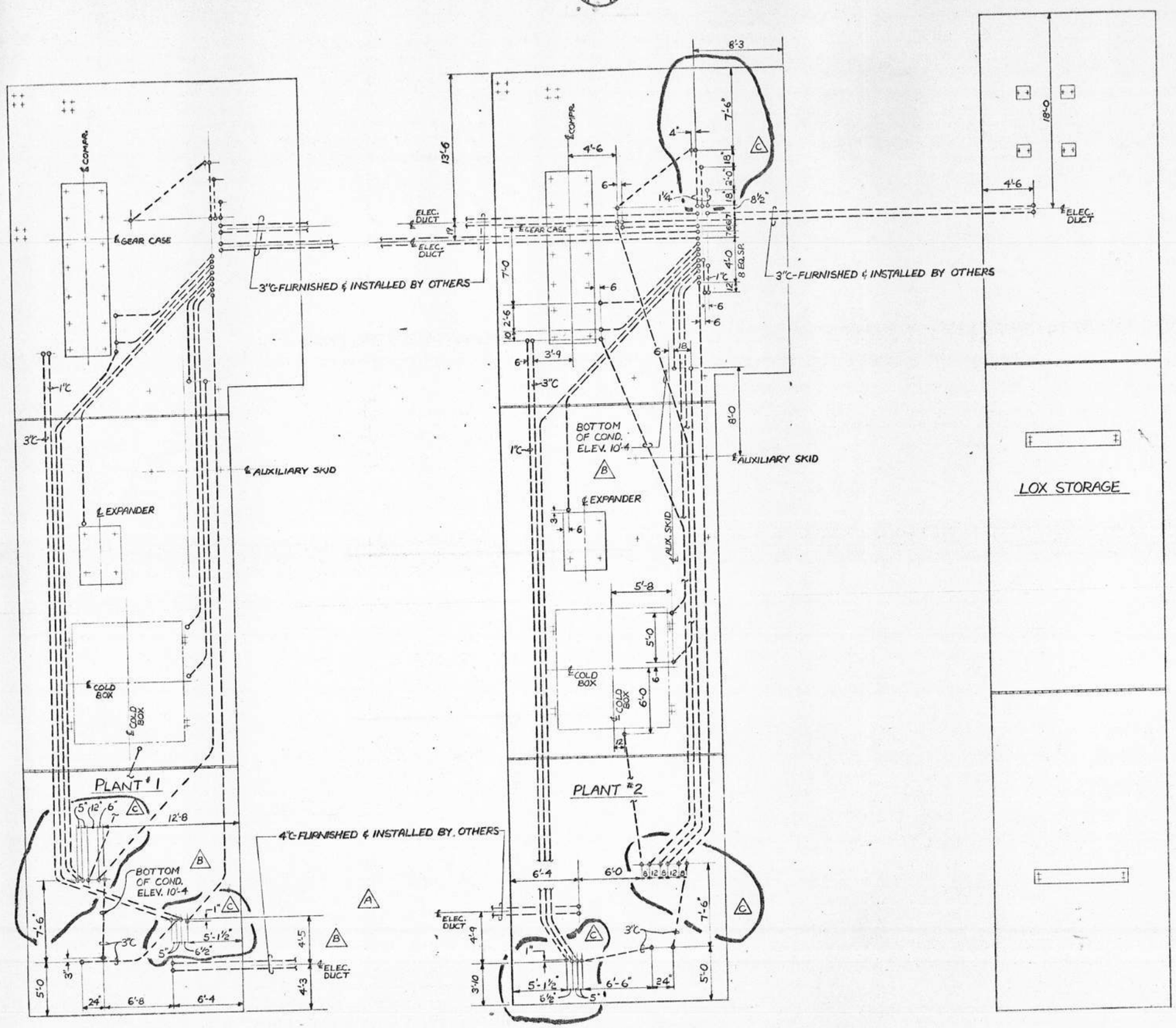
AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PA.

FOR: CHICAGO

5-3555-6261

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

4L1_6211



PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE

NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE; LOCAL LAWS HAVING JURISDICTION.
2. ALL CONDUIT SHALL BE HEAVY-WALL, RIGID STEEL, HOT-DIPPED GALVANIZED.
3. ALL CONDUIT JOINTS SHALL BE COATED WITH A METALLIC LUBRICANT SEALANT, CROUSE-HINDS TYPE STL.
4. FACTORY-MADE CONDUIT BENDS SHALL BE USED WHEREVER POSSIBLE IN MAKING NECESSARY CHANGES IN DIRECTION.
5. CONDUIT RUNS EXTENDING THROUGH STRUCTURAL EXPANSION JOINTS SHALL BE PROVIDED WITH A FITTING PERMITTING LONGITUDINAL AND LATERAL MOVEMENT OF THE CONDUIT ENDS. THE CONDUIT FITTING SHALL BE WATERTIGHT, INCLUDE A GROUNDING BOND AND SHALL BE O-Z ELECTRICAL MANUFACTURING CO. TYPE DX OR EQUAL.
6. CONDUIT STUB-UPS SHALL EXTEND 3 INCHES MINIMUM ABOVE FINISHED CONCRETE.
7. ALL CONDUIT SHALL BE CAPPED TO PREVENT ENTRY OF DIRT AND MOISTURE.
8. ALL CONDUIT SHALL BE 2" TRADE SIZE, UNLESS OTHERWISE NOTED.
9. BOTTOM OF CONDUIT ELEVATION SHALL BE 10'-1, UNLESS OTHERWISE NOTED. (TOP OF CONCRETE SLABS ELEVATION IS 11'-0.) (B)
10. DIMENSIONS FOR PLANT #1 ARE THE SAME AS PLANT #2, UNLESS OTHERWISE NOTED.
11. (B) HORIZONTAL CLEARANCE BETWEEN CONDUIT SHALL BE 3" MINIMUM.

REFERENCE DRAWINGS

5-3555-4000D FOUNDATION PLAN & ANCHOR BOLT LOCATONS
5-3555-4001D FOUNDATION SECTIONS & DETAILS

NOTICE

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5-3555-7000 DWG. SIZE D C

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D APP'D
E-5758	C		CHANGED DIMENSIONS	7-16-76	H.C.	D.J.H.
E-5539	B		SEE E.C.N.	6-11-76	D.J.H.	
E-5493	A		ADDED DIMENSIONS	5-28-76	D.J.H.	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±
FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	D.J. HUTH	5-13-76
CHECKED	R.A. HEBEL	5-14-76
ENGINEER		5-19-76
APP'D		5-19-76

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

TITLE ELECTRICAL UNDERGROUND CONDUIT
(2) 60 T/D O_2 GENERATORS
TAMPA, FLORIDA

SCALE 3/16"=1'-0 WT.

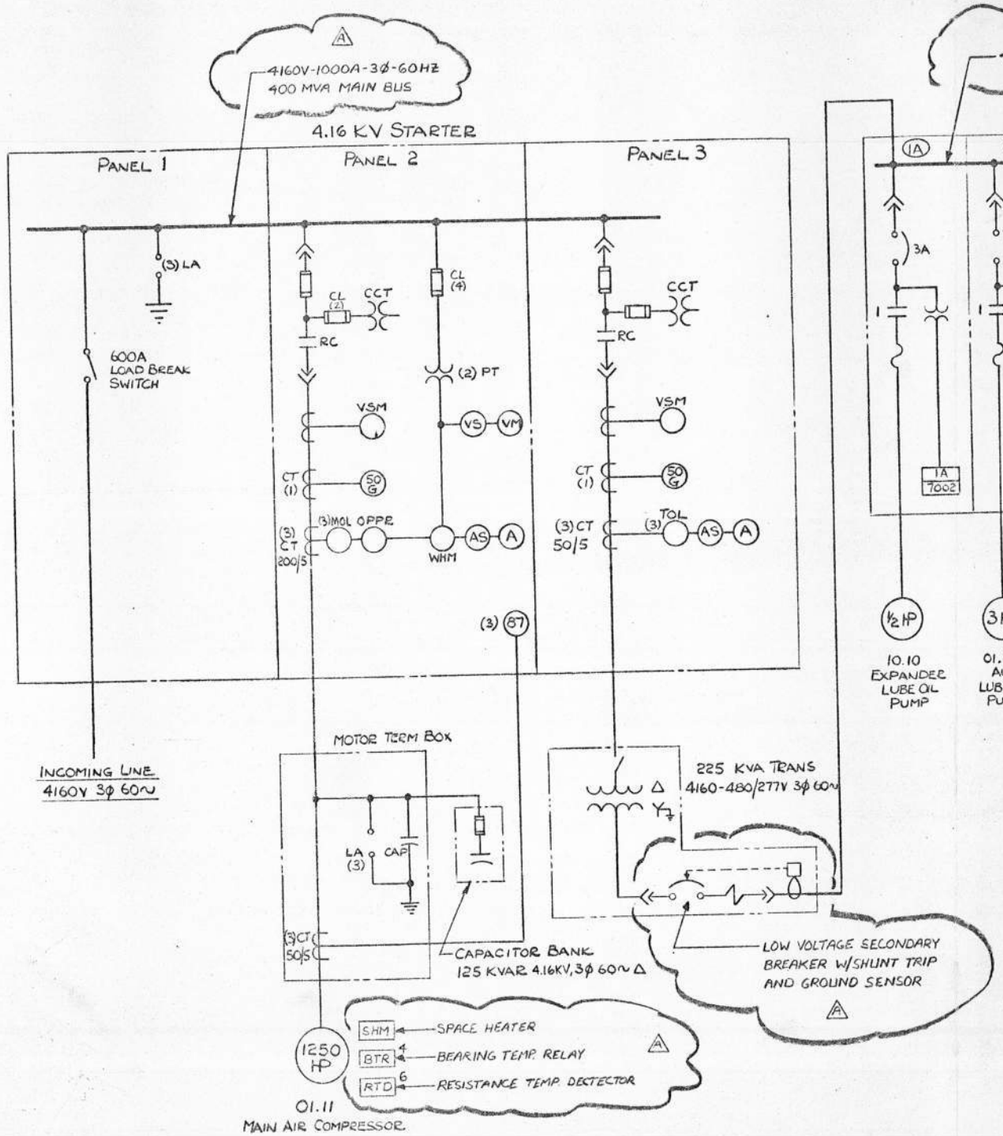
AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

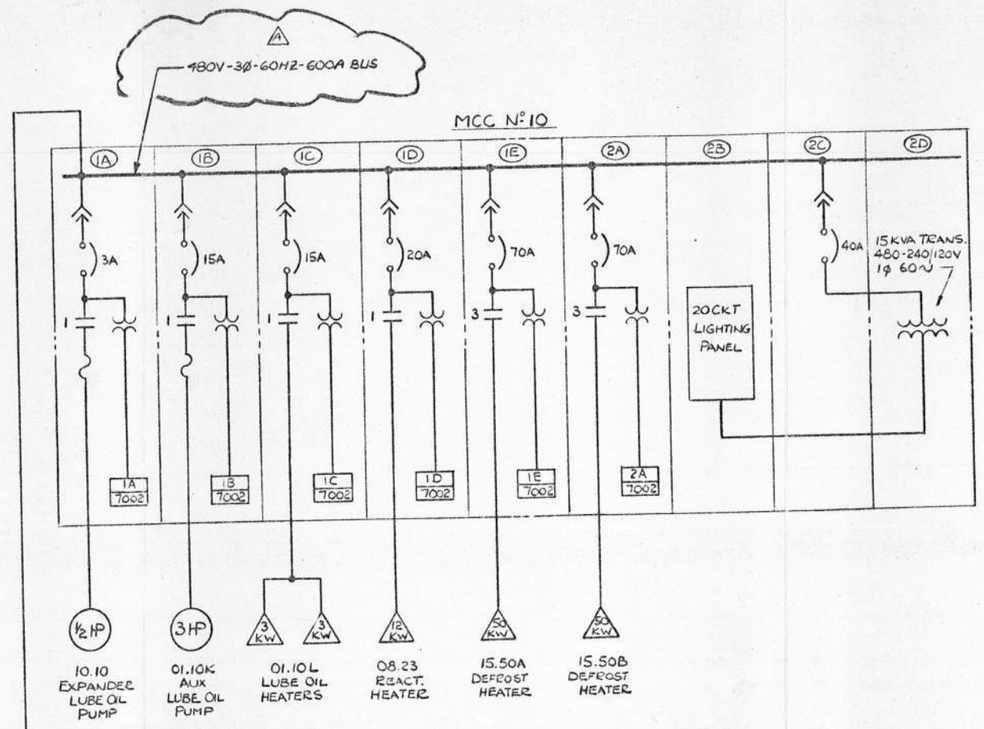
5-3555-7000 D

FORM NO. 8309-4 (REV. 6-70)

4L1_7000

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE





5-3555-7001 DWG. SIZE D A

LEGEND:

1A / 7002 — CIRCUIT Nº / CONTRACT DWG Nº

FOR NOTES SEE DWG 5-3555-7007D

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION
AND STORAGE EQUIPMENT

NOTICE

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ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E-6246	A		REVISED PER CUSTOMER'S COMMENTS	12-6-76	D.W.H.		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± DECIMAL ± ANGLES ± HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	H. COY.	9-13-76
CHECKED	J. MCCOY	9-27-76
ENGINEER	J. G. Ullberg	9-27-76
APP'D	J. Waldron	9-27-76

TITLE: ELECTRICAL SINGLE LINE DIAGRAM PLANT Nº1 (2) 60 T/D O2 GENERATORS TAMPA, FLORIDA

SCALE ~ WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-7001 D

FORM NO. 6209-4 (REV. 6-76)

4L1_7001

PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

01.11 MAIN AIR COMPRESSOR

LL1 CKT. 1 & 3-240VAC TEST POWER LL2

120VAC TEST POWER LL3 A20IN (NEUTRAL)

A201 LSW CCT 4160V-240/120V A203 F F

VSM LE EMERG. MOL STOP A1 3 (SWITCH VALVES) T3 T4 A2 BYPASS ON-OFF A13

(RTD'S) CR14

10.10 (EXPANDER) (LSH-71) A3 28 LY-922 29 A4 CR15 PSL-119 A5 A6 LSH-30 A7

(PSL-14, TSH-18, LSL-7) CR1 A18 7 TSH-5 8 TO ALARMS

BYPASS ON-OFF

A8 6 YSH-10 7 A9 STOP START A11 PSL-16 A12 5 CR ETM A10 4 CR

5 YSH-10 4 TO ALARM

EXP & LSH-71 BYPASS ON (A) SW. VALVE BYPASS ON (A) A20IN LR

RESET 87-1 87-2 87-3 50G OPPR LR

RC TH 250W SP. HTR.

OPPR 115V 115V1 115V2 COM

MOTOR STOP (G) MOTOR RUN (R) A14 CR12 CR13

RC RC

CR-15 A477 B677 A466 B666 TO SCANNER

SP (+) (-) CR RC (RC) RC

CR12 A15 ON (R)

CR12 A16 OFF (G)

LSL-7 17 TSH-18 18 15 PSL-14 16 A17 A18A CR1 TO ALARMS

CR12: TO 01.10 LIGHT; TO 01.10 LIGHT; TO 01.11 MTR. SP. HTR.; TO ALARM PT. 2-1; TO SW. VALVES; A19 SPARE A20

CR13: TO 15.50A HTR.; TO 15.50B HTR.; TO A1-52; TO CKT. 12; SPARE; SPARE

CR1: A7 TO 01.10 S.D. A18; A489 A490 B689 B690 TO SCANNER

(1A) 10.10 EXPANDER

480-120V CPT WITH 100VA EXTRA CAPACITY

A30 PSL-907 A34 X2 R1 W 2

LUBE OIL PUMP STOP START 10 A32 ETM M1 OL'S 3

A31 PICK-UP 2 M1 5

S1-920 3

R2 SPEED RESET R2 W

R3 W

R4 W

R5 W

R6 W

R W

R7 W

TURBO EXPANDER STOP START 22 23 25 XV-921-VS A33 A34 UY-922 24

DPY-904 SSH 920 YS 908 PSL 914 HI TISLH 923 LOW

DPSL 904 DPY 904

(1B) 01.10K AUX. LUBE OIL PUMP

480V-120V CPT

SPRING RETURN FROM "OFF" TO "AUTO" POS.

OFF-AUTO-MAN A41 3 M2 ETM OL'S X2

A40 2 M2 A42 A43 CR A44 PSL-16 11 12 TO 01.11 COMP INTLK & A45 M2 7 OFF (G)

M2 5 6 TO ALARM PT 4-2

35 R1 36 37 R2 38 TO ALARM PT 2-4 TO ALARM PT 1-4

39 R3 40 41 R4 42 TO ALARM PT 4-1 TO ALARM PT 4-3

(1C) 01.10L LUBE OIL HEATER

480V-120V CPT

43 R5 44 45 R6 46 TO ALARM PT. 3-4

47 R7 48 26 UY-922 29 TO ALARM PT 4-4 TO 01.11 COMPR INTLK

ON-OFF A50 A51 TS-8 21 TS-8 22 23 A52 24 ETM C1 X2 ON (R) A53

(1D) 08.23 REACTIVATION HEATER

480-120V CPT

MAN-OFF-AUTO (TSH-82) CR6 FISL-83 A64 ETM C2 X2

TIS-81 A60 A61 A62 A63 3 ON (R) A65

(1E) 15.50A DEFROST HEATER

480-120V CPT

MAN-OFF-AUTO A70 (TSH-31) CR10 (01.10) CR13 ETM C3 X2

TIS-34 A73 A71 A72 3 A74 ON (R) A75

(2A) 15.50B DEFROST HEATER

480-120V CPT

A80 (TSH-32) CR11 (01.10) CR13 ETM C4 X2

A83 A81 A82 3 A84 ON (R) A85

LEGEND

- ▣ - MAIN O_2 PLANT CONTROL PANEL
- □ - 01.11 COMPRESSOR MOTOR STARTER
- ⊠ - 01.10 COMPRESSOR TERMINAL BOX
- ⊡ - 10.10 EXPANDER CONTROL PANEL
- △ - MOTOR CONTROL CENTER
- ⊟ - INSTRUMENT CONTROL PANEL ICP-4
- ⊞ - 01.10 COMPRESSOR CONTROL PANEL

5-3555-7002 DWG. SIZE D A

FOR NOTES SEE DWG 5-3555-7007D

NOTICE

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CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

DCN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
57430	A		"AS BUILT"	1-17-78	DJH		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± DECIMAL ± ANGLES ± HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

DRAFTSMAN V. Valladona 5-7-76
CHECKED D. McCoy 5-27-76
ENGINEER [illegible] 1-29-76
APP'D T. Heidelberg 1-29-76

TITLE: ELECTRICAL SCHEMATIC WIRING DIAGRAM - PLANT #1 (2) 60 T/D O_2 GENERATORS TAMPA, FLORIDA

SCALE ~1/4 WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-7002 D

FORM NO. 6301-4 (REV. 6-70)

4L1_7002

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE

CKT. 1 & 3-240VAC
120VAC
15A
A201 — LL1 — 01.11 COMP STRTR CKT TEST POWER — LL2, LL3 — A203, A201N

CKT 2
120 VAC
20A
A202 — MAIN O2 PLT CONTROL PNL — A202N
A801
LY-71 (H, +, (-), N) — A356 B371 — SHLD A357 B372 A358 B373 — TO CUSTOMER
FY-53-4 (H, +, (-), N) — A359 B374 — SHLD A360 B375 A361 B376 — TO CUSTOMER
AY-52 (H, +, (-), N) — A362 B377 — SHLD A363 B378 A364 B379 — TO CUSTOMER

CKT. 4
120 VAC
15A
A204 — 01.10 COMPRESSOR CONT. PNL — A204N
VIBR. MONITOR YSH-10 (22, H, 6, 7, N, 23)
TO 01.11 COMPR.
24, G, 5, 0, 0, 4
TO ALARM PT. 3-1

CKT 5
120 VAC
20A
A205 — 12.20 SAMPLER VAPORIZER 2KW — A205N

CKT 6
120 VAC
20A
A206 — TS-918 (33, 34) — 10.10 EXPDR L.O. HTR 1.5 KW (33) — A206N
R

CKT 7
120 VAC
15A
A207 (01.11) — CR12 — A207A — 01.11 COMPR. MTR SP. MTR W. — A207N

CKT 8
120 VAC
20A
208 — RECEPTACLES — A208N

CKT 9
120 VAC
20A
A209 — LIGHTING COLD BOX — A209N

CKT 10
120 VAC
15A
A210 — A210N
AI-68-(N_2) (1, 2, 3)
AI-46-(HC) — TO ALARM PT. 3-7
AI-69-(N_2) (1, 2, 3)
AI-52-(O_2) — TO ALARM PT. 4-7
BYPASS ON-OFF
A210A — (01.11) CR13 — A210B CR7 — A210E
RESET
CR7 (A)
O_2 PURITY BYPASS ON (A)
XV-71-1-V_S
CR7 — LSH-76 — A210C — A210D
LSH-94

CKT. 11
120 VAC
15A
A211 — A211N
START TIMING
RESET
KE-131 (0-120 HRS.) — CLUTCH (A, LX, LY, M, B, H) — TO ALARM PT. 3-8
START TIMING
RESET
KE-132 (0-120 HRS.) — CLUTCH (A, LX, LY, M, B, H) — TO ALARM PT. 4-8
RECYCLE MODULE
KE-53 — CLUTCH (M) (1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12)
A211A — XV-53-2-V_S
0-10 MIN. AUTO RESET

CKT 12
120 VAC
20A
A212 — (01.11) CR13 — A212A — T5 (OFF DELAY (0-180 SEC)) — A212N
T5 — A212B
XV-133-V_S
XV-135-V_S
B740 — 61 — XV-53-1-V_S — 62 — B741
XV-53-3-V_S
XV-71-2-V_S
XV-76-2-V_S
I.S. SHOWN WITH VALVE FV-53-2 CLOSED
ZSL-53 — A212C — CR5 — (LSH-94)
B738 50 CR9 51 B739 — A212D — XV-76-1-V_S
PSH-76 — A212J — I/L-76 (R)
TSH-82 — A212E — CR6
TSH-31 — A212F — CR10
TSH-32 — A212G — CR11
CR-41 — A212K — CR14
CONT'D AT RIGHT
CONT'D AT RIGHT

CKT 13
120 VAC
15A
SWITCH VALVE CONTROL
SHOWN WITH VALVES KV-35 & KV-38 OPEN AND KV-36 & KV-37 CLOSED
A213 — CR12 (01.11) — A213A — T1 (OFF DELAY 0-180 SEC) — A213N
A213J — ON-OFF — T1
213B ADVANCE
RECYCLE MODULE
(INSTANT) (DELAY) TIMER CLUTCH (1, 2, 9, 10, 11, 12) — T2
A213K — CR2
CR2 — CR3 (T3) SET FOR 3 SEC
A213C — XV-35-V_{SB} OPEN — XV-38-V_{SB} OPEN
T1 — A213D — XV-37-V_{SA} CLOSE — XV-36-V_{SA} CLOSE
CR2 — CR4 (T4)
A213E — XV-37-V_{SB} OPEN — XV-36-V_{SB} OPEN
XV-35-V_{SA}
T1 — A213F — XV-38-V_{SA} CLOSE
KV-35 OPEN, KV-36 CLOSE, KV-37 CLOSE, KV-38 OPEN — A213G — CR3 — W — T1-1-6
A213H — CR4 — W — T1-1-7
KV-35 CLOSE, KV-36 OPEN, KV-37 OPEN, KV-38 CLOSE

CR5 — TO ALARM PT. 1-7 — CR5 A350 A351 B352 B353 — TO CUSTOMER
CR6 — TO ALARM PT. 4-9 — CR6 — TO 08.23
CR10 — TO 15.50A — CR11 — TO 15.50B
CR10 — CR11 — TO ALARM PT. 3-9
CR14 — TO ALARM PT. 5-9 — CR14 — TO 01.10 S.D.

T3 T4 — TO 01.11 COMPR. CKT
T3 T4 — TO ALARM PT. 1-6

CKT 14
120 VAC
15A
A214 — MCC #10 SW. & LIGHT — A214N
L2, N1

CKT 15
120 VAC
15A
A215 — MCC #10 HTR & THERMOSTAT — A215N
L1, N

CONT'D AT LEFT
A212 — LSH-71 — A465 — CR15 — A212N
TO ALARM PT. 2-8
CR-42 — CR16
RESET
8, FSL-1, 9 — CR-40
TO ALARM PT. 2-3
CR-40 — A212H — XV-1-V_S

CR15 — 0.10 S.D.
CR15 — TO EXPANDER BY-PASS
CR16 — RTD ALARM PT 5-9
CR16 — A463 B663 A464 B664 — TO SCANNER

5-3555-7003 | DWG SIZE D | A

FOR NOTES SEE DWG 5-3555-7007D

NOTICE

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CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD
E7430	A		"AS-BUILT"	1-17-78	DJH		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION, DECIMAL, ANGLES; HOLE LOCATION, HOLE SIZE
FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	[illegible]	5-10-76
CHECKED	[illegible] COY	9-27-76
ENGINEER	[illegible] berg	9-29-76
APPD	[illegible]	9-29-76

TITLE: ELECTRICAL SCHEMATIC WIRING DIAGRAM-PLANT # 1 (2) 60 T/D O_2 GENERATORS TAMPA, FLORIDA

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

SCALE [illegible] WT.

5-3555-7003 D

Form No. 8309-4 (REV. 6-74)

4L1_7003

ALARM & RTD MONITORING UNITS

PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	MATERIAL REMARKS	NOMENCLATURE

RTD

DPSH-129 A301 — DPAH-129 1-1 SA INLET AIR FILTER DIRTY
LSL-7 A302 — LAL-7 1-2 SA 01.10 LUBE OIL LEVEL LOW
TSH-5 (5, 6) A303 — TAH-5 1-3 SA 01.10 DISCHARGE TEMP. HIGH
R2 (37, 38) A304 — SAH-920-1 1-4 SA 10.10 COMPR. SPEED HIGH
1-5 SA SPARE
T3, T4 A305 — UA-130 1-6 SA SWITCH VALVE MALFUNCTION
CR5 A306 — ZA-53 1-7 SA OXYGEN PROD. VENT OPEN
LSL-71 A307 — LAL-71 1-8 SA REBOILER COND. LEVEL LOW
LSL-75 A308 — LAL-75 1-9 SA H. P. COLUMN LEVEL LOW
CR-12 A309 — 2-1 SB 01.10 COMPR. MALFUCTION
PSL-14 (13, 14) A310 — PAL-14 2-2 SB 01.10 LUBE OIL PRESSURE LOW
FSL-1 (10, 11) A311 — FAL-1 2-3 SB 01.10 COMPR. FLOW LOW
R1 (35, 36) A312 — PAL-907-1 2-4 SB 10.10 SEAL GAS PRESSURE LOW
2-5 SB SPARE
LSH-30 A313 — AFTERCOOLER SEPERATOR 2-6 SB LEVEL HIGH
LSH-76-1 A314 — LAH-76 2-7 SB LOX HOLD-UP TANK LEVEL HIGH
LSH-71 A315 — LAH-71 2-8 SB REBOILER COND. LEVEL HIGH
LSH-75 A316 — LAH-75 2-9 SB HP. COLUMN LEVEL HIGH
A300

BYPASS ON-OFF (5, 4) YSH-10 A317 — 01.10 COMPR. VIBRATION 3-1 SA LEVEL HIGH
TSH-18 (19, 20) A318 — TAH-18 3-2 SA 01.10 LUBE OIL TEMP HIGH
PSL-114 A319 — PAL-114 3-3 SA COOLING WATER PRESSURE LOW
R5 (43, 44), R6 (45, 46) A320 — TAHL-922-1 3-4 SA 10.10 LUBE OIL TEMP HIGH-LOW
3-5 SA SPARE
3-6 SA SPARE
AI-46(HC) A321 — ARAH-46 3-7 SA HYDROCARBON LEVEL HIGH
KE-131 (4, 2) A322 — KAH-131 3-8 SA 08.51 ADSORBER REACTIVATION
(TSH-31) CR10, (TSH-32) CR11 A323 — 15.50 DEFROST HTR. ELEMENT 3-9 SA TEMP HIGH
(YS-908) R3 (39, 40) A324 — 10.10 COMPR. VIBRATION 4-1 SB LEVEL HIGH
5, M2, 6 A325 — AUXILIARY LUBE OIL PUMP 4-2 SB RUNNING
R4 (41, 42) A326 — PAL-914-1 4-3 SB 10.10 LUBE OIL PRESSURE LOW
R7 (47, 48) A327 — DPAL-904-1 4-4 SB 10.10 SEAL GAS D. P. LOW
4-5 SB SPARE
PSH-70 A326 — PAH-70 4-6 SB
AI-52 (O_2) A328 — ARAL-52 4-7 SB OXYGEN PRODUCT PURITY LOW
KE-132 (4, 2) A329 — KAH-132 4-8 SB 08.21 ADSORBER REACTIVATION
(TSH-82) CR6 A330 — 08.23 HTR ELEMENT 4-9 SB TEMP HIGH
A300

5-1 01.10 MOTOR BEAR'G NO 1 TEMP. HIGH
MI, M2, VT, VR, IN(+) L1, IN(-) L2, 0, OC, C

TE-11-1 RTD — A461 B661, A462 B662

METER MODULE: MI, M2, VT, VR, M(+), M(-); L1(+), L2(-)
200V 1Ø — METER

TO MAIN BUS TERMINALS ON DWG. 5-3555-7005D
TO HORN RELAY ON DWG. 5-3555-7005D
LC, 5V, OV, LN, F1, F2, FR, LX, FX, SX, R, T, A, N — MAIN BUS TERMINALS
TO FLUSHBUTTONS ON DWG. 5-3555-7005D
TO FLASHER ON DWG. 5-3555-7005D
TO POWER SUPPLY ON DWG. 5-3555-7005D

TE-12-1 RTD — 01.11 STATOR WINDING NO 1 TEMP. HIGH 5-2 — IN(+) O, IN(-) OC
TE-12-3 RTD — 01.11 STATOR WINDING NO 3 TEMP. HIGH 5-3 — IN(+) O, IN(-) OC
TE-12-5 RTD — 01.11 STATOR WINDING NO 5 TEMP. HIGH 5-4 — IN(+) O, IN(-) OC
TE-128-1 RTD — 01.10 COMPR BEARING NO 1 TEMP. HIGH 5-5 — IN(+) O, IN(-) OC
TE-128-3 RTD — 01.10 COMPR BEARING NO 3 TEMP. HIGH 5-6 — IN(+) O, IN(-) OC
TE-128-5 RTD — 01.10 COMPR BEARING NO 5 TEMP. HIGH 5-7 — IN(+) O, IN(-) OC
DPAH-129 A301, LAL-7 A302, TAH-5 A303 — AUXILIARY CONTACT MODULE 5-8 — S1 C1, S2 C1, S3 C2, TA C2, OV C3, LX C3
RTD POINT IN ALARM CONDITION 5-9 — SB
A300 CR14 A331A CR16 A331
TE-11-2 RTD — 01.11 MOTOR BEARING NO 2 TEMP. HIGH 6-1 — IN(+) O, IN(-) OC
TE-12-2 RTD — 01.11 STATOR WINDING NO 2 TEMP HIGH 6-2 — IN(+) O, IN(-) OC
TE-12-4 RTD — 01.11 STATOR WINDING NO 4 TEMP. HIGH 6-3 — IN(+) O, IN(-) OC
TE-12-6 RTD — 01.11 STATOR WINDING NO 6 TEMP. HIGH 6-4 — IN(+) O, IN(-) OC
TE-128-2 RTD — 01.10 COMPR BEARING NO 2 TEMP. HIGH 6-5 — IN(+) O, IN(-) OC
TE-128-4 RTD — 01.10 COMPR BEARING NO 4 TEMP. HIGH 6-6 — IN(+) O, IN(-) OC
TE-128-6 RTD — 01.10 COMPR BEARING NO 6 TEMP. HIGH 6-7 — IN(+) O, IN(-) OC
SAH-920-1 A304, UA-130 A305, ZA-53 A306 — AUXILIARY CONTACT MODULE 6-8 — S1 C1, S2 C1, S3 C2, TA C2, OV C3, LX C3
LC CR-41 — ALARM MODULE 6-9 — O, OC; L1(+), L2(-)

LC (PWR. SUPPLY)
A467 B667, A468 B668, A469 B669, A470 B670, A471 B671, A472 B672, A473 B673, A474 B674, A401 B601, A402 B602, A403 B603, A404 B604, A405 B605, A406 B606
A475 B675, A476 B676, A478 TO CR-42 COIL, A479 B679, A480 B680, A481 B681, A482 B682, A483 B683, A484 B684, A485 B685, A486 B686, A487 B687, A488 B688, A407 B607, A408 B608, A409 B609, A410 B610, A411 B611, A412 B612
TO POWER SUPPLY ON DWG. 5-3555-7005D

FOR NOTES SEE DWG 5-3555-7007D

NOTICE
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CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION
AND STORAGE EQUIPMENT

E7430 | A | "AS-BUILT" | 1-17-78 | DJH

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± DECIMAL ± ANGLES ± HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON: 00-5-3555

		DATE
DRAFTSMAN	R.A. HEBEL	6-15-76
CHECKED	J. McCOY	9/29/76
ENGINEER		
APPD		

TITLE: ELECTRICAL SCHEMATIC WIRING DIAGRAM - PLANT #1 @ 60 T/D O_2 GENERATORS TAMPA-FLORIDA

SCALE: NONE WT.:

DWG SIZE D A — 5-3555-7004 D

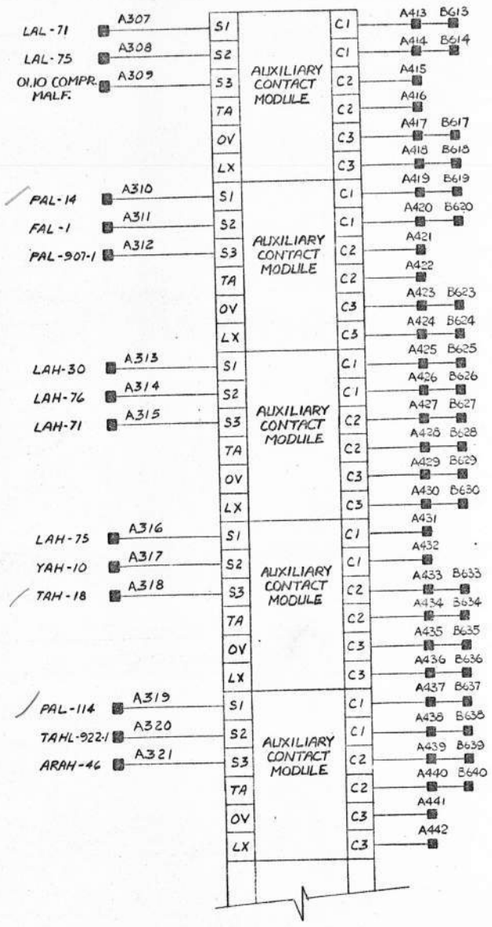
AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

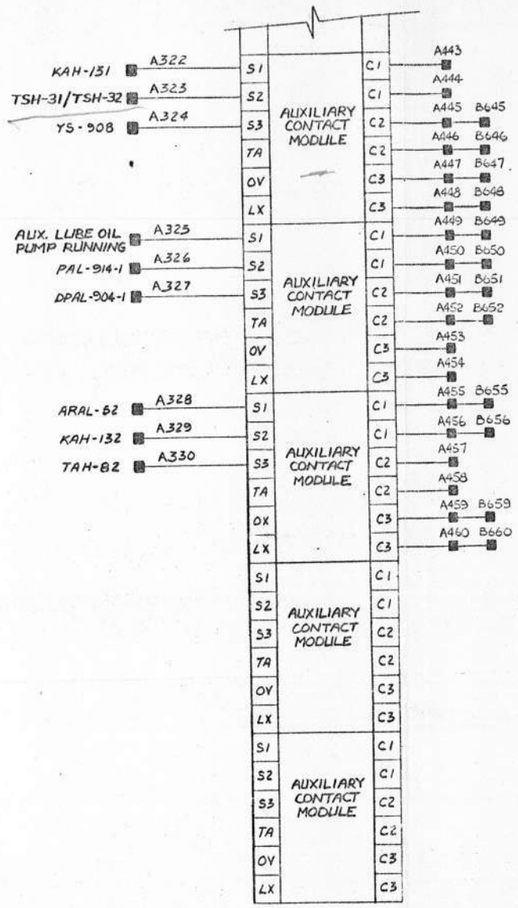
FORM NO. 8309-4 (REV. 6-70)

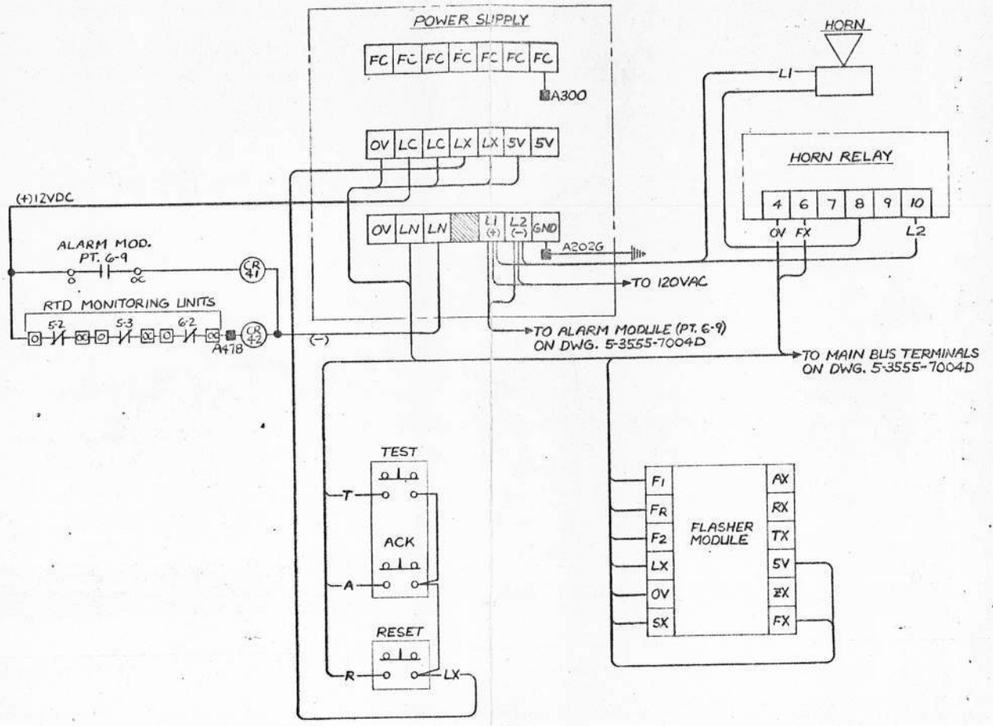
4L1_7004

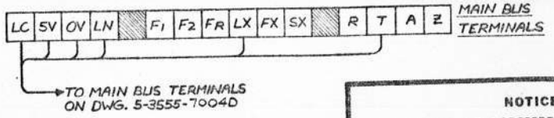
MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

CONTACT FOLLOWER UNITS









FOR NOTES SEE DWG 5-3555-7007D

5-3555-7005 DWG. SIZE D A

NOTICE

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CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E7430	A		"AS-BUILT"	1-17-78	DJH		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE FRACTION ± DECIMAL ± ANGLES ± HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	R.A. HEBEL	6-16-76
CHECKED	J. McCOY	9-27-76
ENGINEER		9-27-76
APPVD		9-27-76

TITLE: ELECTRICAL SCHEMATIC WIRING DIAGRAM - PLANT #1 (2) 60 T/D O_2 GENERATORS TAMPA - FLORIDA

SCALE: None WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-7005 D

FORM NO. 8309-4 (REV. 6-76)

4L1_7005

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE

01.10 COMPR. PANEL | ANALYZER | ANALYZER | MAIN CONTROL PANEL

VALVE SKID

TERM. BOX

2"C.

06.50 SILENCER

PULL BOX Nº4 18"x12"x6"

COLD BOX T/C PULL BOX EL. 14'-0"

TOGGLE SWITCH - 1 POLE 120-277V 20A SPEC GRADE HUBBELL CAT. Nº 1221 (OR EQUAL) MTD IN FS BOX

ZSL 53 EL. 30'-0"

XV 53-3 VS

XV 76-2 VS EL. 17'-6"

XV 135 VS EL. 16'-0"

TIS 81 EL. 17'-6"

TSH 82 EL. 13'-6"

XV 133 VS EL. 30'-0"

08.23 HTRS PULL BOX

PULL BOX Nº5 18"x12"x6"

RUN UNDER PLATFORM (T.O.G. EL 27'-1")

COLD BOX

XV 71-1 VS EL. 30'-0"

PSH 76 EL. 25'-0"

XV 76-1 VS EL. 25'-0"

XV 82-1 VS EL. 15'-6"

12.20 SAMPLE VAPORIZER EL. 32'-0

5-3555-7006 D A

(2) CROUSE-HINDS CAT. Nº VDC22GP INCADESCENT LIGHTING FIXTURE VAPORTIGHT-ENCLOSED-GASKETED WITH GLOBE & GUARD-150W LAMP PENDANT TYPE-¾" HUB SIZE

STD L302A

FISL 83 (MOUNTED ON INSTRUMENT RACK)

CONTROL PANEL

RELAY BOX

10.10 EXPANDER LUBE OIL PUMP

MOUNT & WIRE DUPLEX RECEPT. 125V 20A 2P 3WIRE GROUNDING HUBBELL CAT. Nº 5362 (OR EQUAL) MTD IN F.S. BOX. SPEC. GRADE W/SPRING DOOR COVER CROUSE-HINDS "DS706-SI

PULL BOX Nº3 18"x12"x6"

XV 71-2 VS EL. 12'-6"

10.10 EXPANDER

17.80 DISPOSAL VAPS

RTD TERM BOX

SPACE HTR PULL BOX

PULL BOX Nº1 18"x12"x6"

PULL BOX Nº2 18"x12"x6"

01.10D

01.10 COMPRESSOR

TERM BOX Nº1

TERM BOX Nº2

MOTOR 01.11

CAPACITOR BANK

PROXIMITORS

01.12 FILTER

DPSH 129 EL. 17'-0"

01.10B

STD G307

MOTOR TERM. BOX

01.13

01.14 SEPARATOR

01.17 SILENCER

PSL 114 EL. 18'-6"

XV-1 VS EL. 22'-0"

LSH 30 EL. 18'-0"

EXTEND EXISTING CONDUITS UP TO MOTOR TERM. BOX

FOR NOTES SEE DWG 5-3555-7007D

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

NOTICE

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ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E-6951	A		SEE ECN	4-29-77	D.J.H.		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± DECIMAL ± ANGLES ± HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	H. COY.	9-9-76
CHECKED	J. McCOY	9-29-76
ENGINEER	J. Goldhorn	9-29-76
APPD		9-29-76

TITLE: ELECTRICAL PLAN PLANT Nº1 (2) 60 TPD O2 GENERATORS TAMPA, FLORIDA

SCALE ~ WT.

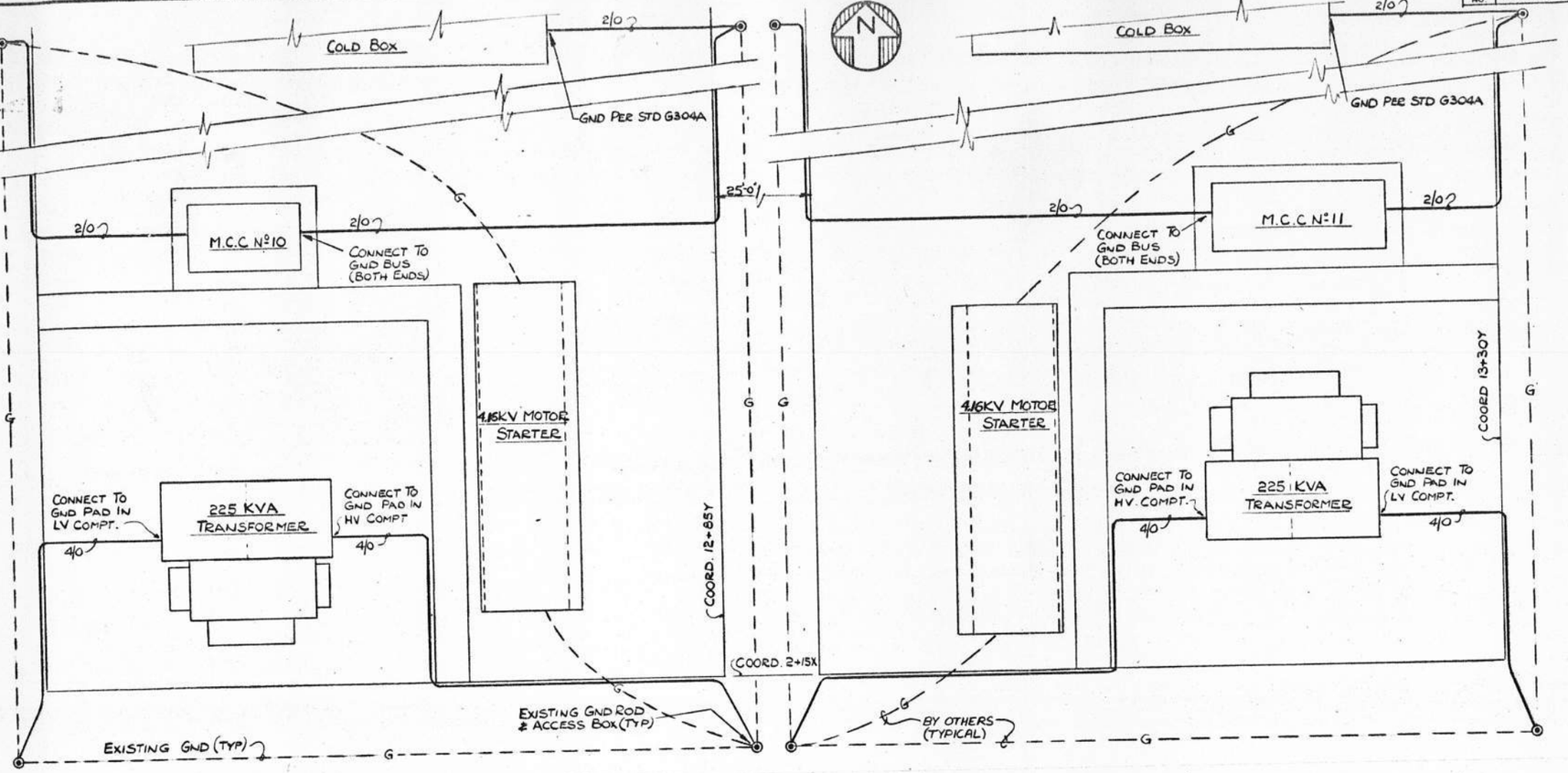
AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-7006 D

FORM NO. 8309-4 REV. 6-70

4L1_7006

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE



PLANT Nº1

PLANT Nº2

NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DWGS & CONSTRUCTION SPEC'S & SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE LOCAL LAWS FOR THE CITY OF TAMPA, FLORIDA HAVING JURISDICTION.
2. CONDUIT:
   - GENERAL - UNDERGROUND CONDUIT IS EXISTING PER DWG 5-3555-7000D EXPOSED CONDUIT SHALL BE ¾" UNLESS OTHERWISE NOTED
   - RIGID - ALL CONDUIT RUN EXPOSED SHALL BE HEAVY-WALL, RIGID ALUMINUM CONDUIT, ALLOY 6063T-42 & SHALL BE LINED WITH A SILICONE COMP., CONFORM'G TO FED. SPEC. WW-C00540c & ANS C80.5
   - FLEXIBLE - ALL FLEXIBLE METAL CONDUIT SHALL BE LIQUIDTIGHT. AMERICAN BRASS "SEALTITE" OR APPROVED EQUAL.
3. WIRE & CABLE - POWER & CONTROL
   - GENERAL - ALL WIRE SHALL BE 600V STRANDED COPPER WITH CROSS LINKED POLYETHYLENE INSULATION & SHALL BE G.E. VULKENE CABLE, TYPE XHHW OR APPROVED EQUAL, UNLESS OTHERWISE NOTED. SIZE OF WIRE SHALL BE AS STATED ON INTERCONNECTION DIAS ALL WIRES SHALL BE TAGGED WITH WIRE Nº AT BOTH ENDS.
   - HIGH VOLTAGE - 5KV INSULATION NON-SHIELDED WITH NS JACKET AS MANUFACTURED BY KERITE CO. THIS CABLE IS PROVIDED BY APCI
4. CONTRACTOR SHALL CUT A HOLE IN REAR OF MAIN COMP. TERM. BOX USING MOTOR THROAT AS TEMPLATE - CONTRACTOR SHALL FURNISH GASKETS, NUTS & BOLTS & SHALL CONNECT TERM. BOX TO MOTOR THROAT (TERM. BOX SUPPORTS BY OTHERS)
5. PULL BOXES SHALL BE CAST ALUMINUM (UNLESS OTHERWISE SPECIFIED) COMPLETE WITH MTG LUGS, THREADED ENTRY BOSSES & FLANGED OR RABBETED GASKETED COVERS.
6. CONNECTIONS TO EXISTING GND TO BE CADWELDED

5-3555-7007 | DWG. SIZE D | A

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

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ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD
E7430	A		"AS-BUILT"	1-24-78	DJH		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± | DECIMAL ± | ANGLES ±
HOLE LOCATION ± | HOLE SIZE ±

FIRST USED ON: 00-5-3555

		DATE
DRAFTSMAN	H. COY	9-9-76
CHECKED	J. McCOY	9-29-76
ENGINEER	L. Goldberg	9-29-76
APPD	L. Goldberg	1-29-76

TITLE: ELECTRICAL GROUNDING & NOTES PLANTS 1 & 2 (2) 60 T/D O2 GENERATORS TAMPA FLORIDA

SCALE: ~ | WT.

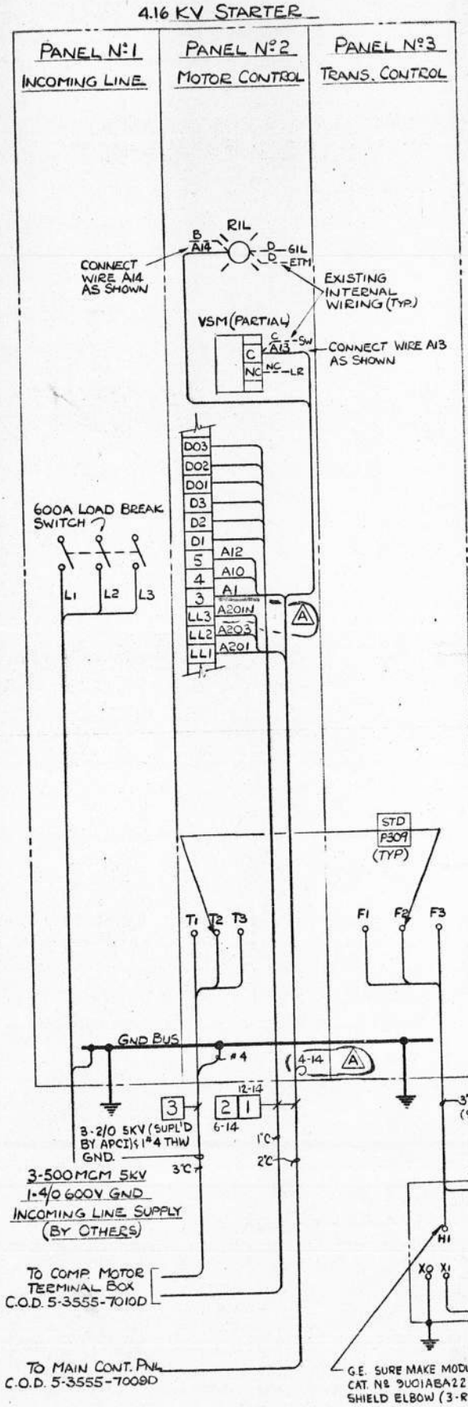
AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

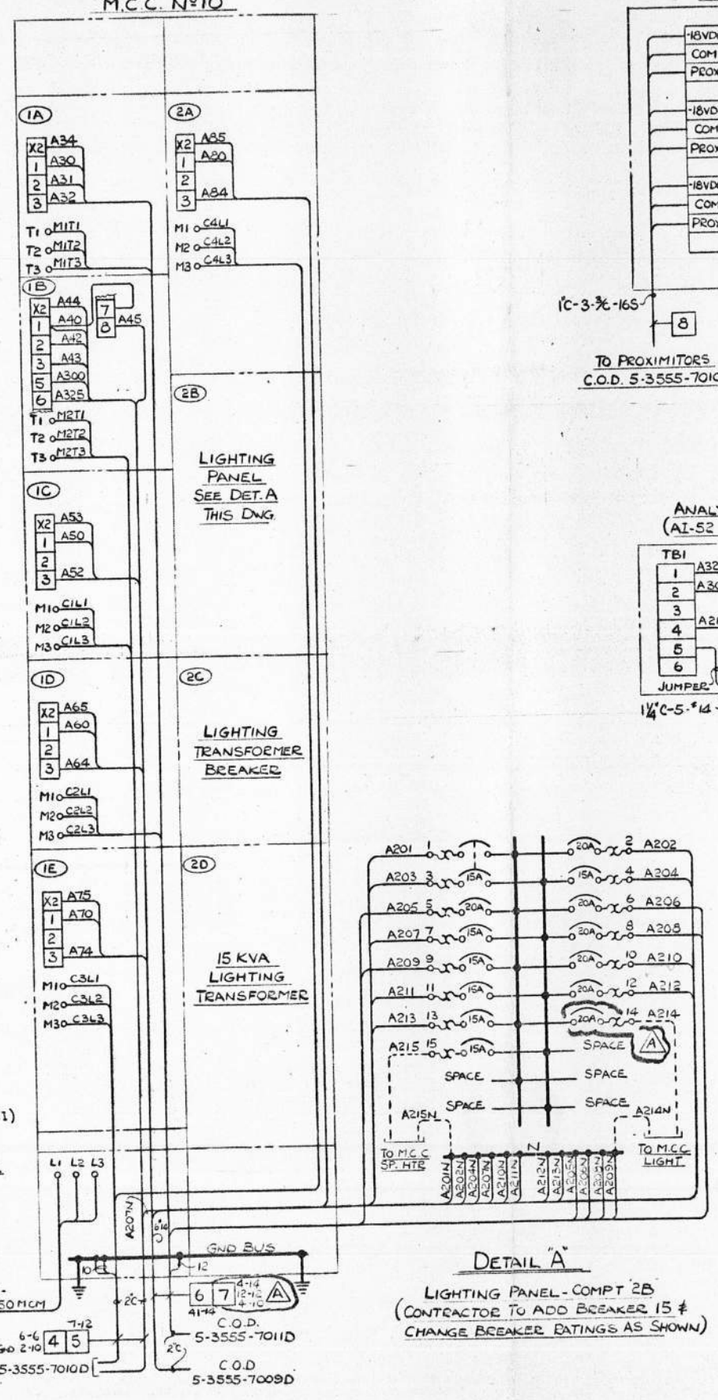
5-3555-7007 D

FORM NO. 8309-4 (REV. 6-74)

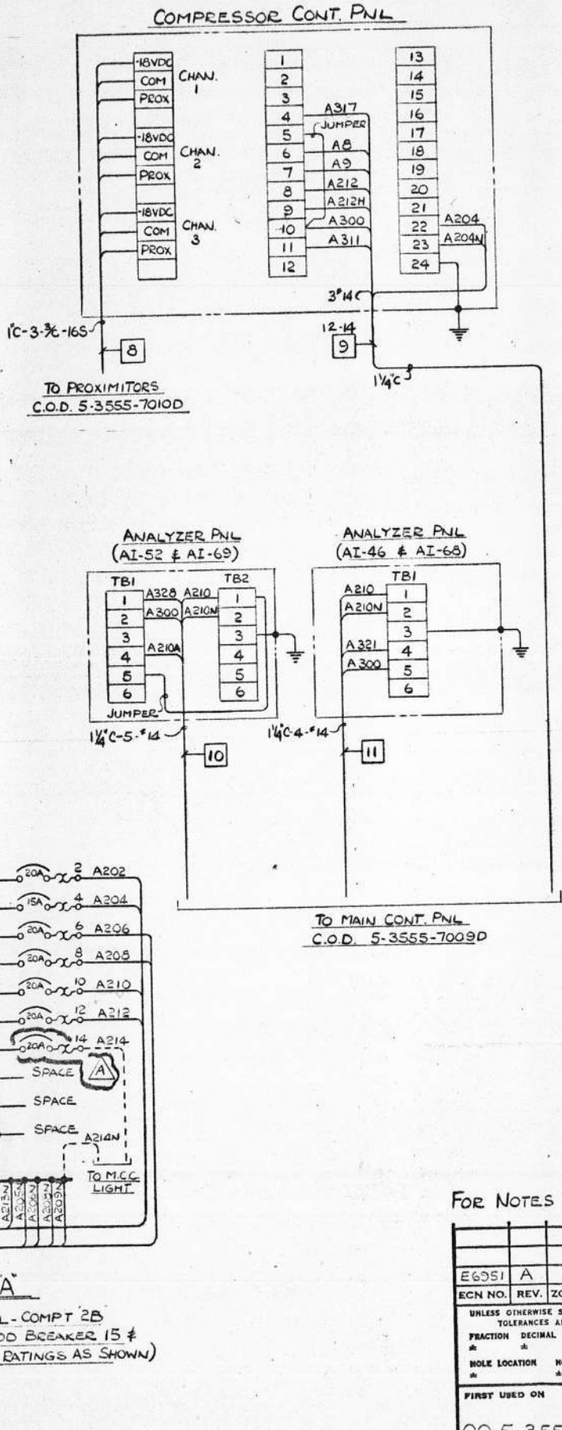
4L1_7007

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE





DETAIL "A"
LIGHTING PANEL - COMPT 2B
(CONTRACTOR TO ADD BREAKER 15 #
CHANGE BREAKER RATINGS AS SHOWN)



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5-3555-7008 | DWG. SIZE D | A

FOR NOTES SEE DWG 5-3555-7007D

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD
E6051	A		SEE ECN	4-22-77	H.COY	D.J.H.	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE FRACTION ± DECIMAL ± ANGLES ± HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	H. COY.	9-9-76
CHECKED	J. McCOY	9-27-76
ENGINEER	J. Goldberg	9-29-76
APPR'D	J.J. Goldberg	9-29-76

TITLE: ELECTRICAL INTERCONNECTION DIAGRAM - PLANT N°1
(2) 60 T/D O2 GENERATORS
TAMPA, FLORIDA

SCALE ~ WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-7008 D

FORM NO. 8309-4 (REV. 6-74)

4L1_7008

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE

RTD ALARM POINTS

5-1 TE-11-1 · 5-2 TE-12-1 · 5-3 TE-12-3 · 5-4 TE-12-5 · 5-5 TE-128-1 · 5-6 TE-128-3 · 5-7 TE-128-5

6-1 TE-11-2 · 6-2 TE-12-2 · 6-3 TE-12-4 · 6-4 TE-12-6 · 6-5 TE-128-2 · 6-6 TE-128-4 · 6-7 TE-128-6

T1-42-1S - 2ND TERMINAL BOARD

T1-42-1S · T1-42-14 · T1-42-15 · T1-42-22 · T1-42-16 · T1-42-17 · T1-42-20 · T1-42-18 · T1-42-19 · T1-42-F

T1-42-1S - 1ST TERMINAL BOARD

T1-42-1S · T1-42-6 · T1-42-7 · T1-42-8 · T1-42-9 · T1-42-3 · T1-42-2 · T1-42-10 · T1-42-11 · T1-42-12 · T1-42-1

2 PR. SPARE

2 PR T/C EXTENSION WIRE TYPE TX

C.O.D. 5-3555-7011D · C.O.D. 5-3555-7008D · C.O.D. 5-3555-7020D · C.O.D. 5-3555-7010D

MAIN CONTROL PANEL

FOR NOTES SEE DWG 5-3555-7007D

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CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD
E7430	B		"AS-BUILT"	1-24-78	DJH		
E6951	A		SEE ECN	4-22-77	H.COY	D.J.H	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE — FRACTION ± · DECIMAL ± · ANGLES ± — HOLE LOCATION ± · HOLE SIZE +

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	H. COY.	9-9-76
CHECKED	J. McCOY	9-27-76
ENGINEER		9-29-76
APPR'D		9-29-76

TITLE: ELECTRICAL INTERCONNECTION DIAGRAM - PLANT N°1
(2) 60 T/D O2 GENERATORS
TAMPA FLORIDA

SCALE · WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-7009 D

DWG SIZE D

FORM NO. 8509-4 (REV. 4-74)

4L1_7009

PART NO.	MATL. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE

TO MAIN CONTROL PNL
C.O.D 5-3555-7009D

TO COMP. CONT. PNL
C.O.D. 5-3555-7008D

1"C-3-3/4"C-16 SHLD

3/4"C

3/4"C-16 SHLD

DO NOT GND SHLD (TYP.)

PROXIMITOR

PROBE (TYP.)

VSH-1 VSH-2 VSH-3

32-14

2"C

4-14

RTD TERMINAL BOX

STATOR W.N.D.#1

TE-128-1 TE-128-2 TE-128-3 TE-128-4 TE-128-5 TE-128-6

TE-12-1 TE-12-2 TE-12-3 TE-12-4 TE-12-5 TE-12-6 TE-11-1 TE-11-2

28-14

2"C

A207A SH1
A207N SH2
TERM. LUGS

COMP. MOTOR SP. HTR. TERM. BOX

A300

3/4"C-9"#14

PULL BOX Nº1

2"C-7"#12

PULL BOX Nº2

1"C-7"#12

18-14

TO MCC Nº10
C.O.D 5-3555-7008D

7-12

5

4 6-6 2-10 GND

2"C

JUMPER

A212	1	A213E	13
A212E	2	A213F	14
A73	3	A213G	15
A71	4	A213H	16
A83	5		17
A81	6		18
A212G	7		19
A213B	8		20
A213N	9		21
A213C	10		22
A213D	11		23
	12		24

C3L3	25		
C3L2	26		
C3L1	27		
GND	28		
C4L3	29		
C4L2	30		
C4L1	31		
GND	32		
	33		

AUXILIARY SKID TERMINAL BOX

A300
A18A

1"C-16"#14

3/4"C-7"#12

A207A

3/4"C-4"#14

(LSL-7)

STEEL A303
A300 BRASS

STEEL A18A
A13 BRASS

COMP. MOTOR TERM. BOX Nº1

5	A300		
6	A303		
7	A18		
8	A8		
9	A11		
10	A12		
11	A42		
12	A43		
13	A300		
14	A310		
15	A17		
16			

JUMPER

17	A18A	A51	21
18			22
19	A300		23
20	A318	A52	24
	M2T1	C1L1	H1
L1	M2T2	C1L2	H2
L2	M2T3	C1L3	H3
L3		C1L1	H4
		C1L2	H5
		C1L3	H6

COMP. MOTOR TERM. BOX Nº2

COMP. MOTOR TERM. BOX

CAPACITOR
LIGHTNING ARRESTER
#4-5KV CABLE
BUS BAR POWER
BUS BAR MOTOR NEUT.
CURRENT TRANS.

STD P309 (TYP)

D1 D2 D3
DO1 DO2 DO3

T1 T2 T3 T4 T5 T6

#4

CAPACITOR BANK

FUSE
UNIT BUSHING

2"C

3-#4.5KV (SUPPLIED BY APC1)

STATOR Temp Dect.

COMP. MOTOR 01.11

8"C, 3-2/0 5KV (SUPL'D BY APC1) 1#4 THW GND

3

6-14

2

1"C

TO 4KV MOTOR STARTER
C.O.D 5-3555-7006D

300

3/4"C-2"#14

3/4"C-7"#14

A6
300

3/4"C-4"#14

3/4"C-6"#14

3/4"C-2"#14

3/4"C-4"#14

DPSH-129
A300 A301

PSL-114
A300 A319
A5 A6

XV-1-VS
A212H A212N

LSH-30
A300 A313
A6 A7

FOR NOTES SEE DWG 5-3555-7007D

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION
AND STORAGE EQUIPMENT

NOTICE

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ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E6951	A		SEE ECN	4-22-77	H.COY	D.H	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION DECIMAL ANGLES
HOLE LOCATION HOLE SIZE
FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	H.COY.	9-5-76
CHECKED	J. McCOY	9-27-76
ENGINEER	J. Goldberg	9-29-76
APPD	J. Goldberg	9-29-76

TITLE
ELECTRICAL INTERCONNECTION DIAGRAM - PLANT Nº1
(2) 60 T/D O2 GENERATORS
TAMPA FLORIDA

SCALE WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

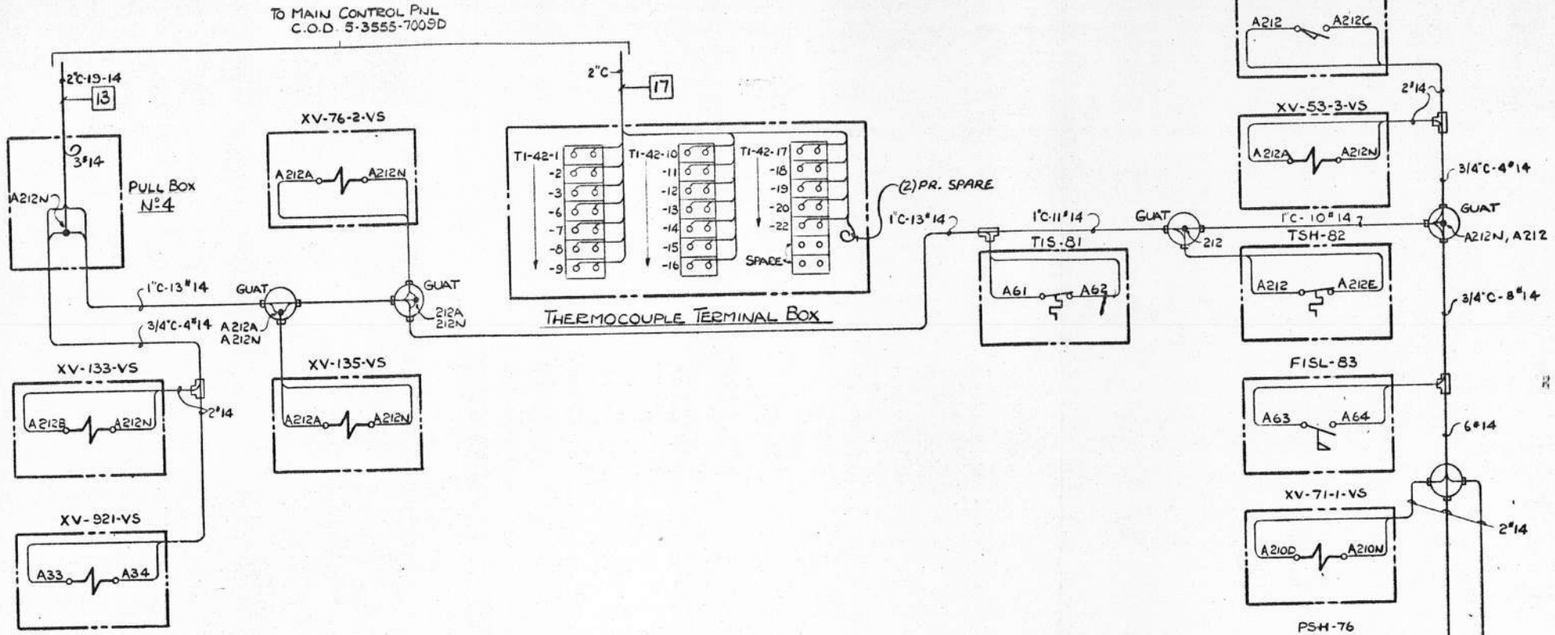
5-3555-7010 D

FORM NO. 2509-4 REV. 6-76

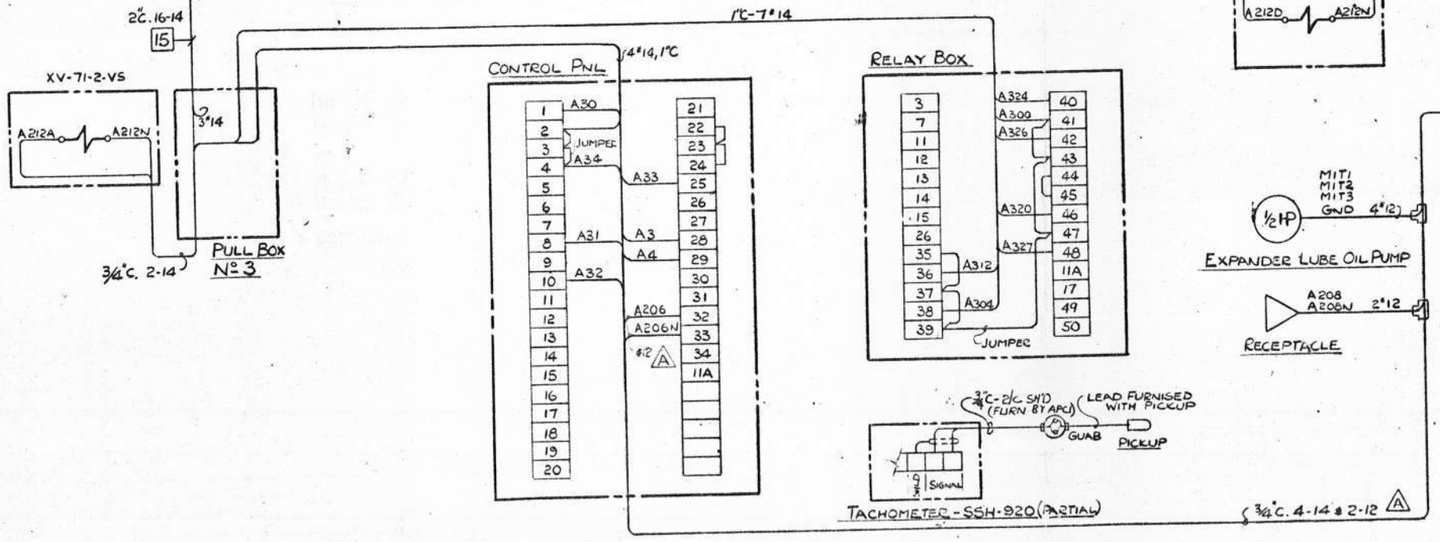
4L1_7010

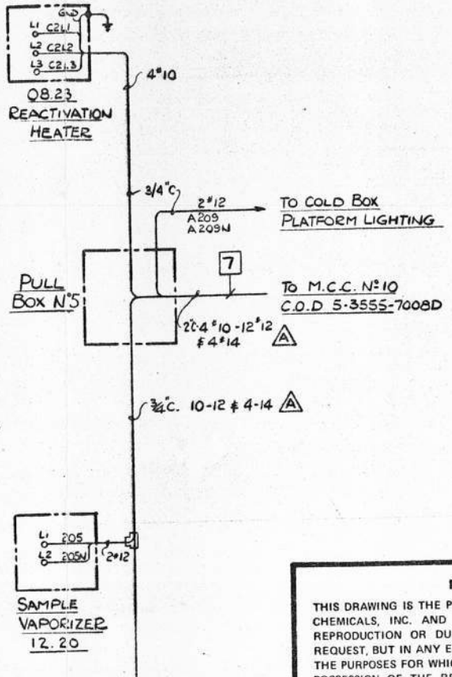
PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE

COLD BOX - POWER & CONTROL WIRING



EXPANDER - POWER & CONTROL WIRING





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5-3555-7011 DWG SIZE D B

FOR NOTES SEE DWG 5-3555-7007D

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKER'S POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION
AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E7430	B		"AS-BUILT"	1-17-78	DJH		
E6951	A		SEE ECN	4-22-77	H.COY	D.J.H	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION DECIMAL ANGLES
HOLE LOCATION HOLE SIZE
FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	H. COY.	9-9-76
CHECKED	J. McCOY	9-27-76
ENGINEER	J. Goldberg	9-29-76
APP'D	J. Goldberg	9-29-76

TITLE
ELECTRICAL INTERCONNECTION DIAGRAM - PLANT Nº1
(2) 60 T.P.D O2 GENERATORS
TAMPA, FLORIDA

SCALE WT.

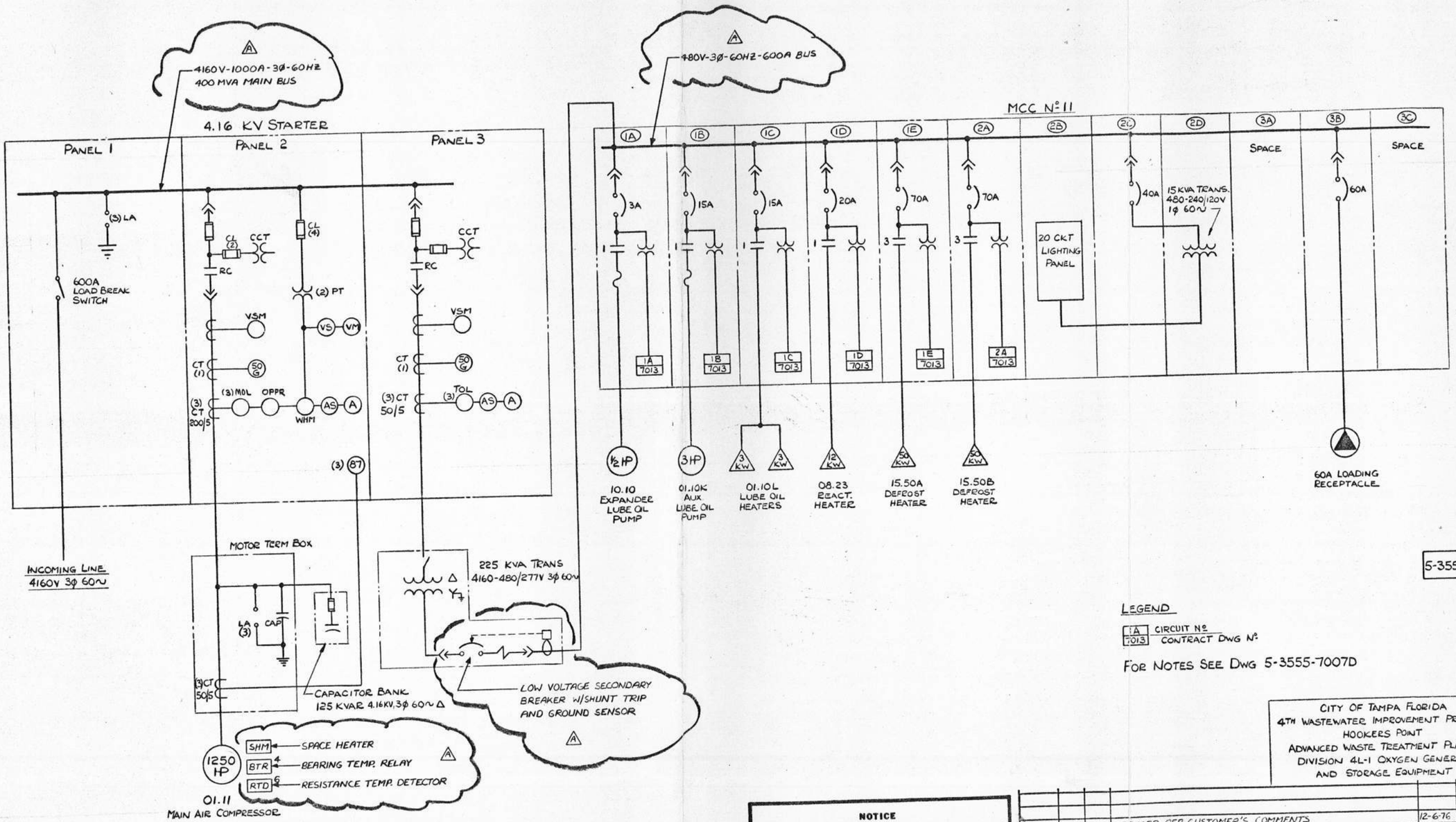
AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-7011 D

FORM NO. 8309-4 (REV. 6-76)

4L1_7011

MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE



5-3555-7012 | DWG. SIZE D | A

LEGEND

A	CIRCUIT Nº
7013	CONTRACT DWG Nº

FOR NOTES SEE DWG 5-3555-7007D

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION
AND STORAGE EQUIPMENT

NOTICE

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ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD
E-6246	A		REVISED PER CUSTOMER'S COMMENTS	12-6-76	D.J.H.		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	H. COY.	9-13-76
CHECKED	J. McCOY	9-27-76
ENGINEER	J. Goldberg	9-29-76
APP'D	J. Goldberg	9-29-76

TITLE
ELECTRICAL
SINGLE LINE DIAGRAM
PLANT Nº 2
(2) 60 T/D O2 GENERATORS
TAMPA, FLORIDA

SCALE ~ | WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-7012 D

FORM NO. 8509-4 (REV. 6-70)

4L1_7012

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE

01.11 MAIN AIR COMPRESSOR

LL1 CKT. 1&3-240VAC TEST POWER LL2 — B201 LSW CCT 4160V-240/120V B203 — F

120VAC TEST POWER — LL3 B20IN (NEUTRAL)

VSM LR — EMERG. MOL STOP B1 3 — (SWITCH VALVES) T3 T4 B2 — BYPASS ON-OFF B13

(RTD'S) CR14

10.10 (EXPANDER) (LSH-71) B3 28 UY-922 29 B4 — CR15 — PSL-114 LSH-30 B5 B6 B7 — (PSL-14, TSH-18, LSL-7) CR1 B18 — TSH-5 — TO ALARMS

B8 6 YSH-10 7 B9 STOP — BYPASS ON-OFF — START B11 B10 — PSL-16 B12 5 — CR 4 — CR — ETM

5 YSH-10 4 — TO ALARM

EXP. & LSH-71 BYPASS ON — SW. VALVE BYPASS ON — B20IN

RESET — 87-1 87-2 87-3 50G OPPR LR

RC TH 250W SP. HTR.

OPPR 115V 115V1 115V2 COM — MOTOR STOP G — MOTOR RUN R

RC RC — B14 — CR 12 — CR 13

CR15 — B477 B466 — TO SCANNER

SP (+) (-) — CR — RC RC RC

CR12 B15 — ON R

CR12 B16 — OFF G

LSL-7 17 TSH-18 18 15 PSL-14 16 B17 — B16A — CR 1 — TO ALARMS

CR12 — TO 01.10 LIGHT

CR12 — TO 01.10 LIGHT

CR12 — TO 01.11 MTR. SP. HTR.

CR12 — TO ALARM PT. 2-1

CR12 — TO SW. VALVES

CR12 B19 — SPARE — B20

CR1 — TO 01.10 S.D.

CR13 — TO 15.50A HTR.

CR13 — TO 15.50B HTR.

CR13 — TO AI-52

CR13 — TO CKT. 12

CR13 — SPARE

CR13 — SPARE

CR1 B489 — B490 — TO SCANNER

1A 10.10 EXPANDER

480-120V CPT WITH 100VA EXTRA CAPACITY — X2

B30 — PSL-907 — B34 — R1 W 2

LUBE OIL PUMP STOP START — ETM — M1 — OLS — B32 10 — B31 8 — PICK-UP — 2 — M1 — 3 — 5

SI-920

SPEED RESET — R2

R2 W — R3 W — R4 W — R5 W — R6 W — R7 W

TURBO EXPANDER STOP START — XV-921-VS — B33 — B34 — UY-922 — 22 23 — 24 — 25 — UY 923

DPY-904 — SSH 920 — YS 908 — PSL 914 — TISLH 923 — HI — LOW — DPY 904 — DPSL 904

1B 01.10K AUX. LUBE OIL PUMP

480V-120V CPT

SPRING RETURN FROM "OFF" TO "AUTO" POS.

OFF-AUTO-MAN B41 3 — M2 ETM — OLS X2 — B40 1 — 2 M2 B42 — B43 — ON R — B44 — PSL-16 11 12 — TO 01.11 COMP INTLK & B45 — OFF G — M2 7

M2 5 6 — TO ALARM PT 4-2

35 R1 36 37 R2 38 — TO ALARM PT 2-4 — TO ALARM PT 1-4

39 R3 40 41 R4 42 — TO ALARM PT 4-1 — TO ALARM PT 4-3

43 R5 44 — 45 R6 46 — TO ALARM PT. 3-4

47 R7 48 26 UY-922 29 — TO ALARM PT 4-4 — TO 01.11 COMPR INTLK

1C 01.10L LUBE OIL HEATER

480V-120V CPT

ON-OFF B50 B51 — TS-8 21 — TS-18 22 23 — B52 24 — ETM C1 X2 — ON R — B53

1D 08.23 REACTIVATION HEATER

480-120V CPT

MAN-OFF-AUTO — (TSH-82) CR6 — FISL-83 B62 B63 B64 — ETM C2 X2 — ON R — B65 — TIS-81 B60 B61

1E 15.50A DEFROST HEATER

480-120V CPT

MAN-OFF-AUTO — (TSH-31) CR10 — (01.10) CR13 — ETM C3 X2 — TIS-34 B70 B71 B72 B73 — ON R B74 — B75

2A 15.50B DEFROST HEATER

480-120V CPT

(TSH-32) CR11 — (01.10) CR13 — ETM C4 X2 — B80 B81 B82 B83 — ON R B84 — B85

LEGEND

- ■ - MAIN O_2 PLANT CONTROL PANEL
- □ - 01.11 COMPRESSOR MOTOR STARTER
- ⊠ - 01.10 COMPRESSOR TERMINAL BOX
- ⊘ - 10.10 EXPANDER CONTROL PANEL
- △ - MOTOR CONTROL CENTER
- ⊟ - INSTRUMENT CONTROL PANEL ICP-4
- ⊞ - 01.10 COMPRESSOR CONTROL PANEL

5-3555-7013 — DWG. SIZE D — A

FOR NOTES SEE DWG 5-3555-7007D

NOTICE

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CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD
E7430	A		"AS BUILT"	1-17-78	PJH		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± — DECIMAL ANGLES ± — HOLE LOCATION ± — HOLE SIZE ±

FIRST USED ON: 00-5-3555

		DATE
DRAFTSMAN		5-7-76
CHECKED	J. McCOY	9-27-76
ENGINEER		9-29-76
APPD		9-29-76

TITLE: ELECTRICAL SCHEMATIC WIRING DIAGRAM - PLANT #2 (2) 60 T/D O_2 GENERATORS TAMPA, FLORIDA

SCALE — WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-7013 D

FORM NO. 8109-4 (REV. 6-70)

4L1_7013

MATERIAL				
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS

NOTICE

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CKT. 1 & 3 - 240VAC
120VAC
15A
B201 LL1 01.11 COMP STRTR CKT. TEST POWER LL2 LL3 B203 B201N

CKT 2
120 VAC
20A
B367 SHLD B366 B365 TO CUSTOMER
OUTPUT
SCANNER TRANSMITTER
H N
B202 #2 MAIN O2 PLT CONTROL PNL B202N
B801
LY-71 H + (-) N
B356 B357 SHLD B358 TO CUSTOMER
FY-53-4 H + (-) N
B359 B360 SHLD B361 TO CUSTOMER
AY-52 H + (-) N
B362 B363 SHLD B364 TO CUSTOMER

CKT 4
120 VAC
15A
01.10 COMPRESSOR CONT. PNL
VIBR. MONITOR YSH-10
TO 01.11 COMPR.
TO ALARM PT. 3-1
B204 B204N

CKT 5
120 VAC
20A
B205 1220 SAMPLER VAPORIZER 2KW B205N

CKT 6
120 VAC
20A
B206 TS-918 33 34 10.10 EXPDR L.O. HTR 1.5 KW 33 B206N

CKT 7
120 VAC
15A
B207 (01.11) CR12 B207A 01.11 COMPR. MTR SP. HTR W B207N

CKT 8
120 VAC
20A
B208 RECEPTACLES B208N

CKT 9
120 VAC
20A
B209 LIGHTING COLD BOX B209N

CKT 10
120 VAC
15A
B210 B210N
1 AI-68-(N2) 2 3
AI-46-(HC)
TO ALARM PT. 3-7
1 AI-69-(N2) 2 3
AI-52-(O2)
TO ALARM PT. 4-7
BYPASS ON-OFF B210A RESET
(01.11) CR13 B210B CR7 B210E ER7 A
O2 PURITY BYPASS ON
A XV-71-1-VS
CR7 LSH-76 B210C B210D

CKT. 11
120 VAC
15A
B211 B211N
START TIMING RESET
KE-131 (0-120 HRS.)
A CLUTCH LX LY M
TO ALARM PT. 3-8
START TIMING RESET
KE-132 (0-120 HRS.)
A CLUTCH LX LY M
TO ALARM PT. 4-8
RECYCLE MODULE
KE-53
CLUTCH M
9 10 11 12 6 8 4 3 7 5
0-10 MIN AUTO RESET
B211A XV-53-2-VS

CKT 12
120 VAC
20A
B212 (01.11) CR13 B212A T5 OFF DELAY (0-180 SEC) B212N
T5 B212B
XV-133-VS
XV-135-VS
59 XV-53-1-VS 60
XV-53-3-VS
XV-71-2-VS
XV-76-2-VS
L.S. SHOWN WITH VALVE PV-33-2 CLOSED
ZSL-53 (LSH-94) B212C ER5
52 CR9 53 B212D XV-76-1-VS
PSH-76 B212J R IL-76
TSH-82 B212E ER6
TSH-31 B212F CR10
TSH-32 B212G CR11
CR-41 B212K CR14
CONT'D AT RIGHT
CONT'D AT RIGHT

CR5 CR5 TO ALARM PT. 1-7
CR5 B350 B351 TO CUSTOMER
CR6 CR6 TO ALARM PT. 4-9
CR6 TO 08.23
CR10 CR11 TO 15.50A TO 15.50B
CR10 CR11 TO ALARM PT. 3-9
CR14 CR14 TO ALARM PT. 5-9
CR14 TO 01.10 S.D.

CKT 13
120 VAC
SWITCH VALVE CONTROL
SHOWN WITH VALVES KV-35 & KV-38 OPEN AND KV-36 & KV-37 CLOSED
15A
B213 CR12 (01.11) T1 OFF DELAY 0-180 SEC B213N
B213J ON-OFF T1
B213B ADVANCE
RECYCLE MODULE
(INSTANT) TIMER CLUTCH
(DELAY) T2
B213K CR2
6 8 4 3 7 5 SET FOR 3 SEC T3
CR2 CR3
XV-35-VSB OPEN
B213C XV-38-VSB OPEN
T1 B213D XV-37-VSA CLOSE
XV-36-VSA CLOSE
CR2 CR4 T4
XV-37-VSB OPEN
B213E XV-36-VSB OPEN
T1 B213F XV-35-VSA CLOSE
XV-38-VSA CLOSE
KV-35 OPEN KV-36 CLOSE KV-37 CLOSE KV-38 OPEN B213G CR3 T1-1-6
B213H CR4 T1-1-7
KV-35 CLOSE KV-36 OPEN KV-37 OPEN KV-38 CLOSE

T3 T4 TO 01.11 COMPR. CKT.
T3 T4 TO ALARM PT. 1-6

CKT 14
120 VAC
20A
B214 B214N
LOX STORAGE AREA
ZSL-108 IL-108
L.S. SHOWN WITH VALVE PV-108 CLOSED
LSH-94
PY-93 H + (-) N
76 B397 B396 B398 SHLD TO CUSTOMER
LY-94 H + (-) N
72 B391 B390 B392 SHLD TO CUSTOMER
PY-108 H + (-) N
74 B394 B393 B395 SHLD TO CUSTOMER
PSL-108 31 C OC 30

CR8 44 B509 45 B510 TO SCANNER
CR8 48 B354 49 B355 TO CUSTOMER
CR9 50 B738 A212 51 B739 A213 XV-76-1-VS (PLANT 1)
CR9 52 B212 53 B212D XV-76-1-VS (PLANT 2)
CR17 54 B793 55 B794 TO SCANNER
CR17 56 B795 57 B796

CKT 15
120 VAC
15A
B215 MCC #11 HTR & THERMOSTAT L1 N B215N

CKT 16
120 VAC
15A
B216 MCC #11 SW & LIGHT L2 N1 B216N

CONT'D AT LEFT
B212 LSH-71 B465 ER15 B212N
TO ALARM PT. 2-8
CR-42 CR 42
8 FISL-1 9 RESET CR 40
TO ALARM PT. 2-3
CR-40 CR-40 XV-1-VS B212H

CR15 0.10 S.D.
CR15 TO EXPANDER BY-PASS
CR16 RTD ALARM PT 5-9
CR16 B463 B464 TO SCANNER

FOR NOTES SEE DWG 5-3555-7007D

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD
E7430	A		"AS-BUILT"	1-17-78	DJH		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION * DECIMAL * ANGLES *
HOLE LOCATION * HOLE SIZE *
FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN		5-10-76
CHECKED	J. McCOY	9-27-76
ENGINEER		9-27-76
APPRD		9-29-76

TITLE: ELECTRICAL SCHEMATIC WIRING DIAGRAM-PLANT #2 (2) 60 T/D O_2 GENERATORS TAMPA, FLORIDA

SCALE WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-7014 D

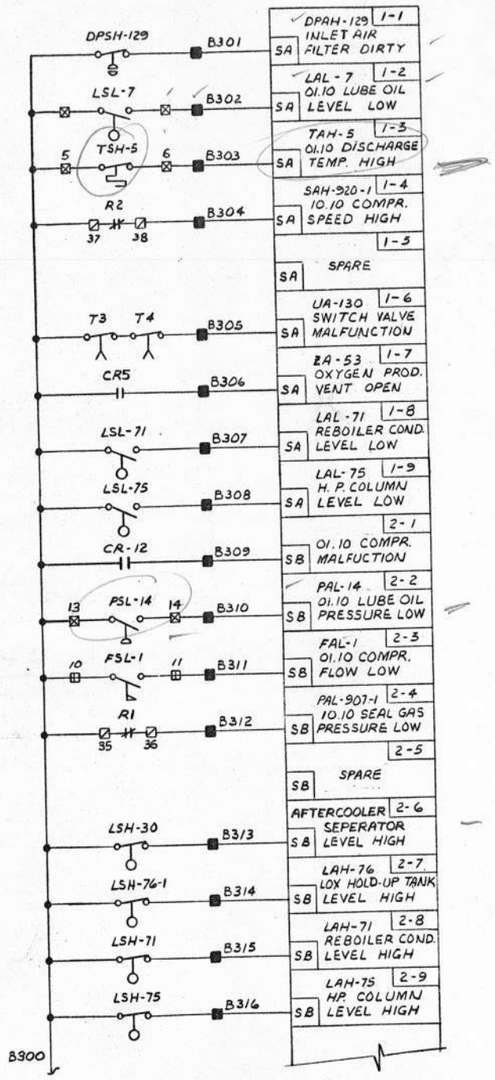
5-3555-7014 DWG. SIZE D A

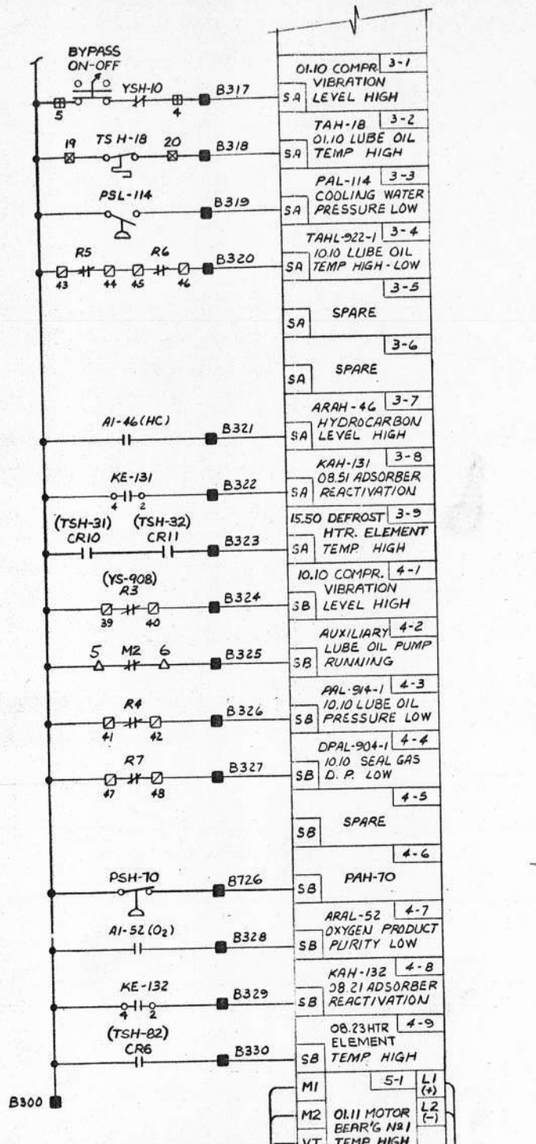
FORM NO. 8309-4 (REV. 6-74)

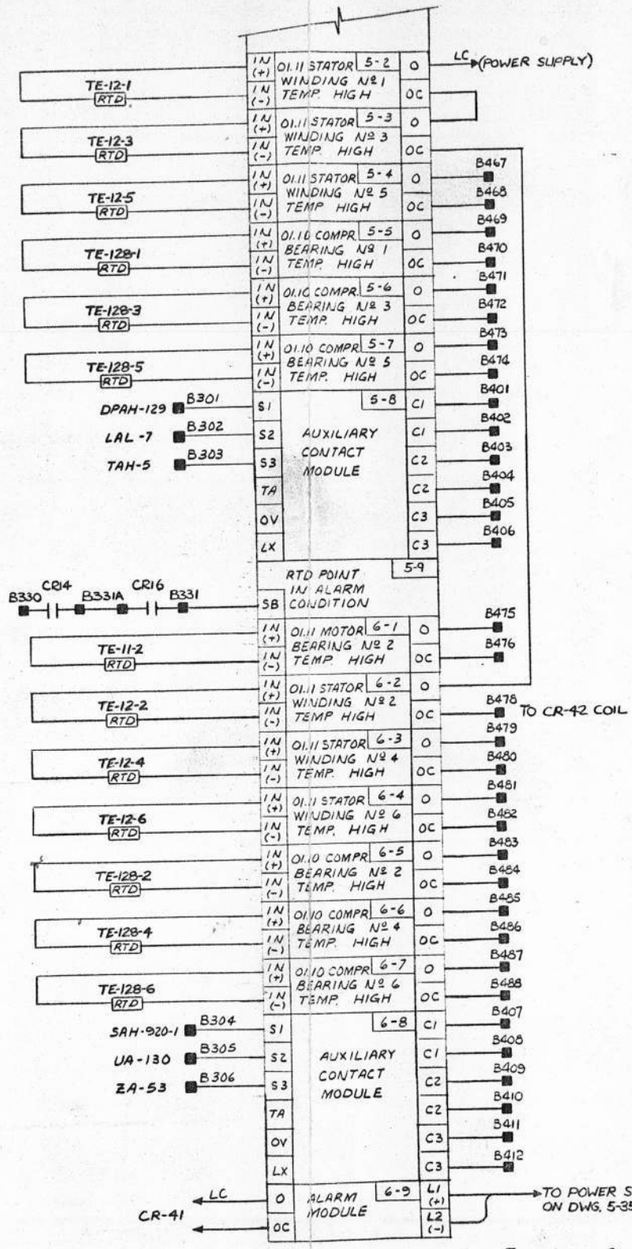
4L1_7014

ALARM & RTD MONITORING UNITS

PART NO.	MATERIAL: MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE







5-3555-7015 DWG SIZE D A

TO MAIN BUS TERMINALS ON DWG. 5-3555-7016D
TO HORN RELAY ON DWG. 5-3555-7016D
LC 5V 0V LN F1 F2 FR LX FX SX R T A Z MAIN BUS TERMINALS
TO FLASHER ON DWG. 5-3555-7016D
TO POWER SUPPLY ON DWG. 5-3555-7016D
TO PUSHBUTTONS ON DWG. 5-3555-7016D

NOTICE
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ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E7430	A		"AS-BUILT"	1-17-78	DJH		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± DECIMAL ± ANGLES ± HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	R.A. HEBEL	6-15-76
CHECKED	J. McCOY	9-27-76
ENGINEER		9-29-76
APP'D		9-29-76

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

TITLE: ELECTRICAL SCHEMATIC WIRING DIAGRAM - PLANT #2 (2) 60 T/D O_2 GENERATORS TAMPA-FLORIDA

SCALE 7/8 WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

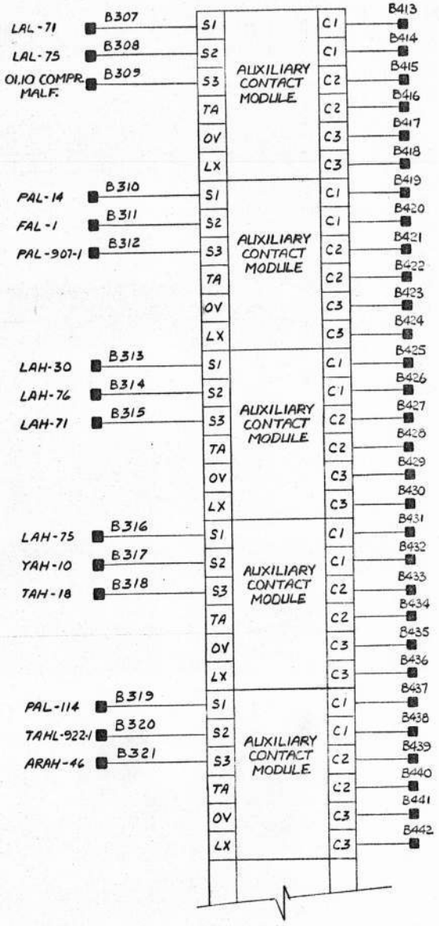
5-3555-7015 D

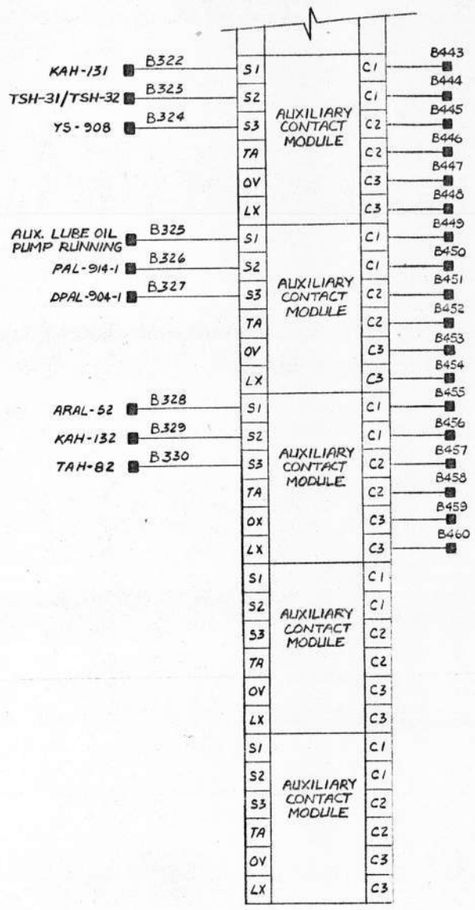
FORM NO. 8309-4 (REV. 6-76)

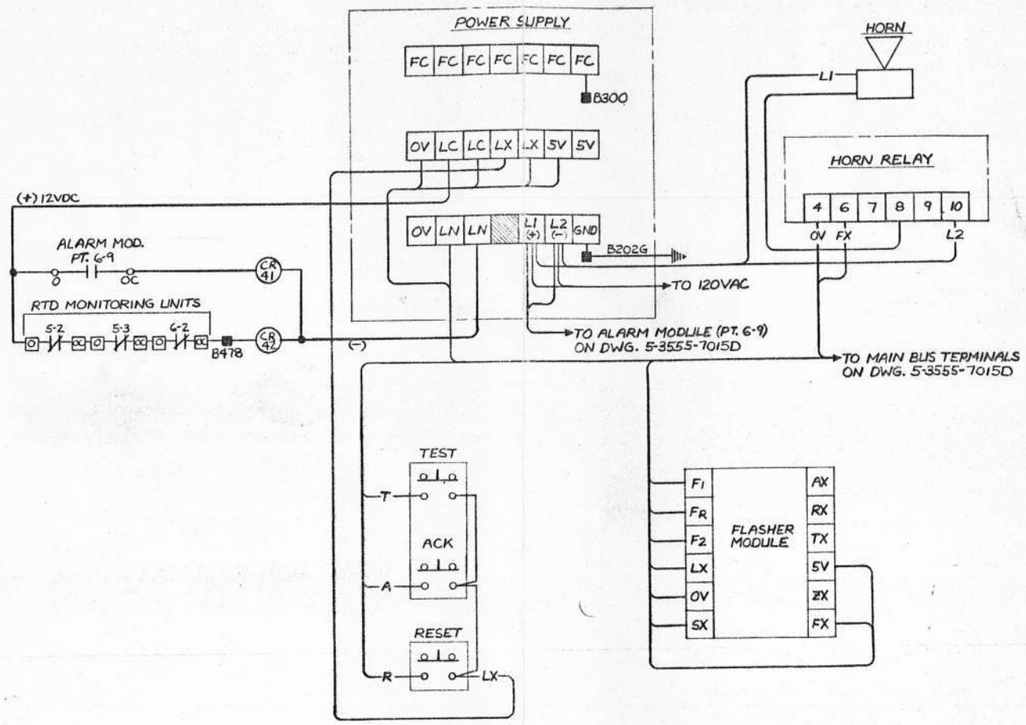
4L1_7015

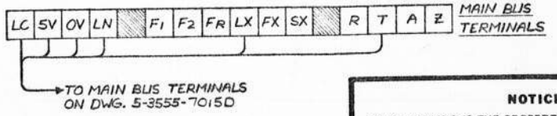
MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

CONTACT FOLLOWER UNITS









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CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 41 OXYGEN GENERATION AND STORAGE EQUIPMENT

5-3555-7016 D A

FOR NOTES SEE DWG 5-3555-7007D

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E7430	A		"AS-BUILT"	1-17-78	DJH		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION DECIMAL ANGLES; HOLE LOCATION HOLE SIZE; FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	R.A. HEBEL	6-16-76
CHECKED	J. McCOY	9-27-76
ENGINEER		9-29-76
APP'D		9-29-76

TITLE: ELECTRICAL SCHEMATIC WIRING DIAGRAM - PLANT #2 (2) 60 T/D O_2 GENERATORS TAMPA - FLORIDA

SCALE 7/2 WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-7016 D

FORM NO. 83079-4 (REV. 6-74)

4L1_7016

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE

01.10 COMPR. PANEL | ANALYZER | ANALYZER | MAIN CONTROL PANEL — SCANNER

PULL BOX N°6 24"Hx12x12 — (3) 3/4"C.

2"C. — TERM. BOX — 2"C.

VALVE SKID

06.50 SILENCER

PULL BOX N°4 18"x12x6" — XV 76-2 VS EL. 17'-6" — XV 135 VS EL. 16'-0"

COLD BOX T/C PULL BOX EL. 14'-0

TOGGLE SWITCH - 1 POLE 120-277V 20A SPEC. GRADE HUBBELL CAT. N° 1221 (OR EQUAL) MTD IN FS BOX

ZSL 53 EL. 30'-0" — XV 53-3 VS

TIS 81 — TSH 82 EL. 13'-6"

08.23 HTRS PULL BOX

PULL BOX N°5 18"x12x6" — RUN UNDER PLATFORM T.O.G. EL. 27'-1"

COLD BOX

XV 71-1 VS EL. 30'-0" — PSH 76 EL. 25'-0" — XV 76-1 VS EL. 25'-0"

XV 921 VS EL. 15'-6"

12.20 SAMPLE VAPORIZER EL. 32'-0"

EL. 30'-0" XV 133 VS

CONTROL PANEL — RELAY BOX — 10.10 EXPANDER LUBE OIL PUMP

MOUNT & WIRE DUPLEX RECEPT 125V 20A 2P 3WIRE GROUNDING HUBBELL CAT. N° 5362 (OR EQUAL) MTD IN F.S. BOX SPEC. GRADE W/SPRING DOOR COVER CROUSE-HINDS "DS706-51

PULL BOX N°3 18"x12x6" — XV 71-2 VS EL. 12'-6"

10.10 EXPANDER

(2) CROUSE-HINDS CAT. N° VDC22GP INCANDESCENT LIGHTING FIXTURE VAPORTIGHT-ENCLOSED-GASKETED WITH GLOBE & GUARD-150W LAMP PENDANT TYPE-3/4" HUB SIZE — STD L302A

FISL 83 (MOUNTED ON INSTRUMENT RACK)

17.60 DISPOSAL VAPS

01.10D — 01.10 COMPRESSOR — MOTOR 01.11 — 01.10B — 01.12 FILTER — 01.13 — 01.14 SEPARATOR — 01.17 SILENCER

RTD TERM BOX — TERM BOX N°1 — TERM BOX N°2

SPACE HTR PULL BOX — PULL BOX N°1 18"x12x6" — PULL BOX N°2 18"x12x6"

PROXIMITORS — CAPACITOR BANK — STD G307 — MOTOR TERM. BOX

DPSH 129 EL. 17'-0" — PSL 114 EL. 18'-6" — XV-1 VS EL. 22'-0" — LSH 30 EL. 18'-0"

EXTEND EXISTING CONDUITS UP TO MOTOR TERM. BOX

FOR NOTES SEE DWG 5-3555-7007D

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

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ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD
E-6951	A		SEE ECN	4-29-77	D.J.H.		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± — DECIMAL ± — ANGLES ± — HOLE LOCATION ± — HOLE SIZE ±

FIRST USED ON: 00-5-3555

		DATE
H. COY — DRAFTSMAN		9-9-76
J. McCOY — CHECKED		9-27-76
ENGINEER		9-29-76
APPR'D		9-29-76

TITLE: ELECTRICAL PLAN PLANT N°2 (2) 60 T/D O2 GENERATORS TAMPA, FLORIDA

SCALE — WT.

FORM NO. 8009-4 (REV. 6-74)

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

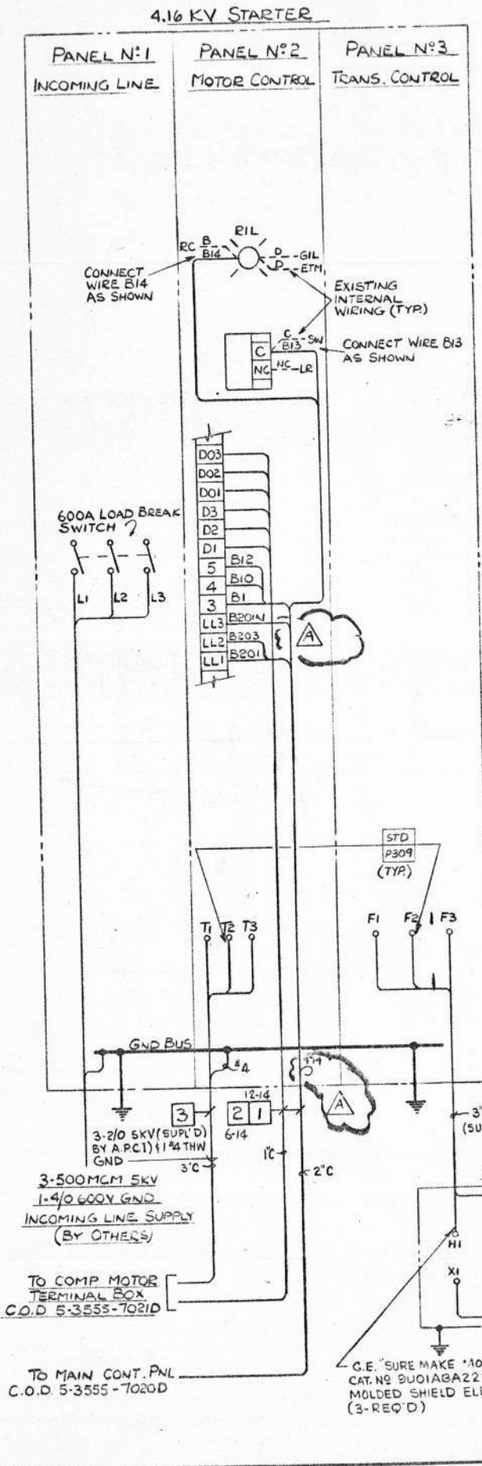
5-3555-7017 D

4L1_7017

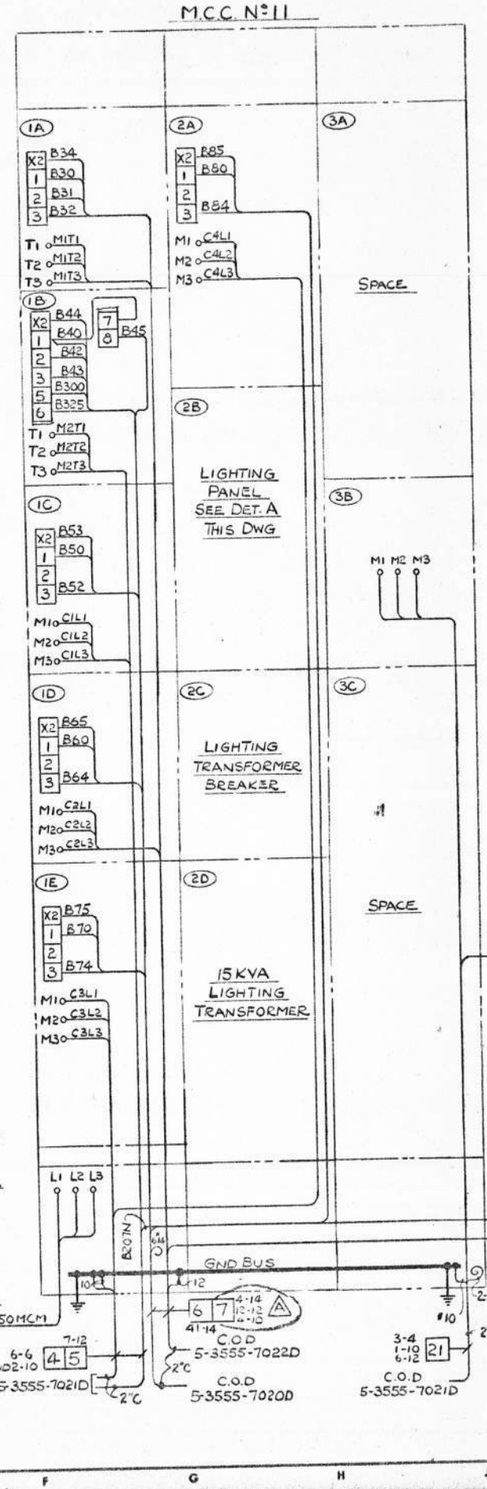
MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

4.16 KV STARTER

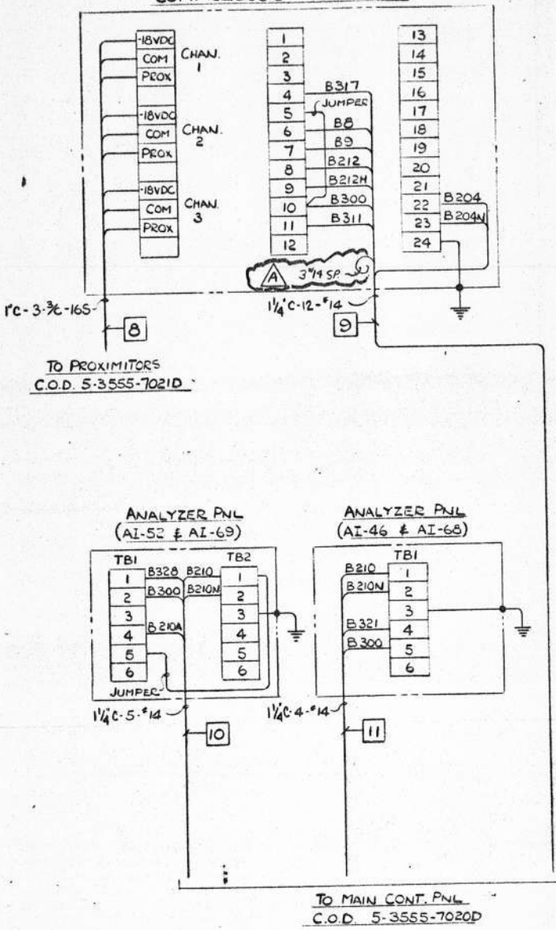
PANEL N°1 INCOMING LINE | PANEL N°2 MOTOR CONTROL | PANEL N°3 TRANS. CONTROL



M.C.C. N°11



COMPRESSOR CONT. PNL

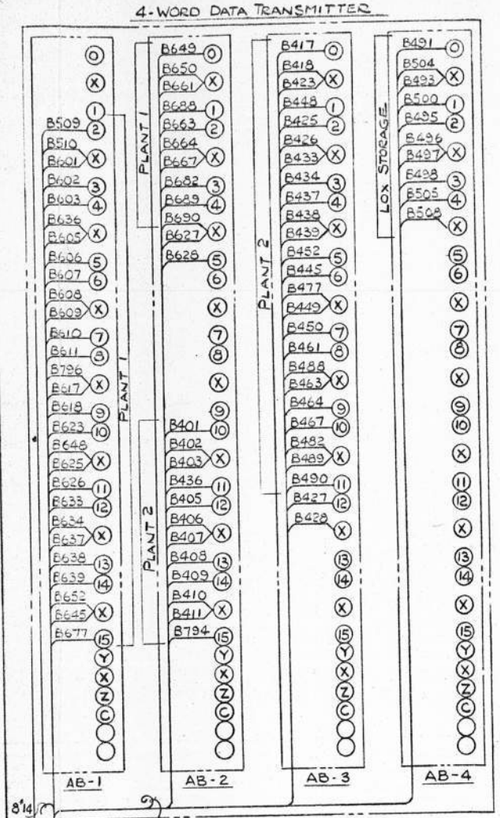


ANALYZER PNL (AI-52 & AI-69)

ANALYZER PNL (AI-46 & AI-68)

TO MAIN CONT. PNL C.O.D 5-3555-7020D

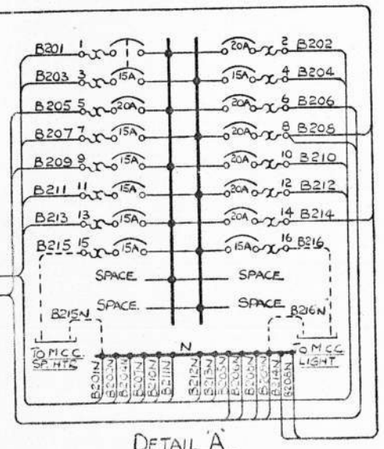
4-WORD DATA TRANSMITTER



TO MAIN CONT. PNL C.O.D 5-3555-7020D

DETAIL 'A'

LIGHTING PANEL-COMPT. 2B
CONTRACTOR TO ADD BREAKERS 15 #16 & CHANGE BREAKER RATINGS AS SHOWN



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FOR NOTES SEE DWG 5-3555-7007D

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

5-3555-7019 | DWG SIZE D | A

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E6851	A		SEE ECN	4-22-77	H.COY	D.J.H.	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± | DECIMAL ± | ANGLES ± | HOLE LOCATION ± | HOLE SIZE ±

FIRST USED ON: 00-5-3555

		DATE
DRAFTSMAN	H. COY.	3-10-76
CHECKED	J. McCOY	9-29-76
ENGINEER		
APPD		9-29-76

TITLE: ELECTRICAL INTERCONNECTION DIAGRAM - PLANT N°2 (2) 60 T/D O2 GENERATORS TAMPA FLORIDA

SCALE | WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-7019 D

FORM NO. 5509-4 (REV. 6-74)

4L1_7019

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE

ETD ALARM POINTS

5-1 MI M2 VT VE IN IN — TE-11-1
5-2 MI M2 VT VE IN IN — TE-12-1
5-3 MI M2 VT VE IN IN — TE-12-3
5-4 MI M2 VT VE IN IN — TE-12-5
5-5 MI M2 VT VE IN IN — TE-128-1
5-6 MI M2 VT VE IN IN — TE-128-3
5-7 MI M2 VT VE IN IN — TE-128-5
6-1 MI M2 VT VE IN IN — TE-11-2
6-2 MI M2 VT VE IN IN — TE-12-2
6-3 MI M2 VT VE IN IN — TE-12-4
6-4 MI M2 VT VE IN IN — TE-12-6
6-5 MI M2 VT VE IN IN — TE-128-2
6-6 MI M2 VT VE IN IN — TE-128-4
6-7 MI M2 VT VE IN IN — TE-128-6

TI-42-1S - 2ND TERMINAL BOARD

TI-42-13 (-) GND S1 S12
TI-42-14 (-) GND S2 S11
TI-42-15 (-) GND S3 S10
TI-42-22 (-) GND
+ (-) GND H1 L0
TI-42-16 (-) GND S4 S9
TI-42-17 (-) GND S5 S8
TI-42-20 (-) GND S6 S7
TI-42-19 (-) GND S7 S6

TI-42-1I GND (-) +

TI-42-1S - 1ST TERMINAL BOARD

TI-42-6 (-) GND S6 S1
TI-42-5 (-) GND S5 S2
TI-42-4 (-) GND S4 S3
TI-42-7 (-) GND S7 S12
TI-42-8 (-) GND S8 S11
TI-42-9 (-) GND S9 S10
+ (-) GND H1 L0
TI-42-3 (-) GND S3 S10
TI-42-2 (-) GND S2 S11
TI-42-21 (-) GND S1 S12

2 PR. SPARE

4-14 — 18 — 32-14 — C.O.D. 5-3555-7021D
C.O.D. 5-3555-7022D
21 PR. T/C EXTENSION WIRE TYPE 'TX'
8-14 — 17 — C.O.D. 5-3555-7019D
6-14 — 16 — 30-14 22-14 — 86-14 33-14&16S C.O.D. 5-3555-7009D
12-14 4-14 5-14 — 9 11 10 — 34-14 — 3/C #16 — C.O.D. 5-3555-7025D
C.O.D. 5-3555-7019D
2-14 — 4-14 — 3/14 — 14 15 — 2/14 12/14 — C.O.D. 5-3555-7019D
REMOTE SIGNALS TO CUSTOMER — 4/14 — 6 11 — 4/14 — 6-14 — 3/14 — 12 13 — 8/14 14C — 3*14 — 3*14 30 — C.O.D. 5-3555-7021D — C.O.D. 5-3555-7022D — C.O.D. 5-3555-7021D

5-3555-7020 D B

MAIN CONTROL PANEL

FOR NOTES SEE DWG 5-3555-7007D

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CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION
AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E7430	B		"AS-BUILT"	1-24-78	DJH		
E6951	A		SEE ECN	4-22-77	H.COY	D.J.H.	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± — DECIMAL ± — ANGLES ±
HOLE LOCATION ± — HOLE SIZE ±

FIRST USED ON 00-5-3555

	DRAFTSMAN	DATE
	H. COY	9-10-76
	CHECKED	
	J. McCOY	9-27-76
	ENGINEER	
		9-29-76
	APP'D	
		9-29-76

TITLE
ELECTRICAL INTERCONNECTION DIAGRAM - PLANT N°2
(2) 60 T/D O2 GENERATORS
TAMPA, FLORIDA

SCALE — WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-7020 D

FORM 80. 8501-4 (REV. 6-70)

4L1_7020

PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE
					MATERIAL

TO MAIN CONTROL PNL
C.O.D 5-3555-7020D

TO COMP. CONT. PNL
C.O.D. 5-3555-7019D

1"C-3-3/C-16 SHLD

3/4"C

3/C-16 SHLD

DO NOT GND SHLD (TYP.)

PROXIMITOR

N°1 N°2 N°3

PROBE (TYP.)

VSH-1 VSH-2 VSH-3

TO LOX STORAGE AREA
C.O.D. 5-3555-7025D

3"C-3#4-1#10 & 6#12

PULL BOX N°6

2"C-3#4,1#10 & 6#12

TO MCC N°11
C.O.D 5-3555-7019D

32-14

2"C

4-14

RTD TERMINAL BOX

TE-12-1 TE-12-2 TE-12-3 TE-12-4 TE-12-5 TE-12-6 TE-11-1 TE-11-2

TE-128-1 TE-128-2 TE-128-3 TE-128-4 TE-128-5 TE-128-6

TDIC TD2C TD3C TD4C TD5C TD6C BTD-1C

RTD1R RTD2R RTD3R RTD4R RTD5R RTD6R

28-14

2"C

4"#14

B300

PULL BOX N°1

3/4"C-9#14

1"C-16#14

3/4"C-2#12

COMP MOTOR SP. HTR. TERM. BOX

B207A SH1 SH2 B207N TERM. LUGS

PULL BOX N°2

1"C-7#12

B207A

B300 B18A

3/4"C-4#14

(LSL-7) STEEL B302 B300 BRASS

STEEL B18A B13 BRASS

COMP MOTOR TERM. BOX N°1

B300 B303 B18 B8 B11 B12 B42 B43 B300 B310 B17

JUMPER 17 18 19 20

B18A B300 B318 M2T1 M2T2 M2T3 L1 L2 L3

B51 21 22 23 24

B52 CIL1 CIL2 CIL3 CIL1 CIL2 CIL3 H1 H2 H3 H4 H5 H6

COMP MOTOR TERM. BOX N°2

18-14

2"C-7#12

TO MCC N°11
C.O.D 5-3555-7019D

5 4 6-6 2-10 GND 2"C

B212 B212F B73 B71 B83 B81 B212G B213B B213N B213C B213D

B213E B213F B213G B213H

C3L3 C3L2 C3L1 GND C4L3 C4L2 C4L1 GND

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33

JUMPER

AUXILIARY SKID TERMINAL BOX

COMP MOTOR TERM. BOX

CAPACITOR

LIGHTNING ARRESTER

#4-5KV CABLE

STD P309 (TYP)

BUS BAR POWER

BUS BAR MOTOR NEUT.

CURRENT TRANS.

CAPACITOR BANK

FUSE UNIT BUSHING

2"C

3-#4, 5KV (SUPPLIED BY APCI)

D1 D2 D3 DO1 DO2 DO3

T1 T2 T3 T4 T5 T6

COMP. MOTOR 01.11

#4

3"C-3-2/0 KV (SUPL'D BY APCI) & 1#4 THW GND

3 6-14 2 1"C

TO 4KV MOTOR STARTER
C.O.D 5-3555-7019D

3/4"C-2#14 B300 3/4"C-7#14 B6 B300 3/4"C-4#14

3/4"C-6#14

3/4"C-4#14 3/4"C-2#14

DPSH-129 B300 B301

PSL-114 B300 B319 B5 B6

XV-1-VS B212H B212N

LSH-30 B300 B313 B6 B7

5-3555-7021 DWG. SIZE D A

FOR NOTES SEE DWG 5-3555-7007D

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION
AND STORAGE EQUIPMENT

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ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E6951	A		SEE ECN	4-22-77	D.J.H	H.C.	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION * DECIMAL * ANGLES *
HOLE LOCATION * HOLE SIZE *

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	H.COY.	9-10-76
CHECKED	J. McCOY	9-27-76
ENGINEER		9-29-76
APP'D		9-29-76

TITLE
ELECTRICAL INTERCONNECTION DIAGRAM - PLANT N°2
(2) 60 TPD O2 GENERATORS
TAMPA FLORIDA

SCALE ~ WT.

FORM NO. 8309-4 (REV. 6-74)

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-7021 D

4L1_7021

COLD BOX - POWER & CONTROL WIRING

TO MAIN CONTROL PNL
C.O.D. 5-3555-7020D

2°C - 19#14 — 13 — 3 SP. — PULL BOX Nº4 — B212N

XV-76-2-VS — B212A — B212N

2°C — 17

T1-42-1 -2 -3 -6 -7 -8 -9
T1-42-10 -11 -12 -13 -14 -15 -16
T1-42-17 -18 -19 -20 -22 SPACE
THERMOCOUPLE TERMINAL BOX

(2)PR. SPARE

1°C-13#14 — 1°C-11#14 — TIS-81 — B61 — B62

GUAT — 212A 212N — 1°C-10#14 — TSH-82 — B212 — B212E

GUAT — 212A 212N — 212N, B212

1°C 13#14 — 3/4"C-4#14

XV-133-VS — B212B — B212N — 2#14

XV-135-VS — B212A — B212N

XV-921-VS — B33 — B34

ZSL-53 — B212 — B212G

XV-53-3-VS — B212A — B212N — 2#14

3/4"C-4#14

8#14

FISL-83 — B63 — B64

6#14

XV-71-1-VS — B210D — B210N — 2#14

PSH-76 — B212 — B212J

XV-76-1-VS — B212D — B212N

Q8.23 REACTIVATION HEATER — L1 C2L1, L2 C2L2, L3 C2L3, GND — 4#10

3/4"C — 2#12 B209 B209N — TO COLD BOX PLATFORM LIGHTING

PULL BOX N°5 — 7 — TO M.C.C. N°11 C.O.D 5-3555-7019D

20-4#10-12#12 & 4#14 Ⓐ

3/4"C. 10-#12 & 4#14 Ⓐ

L1 B205, L2 B206N — 2#12 — SAMPLE VAPORIZER 12.20

Ⓐ 3/4"C. 8#12 & 4#14

MIT1 MIT2 MIT3 GND 4#12 — ½HP — EXPANDER LUBE OIL PUMP

B208 B208N 2#12 — RECEPTACLE

EXPANDER - POWER & CONTROL WIRING

TO MAIN CONTROL PNL
C.O.D. 5-3555-7020D

2C. 16-14 — 15 — XV-71-2-VS — B212A — B212N — 3#14 — PULL BOX Nº3 — 3/4"C. 2-14

1°C-7#14

CONTROL PNL — 4#14, 1°C

1	B30		21
2	JUMPER		22
3	B34		23
4		B33	24
5			25
6			26
7	B31	B3	27
8		B4	28
9			29
10	B32		30
11			31
12		B206	32
13		B206N	33
14		#12 Ⓐ	34
15			11A
16			
17			
18			
19			
20			

RELAY BOX

3		B324	40
7		B309	41
11		B326	42
12			43
13			44
14		B320	45
15			46
26		B327	47
35	B312		48
36			11A
37	B304		17
38			49
39	JUMPER		50

¾"C - 2/C SH'D TURN. BY ARC — LEAD FURNISED WITH PICKUP — GUAB — PICKUP

TACHOMETER - SSH-920 (PARTIAL) — SIGNAL

¾"C.-4-14 & 2-12 Ⓐ

FOR NOTES SEE DWG 5-3555-7007D

MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

NOTICE

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5-3555-7022 — DWG. SIZE D — B

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION
AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E7430			"AS-BUILT"	1-17-78	DJH		
E6951	A		SEE ECN	4-22-77	H.Coy.	D.J.H	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	H. COY.	9-10-76
CHECKED	J. McCOY	9-27-76
ENGINEER		9-29-76
APPD		9-29-76

TITLE: ELECTRICAL INTERCONNECTION DIAGRAM - PLANT Nº2 (2) 60 T/D O2 GENERATORS TAMPA FLORIDA

SCALE — WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

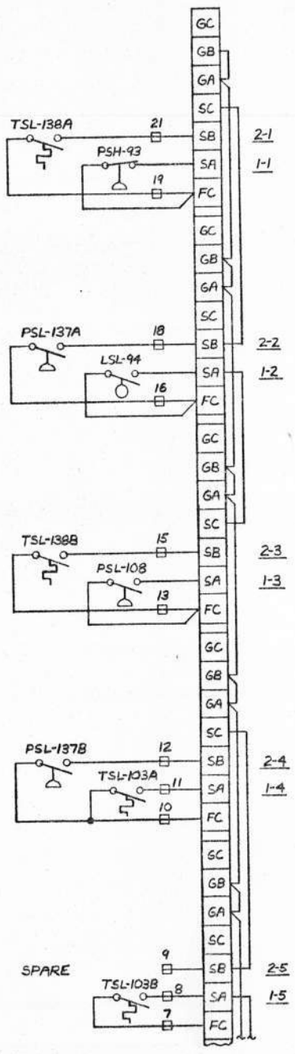
5-3555-7022 D

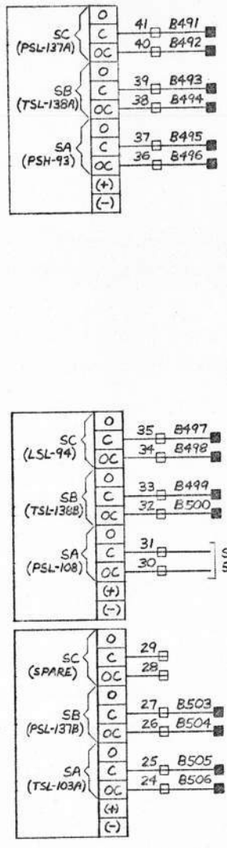
FORM NO. 8309-4 (REV. 6-70)

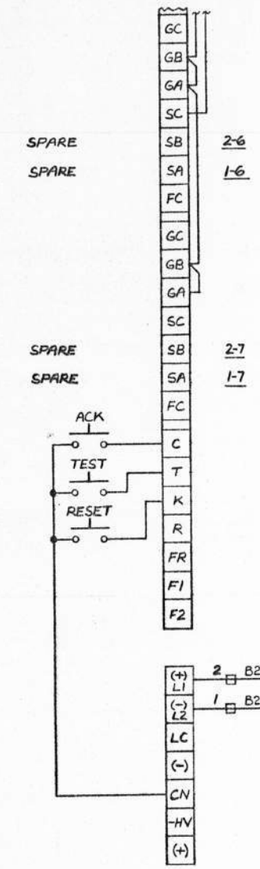
4L1_7022

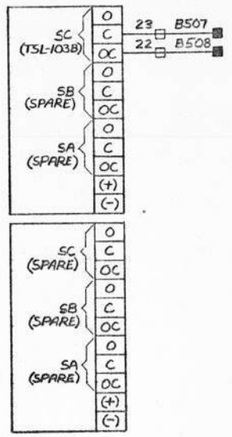
MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

ALARM UNITS









5-3555-7023 DWG SIZE D

NOTICE

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CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION
AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION DECIMAL ANGLES
HOLE LOCATION HOLE SIZE
FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	D.J. HUTH	7-8-76
CHECKED	J. McCOY	9-27-76
ENGINEER		9-29-76
APP'D		9-29-76

TITLE: ELECTRICAL SCHEM. WIRING DIAG. LOX STORAGE AREA (2) 60 T/D O_2 GENERATORS TAMPA, FLORIDA

SCALE WT.

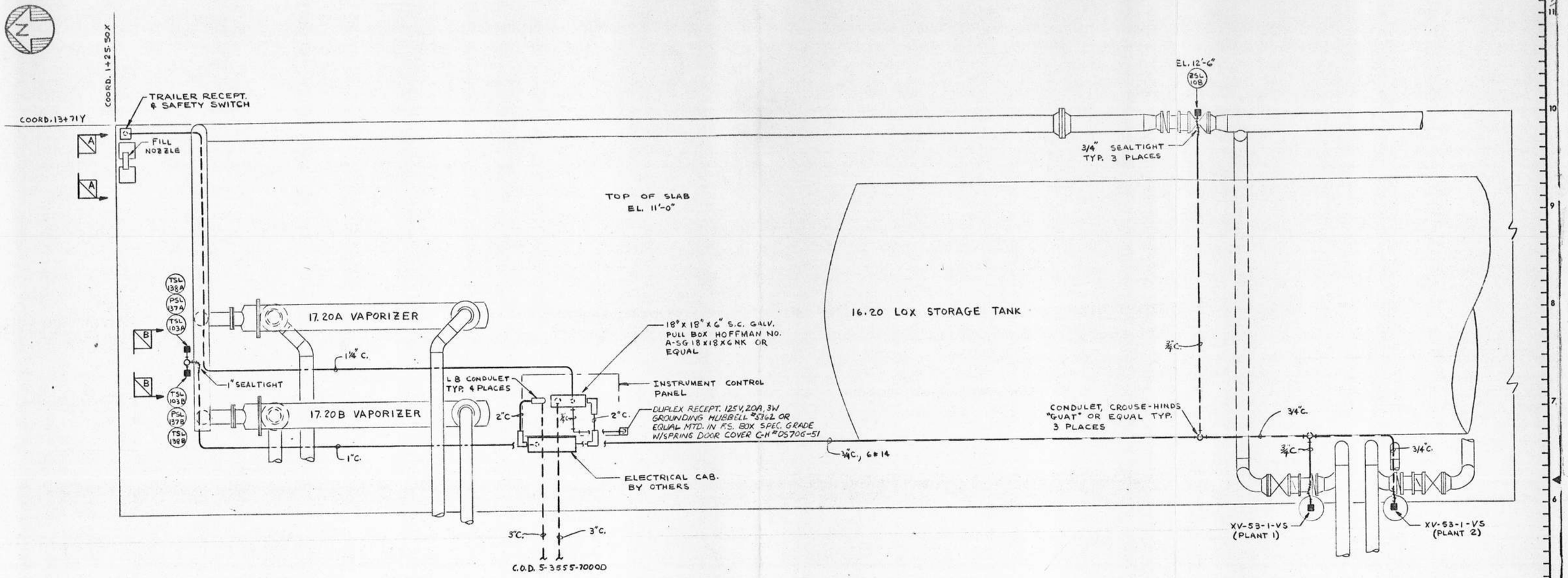
AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-7023 D

FORM NO. 8509-4 (REV. 6-74)

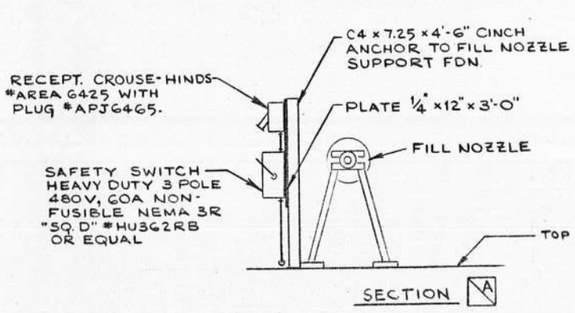
4L1_7023

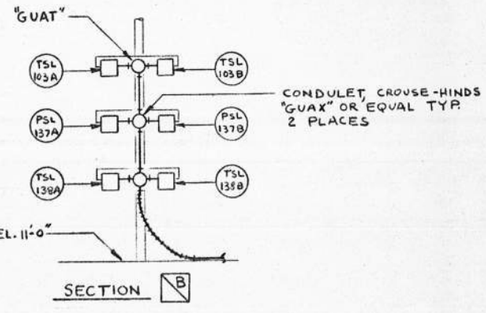
MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE



NOTES:

1. FOR WIRING DIAGRAM REFER TO DWG. 5-3555-7023D





ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD
E7430	A		"AS-BUILT"	1-24-78	DJH		

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	M. MILES	7-12-76
CHECKED	J. McCOY	9-27-76
ENGINEER		1-28-16
APPR'D		1-29-16

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM

HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

TITLE: ELECTRICAL PLAN LOX STORAGE AREA

(2) 60 T/D O_2 GENERATORS TAMPA FLORIDA

SCALE 1/2"=1'-0" WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-7024 D

FORM NO. 8309-4 (REV. 6-70)

5-3555-7024 | DWG SIZE D | A

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4L1_7024

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE

60 A. TRAILER RECEPTACLE

1¼"C. 3#4 & 1#10

60 A. NON-FUSED SAFETY SWITCH

1¼"C., 3#4 & 1#10

RECEPT.

¾"C-2"#12

B208, B208N

PULL BOX

2#12 SPARE

4#12 SPARE

3"C., 3#4, 1#10 & 6#12

20

TO PULL BOX N° 6
C.O.D. 5-3555-7021D

19

TO MAIN INST. PNL - PLANT 2
C.O.D. 5-3555-7020D

3"C

2"C., 6#12

2"C.
36#14 & 3-¾C-16S

XV-53-1-VS (PLANT-2)

59 60

3/4"C., 2#14

XV-53-1-VS (PLANT-1)

61 62

3/4"C., 2#14

"GUAT"

3/4"C., 4#14

ZSL-108

1 3

3/4"C., 2#14

3/4"C., 6#14

TSL-103A

10 11

3/4"C., 2#14

"GUAT"

TSL-103B

7 8

3/4"C., 2#14

3/4"C., 4#14

PSL-137A

16 18

3/4"C., 2#14

10

"GUAX"

3/4"C., 7#14

PSL-137B

10 12

3/4"C., 2#14

TSL-138A

19 21

¾"C-2"#14

TSL-138B

13 15

¾"C-2"#14

1"C, 11#14

ELECTRICAL CABINET (BY OTHERS) ICP-4

1,2

4#12 SPARE

B214

B214N

B508

1 1 2 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

23 B507
24 B506
25 B505
26 B504
27 B503
28
29
30 1
31 B500
32 B499
33 B498
34

35 B497
36 B496
37 B495
38 B494
39 B493
40 B492
41 B491
42
43
44 B509
45 B510
46

47 B354
48 B355
49 B738
50 B739
51 B212
52 B212D
53 B793
54 B794
55 B795
56 B796
57
58

59 B212A
60 B212N
61 B740
62 B741
63
64
65
66
67
68
69
70

4#14 SPARE

B390 71
B391 72
SHD
B393 73
B394 74
SHD
B396 75
B397 76
SHD

30 (55/17) 2
54 55
56 57

CONTRACTOR TO ADD:
(1) CUTLER-HAMMER CAT. N° D26MR20A
RELAY 2 N.O. CONTACTS - 120V 60~ COIL

NOTES:
1. FOR ELECTRICAL PLAN REFER TO DWG 5-3555-7016 D

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5-3555-7025 DWG. SIZE D 0

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D/APPD

CITY OF TAMPA FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM

HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION
AND STORAGE EQUIPMENT

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

M. MILES DRAFTSMAN 7-13-76
J. McCOY CHECKED 9-29-76
ENGINEER
APP'D

TITLE ELECTRICAL WIRING DIAGRAM LOX STORAGE AREA

(2) 60 T/D O2 GENERATORS
TAMPA FLORIDA

SCALE WT.

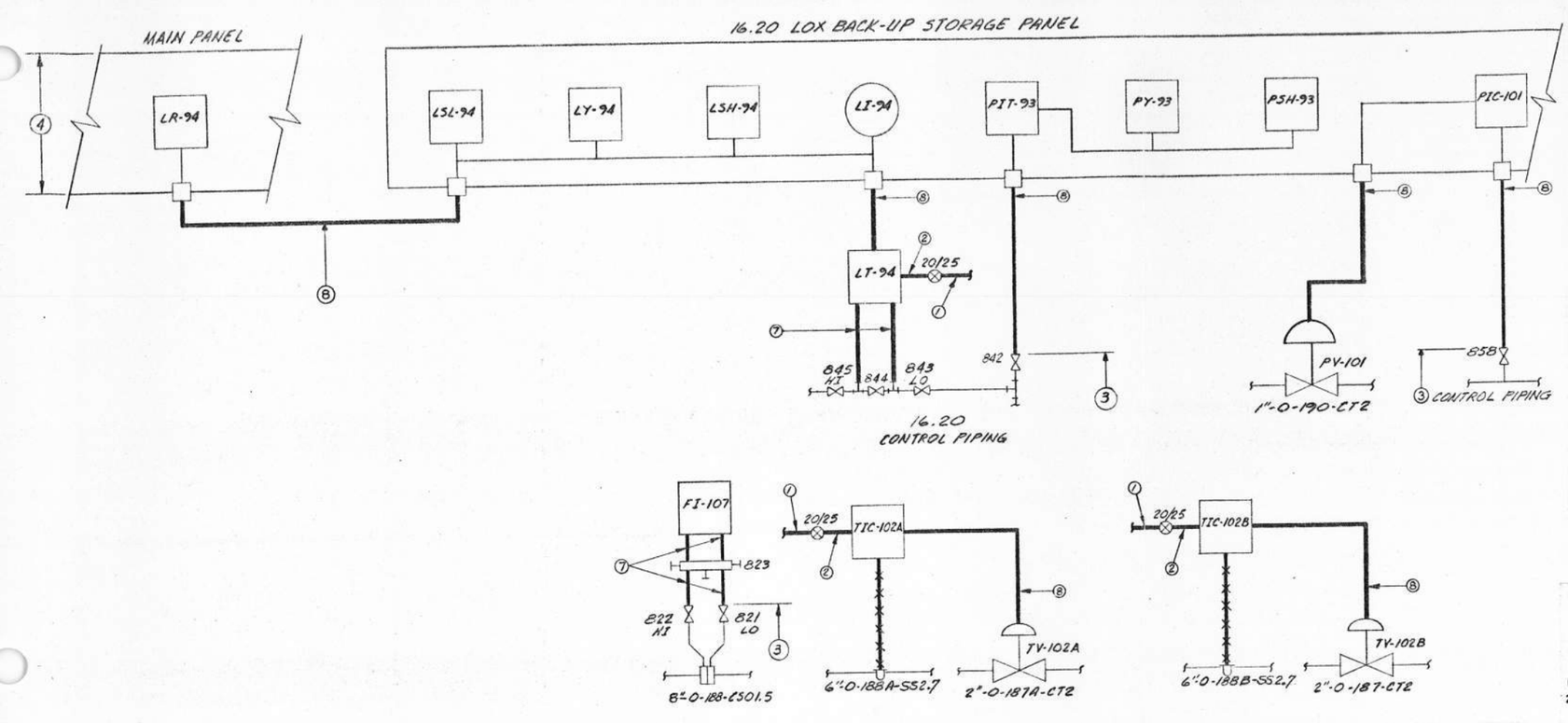
AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

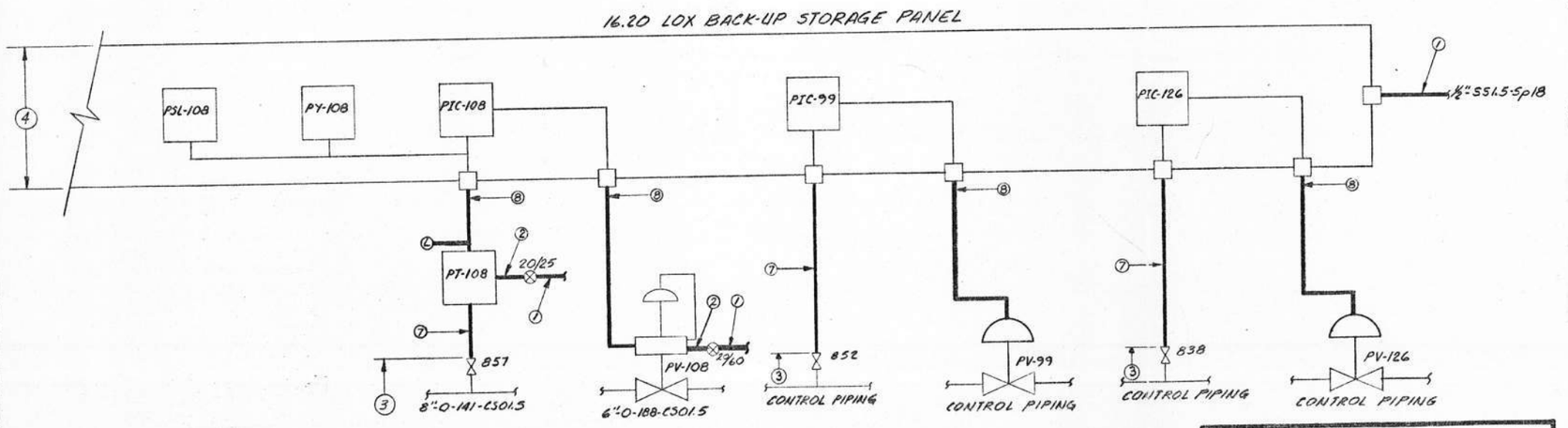
5-3555-7025 D

FORM NO. 0309-4 (REV. 6-70)

4L1_7025

MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE





LEGEND

DES DESIGN ENGINEERING STANDARD- APCI

(1)	SS1.5-Sp8 INSTRUMENT AIR SUPPLY	150 PSIG MAX.
(2)	IAS4SP INSTRUMENT AIR SUPPLY	400 PSIG MAX.
(3)	DES PROCESS PIPING TERMINATION (BY OTHERS)	
(4)	DES BULKHEAD BAR PANEL TERMINATION (BY OTHERS)	
(5)	DES PLA15 PROCESS LEAD ANALYZER	1500 PSIG MAX.
(6)	DES PL15 PROCESS LEAD	1500 PSIG MAX.
(7)	DES PL35 PROCESS LEAD	3500 PSIG MAX.
(8)	CAS15SP CONTROLLED AIR SIGNAL	1500 PSIG MAX.
(9)	DES CAB15 CONTROLLED AIR BUNDLE	1500 PSIG MAX.
(10)	DES CAB1.2 CONTROLLED AIR BUNDLE	120 PSIG MAX.
(11)	DES PLA35 PROCESS LEAD ANALYZER	3500 PSIG MAX.

- ELECTRICAL WIRING (BY OTHERS)
- MERGING CONTROL OR PROCESS INST. LINE
- CAPILLARY TUBING (DO NOT CUT)
- BULKHEAD BAR
- MANIFOLD VALVE (INCLUDES BLEED VALVE)
- INST. AIR FILTER REGULATOR (SEE NOTE 4)
- SOLENOID VALVE
- (S) RECEIVER GAUGE - SQ. ROOT SCALE
- (L) RECEIVER GAUGE - LINEAR SCALE
- [S] PRESSURE SNUBBER

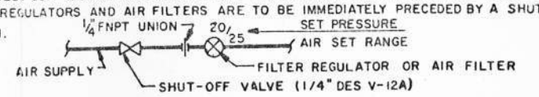
10TB-1-CAB15
- DES Nº
- BUNDLE Nº
- Nº OF TUBES IN BUNDLE

(F) AIR FILTER ONLY (SEE NOTE 4)

CONTROL VALVE

GENERAL NOTES

1. SEE DESIGN ENGINEERING STANDARDS 530.3 THRU 530.10
2. INSTRUMENT PIPING TO BE SUPPORTED ADEQUATELY BY INSTRUMENT CONTRACTOR, TUBING IS NOT TO BE SUPPORTED FROM ANY PANEL DESIGNATED AS REMOVABLE. SINGLE TUBE RUNS ARE TO BE SUPPORTED IN ACCORDANCE WITH DES 530.10 530.3 PAGE 2 PAR. H
3. ALL INSTR. LINES SHOWN ON DRAWINGS ARE GENERAL ROUTINGS. ROUTING OF INDIVIDUAL LINES MAY BE REVISED IN FIELD, TO BEST SUIT CONDITIONS AND AFFORD PROTECTION FROM MECHANICAL INJURY.
4. ALL INSTR. AIR FILTER REGULATORS AND AIR FILTERS ARE TO BE IMMEDIATELY PRECEDED BY A SHUT-OFF VALVE AS SHOWN.



5. VERTICAL CLEARANCE FOR ALL LINES ACROSS PLATFORMS OR WALKWAYS TO BE 7'-6" MIN.
6. ALL SPARE TUBES IN TUBE BUNDLES ARE TO BE CONNECTED TO SPARE BULKHEADS AND PLUGGED FOR FUTURE USE.
7. ALL INSTR. PIPING IS TO BE SUPPORTED BY TRAY WHERE SHOWN AND NOTED ON DWG'S. TRAY IS TO BE GALVANIZED STEEL LADDER TYPE, PW INDUSTRIES OR EQUAL, WIDTH SIZES AS NOTED ON DWG'S. SEE DES 530.10.

9. ALL FILTER REGULATORS ARE TO BE SUPPLIED BY APCI PER APCI SPEC. 530-SD-71A EXCEPT AS SHOWN, ALSO SUPPLIED BY APCI ARE THE FILTERS.

CITY OF TAMPA, FLORIDA
4th WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

NOTICE

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ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
	A						

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION DECIMAL ANGLES
HOLE LOCATION HOLE SIZE
FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	J.V. GWIN	YEAPR, 76
CHECKED		10 SEP 1976
ENGINEER		10 SEP 1976
APPR'D		Sept 76

TITLE
INSTRUMENT SCHEMATICS
LOX STORAGE AREA
60 T/D O_2 GENERATOR
HOOKERS PT. TAMPA, FLA

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-8001 D

SCALE NONE WT.

FORM NO. 8309-4 (REV. 6-74)

4L1_8001

PART NO.	MAT'L. CODE NO.	QTY.	MATERIAL DIMENSIONS	REMARKS	NOMENCLATURE

½"-SS1.5-Sp18 BOP EL.13'-6"

VALVE NO. 855

2-3-PLA35 3'-6"

WELD A 3"x3"x¼"x6" LG. ANGLE TO EXISTING SUPPORT. DRILL ONE ⅝" DIA. HOLE FOR SWAGELOK QUICK CONNECT BODY "SS-QC4-B1-400.

TIC-102A—WELL 6"-O-188A—SS2.7 EL. 17'-1½"

CAPILLARY TUBING-DO NOT CUT OR CRIMP TUBING COIL EXTRA AT INSTR.

CINCH ANCHOR A 6"x6"x⅛" PLATE TO FOUNDATION AND 2" PIPE MOUNT TIC-102A 4'-6" ABOVE GRADE

¼"-TIC-102A-IA34-Sp

¼"-TIC-102B-IA34-Sp

CAPILLARY TUBING-DO NOT CUT OR CRIMP TUBING COIL EXTRA AT INSTR.

CINCH ANCHOR A 6"x6"x⅛" PLATE TO FOUNDATION AND 2" PIPE MOUNT TIC-102B 4'-6" ABOVE GRADE

TOP OF SLAB EL.11'-0"

TIC-102B-WELL 6"-O-188B-SS2.7 EL.17'-1½"

SEE DET'L B THIS DWG. FE 166

PIC-101-PL35(858) CONTROL PIPING EL.12'-9½"

½"-TIC-102A & TIC-102B-SS1.5-Sp18(203) BOP EL. 13'-11"

FI-107 (FOR MOUNTING SEE DETAIL 'A')

AI-52-3-PLA35(855)

½"-SS1.5-Sp18 BOP EL. 13'-11"

¾"-SS1.5-Sp18(217) BOP EL. 12'-4"

AI-52-3-PLA35(835) BOP EL. 12'-4"

PCV-95

PV-108-CA515SP

PT-108 (FOR MOUNTING SEE DETAIL 'A')

PIC-108-CA515SP

¼"-PT-108-IA34-Sp

FE-107 8"-O-188-C501.5 BOR EL. 12'-4"

PV-108 6"-O-188-C501.5 BOP EL. 12'-4"

PT-108 & PV-108-SS1.5-Sp18(229) BOP EL. 12'-4"

¼"-PV-108-IA34-Sp

PT-108-PL35(857) 6"-O-141-C501.5 BOP EL. 12'-4"

TV-102A-CA515SP EL. 11'-10"

TV-102A 2"-O-187A-CT2 EL. 11'-10"

17.20A

TV-102B 2"-O-187B-CT2 EL. 11'-10"

TV-102B-CA515SP EL. 11'-10"

17.20B

¼"-LT-94-IA34-Sp

17.30

LT-94-NI-PL35(845) EL. 14'-3"

LT-94-LO-PL35(843) EL. 14'-3"

CINCH ANCHOR A 6"x6"x¼" PLATE TO FOUNDATION AND 2" PIPE MOUNT LT-94 4'-6" ABOVE GRADE

LI-94-CA515-SP

16.20 LOX BACK-UP PANEL

PIC-99-PL35(852) CONTROL PIPING EL. 14'-3"

½"-SS1.5-Sp18 EL. 12'-0

PV-101-CA515SP

PV-101 1"O-190-CT2 EL. 13'-3

PIC-126-PL35(838) CONTROL PIPING EL. 13'-11¼"

PV-99 CONTROL PIPING EL. 12'-7½"

PV-99-CA515Sp

PV-126-CA515SP

AI-52-3-PLA35(815) CONTROL PIPING EL. 12'-7½"

PV-126 CONTROL PIPING EL. 12'-7½"

PIT-93-PL35(842) EL. 14'-3"

FOR CONNECTION TO LOX BACK-UP PANEL SEE DRAWING 5-3555-8001D

FI-107-LO-PL35(821)

FI-107-HI-PL35(822)

FI-101-LO-PL35

FI-107-HI-PL35

BOP EL. 12'-4"

PV-108-CA515SP

PIC-108-CA515SP

AI-52-3-PLA35

LR-94-CA515-SP

BOP EL. 12'-4"

16.20

AI-52-3-PLA35 LR-94-CA515-SP BOP EL. 11'-3"

MATCHLINE COD 5-3555 8004D

PV-108-CA515-SP
PIC-108-CA515-SP
PV-101-CA515-SP
PIC-101-PL35
PIC-126-PL35
PIC-99-PL35
PV-99-CA515-SP
PV-126-CA515-SP
PIT-93-PL35
LI-94-CA515-SP
LR-94-CA515-SP
MIN. EL. 18'-6"

CENTER LINE INSTR. EL. 4'-6" ABOVE GRADE FOR FI-107, MOUNT VALVE 823 1'-0" BELOW INSTRUMENT

EL. 12'-4"

MOUNTING DETAIL 'A'

SCALE: NONE

CONTRACTOR SHALL SUPPLY AND INSTALL ONE DANIELS LEVELING SADDLE

FE-166 EL 13'-2⅛" 8"CW-185-C51.5

FI-166-LO-PL35

FI-166-HI-PL35

CONTRACTOR SHALL 2" PIPE MOUNT FI-166 TO LEVELING SADDLE AT EL 12'-6"

WELD A 3"x3"x¼"x3" LONG ANGLE TO PIPE AT EL 11'-9"

MOUNT MANIFOLD VALVE N° 193 ON ANGLE (USE VALVE AS TEMPLATE)

TOC 11'-0"

DETAIL B

SCALE: NONE

SCALE: FEET

0 1 2 3 4 5 6

NOTICE

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CITY OF TAMPA, FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

REFERENCE DRAWINGS

EQUIPMENT ARRG'T PLAN	5-3555-6200D
EQUIPMENT & PIPING ARRGT-PLAN LOX STORAGE AREA	5-3555-6203D
EQUIPMENT & PIPING ARRGT.-PLAN LOX STORAGE AREA	5-3555-6204D
EQUIPMENT & PIPING ARRGT.-SECTIONS LOX STOR. AREA	5-3555-6210D
CONTROL PIPING ASSEMBLY 25,000 GAL. LOX TANK	403128E

5-3555-8002 DWG. RTE D B

CONTRACT DRAWINGS

INSTRUMENT SCHEMATICS LOX STORAGE AREA	5-3555-8001D
INSTRUMENT SCHEMATICS LOX STORAGE AREA	5-3555-8002D
VALVE SUMMARY	5-3555-55.10-03B
INSTRUMENT SUMMARY	5-3555-1200-01A
INSTRUMENT SUMMARY-INSTALLED BY LEGEND	530-SD-50A
IA34-SP	5-3555-8006D
CA515-SP	5-3555-8007D
SS1.5-SP18	5-3555-55.10-04A

NOTE FOR GENERAL NOTES SEE DWG 5-3555-8001D

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D/APP'D
E-6183	B		SEE ECN	29 NOV 76	PCM	LM / EJC
	A					

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE FRACTION DECIMAL ANGLES ± ± ± HOLE LOCATION HOLE SIZE ± ±

FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	J.J. GWIN	4/19/76
CHECKED		10 SEP 1976
ENGINEER		16 JUN 1976
APPD		2/1/76

TITLE: INSTRUMENT PIPING PLAN LOX STORAGE AREA 60T/D O_2 GENERATOR HOOKERS PT. TAMPA, FLA.

SCALE ½"-1'-0" WT.

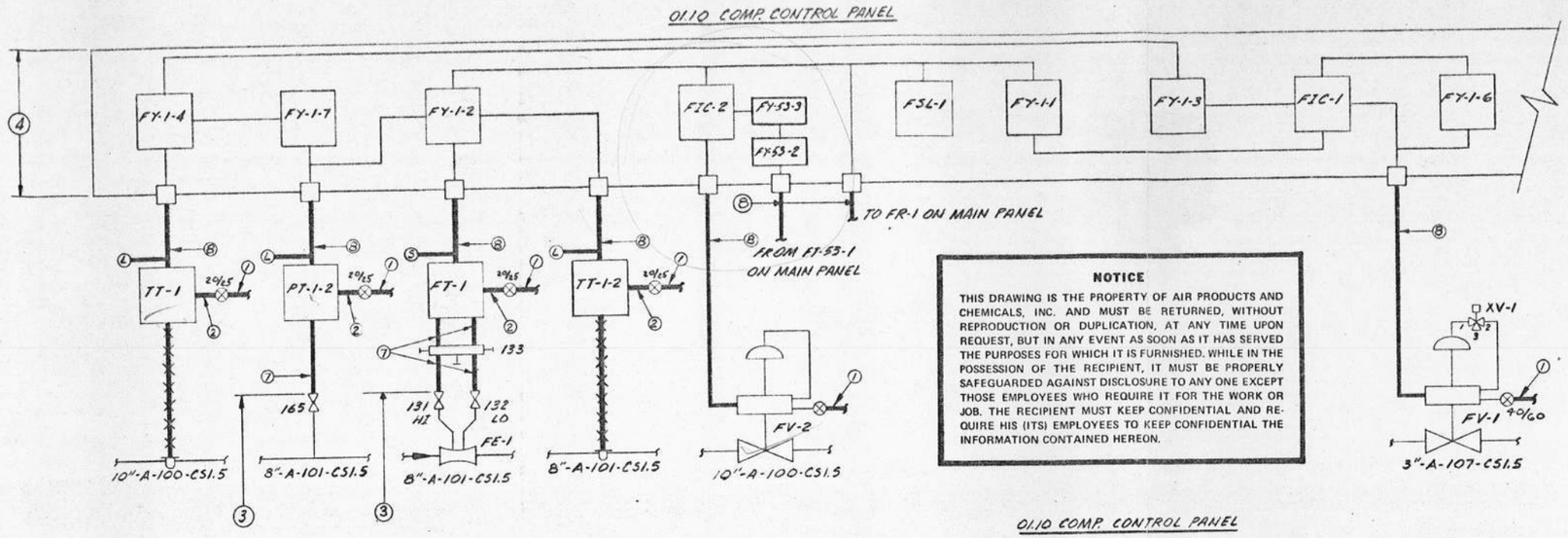
AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

5-3555-8002 D

FORM NO. 8309-4 (REV. 6-74)

4L1_8002

PART NO.	MATL. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE
				MATERIAL	



NOTICE

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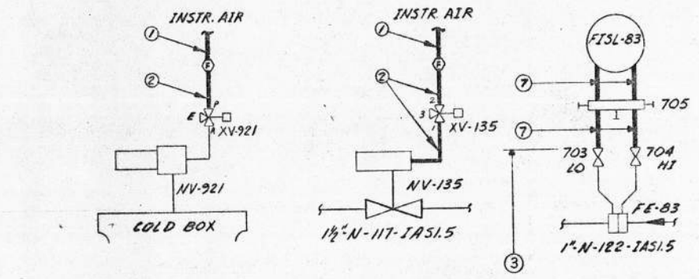
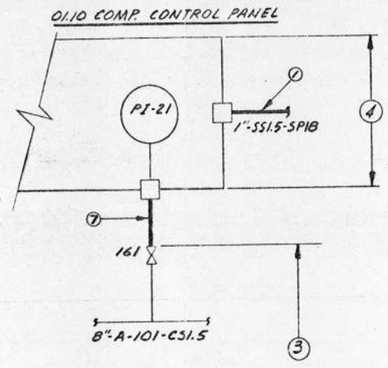
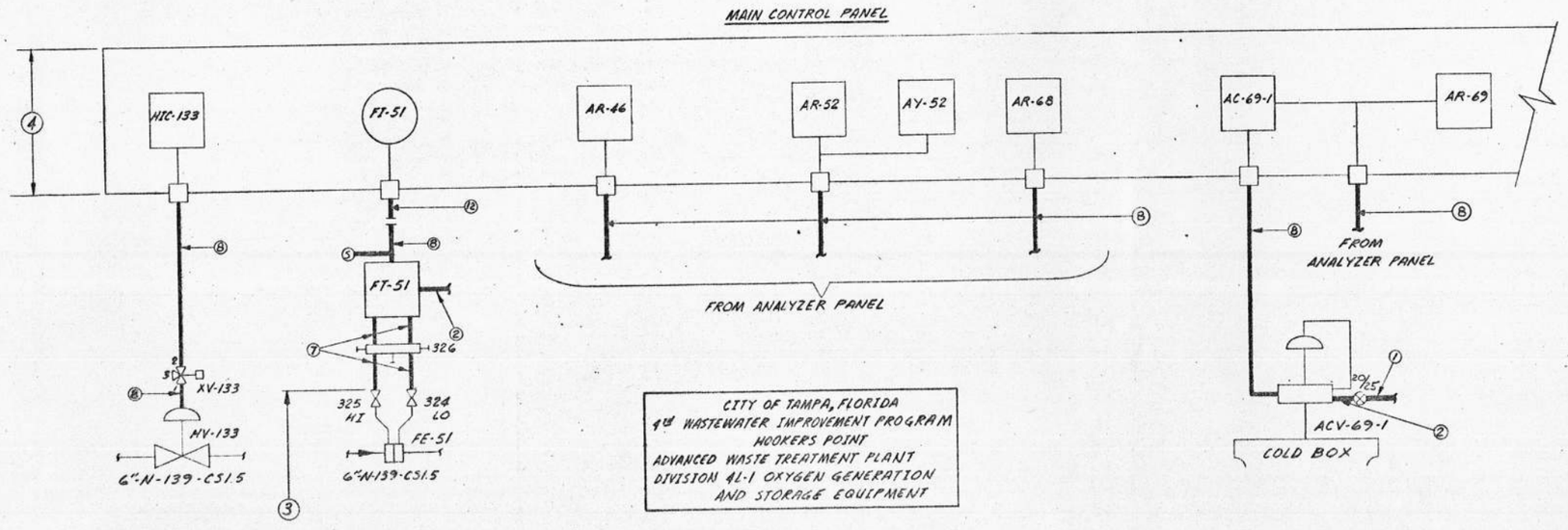






CITY OF TAMPA, FLORIDA
4L1 WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

LEGEND

DES DESIGN ENGINEERING STANDARD- APCI

(1)	SS1.5-SP1B INSTRUMENT AIR SUPPLY	150 PSIG MAX.
(2)	IAS4SP INSTRUMENT AIR SUPPLY	400 PSIG MAX.
(3)	DES PROCESS PIPING TERMINATION (BY OTHERS)	
(4)	DES BULKHEAD BAR PANEL TERMINATION (BY OTHERS)	
(5)	DES PLA15 PROCESS LEAD ANALYZER	1500 PSIG MAX.
(6)	DES PL15 PROCESS LEAD	1500 PSIG MAX.
(7)	DES PL35 PROCESS LEAD	3500 PSIG MAX.
(8)	CAS15SP CONTROLLED AIR SIGNAL	1500 PSIG MAX.
(9)	DES CAB15 CONTROLLED AIR BUNDLE	1500 PSIG MAX.
(10)	DES CAB1.2 CONTROLLED AIR BUNDLE	120 PSIG MAX.
(11)	DES PLA35 PROCESS LEAD ANALYZER	3500 PSIG MAX.
(12)	8TB-1-CAB15-SP	
(13)	8TB-2-CAB15-SP	

- ELECTRICAL WIRING (BY OTHERS)
- MERGING CONTROL OR PROCESS INST. LINE
- CAPILLARY TUBING (DO NOT CUT)
- BULKHEAD BAR
- MANIFOLD VALVE (INCLUDES BLEED VALVE)
- INST. AIR FILTER REGULATOR (SEE NOTE 4)
- SOLENOID VALVE
- (S) RECEIVER GAUGE - SQ. ROOT SCALE
- (L) RECEIVER GAUGE - LINEAR SCALE
- (S) PRESSURE SNUBBER

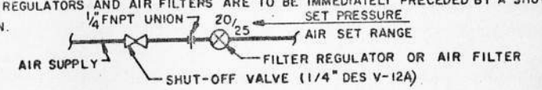
10TB-1-CAB15
- DES NO.
- BUNDLE NO.
- NO. OF TUBES IN BUNDLE

(F) AIR FILTER ONLY (SEE NOTE 4)

CONTROL VALVE

GENERAL NOTES

1. SEE DESIGN ENGINEERING STANDARDS 530.3 THRU 530.10
2. INSTRUMENT PIPING TO BE SUPPORTED ADEQUATELY BY INSTRUMENT CONTRACTOR, TUBING IS NOT TO BE SUPPORTED FROM ANY PANEL DESIGNATED AS REMOVABLE. SINGLE TUBE RUNS ARE TO BE SUPPORTED IN ACCORDANCE WITH DES 530.10 530.3 PAGE 2 PAR. H
3. ALL INSTR. LINES SHOWN ON DRAWINGS ARE GENERAL ROUTINGS. ROUTING OF INDIVIDUAL LINES MAY BE REVISED IN FIELD, TO BEST SUIT CONDITIONS AND AFFORD PROTECTION FROM MECHANICAL INJURY.
4. ALL INSTR. AIR FILTER REGULATORS AND AIR FILTERS ARE TO BE IMMEDIATELY PRECEDED BY A SHUT-OFF VALVE AS SHOWN.



5. VERTICAL CLEARANCE FOR ALL LINES ACROSS PLATFORMS OR WALKWAYS TO BE 7'-6" MIN.
6. ALL SPARE TUBES IN TUBE BUNDLES ARE TO BE CONNECTED TO SPARE BULKHEADS AND PLUGGED FOR FUTURE USE.
7. ALL INSTR. PIPING IS TO BE SUPPORTED BY TRAY WHERE SHOWN AND NOTED ON DWG'S. TRAY IS TO BE GALVANIZED STEEL LADDER TYPE, PW INDUSTRIES OR EQUAL, WIDTH SIZES AS NOTED ON DWG'S. SEE DES 530.10.
9. ALL FILTER REGULATORS ARE TO BE SUPPLIED BY APCI PER APCI SPEC. 530-SD-71A EXCEPT AS SHOWN, ALSO SUPPLIED BY APCI ARE THE FILTERS.
10. FOR TUBE BUNDLE TABULATION SEE DWG. NO. 5-3555-8004D

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APPD
—	A						

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: FRACTION ± , DECIMAL ANGLES ± , HOLE LOCATION ± , HOLE SIZE ±

FIRST USED ON: 00-5-3555

		DATE
DRAFTSMAN	J.J. GWIN	4/21/76
CHECKED	J.C. Magee	5 SEP 1976
ENGINEER	H.C. Wilden	6 SEP 1976
APVD		13 Sept 76

TITLE: INSTRUMENT SCHEMATICS NOTES & REF DWGS. (2) 60T/D O_2 GENERATORS HOOKERS PT. TAMPA, FLA.

SCALE NONE | WT.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

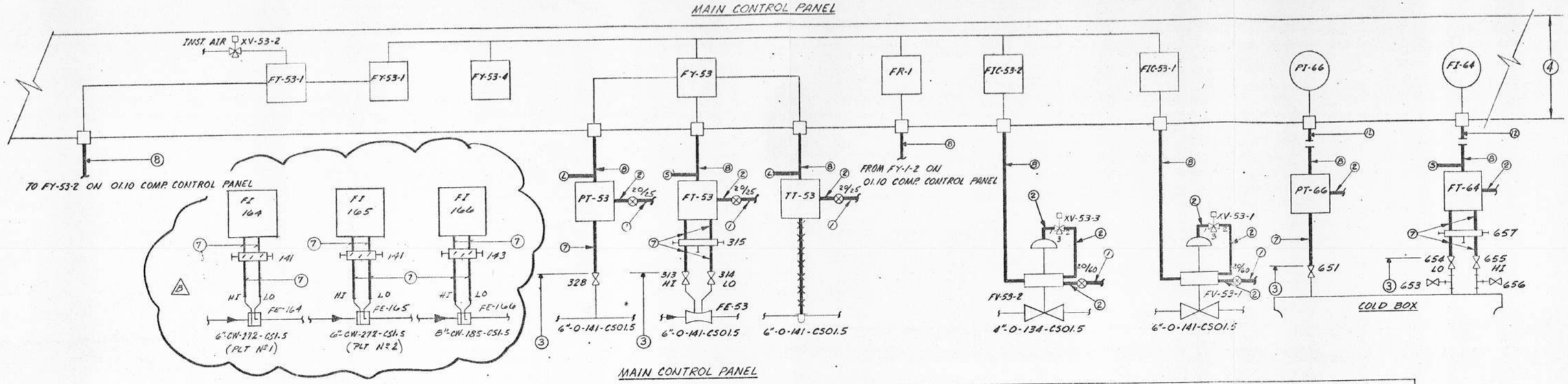
5-3555-8003 SHT. 1 OF 3 | D

FORM NO. 8009-4 (REV. 6-70)

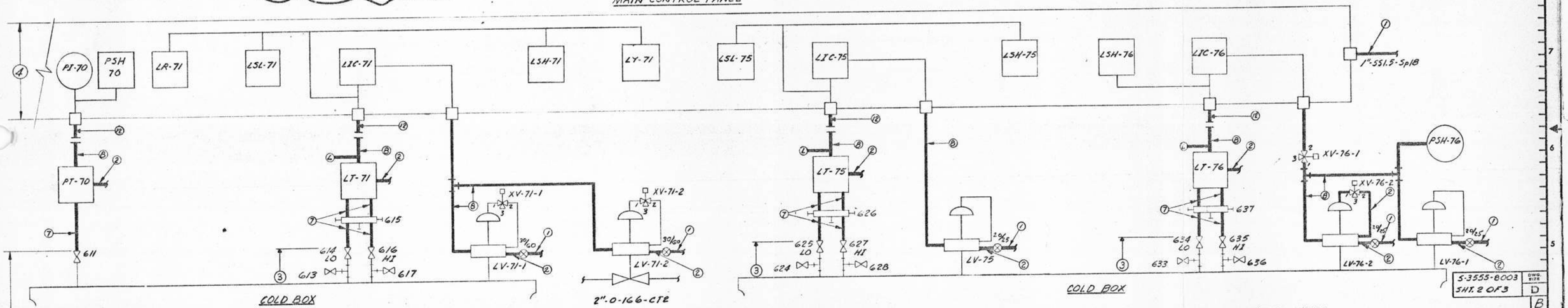
4L1_8003

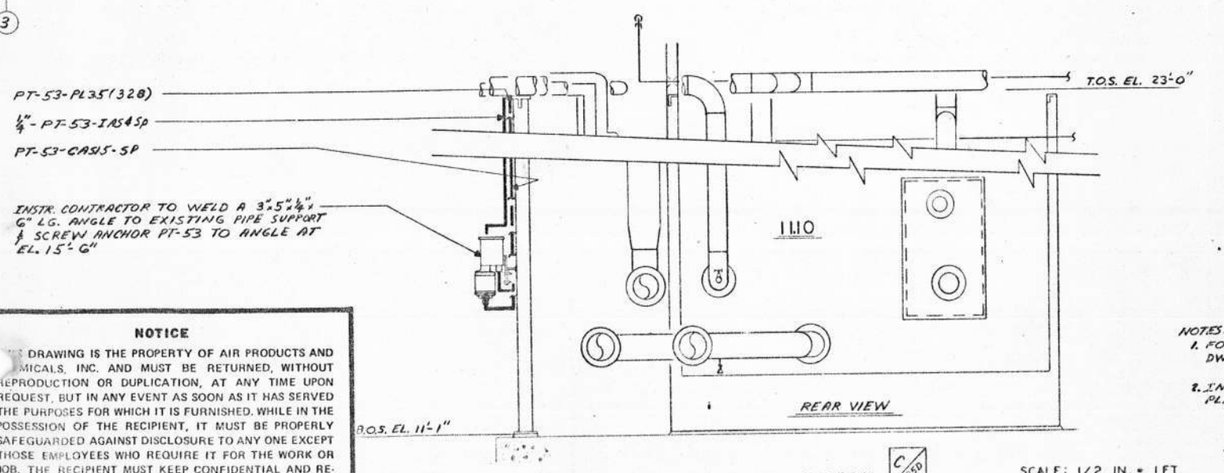
MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

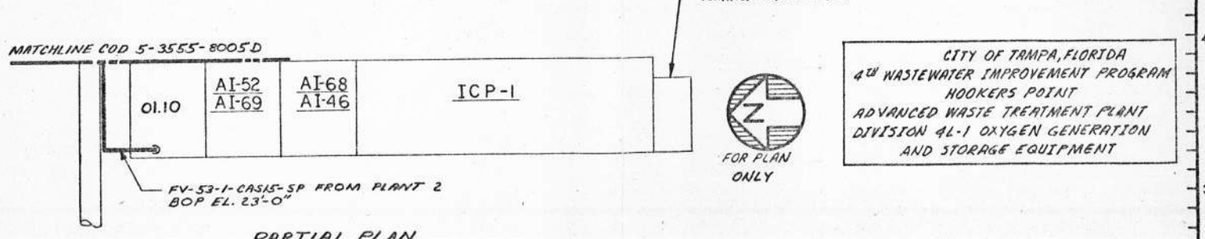
MAIN CONTROL PANEL



MAIN CONTROL PANEL







CITY OF TAMPA, FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

NOTES:
1. FOR GENERAL NOTES AND REFERENCE DRAWINGS SEE DWG. 5-3555-8003D SHT. 1 OF 3
2. INSTRUMENT PIPING ON PLANT 1 IS IDENTICAL TO PLANT 2.

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
E-6483	B		SEE ECN				
—	A						

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±
FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	J.J.GWIN	4/23/76
CHECKED	R.C. Mayes	13 SEP 1976
ENGINEER	W.C. Miller	16 SEP 1976
APPR'D		17 SEP 76

TITLE
INSTRUMENT SCHEMATICS AND REFERENCE DWGS.
(2) 60 T/D O_2 GENERATORS
HOOKERS PT. TAMPA, FLA

SCALE NONE WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-8003 SHT. 2 OF 3 D

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FORM NO. 8509-4 (REV. 6-74)

4L1_8003A

NOTICE

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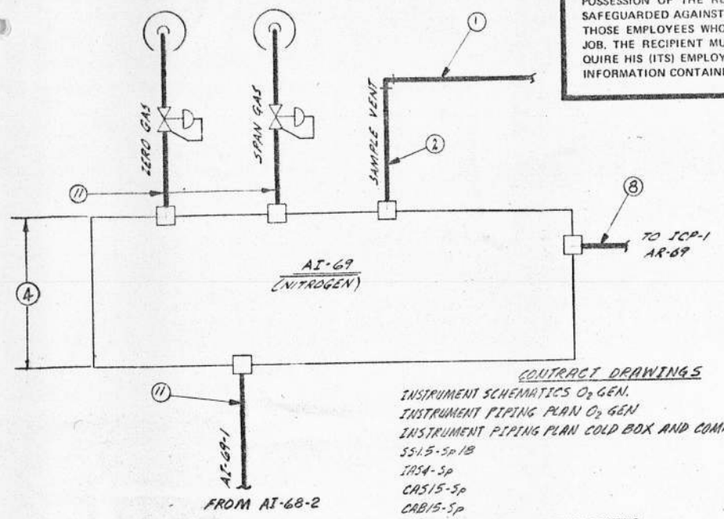
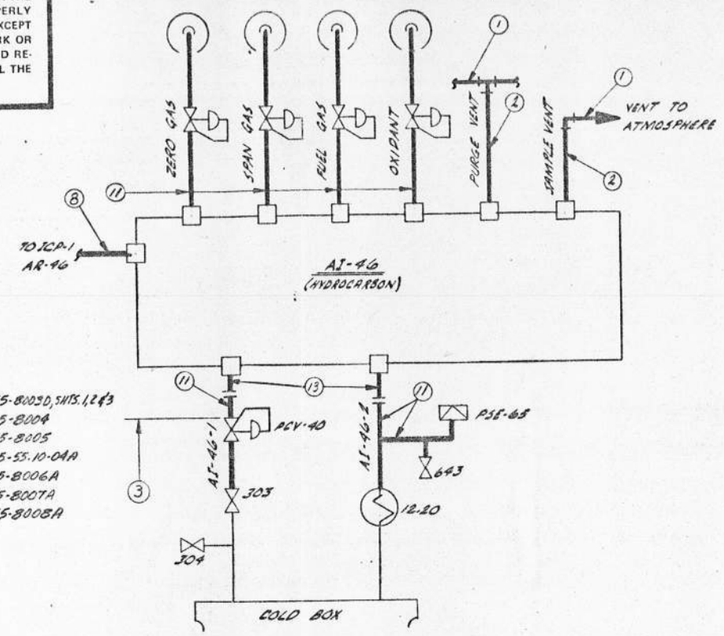




CONTRACT DRAWINGS

INSTRUMENT SCHEMATICS O_2 GEN.
INSTRUMENT PIPING PLAN O_2 GEN
INSTRUMENT PIPING PLAN COLD BOX AND COMPRESSOR AREA
SS1.5-Sp18
IPS4-Sp
CAS15-Sp
CAB15-Sp

REFERENCE DRAWINGS

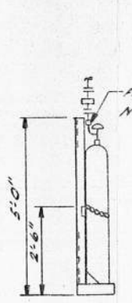
EQUIPMENT ARRANGEMENT PLAN	5-3555-6200D
EQUIPMENT ARRANGEMENT PLAN - COLD BOX & COMPRESSOR AREA (PLANT 1)	5-3555-6201D
EQUIPMENT ARRANGEMENT PLAN - COLD BOX & COMPRESSOR AREA (PLANT 2)	5-3555-6202D
EQUIPMENT & PIPING ARRANGEMENT PLAN - LOX STORAGE AREA	5-3555-6203D
EQUIPMENT ARRANGEMENT SECTIONS - COMPRESSOR & VAPORIZER AREA	5-3555-6205D
EQUIPMENT ARRANGEMENT SECTIONS - COMPRESSOR & VAPORIZER AREA	5-3555-6206D
EQUIPMENT & PIPING ARRANGEMENT-SECTIONS-COLD BOX AREA	5-3555-6207D
EQUIPMENT & PIPING ARRANGEMENT-SECTIONS-COLD BOX AREA	5-3555-6208D
EQUIPMENT & PIPING ARRANGEMENT-SECTIONS-LOX STORAGE AREA	5-3555-6210D
CONTROL PIPING ASSEMBLY	403128R
INSTRUMENT PIPING SCHEMATICS-COLD BOX	301125 SHEET 2
INSTRUMENT SUMMARY	5-3555-1200-01A
VALVE SUMMARY	5-3555-55.10-03B
INSTRUMENT SUMMARY-INSTALLED BY LEGEND	530-SD-50A

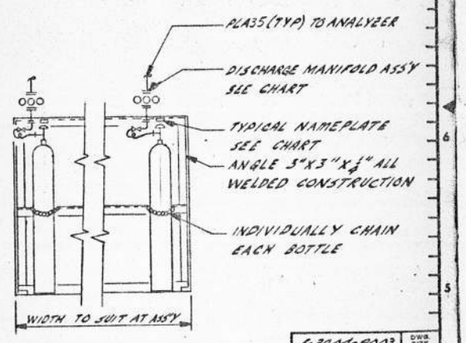
5-3555-8003D, SHTS. 1 & 3
5-3555-8004
5-3555-8005
5-3555-55.10-04A
5-3555-8006A
5-3555-8007A
5-3555-8008A

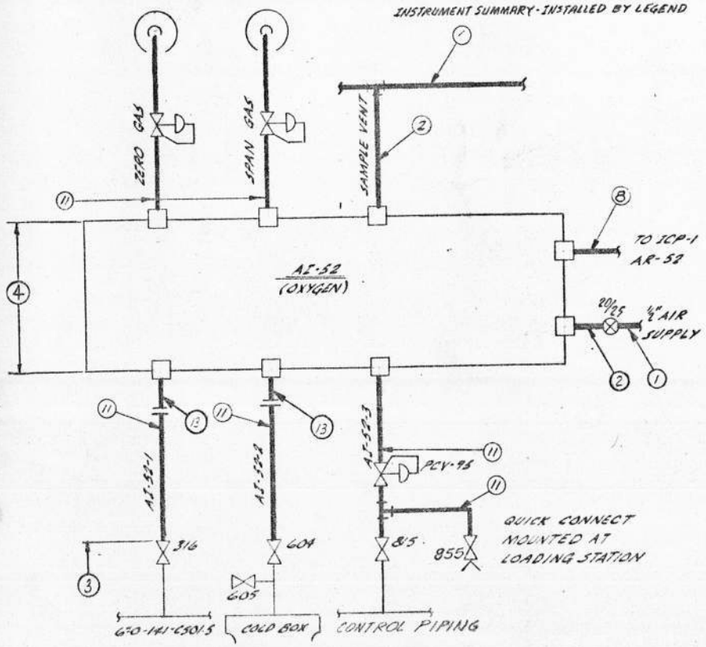
MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

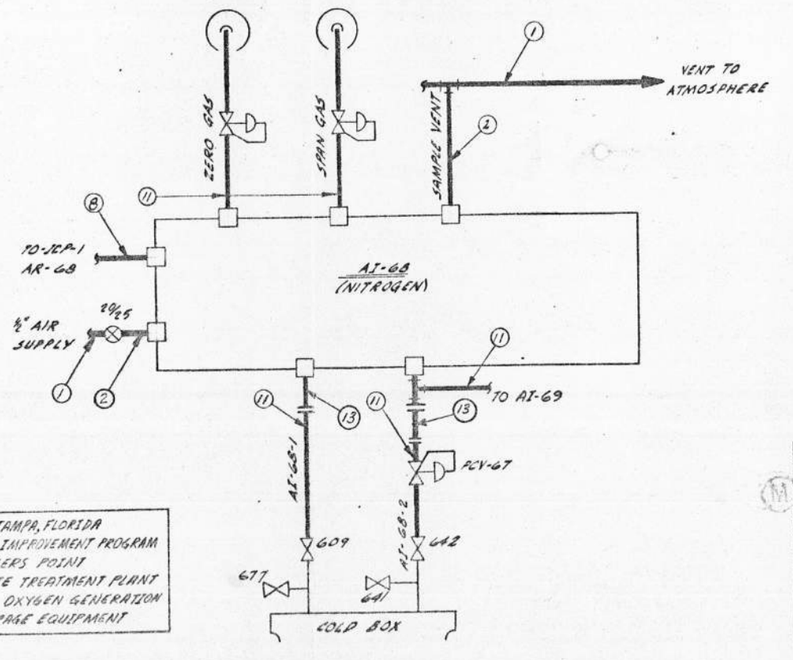
ANALYZER BOTTLE MANIFOLD CHART					ANALYSIS OF GAS BOTTLES USED
ANALYZER	GAS	DISH MANIFOLD	REGULATOR NO.	NAMEPLATE LETTERS	
AI-52 (O_2)	ZERO GAS	WPD-275-W-8001	WPD-231-U-120454	AI-52(O_2) ZERO GAS	APCI ZERO GRADE O_2
	SPAN GAS	WPD-275-W-8001	WPD-231-U-120454	AI-52(O_2) SPAN GAS	95% O_2 IN N_2
AI-68 (N_2)	ZERO GAS	WPD-275-X-8002	WPD-235-U-1486980	AI-68(N_2) ZERO GAS	APCI ZERO GRADE N_2
	SPAN GAS	WPD-275-G-8001	WPD-231-P-120358	AI-68(N_2) SPAN GAS	4% O_2 IN N_2
AI-69 (N_2)	ZERO GAS	WPD-275-X-8002	WPD-235-U-2458483	AI-69(N_2) ZERO BAS	A PCI ZERO GRADE N_2
	SPAN GAS	WPD-275-G-8001	WPD-231-P-118058	AI-69(N_2) SPAN GAS	4% O_2 IN N_2
AI-46 (HC)	ZERO GAS	WPD-275-W-8001	WPD-231-U-120454	AI-46(HC) ZERO GAS	UHC GRADE O_2
	SPAN GAS	WPD-275-W-8001	WPD-231-U-120454	AI-46(HC) SPAN GAS	90 PPM METHANE IN O_2
	OXIDANT	WPD-275-G-8001	WPD-231-P-118058	AI-46(HC) OXIDANT	AIR OIL FREE 0.5 PPM THC ▲
	FUEL GAS	WPD-275-K-8001	WPD-231-G-1186035	AI-46(HC) FUEL GAS	APCI COMMERCIAL GRADE H_2

1. WPD- WELDING PRODUCT DIVISION - AIR PRODUCTS AND CHEMICAL INC. ALL BOTTLES, MANIFOLDS AND PIGTAIL ASS'Y SHALL BE INSTALLED BY THE INSTR. CONTRACTOR.
2. NAMEPLATES SHALL BE BLACK PLASTIC WITH WHITE CORE AND BEVEL EDGES ALL LETTERING SHALL BE WIDE V-GROOVE WITH A MINIMUM OF 3/16" CHARACTER HEIGHT. NAMEPLATE SHALL BE 1" HIGH X 3" LONG AND SHALL BE SCREW FASTENED
3. ANALYZER VENT HEADERS SHALL BE ½" SS1.5-Sp18
4. ▲ MANIFOLD ASS'Y SUPPLIED WITH WESTERN ENTERPRISE ADAPTER #BIS-CGA590 TO 580
5. ● MANIFOLD ASS'Y SUPPLIED WITH WESTERN ENTERPRISE ADAPTER #B3A-CGA296 TO 540.









CITY OF TAMPA, FLORIDA
6th WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 42-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

NOTE: 1. FOR GENERAL NOTES AND REFERENCE DRAWINGS SEE DWG. 5-3555-8003D SHT. 1 of 3

2. INSTRUMENT PIPING ON PLANT 1 IS IDENTICAL TO PLANT 2.

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
—	A						

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±
FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	J.J. GWIN	4-27-76
CHECKED	R.G. Mayer	15 SEP 1976
ENGINEER		16 SEP 1976
APP'D		

TITLE: INSTRUMENT SCHEMATICS NOTES & REF DWGS. (2) 60 T/D OXYGEN GENERATORS HOOKERS P.T. TAMPA, FLA.

AIR PRODUCTS AND CHEMICALS, INC. ALLENTOWN, PENNSYLVANIA

SCALE — WT. CAD

5-3555-8003 SHT 3 of 3 D

5-3204-8003 SHT 3 of 3 D A

FORM NO. 8009-4 (REV. 6-74)

4L1_8003B

MATERIAL					
PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE

TT-53-WELL
6"-O-141-CS01.5 (PLANT 2)
BOP EL. 23'-0"
CAPILLARY TUBING - DO NOT CUT OR CRIMP TUBING
COIL EXTRA AT INSTR.
¼"-TT-53-IA54-Sp
WELD A 3"×3"×¼"×3" ANGLE TO PIPE SUPPORT AND 2" PIPE MOUNT TT-53 4'-6" ABOVE GRADE.
FY(TT)-53-CAS15SP
¼"-FV-53-1-IA54-Sp (PLANT 1)
FV-53-1 (PLANT 1)
6"-O-141-CS01.5
BOP EL. 12'-0"
INST. CONTRACTOR SHALL INSTALL XV-53-1 (PLANT 1) BETWEEN TOPWORKS & POSITIONER
AI-52-3-PL35
LR-94-CAS15-SP
BOP EL. 11'-3"
FT-53-HI-PL35(313) (PLANT 2)
BOP EL. 23'-0"
¼"-FV-53-1-IA54-Sp (PLANT 1)
BOP EL. 23'-0"
FV-53-1-CAS15SP (PLANT 1)
FY(FT)53-CAS15SP (PLANT 2)
BOP EL. 23'-0"
FY(FT)53-CAS15SP (PLANT 2)
BOP EL. 23'-0"
I-52-3-PL35
LR-94-CAS15-SP
FV-53-1-CAS15-SP (PLANT 1)
BOP EL. 23'-0"

½"-FT-53 & TT-53-SS1.5-Sp18 (202)
EL. 15'-6"
FT-53-HI-PL35
FT-53-LO-PL35
¼"-FT-53-IA54-Sp
CINCH ANCHOR A 6"×6"×¼" PLATE TO FOUNDATION AND 2" PIPE MOUNT FT-53 4'-6" ABOVE GRADE
MOUNT VALVE 315 1'-0" BELOW INSTR. (PLANT 2)
FY(FT)-53-CAS15SP

MATCHLINE COD 5-3555-8002D

INST. CONTRACTOR SHALL INSTALL XV-53-1 (PLANT 2) BETWEEN TOPWORKS & POSITIONER
FV-53-1 (PLANT 2)
6"-O-141-CS01.5
BOP EL. 12'-0"
½"-FV-53-1-IA54-Sp (PLANT 2)
½"-FV-53-1-SS1.5-Sp18 (228) (PLANTS 1&2)
BOP EL. 23'-0"
FT-53-LO-PL35 (314) (PLANT 2)
BOP EL. 23'-0"
FE-53 (PLANT 2)
BOP EL. 23'-0"
6"-O-141-CS01.5
FV-53-1-CAS15-Sp (PLANT 2)
BOP EL. 23'-0"

MATCHLINE COD 5-3555-8005D

BTB-1-CAB15-Sp
½"-SS1.5-Sp18
⅛"-IA54-Sp (TYP.)

SPARE SPARE SPARE FISL-83

PT-66 PT-70 FT-64 LT-71 FT-51 LT-75 LT-76

705 G57 G15 32G G26 G37

EL. 11'-0"

FT-51-HI-PL35
FT-51-LO-PL35
FT-64-HI-PL35
FT-64-LO-PL35
LT-71-HI-PL35
LT-71-LO-PL35
LT-75-HI-PL35
LT-75-LO-PL35
LT-76-HI-PL35
LT-76-LO-PL35
PT-66-PL35
PT-70-PL35
FISL-83-LO-PL35
FISL-83-HI-PL35

NOTE: ALL AIR PIPE & VALVES SHALL CONFORM TO SS1.5-Sp18.

INSTRUMENT RACK NUMBER I
DES NO. 530.9-9
TYPE III

DETAIL A
SCALE: NONE

PI-21-PL35
FY-1-7-CAS15-Sp
FY-1-2-CAS15-Sp
TT-1-2-CAS15-Sp
FY-1-4-CAS15-Sp

FE-1
8"-A-101-CS1.5
EL. 22'-10½"
PT-1-2-PL35 (116)
FT-1-HI-PL35 (131)
FT-1-LO-PL35 (132)
FV-1
FV-2
0107
0113
0112
0110
0110.1
0110.8

FY-1-7-CAS15-SP
FY-1-2-CAS15-SP
FY(T.T.)-1-2-CAS15-SP
½"-SS1.5-Sp18 (209)
EL. 18'-9"
FT-1 SCREW ANCHORED TO ANGLE.
TT-1-2 SCREW ANCHORED TO ANGLE.
PI-21-PL35 (116) EL. 18'-2"
½"-FT-1-IA54-Sp
½"-TT-1-2-IA54-Sp
FY-1-4-CAS15-SP
CAPILLARY TUBING - DO NOT CUT OR CRIMP TUBING. COIL EXTRA AT INSTR.
FT-1-LO-PL35
FT-1-HI-PL35
TT-1 SCREW ANCHOR TO ANGLE.
¼"-TT-1-IA54-Sp
WELD A 3"×3"×½"×6" LG. ANGLE TO EXISTING SUPPORT AT EL. 14'-0"

½"-SS1.5-Sp18
½"-FV-2-IA54-Sp
FV-53-1-CAS15-SP (PLANT 1)
BOP EL. 23'-0"
½"-FV-1-IA54-SP
FV-1-CAS15-SP
CAPILLARY TUBING - DO NOT CUT OR CRIMP TUBING
COIL EXTRA AT INSTRUMENT
PT-1-2-PL35
FT-1-LO-PL35
FT-1-HI-PL35
FV-53-1-CAS15-Sp (PLANT 1)
¼"-PT-1-2-IA54-Sp
FE-164
60"-CW-272-CS1.5
EL 116'-0"
FT-164-LO-PL35
FT-164-HI-PL35
℄ EL 115'-6"
INSTRUMENT CONTRACTOR SHALL MOUNT FT-164 TO 6"-CW-272-CS1.5 WITH A DANIEL LEVELING SADDLE. WELD A 3"×3"×¼"×6" LONG ANGLE TO EXIST'G PIPE 1'-0" BELOW INDICATOR MOUNT MANIFOLD VALVE Nº 141 ON ANGLE (USE VALVE AS TEMPLATE)
WELD A 3"×3"×¼"×2'-0" LG. ANGLE TO EXISTING SUPPORT AT EL 15'-6"
PT-1-2 SCREW FASTEN TO FACE OF ANGLE
EL. 11'-0"
PT-1-2-PL35
WELD A 3"×3"×¼"×3" LG. ANGLE TO EXIST'G SUPPORT. MOUNT MANIFOLD VALVE Nº 133 6" BELOW INSTRUMENT USE VALVE AS TEMPLATE

SECTION B
SCALE: ½"=1'-0"

TUBE BUNDLE & TB-1-CAB15			TUBE BUNDLE	TB-2-CAB15	
LINE NUMBER	TO	FROM	LINE NUMBER	TO	FROM
FI-51-CAS15-SP	ICP-1	I.R.# I	AI-46-1-PL35	WALK	COLD BOX
FI-64-CAS15-SP			AI-52-1-PL35		
LT-71-CAS15-SP			AI-52-2-PL35		
LIC-75-CAS15-SP			AI-68-1-PL35		
LIC-76-CAS15-SP			AI-68-2-PL35		
PT-66-CAS15-SP			AI-76-2-PL35		
PT-70-CAS15-SP			SPARE		
SPARE			SPARE		

NOTES:
1. FOR GENERAL NOTES AND REFERENCE DRAWINGS SEE DWG. 5-3555-8003D
2. INSTRUMENT PIPING ON PLANT 1 IS IDENTICAL TO PLANT 2.

NOTICE

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5-3555-8004 SIZE D

CITY OF TAMPA, FLA.
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

SCALE: 1/2 IN. = 1FT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
—	C		AS BUILT CHANGE	6 JUNE 1974	R.J. GUNN	JCM	EJC
E-6183	B		SEE ECN	18 MAY 1973	JCM	JCM	EJC
—	A						

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION DECIMAL ANGLES ± ± ±
HOLE LOCATION HOLE SIZE ± ±
FIRST USED ON 00-5-3555

		DATE
DRAFTSMAN	R.T. KILBABA	6-18-74
CHECKED		16 SEP 1974
ENGINEER		16 SEP 1974
APPR'D		

TITLE
INSTRUMENT PIPING PLAN
LOX STORAGE AREA
(2) 60 TID O_2 GENERATORS
HOOKERS PT. TAMPA, FLA.
SCALE 1/4"=1'-0" WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-8004 D

FORM NO. 8309-4 (REV. 6-74)

4L1_8004

PART NO.	MAT'L. CODE NO.	QTY.	DIMENSIONS	REMARKS	NOMENCLATURE
					MATERIAL

TUBE TRAY

AI-46-1-PL43S
AI-46-2-PL43S
AI-68-1-PL43S
AI-68-2-PL43S

FOR BOTTLES, MANIFOLDS & REGULATORS SEE CHART ON DWG 5-3555-8003D SHT. 3 OF 3

FT-53-1-CA515-SP
FT-53-CA515-SP
TT-53-CA515-SP
FV-53-2-CA515-SP
FY-53-1-CA515-SP
FT-66-CA515-SP
FT-64-CA515-SP
PT-70-CA515-SP
LT-71-CA515-SP
LV-71-1&2-CA515-SP
LT-75-CA515-SP
LT-75-CA515-SP
LV-76-1&2-CA515-SP
LR-94-CA515-SP
HV-133-CA515-SP
FT-51-CA515-SP

FOR BOTTLES, MANIFOLDS REGULATORS SEE CHART ON DWG. NO. 5-3555-8003D SHT. 3 OF 3.

AI-52-1-PL43S
AI-52-2-PL43S
AI-52-3-PL43S
AI-69-1-PL43S

STRIP BOTH BUNDLES BACK TO THIS POINT

01.10 COMP. PANEL | AI-52 | AI-68 | AI-69 | AI-46 | ICP-1

1"-SS15-Sp18 AIR SUPPLY TO 01.10 PANEL

½"-SS15-Sp18 AIR SUPPLY TO ANALYZER PANEL.
AR-68-CA515-SP
AR-46-CA515-SP

½"-SS15-Sp18 AIR SUPPLY TO ANALYZER PANEL.
AR-69-CA515-SP
AR-52-CA515-SP

1"-SS15-Sp18 AIR SUPPLY TO ICP-1

WELD A 3"x3"x¼"x2'-0" ANGLE AT TOS EL. 19'-1½"

1"-SS15-Sp18(204) EL. 21'-5⅛"

SCANNER TRANSMITTER

FY-1-4-CA515-SP
FY-1-7-CA515-SP
FY-1-2-CA515-SP
FY(FT)-1-2-CA515-SP
FV-2-CA515-SP
FV-1-CA515-SP
PI-21-PL35

FY-53-1-CA515-SP
FR-1-CA515-SP

VENT LINES-RUN PIPING TO BOP EL 23'-0". BEND PIPING 90° FOR WEATHER PROTECTION.

B 8004D

BOP EL. 23'-0"

EL 18'-3"

PI-21-PL35(161)
8"-A-101-CS1.5
EL. 18'-2"

PT-1-2-PL35(165)
8"-A-101-CS1.5
EL. 21'-8"

01.10D

MOTOR

01.10B

01.14

01.17

FY-1-4-CA515-SP
EL 18'-6"

FV-2
10"-A-100-CS1.5
EL. 16'-8"

TT-1
10"-A-100-CS1.5
EL. 16'-8"

FT-1-HI-PL35(131)

½"-SS15-Sp18
EL 18'-3"

EL 20'-9"

XV-1

½"-SS15-Sp18(209)
EL. 18'-9"

FV-1
3"-A-107-CS1.5
EL 20'-9"

¼"-FV-1-IAS4-Sp

FE-164(PLT 1)
FE-165(PLT 2)
FOR INDICATOR & TUBING RUNS SEE A B 8004D

FV-1-CA515-SP

MATCHLINE COD 5-3555-8003D SHT. 2 OF 3

PT-1-2-PL35
FT-1-LO-PL35
FT-1-HI-PL35
EL. 22'-10½"

FY-1-7-CA515-SP
FY-1-2-CA515-SP
FY(FT)-1-2-CA515-SP

TT-1-2
8"-A-101-CS1.5
EL. 21'-3"

CAPILLARY TUBING-DO NOT CUT OR CRIMP TUBING. COIL EXTRA AT INSTR.

EL. 18'-3"
FV-2-CA515-SP
¼"-FV-2-IAS4-Sp
FT-1-LO-PL35(132)
FE-1
8"-A-101-CS1.5
EL. 22'-10½"

FV-53-1-CA515-SP(PLANT 1)
BOP EL. 23'-0"

MAIN TUBE TRAY RUN

FY(FT)-53-CA515-SP
BOP EL. 23'-0"

FY(FT)-53-CA515-SP
BOP EL. 23'-0"

FV-53-1-CA515-SP
BOP EL. 23'-0"
(PLANT 1)

AI-52-3-PL43S
LR-94-CA515-SP

AI-52-1-PL43S(316)
6"-O-141-CS01.5
EL. 15'-1"

XV-133

HV-133
6"-N-139-CS1.5
EL. 31'-0½"

HV-133-CA515-SP

FE-51
6"-N-139-CS1.5
EL. 28'-8"

FT-51-HI-PL35(325)
FT-51-LO-PL35(324)

½"-SS15-Sp18(307)
EL 16'-11¾"

½"-SS15-Sp18(250)
BOP EL. 18'-6"

LV-71-2-CA515-SP

BOP EL. 18'-6"

½"-NV-921-IAS4-SP
EL. 16'-11¾"

XV-921

NV-921
EL. 15'-8½"

BOT EL. 18'-6"

17.80

LV-71-1-CA515-Sp

LV-71-2
2"-O-166-CT2
EL. 13'-9"

¼"-LV-71-2-IAS4-Sp

XV-71-2

LINE LIST "A"

LT-71-HI-PL35(616)	FT-64-HI-PL35(655)
LT-71-LO-PL35(614)	FT-64-LO-PL35(654)
LT-75-HI-PL35(627)	PT-66-PL35(651)
LT-75-LO-PL35(625)	PT-70-PL35(611)
LT-76-HI-PL35(635)	AI-96-1-PL43S(303)
LT-76-LO-PL35(634)	AI-52-2-PL43S(604)
AI-68-1-PL43S(609)	AI-68-2-PL43S(692)

8TB-1-CA815-Sp
8TB-2-CA815-Sp
FY(FT)-53-CA515-SP
FV-53-1-CA515-SP (PLANT 2)
FV-53-1-CA515-SP (PLANT 1)
FY(FT)-53-CA515-SP
LV-71-1&2-CA515-SP
LV-76-1&2-CA515-SP
FV-53-2-CA515-SP
LV-75-CA515-SP
ACV-69-1-CA515-SP
HV-133-CA515-SP
FY(FT)-53-CA515-SP
AI-52-3-PL43S
LR-94-CA515-SP

(PLANT #2)

LV-76-2-CA515-SP

INST. CONTRACTOR TO INSTALL VALVE XV-76-2 BETWEEN TOPWORKS AND POSITIONER.

¼"-LV-76-2-IAS4-Sp

LV-76-2
EL. 17'-5"

FY(FT)-53-CA515-SP

FV-53-1-CA515-SP
(PLANT 2)

MATCHLINE COD 5-3555-8004D

½"-PT-53-IAS4-Sp(23G)
EL. 23'-0"

PT-53-PL35(32B)
6"-O-141-CS01.5
BOP EL. 23'-0"

SEE DETAIL C

06.50

11.10

BOT. EL. 23'-0"
NV-135
1½"-N-117-IAS1.5
EL. 15'-9"

XV-135

¼"-NV-135-IAS4-Sp

½"-SS15-Sp18(230)
BOP EL. 18'-6"
EL. 22'-11¾"

ACV-69-1-CA515-SP

EL. 30'-0"

10.10

¼"-LV-76-1-IAS4-Sp(257)
EL. 31'-0½"

¼"-LV-71-1-IAS4-Sp(231)
EL. 31'-0½"

LV-76-1-CA515-SP

LV-71-1-CA515-SP

XV-71-1

LV-76-1&2-CA515-Sp

FV-53-2-CA515-SP

¼"-FV-53-2-IAS4-Sp
EL. 31'-0½"

INSTRUMENT CONTRACTOR TO INSTALL VALVE XV-53-2 BETWEEN TOPWORKS & POSITIONER

FV-53-2
4"-O-134-CS01.5
EL. 31'-0½"

1"SS1-83-HI-PL35(704)
8TB-2-CA815-Sp(SEE NOTE)

FOR ORIENTATION OF VALVES SEE DWG. NO. 301125 SHT. 2 OF 2. AND LINE LIST A" BELOW.

MATCHLINE COD 5-3555-8004D

FE-83
1"-N-122-IAS1.5
EL. 12'-3"

LV-75-CA515-SP

¼"-LV-75-IAS4-Sp(207)
EL. 31'-0½"

LV-75
EL. 30'-1"

½"-ACV-69-1-IAS4-Sp(256)
EL. 31'-0½"

ACV-69-1
EL. 30'-1"

LV-71-1
LV-76-1
EL. 31'-9"
EL. 30-1"

PSH-76
X-V-76-1
PSE-G5

VA. G43

AI-46-2-PL43S
EL. 31'-9"

12.20

I.R. #1

½"-SS15-Sp18 AIR SUPPLY TO INSTRUMENT RACK

SEE DETAIL A

1"SS1-83-HI-PL35(703)

BOT. EL. 25'-0"

3"-S¼"x¼"x10'-0" LG. ANGLE WELD TO COLD BOX AT EL. 25'-0"

8TB-1-CA815-Sp
SEE TUBE BUNDLE TABULATION CHART ON DWG. NO. 5-3555-8004D.

NOTE FOR 8TB-2-CA815-Sp
1. SEE TUBE BUNDLE TABULATION CHART ON DWG. NO. 5-3555-8004D.
2. WELD THE FACE OF A 3"x3"x¼"x1'-6" LG. ANGLE TO COLD BOX. DRILL (8) 29/64" DIA. HOLES ON 6" CENTERS. INSTALL (8) SWAGELOK BULKHEAD UNIONS #SS-400-61. CENTER ANGLE AT EL. 23'-6". PLUG SPARES FOR FUTURE USE.

1"SS1-83-LO-PL35
1"SS1-83-HI-PL35
FT-51-HI-PL35
FT-51-LO-PL35
FT-64-HI-PL35
FT-64-LO-PL35
LT-71-HI-PL35
LT-71-LO-PL35
LT-75-HI-PL35
LT-75-LO-PL35
LT-76-HI-PL35
LT-76-LO-PL35
PT-66-PL35
PT-70-PL35

SCALE: 1/2 IN. = 1 FT.

NOTES:
1. FOR GENERAL NOTES AND REFERENCE DWGS SEE DWG. NO. 5-3555-8003D
2. INSTRUMENT PIPING ON PLANT 1 IS IDENTICAL TO PLANT 2.

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CITY OF TAMPA, FLORIDA
4TH WASTEWATER IMPROVEMENT PROGRAM
HOOKERS POINT
ADVANCED WASTE TREATMENT PLANT
DIVISION 4L-1 OXYGEN GENERATION AND STORAGE EQUIPMENT

ECN NO.	REV.	ZONE	REVISION DESCRIPTION	DATE	BY	CHK'D	APP'D
—	B		AS BUILT MARK-UP	2 JUNE 1976	J.J. SHIM	JCA1	GC
E-6183	A		SEE ECN	18 MAR. 76	P.C.M.	JCA1	GC

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
FRACTION ± DECIMAL ± ANGLES ±
HOLE LOCATION ± HOLE SIZE ±

FIRST USED ON 00-5-3555

	NAME	DATE
DRAFTSMAN	S.T. KULKARNI	8-16-76
CHECKED		15 SEP 1976
ENGINEER		16 SEP 1976
APP'D		17 SEP 1976

TITLE
INSTRUMENT PIPING PLAN
COLD BOX & COMPRESSOR AREA
(2) 60 TO O_2 GENERATORS
HOOKERS POINT
TAMPA, FLORIDA

SCALE ½"=1'-0 WT.

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PENNSYLVANIA

5-3555-8005 D

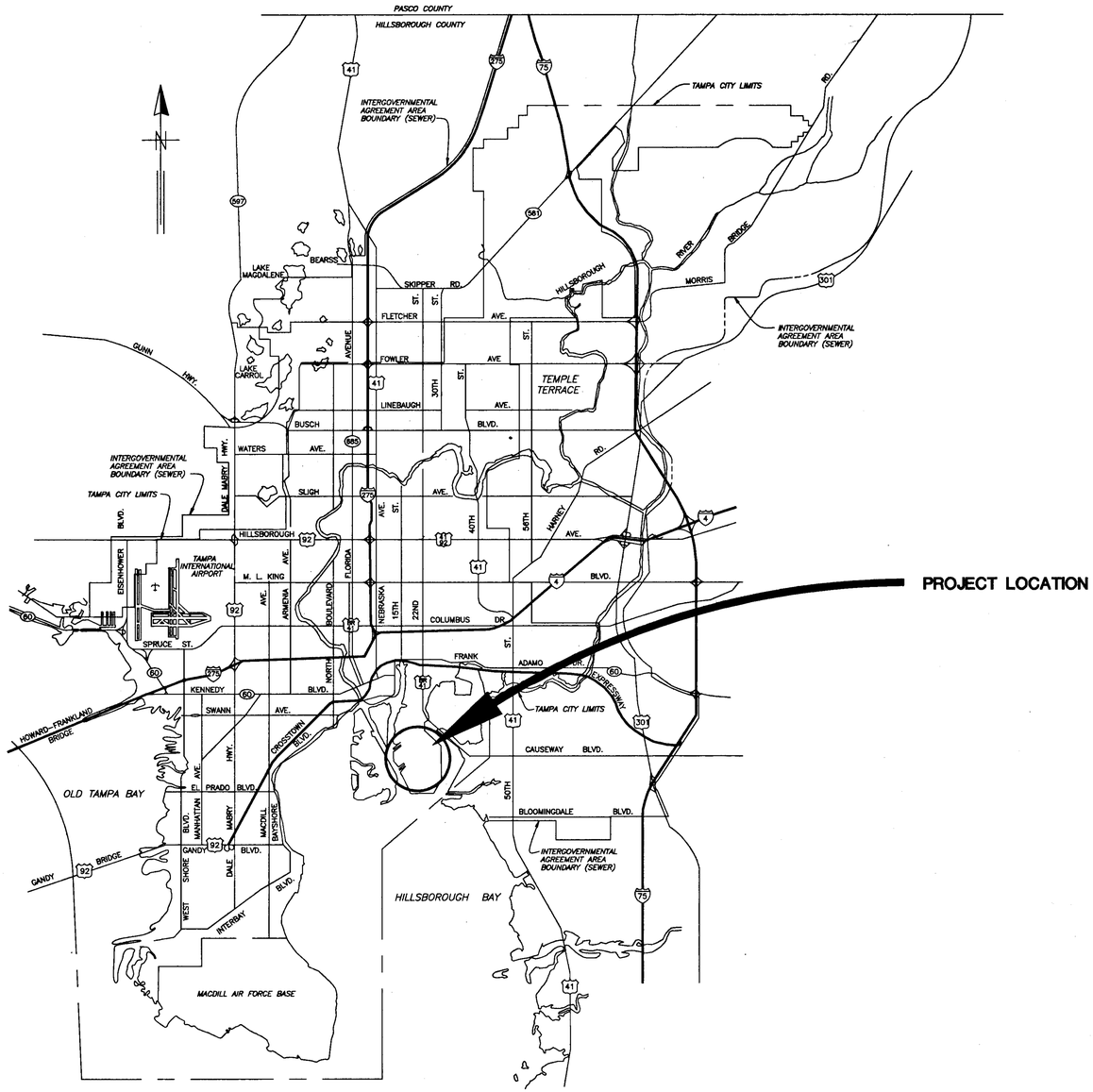
FORM NO. 8309-4 REV. 6-70

4L1_8005

41_090-001

R12

LOCATION MAP



CITY of TAMPA

CITY OF TAMPA FLORIDA
MASCOTTE
ORGANIZED JULY 15 1887

DEPARTMENT OF SANITARY SEWERS

PLANS FOR

DIVISION 4H23B, PHASE II-A

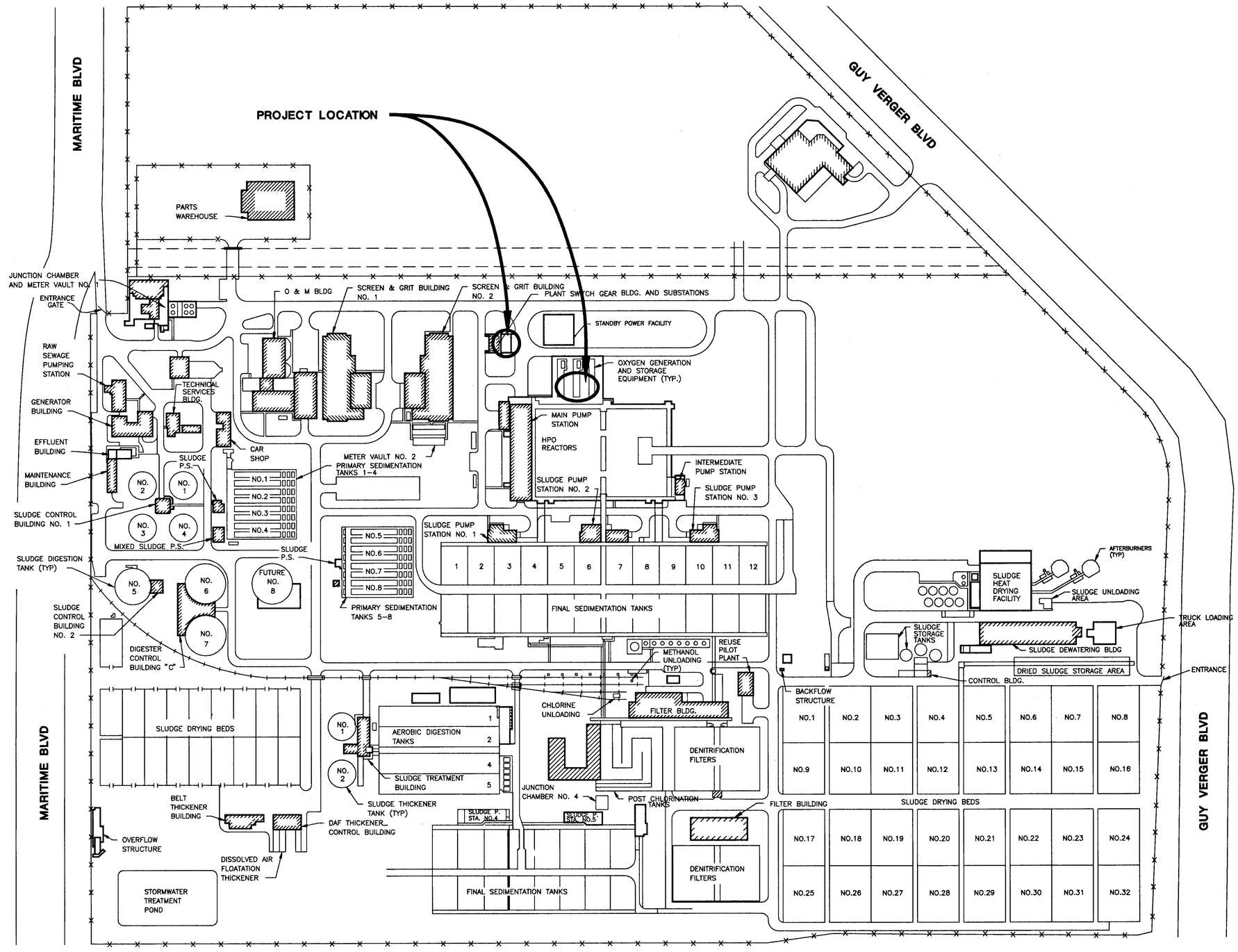
HIGH PURITY OXYGEN SYSTEM MODIFICATIONS TRANSFORMER AND SWITCHGEAR ENCLOSURES

TP11-17

ROMAN D. KORCHAK, P.E. #42626 ELECTRICAL SECTION HEAD DEPARTMENT OF SANITARY SEWERS	for HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: B.G./R.K. DRN: BB CKD: A.H. DATE: 11/30/95	No. / DATE / REVISIONS 1 2 3 4 5	CITY OF TAMPA FLORIDA DEPARTMENT OF SANITARY SEWERS HOWARD F. CURREN ADVANCED WASTEWATER TREATMENT PLANT	TITLE SHEET	DESIGN W.O. 7714 CONSTRUCTION W.O.	SHEET 1 OF 13

C:\ACAD\DWGS\TP\7714-1 1=50 STA47

TP11-17



TP11-18

C:\ACAD\DWGS\TP\7714-2 1=50 STATION #7

ROMAN D. KORCHAK, P.E. #42626 ELECTRICAL SECTION HEAD DEPARTMENT OF SANITARY SEWERS	HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS

DES: B.G./R.K.
DRN: BB
CKD: A.H.
DATE: 11/30/95

No.	DATE	REVISIONS
1		
2		
3		
4		
5		

NO SCALE

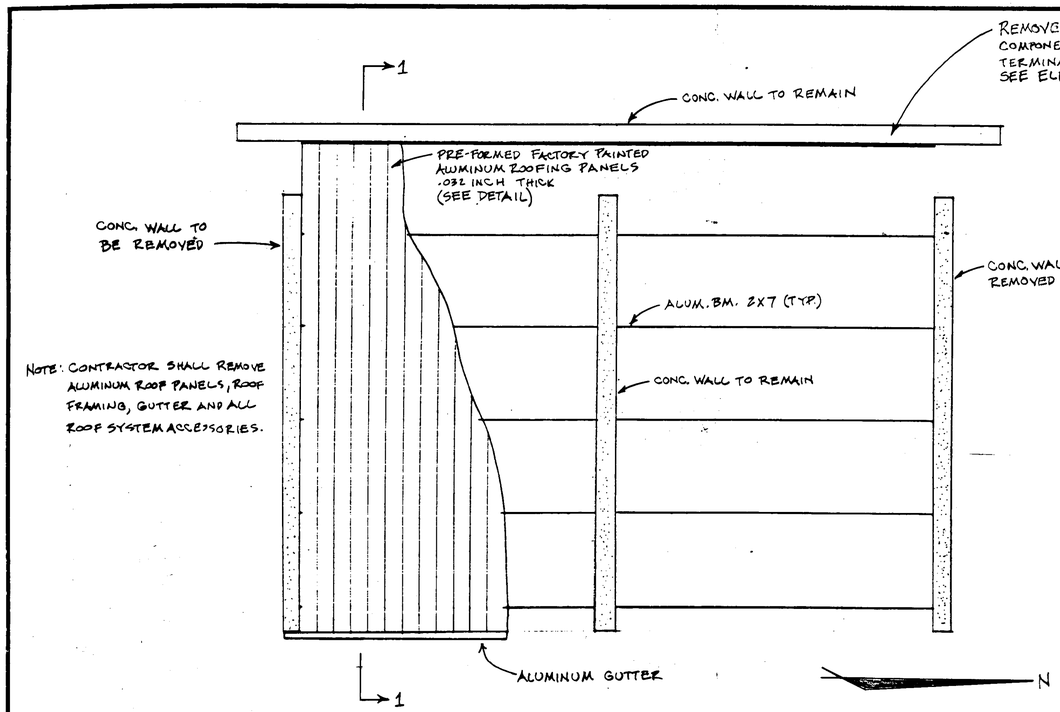
CITY OF TAMPA FLORIDA
DEPARTMENT OF SANITARY SEWERS
HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

DIVISION 4H23B, PHASE II-A
HIGH PURITY OXYGEN SYSTEM MODIFICATIONS TRANSFORMER AND SWITCHGEAR ENCLOSURES

DESIGN W.O. 7714
CONSTRUCTION W.O.

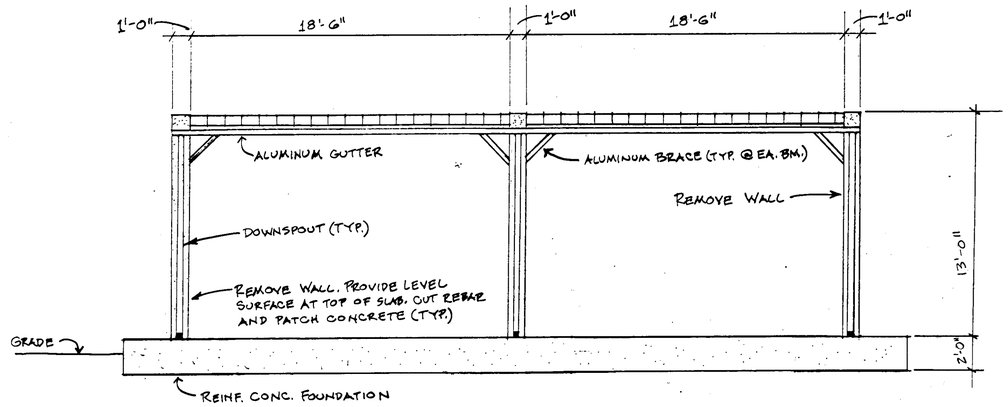
SHEET 2 OF 13

TP11-18



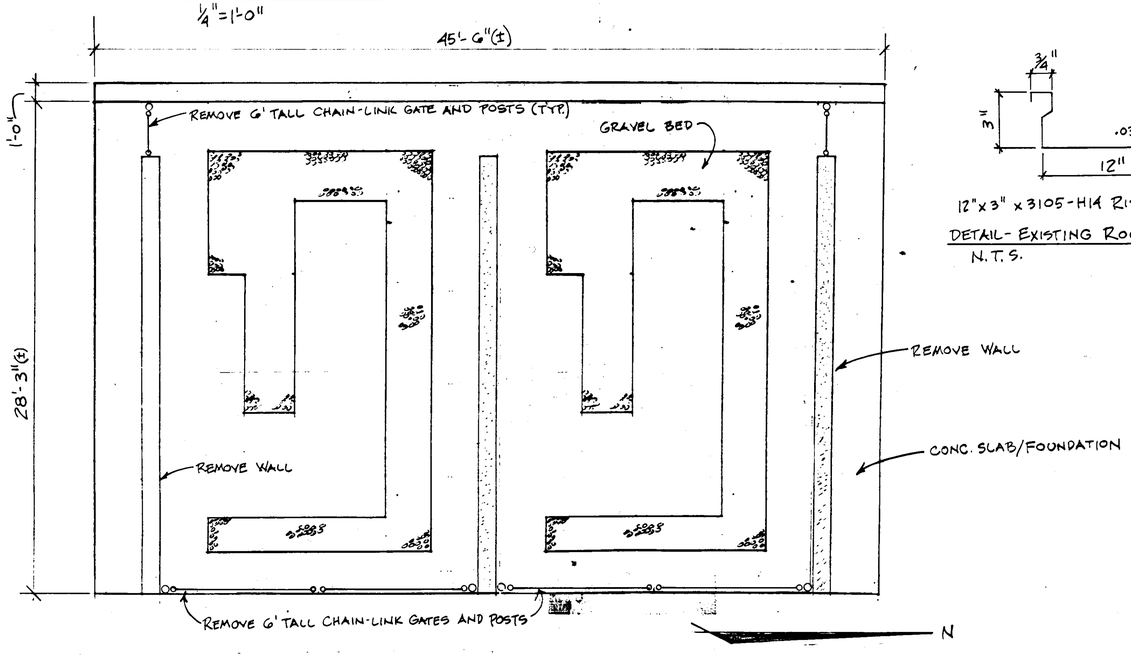
ROOF/ROOF FRAMING PLAN - EXISTING TRANSFORMER YARD ENCLOSURE

1/4" = 1'-0"



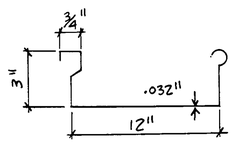
EAST ELEVATION - EXISTING TRANSFORMER YARD ENCLOSURE

1/4" = 1'-0"



SLAB PLAN - EXISTING TRANSFORMER YARD ENCLOSURE

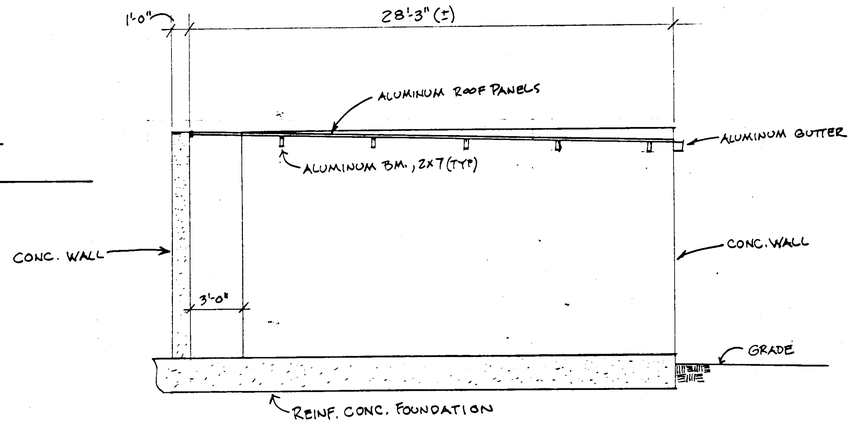
1/4" = 1'-0"



12"x3" x 3105-H14 RISER PANEL

DETAIL - EXISTING ROOF PANEL

N.T.S.

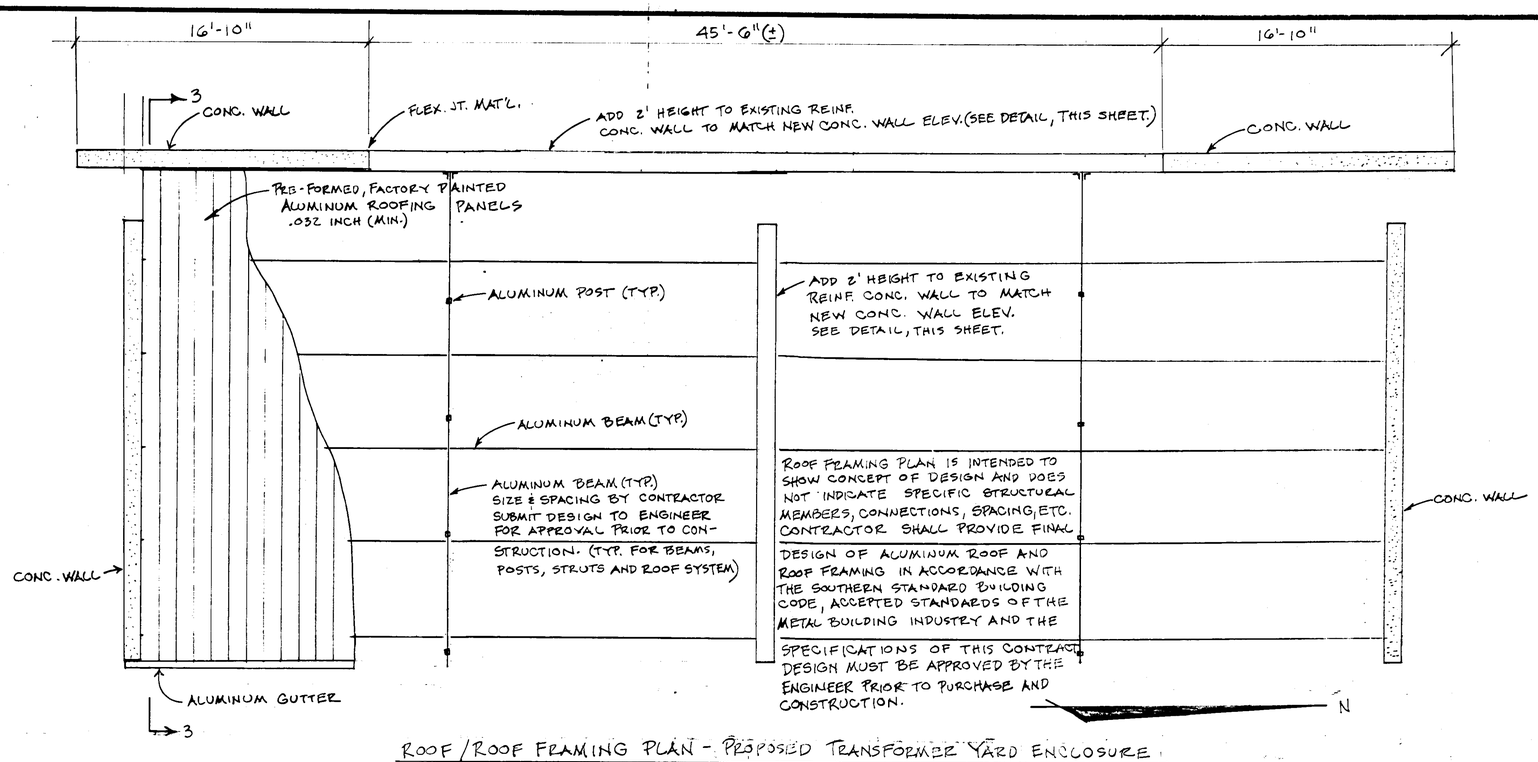


SECTION 1-1

1/4" = 1'-0"

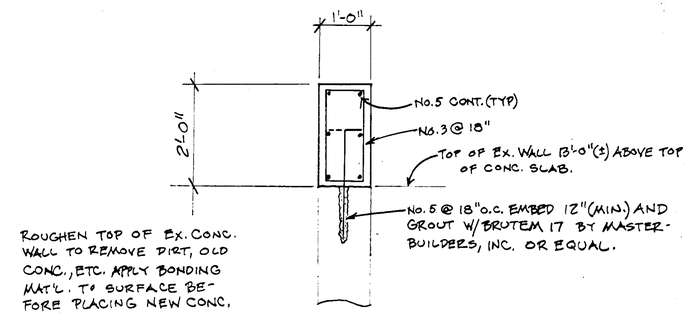
TP11-19

	HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: B.G. DRN: R.A.R. CKD: A.H. DATE: 11/30/95	No. / DATE / REVISIONS: 1, 2, 3, 4, 5	SCALE: AS SHOWN	CITY OF TAMPA FLORIDA DEPARTMENT OF SANITARY SEWERS HOWARD F. CURREN ADVANCED WASTEWATER TREATMENT PLANT	DIVISION 4H23B, PHASE II-A HIGH PURITY OXYGEN SYSTEM MODIFICATIONS TRANSFORMER AND SWITCHGEAR ENCLOSURES	DESIGN W.O. 7714 CONSTRUCTION W.O.	SHEET 3 OF 13



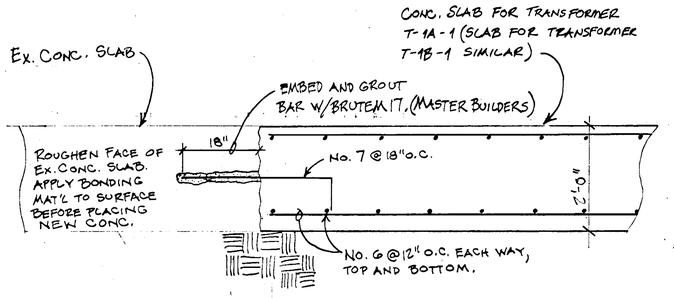
ROOF/ROOF FRAMING PLAN - PROPOSED TRANSFORMER YARD ENCLOSURE

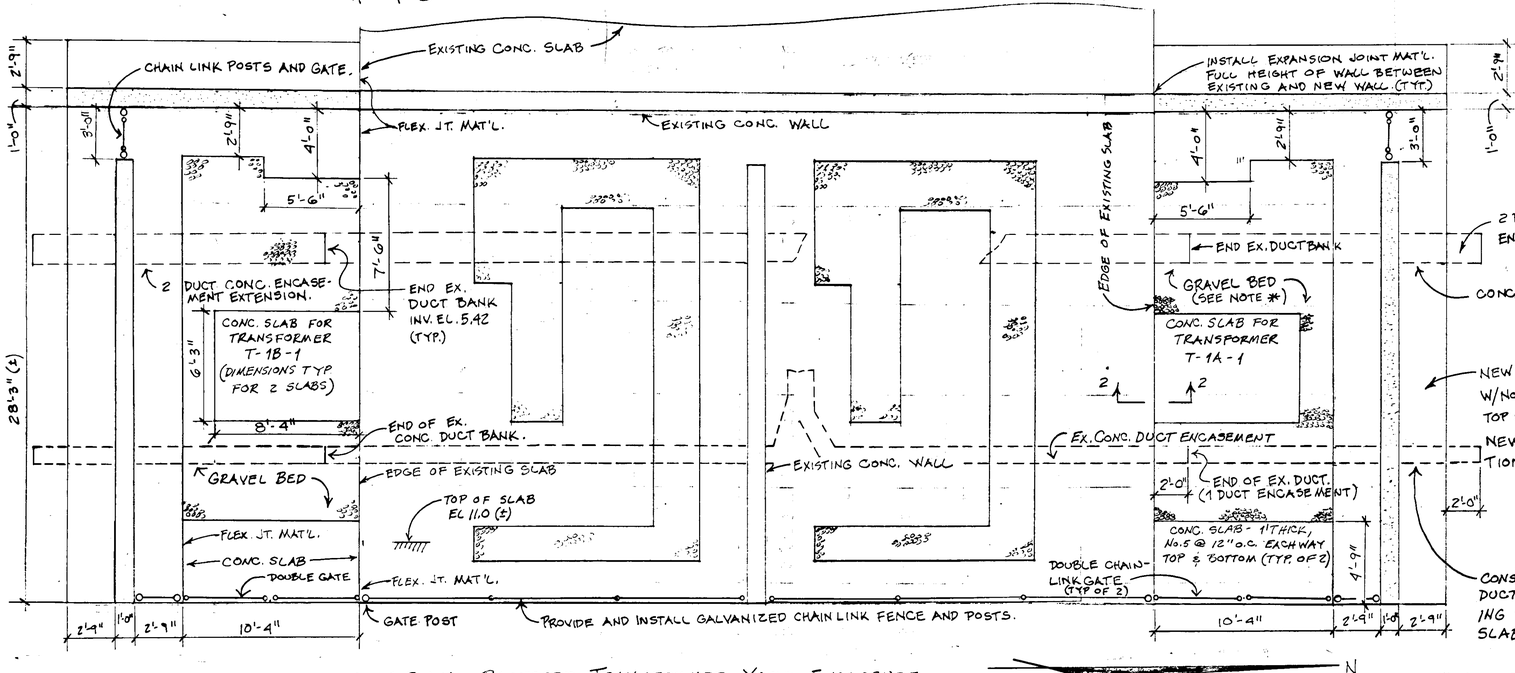
1/4" = 1'-0"



DETAIL - 2'-0" ADDED TO EXISTING CONC. WALLS

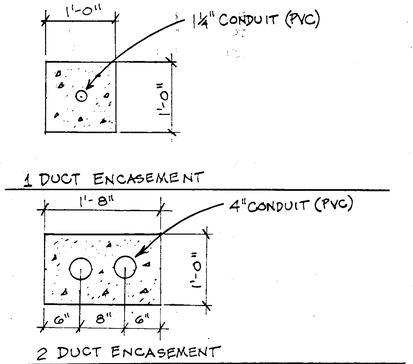
3/4" = 1'-0"





SLAB PLAN - PROPOSED TRANSFORMER YARD ENCLOSURE

1/4" = 1'-0"



CONCRETE DUCT ENCASEMENT DETAILS

1" = 1'-0"

SECTION 2-2

3/4" = 1'-0"

* NOTE: PROVIDE GRAVEL FOR BED 24" DEEP. USE GRAVEL FROM SWITCHGEAR ENCLOSURE SITE. (SEE SHEET 6) TYP. FOR 2 GRAVEL BEDS SHOWN.

TP11-20

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: B.G.
DRN: R.A.R.
CKD: A.H.
DATE: 11/30/95

No.	DATE	REVISIONS
1		
2		
3		
4		
5		

SCALE

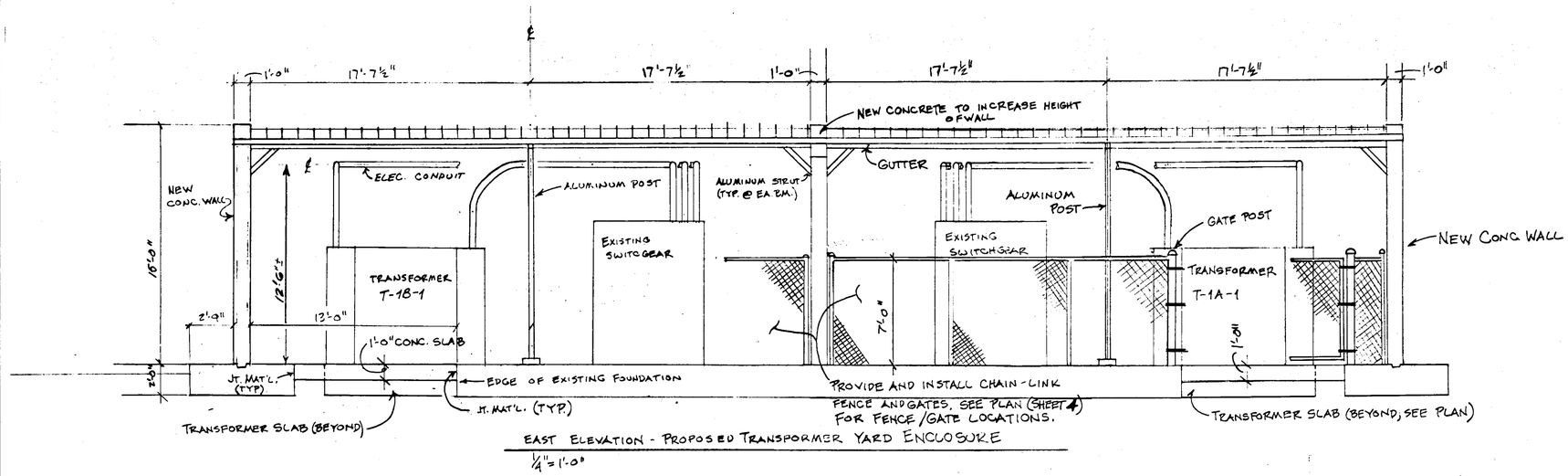
AS SHOWN

CITY OF TAMPA FLORIDA
DEPARTMENT OF SANITARY SEWERS
HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

DIVISION 4H23B, PHASE II-A
HIGH PURITY OXYGEN SYSTEM MODIFICATIONS
TRANSFORMER AND SWITCHGEAR ENCLOSURES

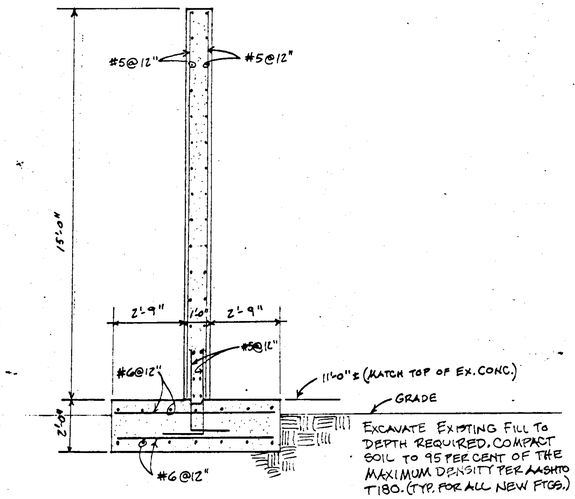
DESIGN W.O. 7714
CONSTRUCTION W.O.

SHEET 4 OF 13



EAST ELEVATION - PROPOSED TRANSFORMER YARD ENCLOSURE

1/4"=1'-0"



DETAIL - REINFORCED CONC. WALL - TYP. FOR NEW WALLS

3/8"=1'-0"

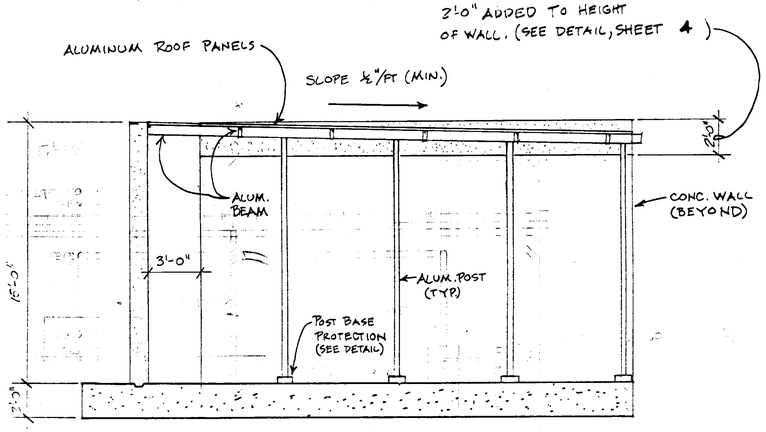
DESIGN CRITERIA

ROOF LOADS

LIVE LOAD	20 PSF
DEAD LOAD	10 PSF (MIN.)
WIND LOAD	PER SOUTHERN STANDARD BUILDING CODE FOR 125 MPH WIND W/APPROPRIATE FACTORS APPLIED

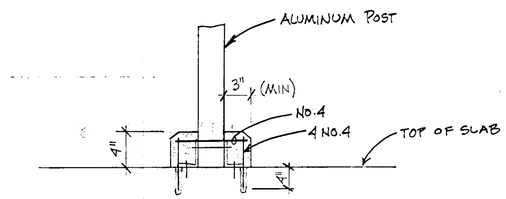
MATERIALS

CONCRETE	f'_c = 4000 psi @ 28 DAYS
REINF. STEEL	F_y = 60,000 psi
STRUCTURAL ALUMINUM	6061-T6, 6063 OR OTHER ALLOY AS APPROVED BY ALUMINUM ASSOCIATION FOR STRUCTURAL PURPOSES
ALUMINUM ROOF PANELS	.032" (MIN) PRE-FORMED, FACTORY PAINTED, WEATHER-PROOF ROOFING SYSTEM.



SECTION 3-3

1/4"=1'-0"



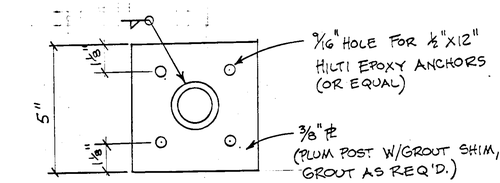
DETAIL - ALUMINUM POST BASE PROTECTION

1½"=1'-0"

NOTES

1. EXTRUDED ALUMINUM POSTS SHALL BE PROVIDED WITH WALL THICKNESS NOT LESS THAN .125 INCH. OTHER DIMENSIONS AND SPACING, LOCATION SHALL BE DETERMINED BY THE CONTRACTOR TO SUIT BUILDING REQUIREMENTS.

2. GALVANIZED STEEL FENCE POSTS SHALL BE PROVIDED WITH BASE PLATES AS SHOWN AND REQUIRED FOR INSTALLATION ON CONCRETE SLABS. ALL OTHER FENCING REQUIREMENTS SHALL MEET SPECIFICATIONS.

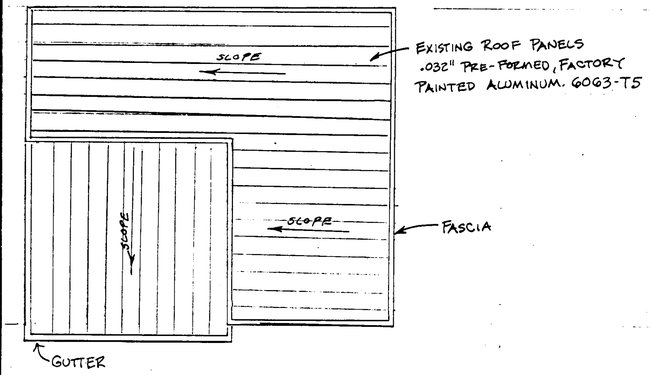


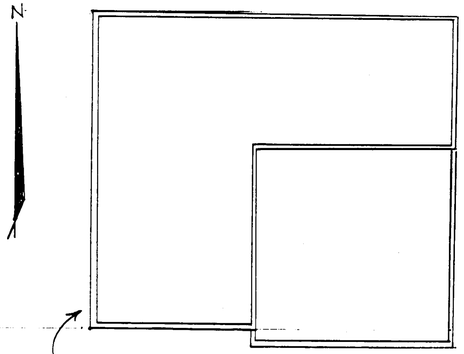
TYPICAL FENCE POST BASE ℄ (MIN. REQ'MT.)

N.T.S.

TP11-21

HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: B.G. DRN: R.A.R. CKD: A.H. DATE: 11/30/95	No. / DATE / REVISIONS: 1, 2, 3, 4, 5	SCALE: AS SHOWN	CITY OF TAMPA FLORIDA DEPARTMENT OF SANITARY SEWERS HOWARD F. CURREN ADVANCED WASTEWATER TREATMENT PLANT	DIVISION 4H23B, PHASE II-A HIGH PURITY OXYGEN SYSTEM MODIFICATIONS TRANSFORMER AND SWITCHGEAR ENCLOSURES	DESIGN W.O. 7714 CONSTRUCTION W.O.	SHEET 5 OF 13

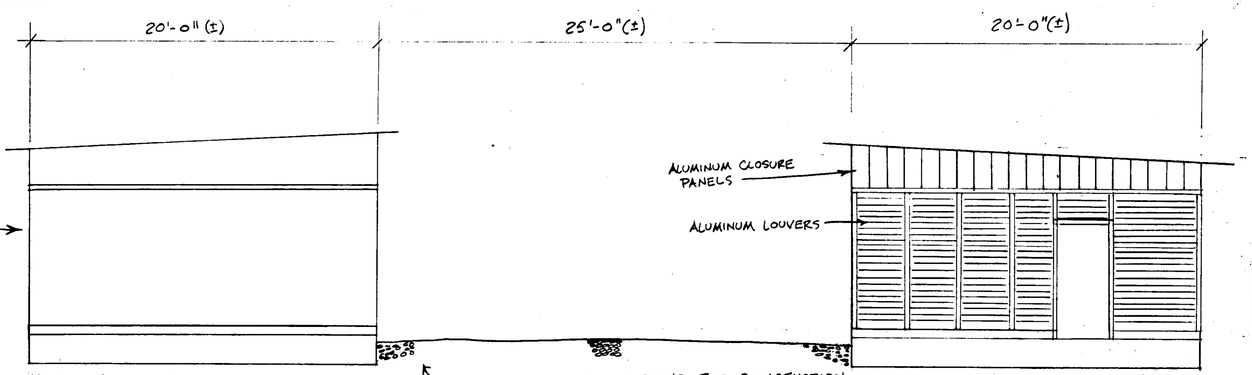


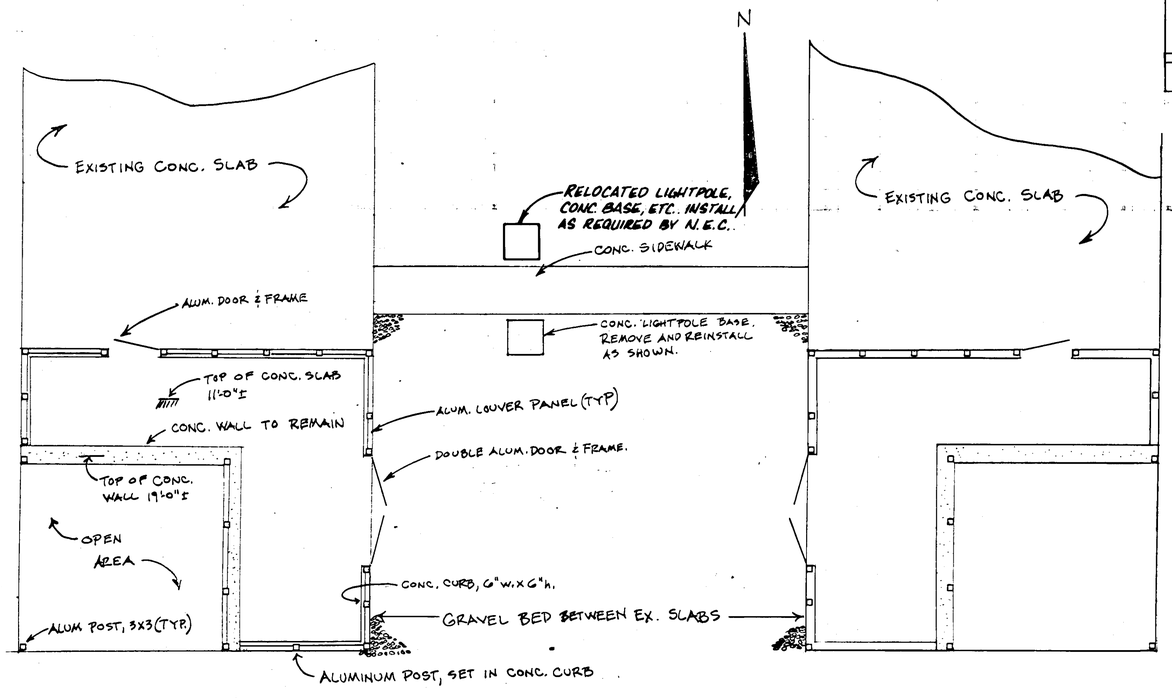


EXISTING SWITCHGEAR ENCLOSURES SHALL BE REMOVED BY CONTRACTOR INCLUDING ALUMINUM ROOFING AND SIDING PANELS, ALUMINUM POSTS AND BEAMS, ALUMINUM LOUVER PANELS, ALUMINUM DOORS AND FRAMES, AND CONCRETE CURB.

ROOF PLAN - EXISTING SWITCHGEAR ENCLOSURES

1/4"=1'-0"



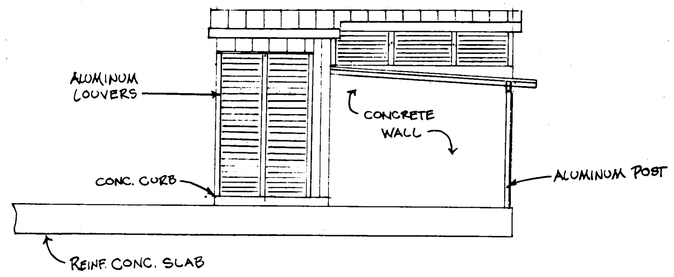


SLAB PLAN - EXISTING SWITCHGEAR ENCLOSURES

1/4" = 1'-0"

NORTH ELEVATION - EXISTING SWITCHGEAR ENCLOSURES

1/4" = 1'-0"

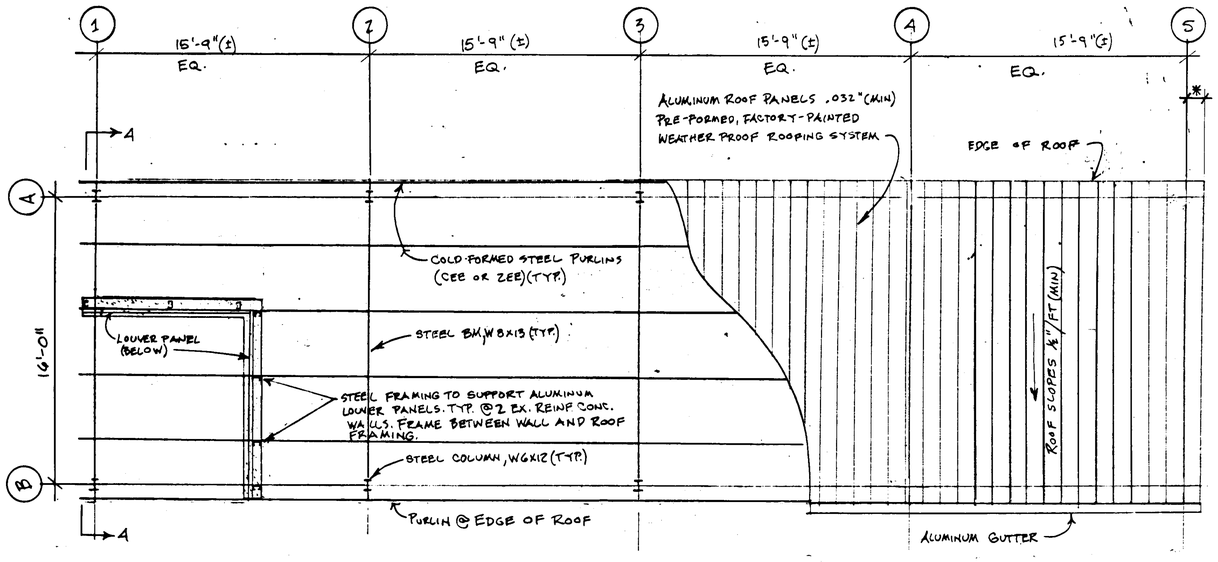


WEST ELEVATION (WESTERNMOST BLDG.) - EXISTING SWITCHGEAR ENCLOSURE

1/4"=1'-0"

TP11-22

HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: B.G. DRN: R.A.R. CKD: DATE:	No. / DATE / REVISIONS: 1, 2, 3, 4, 5	SCALE: AS SHOWN	CITY OF TAMPA FLORIDA DEPARTMENT OF SANITARY SEWERS HOWARD F. CURREN ADVANCED WASTEWATER TREATMENT PLANT	DIVISION 4H23B, PHASE II-A HIGH PURITY OXYGEN SYSTEM MODIFICATIONS TRANSFORMER AND SWITCHGEAR ENCLOSURES	DESIGN W.O. 7714 CONSTRUCTION W.O.	SHEET 6 OF 13

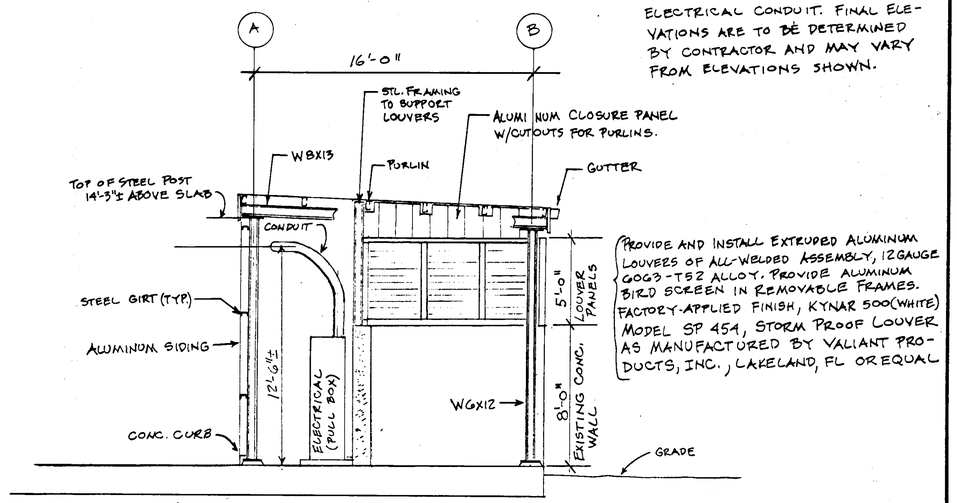


ROOF/ROOF FRAMING PLAN - PROPOSED SWITCHGEAR ENCLOSURE

¼" = 1'-0"

N

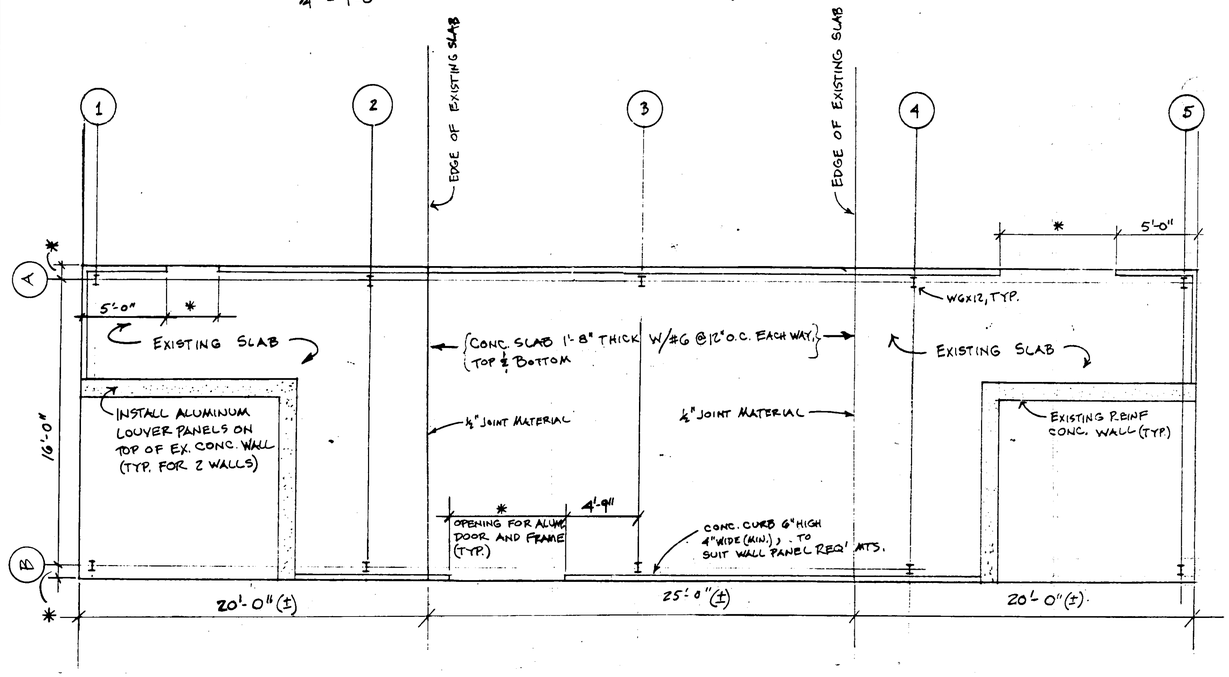
NOTE: ELEVATIONS OF STEEL FRAMING SHOWN ARE BASED ON PROVIDING ADEQUATE CLEARANCE FOR NEW OVERHEAD ELECTRICAL CONDUIT. FINAL ELEVATIONS ARE TO BE DETERMINED BY CONTRACTOR AND MAY VARY FROM ELEVATIONS SHOWN.



PROVIDE AND INSTALL EXTRUDED ALUMINUM LOUVERS OF ALL-WELDED ASSEMBLY, 12GAUGE 6063-T52 ALLOY. PROVIDE ALUMINUM BIRD SCREEN IN REMOVABLE FRAMES. FACTORY-APPLIED FINISH, KYNAR 500(WHITE) MODEL SP 454, STORM PROOF LOUVER AS MANUFACTURED BY VALIANT PRODUCTS, INC., LAKELAND, FL OR EQUAL

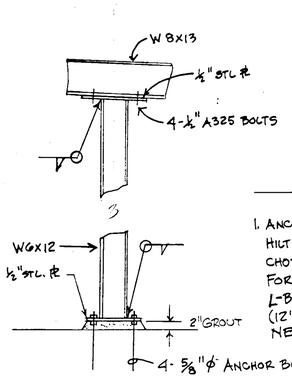
SECTION 4-4 - TYPICAL CONSTRUCTION

¼" = 1'-0"



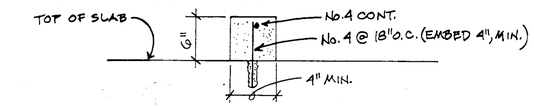
SLAB PLAN - PROPOSED SWITCHGEAR ENCLOSURE

¼" = 1'-0"



BASE AND CAP PL DETAILS

¾" = 1'-0"



CURB DETAIL

N.T.S.

NOTES

1. ANCHOR BOLTS SHALL BE HILTI HVA ADHESIVE ANCHOR (10" EMBEDMENT) FOR EXISTING SLABS; L-BOLTS, CAST IN PLACE (12" EMBEDMENT) FOR NEW CONC. SLABS.
2. METAL SURFACES IN CONTACT W/CONCRETE (BOTTOM OF BASE PL, ALUMINUM LOUVER BASE, ETC.) SHALL BE COATED W/2 COATS BITUMASTIC PAINT OR ASPHALTIC VARNISH.
3. FRAMING DESIGN, CONNECTION DETAILS, ETC. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATION.

NOTES

1. THESE DRAWINGS ARE INTENDED TO SHOW THE CONCEPT FOR THE PROPOSED SWITCHGEAR ENCLOSURE AND DO NOT INCLUDE CONNECTION OR FABRICATION DETAILS FOR THE STRUCTURE, ROOFING AND SIDING PANELS, LOUVERS, ETC. THE CONTRACTOR SHALL PROVIDE THE FINAL DESIGN DETAILS FOR THESE ITEMS IN ACCORDANCE WITH THE SOUTHERN STANDARD BUILDING CODE, THE SPECIFICATIONS OF THIS CONTRACT AND THE ACCEPTED STANDARDS OF THE METAL BUILDING INDUSTRY. IN SOME CASES, SPECIFIC DETAILS HAVE BEEN PROVIDED AND SPECIFIC ITEMS HAVE BEEN CALLED FOR; IN THESE CASES, THE CONTRACTOR SHALL PROVIDE AND INSTALL THE ITEMS AS SHOWN IN THE DRAWINGS.
2. CONTRACTOR SHALL SUBMIT MFR'S. LITERATURE FOR ALUMINUM PANELS, ALUMINUM LOUVERS AND COLD-FORMED STEEL FRAMING MEMBERS DESCRIBING MECHANICAL AND MATERIAL PROPERTIES, INSTALLATION RECOMMENDATIONS, ETC. TO THE ENGINEER FOR APPROVAL PRIOR TO PURCHASE AND FABRICATION.
3. ALL STRUCTURAL STEEL (INCLUDING PURLINS AND GIRTS) SHALL BE PAINTED AS FOLLOWS:
   a) PRIMER - (SHOP APPLIED, TOUCH-UP IN FIELD BEFORE FINISH COATS APPLIED) 2.0 MILS (DFT) KOP-COAT 340 GOLD. b) 2-COATS FINISH COAT SUNTARMOR 500 SPEED, 1.5 MILS (DFT)/COAT APPLIED WITH BRUSH OR ROLLER ONLY.

TP11-23

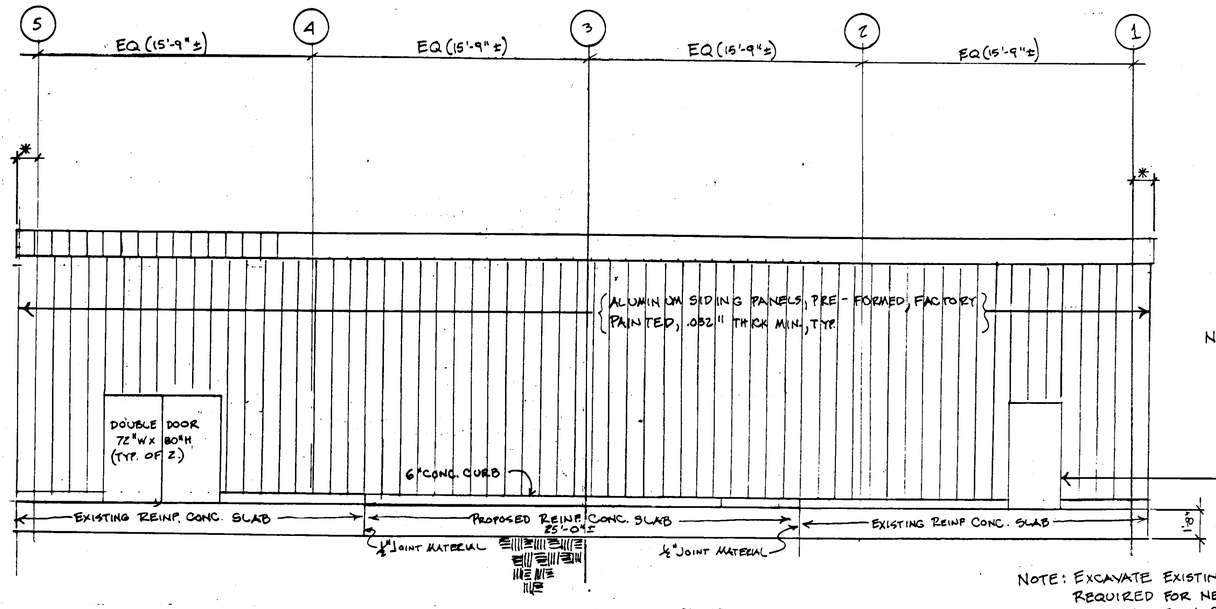
	HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: B.G. DRN: R.A.R. CKD: A.H. DATE: 11/30/05	No. / DATE / REVISIONS: 1 2 3 4 5	SCALE AS SHOWN	CITY OF TAMPA FLORIDA DEPARTMENT OF SANITARY SEWERS HOWARD F. CURREN ADVANCED WASTEWATER TREATMENT PLANT

DIVISION 4H23B, PHASE II-A
HIGH PURITY OXYGEN SYSTEM MODIFICATIONS
TRANSFORMER AND SWITCHGEAR ENCLOSURES

DESIGN W.O. 7714
CONSTRUCTION W.O.

SHEET 7 OF 13

TP11-23

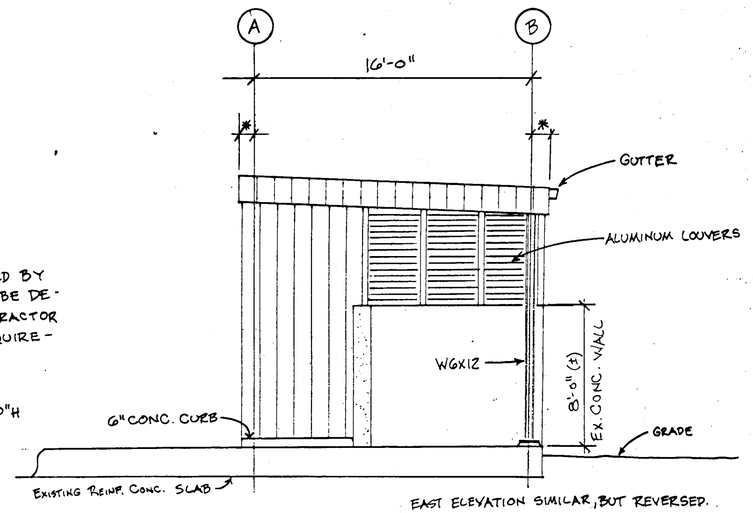


NORTH ELEVATION - PROPOSED SWITCHGEAR ENCLOSURE

¼" = 1'-0"

NOTE: DIMENSIONS INDICATED BY ASTERISK (*) SHALL BE DETERMINED BY CONTRACTOR TO SUIT BLDG. REQUIREMENTS.

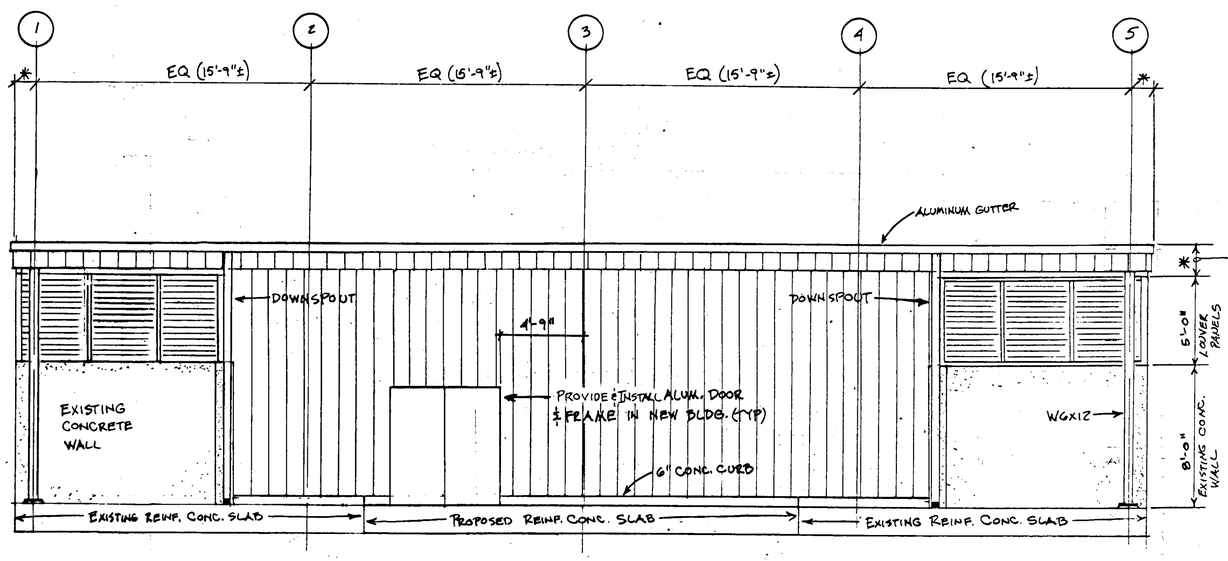
NOTE: EXCAVATE EXISTING FILL AS REQUIRED FOR NEW SLAB CONSTRUCTION. COMPACT SOIL BELOW SLAB TO 95 PER CENT OF MAXIMUM DENSITY PER AASHTO T180. PROVIDE MOISTURE BARRIER UNDER NEW CONCRETE SLAB.



EAST ELEVATION SIMILAR, BUT REVERSED.

WEST ELEVATION - PROPOSED SWITCHGEAR ENCLOSURE

¼" = 1'-0"



SOUTH ELEVATION - PROPOSED SWITCHGEAR ENCLOSURE

¼" = 1'-0"

DESIGN CRITERIA - SWITCHGEAR ENCLOSURE

ROOF LIVE LOAD	20 PSF
ROOF DEAD LOAD	10 PSF (MIN), LOAD RESULTING FROM BLDG. MATERIALS
WIND LOAD	LOAD RESULTING FROM 125 MPH WIND, IN ACCORDANCE W/ SOUTHERN STANDARD BUILDING CODE W/ APPROPRIATE FACTORS APPLIED
MATERIALS	
STRUCTURAL STEEL (PRIMARY)	ASTM A36
SECONDARY MEMBERS (COLD-FORMED PURLINS AND GIRTS)	ASTM A570, A606, A607 OR SIMILAR (ON APPROVAL OF ENGINEER)
CONCRETE	f'_c = 1000 psi
REINFORCING STEEL	Fy = 60,000 psi

TP11-24

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: B.G.
DRN: R.A.R.
CKD: R.L.M.
DATE: 11/30/95

No.	DATE	REVISIONS
1		
2		
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5		

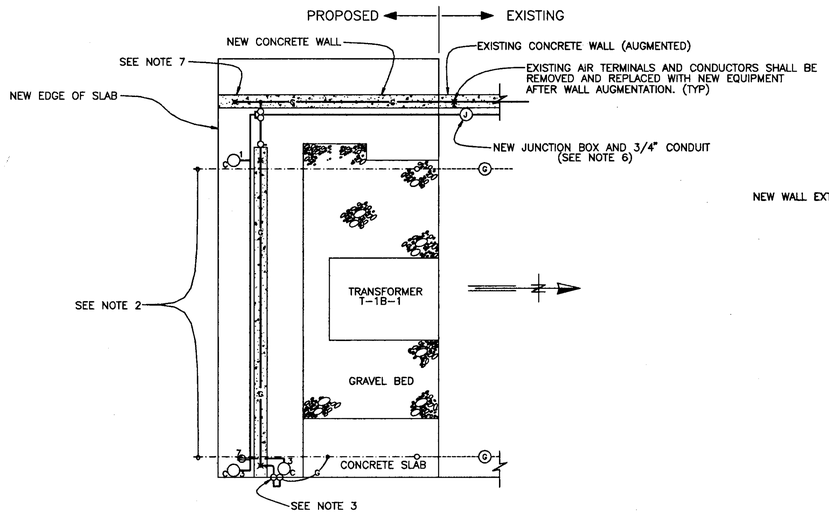
SCALE: AS SHOWN

CITY OF TAMPA FLORIDA
DEPARTMENT OF SANITARY SEWERS
HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

DIVISION 4H23B, PHASE II-A
HIGH PURITY OXYGEN SYSTEM MODIFICATIONS
TRANSFORMER AND SWITCHGEAR ENCLOSURES

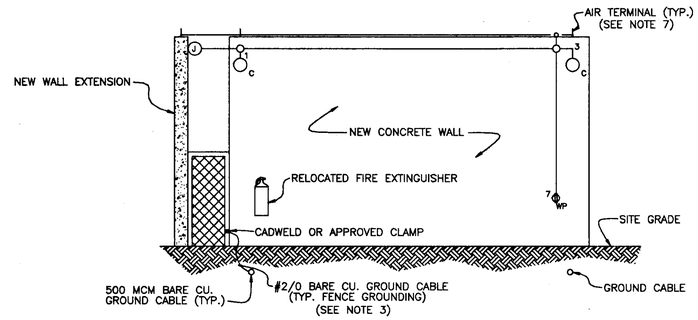
DESIGN W.O. 7714
CONSTRUCTION W.O.

SHEET 8 OF 13



PROPOSED TRANSFORMER YARD LIGHTING MODIFICATIONS – PLAN VIEW

SCALE: 3/16"=1'-0" (SEE NOTES 1,4,5)

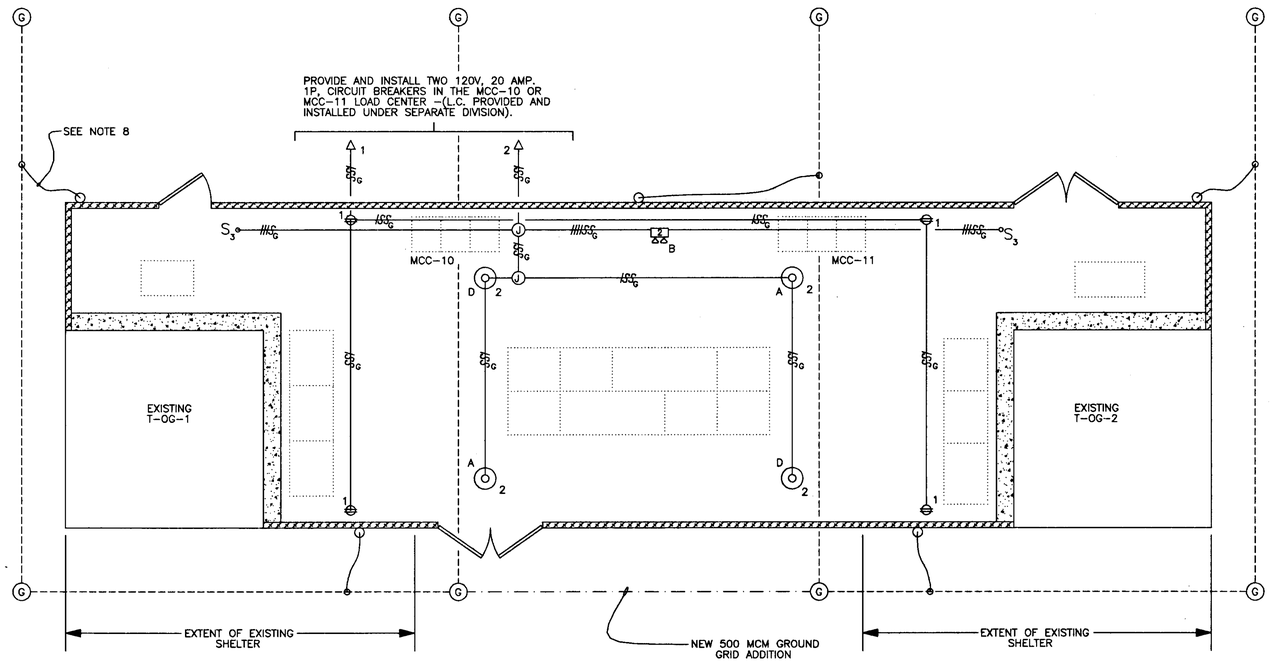


PROPOSED TRANSFORMER YARD LIGHTING MODIFICATIONS – SOUTH ELEVATION

SCALE: 3/16"=1'-0" (SEE NOTES 1,4,5)

LEGEND

- EXPOSED RIGID ALUMINUM CONDUIT
- (J) JUNCTION BOX OR CONDUIT BODY
- ↑1 HOME-RUN TO LOAD CENTER, CIRCUIT NO.1
- EXISTING GROUND GRID
- PROPOSED GROUND GRID ADDITION
- (G) EXISTING GROUND ROD ACCESS
- 3/4" CONDUIT WITH 3 HOT, 1 NEUTRAL, AND 1 GROUNDING CONDUCTOR.



PROPOSED OXYGEN PLANTS SWITCHGEAR LIGHTING – PLAN VIEW

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

NOTES:

1. THE SOUTHERN PORTION OF THE TRANSFORMER YARD LIGHTING MODIFICATIONS SITE PLAN IS SHOWN. IMPROVEMENTS TO THE NORTHERN PORTION ARE A MIRROR IMAGE OF THAT SHOWN.
2. 500MCM GROUND CABLE SHALL BE EXTENDED 2 FT. BEYOND FOUNDATION; CABLE IS BURIED 2 FT. DEEP.
3. ALL FENCING SECTIONS SHALL BE GROUNDED AS SHOWN. HINGES, GATE LATCHES, ETC, SHALL NOT BE RELIED ON TO PROVIDE A GROUNDING PATH. BONDING SHALL BE ACCOMPLISHED BY EITHER THE EXOTHERMIC WELDING PROCESS OR APPROVED CLAMPS USING #2/0 STRANDED BARE COPPER CONDUCTOR ATTACHED TO THE 500MCM GRID.
4. EACH ROOFING BEAM SHALL BE GROUNDED AT BOTH ENDS WITH A #2 AWG STRANDED BARE COPPER CONDUCTOR. INDIVIDUAL DOWN CONDUCTORS SHALL BE RUN AT EACH CONNECTION AND ATTACHED TO THE LIGHTNING PROTECTION GRID USING APPROVED MEANS. RUN A #2 GROUNDING STRAP BETWEEN EACH METAL POST AND THE ROOFING BEAM TO ENSURE ELECTRICAL CONTINUITY. A #2/0 AWG STRANDED BARE COPPER CONDUCTOR SHALL BE ATTACHED TO THE BASE OF EACH METAL POST AND RUN TO THE GROUND GRID. PVC CONDUIT SHALL BE INSTALLED IN THE FOUNDATION TO PREVENT THE NECESSITY OF RUNNING THE GROUNDING CONDUCTORS ON THE SURFACE OF THE CONCRETE.
5. PERTINENT EXISTING ELECTRICAL CONDUITS, CONDUCTORS, AND FIXTURES SHALL BE DISCONNECTED AND PROTECTED FOR FUTURE RECONNECTION BEFORE THE PLANNED DEMOLITION OF EXISTING STRUCTURES AND EQUIPMENT.
6. INTERCEPT THE EXISTING CONDUITS AND INSTALL A SUITABLE JUNCTION BOX OR CONDUIT BODY AS SHOWN. EXTEND 3/4 INCH CONDUITS AND CONDUCTORS AS SHOWN AND REQUIRED TO SERVE THE PROPOSED LOADS. THE EXISTING CIRCUITS ORIGINATING FROM THE AUXILIARY POWER PANEL IN SWITCHGEAR #1 SHALL BE UTILIZED AS REQUIRED.
7. PROVIDE AND INSTALL NEW LIGHTNING PROTECTION AIR TERMINALS AS SHOWN. ALL LIGHTNING PROTECTION ROOF AND DOWN CONDUCTORS SHALL BE #2 AWG STRANDED BARE COPPER CABLE. PROVIDE CABLE SUPPORTS AND GUIDES AS REQUIRED TO EFFECT A NEAT AND SECURE GROUNDING SYSTEM.
8. PROVIDE AND INSTALL #2/0 AWG STRANDED BARE COPPER CONDUCTORS AT THE BASE OF EACH COLUMN USING SUITABLE BOLTED TERMINATIONS AND EXTEND TO THE 500 MCM GROUND GRID AS SHOWN. PVC CONDUIT SHALL BE USED AS NECESSARY TO PREVENT THE RUNNING OF EXPOSED CONDUCTOR ON THE CONCRETE SLAB. RUN A #2 GROUNDING STRAP BETWEEN EACH COLUMN AND THE ROOFING BEAM TO ENSURE ELECTRICAL CONTINUITY.

LIGHTING SCHEDULE

SYMBOL	DESCRIPTION	MANUFACTURER	MODEL	RATING	COMMENT	MOUNTING HEIGHT ABOVE FLOOR
(A)	LOWBAY LUMINAIRE– HIGH PRESSURE SODIUM	HUBBELL	LWP–100S8–A	100 WATT 120/208/ 240/277V QUAD. TAP	BALANCED PEND. MOUNTING FOR DAMP/WET LOC.	11 FT.
B	EMERGENCY LIGHTING– BATTERY POWERED DUAL HALOGEN LAMPS	HUBBELL	N46–15–2	15 WATT 120/277 V	NEMA 4X FIBER–GLASS ENCLOS'R 15HR BURN TIME	7 FT.
C	WALL MOUNTED LUMINAIRE– HIGH PRESSURE SODIUM	HOLOPHANE	WL2K–070HP–12–BZ	70 WATT 120 V	WEATHER RESIS HEAVY DUTY CAST ALUMINUM HOUSING	14 FT.
S_3	3–WAY TOGGLE SWITCH	HUBBELL	1223	20 AMPERE 120/277 V	WITH CROUSE–HINDS SWITCH COVER #DS185	4.5 FT.
	DUPLEX OUTLET	HUBBELL	5362	20 AMPERE 120 V	WITH CROUSE–HINDS WET LOC. COVER #WLRD–1	2 FT.
—	DEVICE BOXES	CROUSE–HINDS	FD2019–SA	2.5 IN. DEEP	CAST ALUMINUM WITH MTG LUGS AND 3/4 IN HUB	
(D)	LOWBAY LUMINAIRE– HIGH PRESSURE SODIUM W/ 100 WATT QUARTZ STANDBY	HUBBELL	LWP–100S8–A–QSL	100 WATT 120/208/ 240/277V QUAD. TAP	BALANCED PEND. MOUNTING FOR DAMP/WET LOC.	11 FT.

TP11-25

ROMAN D. KORCHAK, P.E. #42626
ELECTRICAL SECTION HEAD
DEPARTMENT OF SANITARY SEWERS

HENRY DORZBACK, P.E.
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DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: R.K.
DRN:
CKD:
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SCALE: AS SHOWN

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HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

DIVISION 4H23B, PHASE II-A
HIGH PURITY OXYGEN SYSTEM MODIFICATIONS TRANSFORMER AND SWITCHGEAR ENCLOSURES

DESIGN W.O. 7714
CONSTRUCTION W.O.

SHEET 9 OF 13

TP11-25

R12
C:\ACAD\DWG\TP\7714-9 1/4"=1' STA#7

NOTES:

1. IN BREAKER CUBICLES 1-52-1A AND 1-52-1B REPLACE THE EXISTING 200/5A PHASE CURRENT TRANSFORMERS WITH 300/5A CURRENT TRANSFORMERS. REVISE THE AMMETER SCALE TO READ 0-300A. THE EXISTING 13.2 KV SWITCHGEAR NO. 1 WAS MANUFACTURED BY WESTINGHOUSE ELECTRICAL CORP. ON THEIR GO NUMBER TA-60200-VY1.
2. IN TRANSFORMER T-1A-1 AND T-1B-1 SECONDARY BREAKER CUBICLES REPLACE THE EXISTING 250/5A WITH 700/5A CURRENT TRANSFORMERS. THE SWITCHGEAR CUBICLES WERE MANUFACTURED BY WESTINGHOUSE ELECTRIC CORP. ON THEIR GO NUMBER TA-60200-VY1.
3. PROVIDE A COORDINATION STUDY AND NEW RELAY SETTING FOR THE REVISED FEEDERS.

FOR REFERENCE ONLY

EXISTING 13.2 KV SWITCHGEAR NO. 1 SECTION B

MAIN BRKR 1-52-2

DIST BRKR 1-52-1B

300/5A (3)

SEE NOTE 1

1H1B1

EXISTING INCOMING SERVICE FROM TECO

EXISTING 600A L.B. HV SWITCH

1H1B2

NEW 3000/3360/4200 KVA TRANSFORMER T-1B-1 13.2 KV-4.16 KV OA/OA/FA

1T1B3

63X 63

1T1B1A
1T1B1B

R GROUNDING RESISTOR

C2

86L 52 51N

SEE NOTE 2 ON DWG VE2

EXISTING SWITCHGEAR

700/5A (3)

EXISTING 13.2 KV SWITCHGEAR NO. 1 SECTION A

DIST BRKR 1-52-1A

MAIN BRKR 1-52-1

300/5A (3)

SEE NOTE 1

1H1A1

EXISTING 600A L.B. HV SWITCH

EXISTING INCOMING SERVICE FROM TECO

1H1A2

NEW 3000/3360/4200 KVA TRANSFORMER T-1A-1 13.2 KV-4.16 KV OA/OA/FA

1T1A3

63X 63

1T1A1A
1T1A1B

R GROUNDING RESISTOR

C1

86L 52 51N

SEE NOTE 2 ON DWG VE2

700/5A (3)

EXISTING SWITCHGEAR

NEW MEDIUM VOLTAGE MOTOR CONTROL CENTER MVMCC-1

4160V, 1000A, 3Φ, MAIN BUS

8 7 6 5 4 3 2 1

4200-120V (2)

MAIN 1200A L.B. SWITCH

1200A TIE SW

MAIN 1200A L.B. SWITCH

700/5A (3)

MPMS

4200-120V (2)

OPEN/ CLOSE

100/5A (3)

MPS

300/5A (3)

TR

LOR

START/ STOP/ EM STOP PB

RESET

50/5A (1)

3 87

ADDITIONAL CONTROLS REQUIRED FOR THE PROPER OPERATION OF MAIN AIR COMPRESSOR

GROUND BUS

1M4

EXISTING T-OG-2 225 KVA 4160V-480/277V TRANSFORMER

11M1

NEW MCC-11

1C3A

TO MAIN INSTRUMENT PANEL NO. 2

1M3

1C3

CT 50/5A (3)

MSH 1500

EM/STOP/L PB

BEARING TEMPERATURE RELAY

MOTOR WINDING RTD'S MONITOR

MAIN AIR COMPRESSOR NO. 2 MAC-2

1T1B2A
1T1B2B

1C2A

TO MAIN INSTRUMENT PANEL NO. 1

1M2

1C2

MOTOR WINDING RTD'S MONITOR

MAIN AIR COMPRESSOR NO. 1 MAC-1

1M1

EXISTING T-OG-1 225 KVA 4160V-480/277V TRANSFORMER

10M1

NEW MCC-10

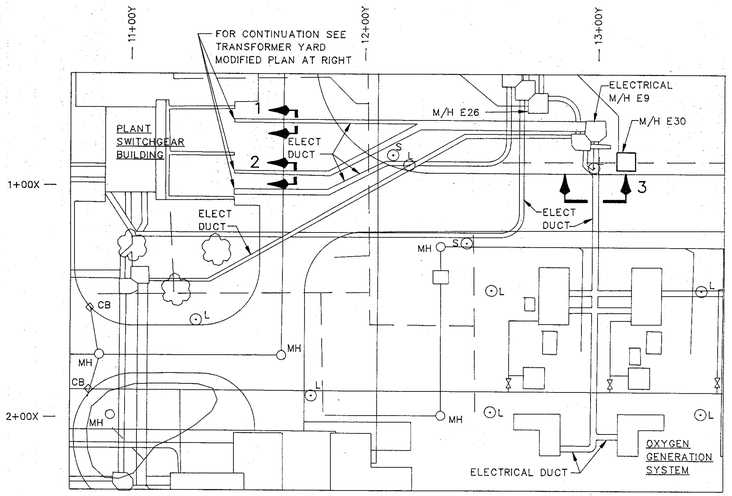
1T1A2A
1T1A2B

TP11-26

GREELEY AND HANSEN ENGINEERS 1715 NORTH WESTSHORE BLVD. TAMPA, FLORIDA 33607-4135	DESIGNED BBK DRAWN BBK, ROO CHECKED BBK	APPROVED _____ DATE _____ _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	NO. DATE APPD REVISION	SCALE NOT TO SCALE	CITY OF TAMPA, FLORIDA HOOKERS POINT WASTEWATER TREATMENT PLANT OXYGEN GENERATION SYSTEM MODIFICATIONS	ELECTRICAL ONE LINE DIAGRAM	DES W.O. 7714 CONST. W.O.	SHEET 10 OF 13

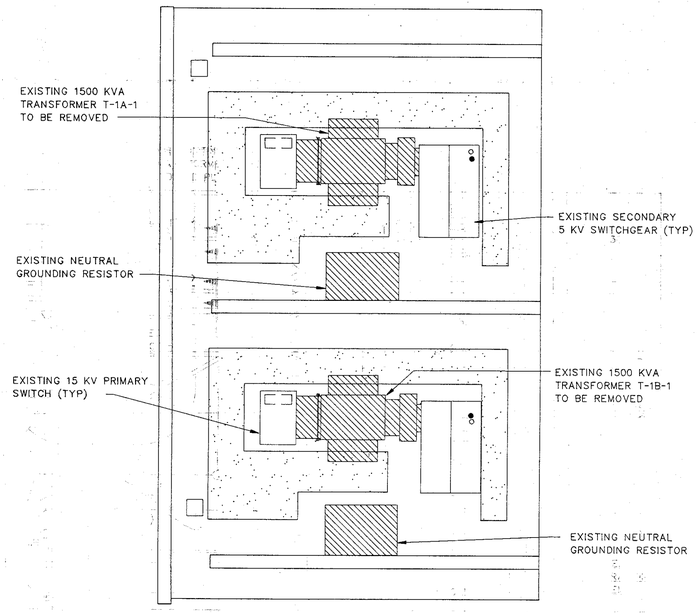
TP11-26

FOR REFERENCE ONLY



PARTIAL SITE PLAN

SCALE: 1"=30'



TRANSFORMER YARD DEMOLITION PLAN - ELECTRICAL

SCALE: 3/16"= 1'-0"

1T1A2A, 1T1A2B

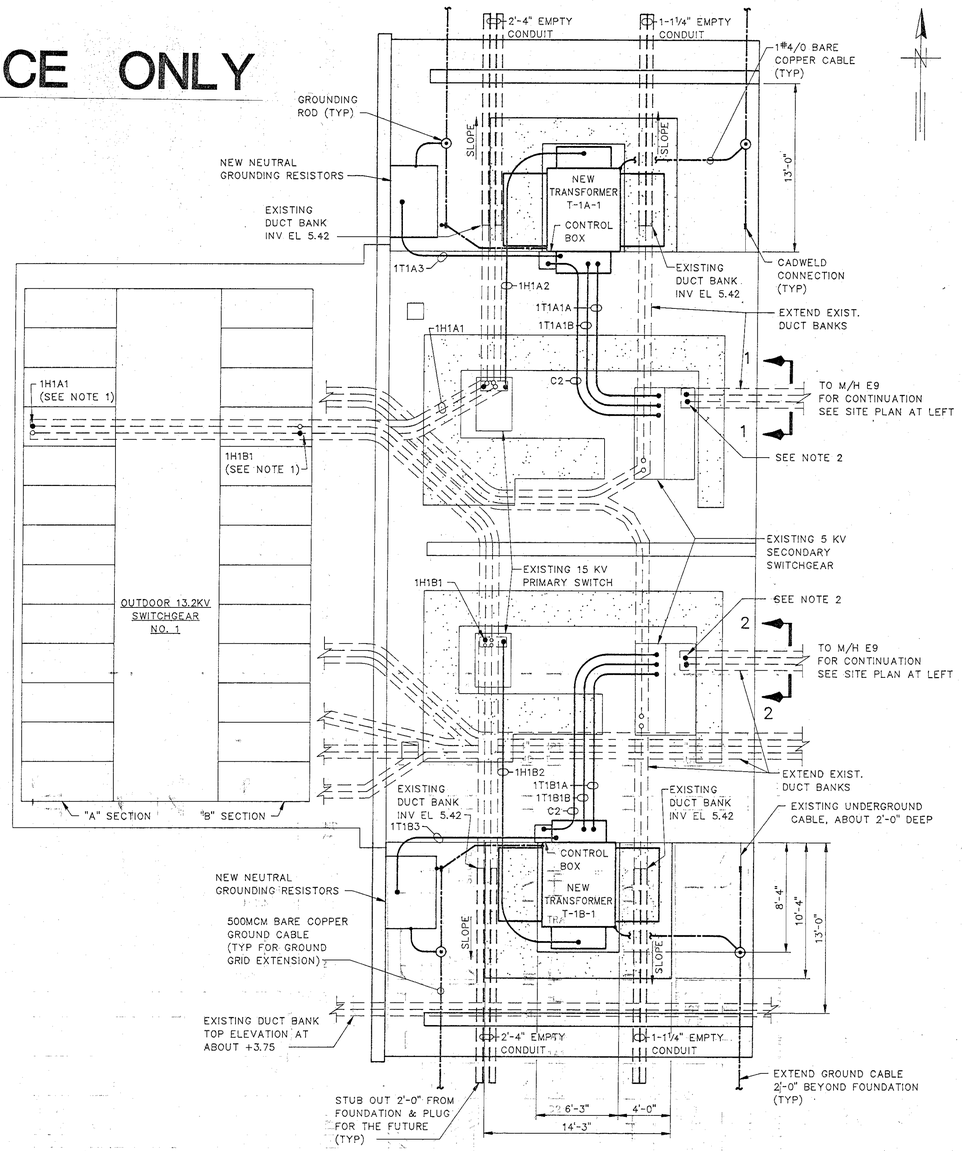
SECTION 1

1T1B2A, 1T1B2B

SECTION 2

1T1A2A, 1T1A2B
1T1B2A, 1T1B2B
3" C, SP, IN2 (EXISTING)
3" C, SP, IN3 (EXISTING)

SECTION 3



NOTES:
1. REMOVE EXISTING 3-350 MCM AL, 15KV & 1#4/0, AL 600V CONDUCTORS.
2. REMOVE EXISTING 3-500 MCM AL, 5KV & 1#4/0, AL, 600V CONDUCTORS.

TRANSFORMER YARD MODIFIED PLAN - ELECTRICAL

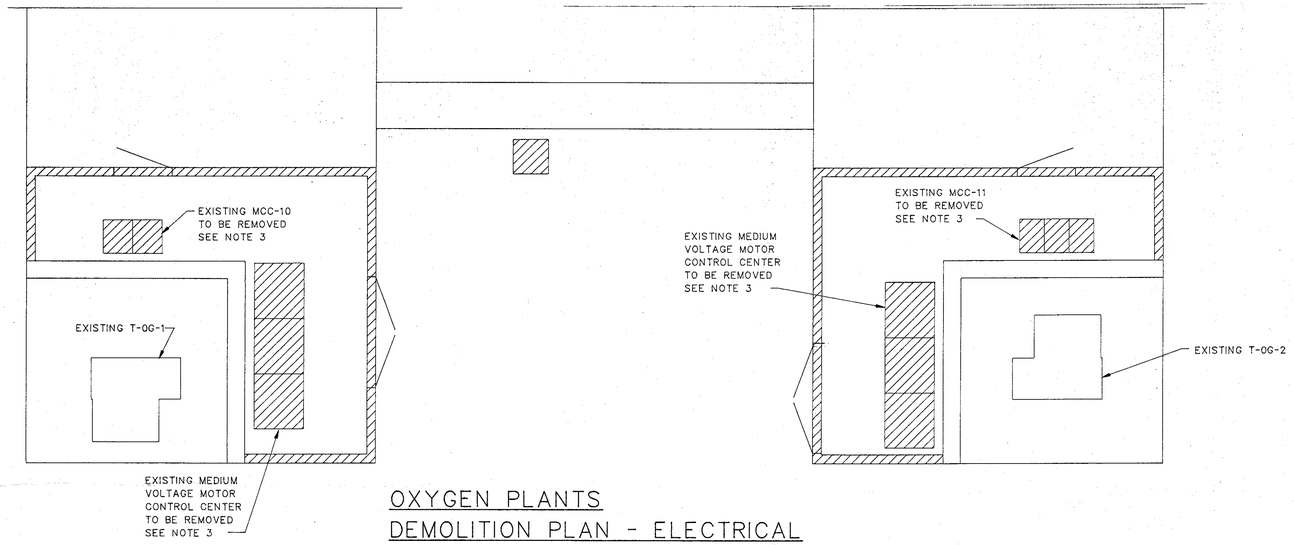
SCALE: 3/16"= 1'-0"

TP11-27

GREELEY AND HANSEN ENGINEERS 1715 NORTH WESTSHORE BLVD. TAMPA, FLORIDA 33607-4135	DESIGNED BBK DRAWN BBK, ROO CHECKED BBK	APPROVED _____ DATE _____ _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	NO.	DATE	APPD	REVISION	SCALE 4 0 4 8 12 FT 3/16"=1'-0" 30 0 30 60 FT 1"=30'	CITY OF TAMPA, FLORIDA HOOKERS POINT WASTEWATER TREATMENT PLANT OXYGEN GENERATION SYSTEM MODIFICATIONS	ELECTRICAL SITE PLAN AND OUTDOOR 13.2 KV SWITCHGEAR NO. 1 TRANSFORMER YARD DEMOLITION AND MODIFIED PLANS	DES W.O. 7714 CONST. W.O.	SHEET 11 OF 13

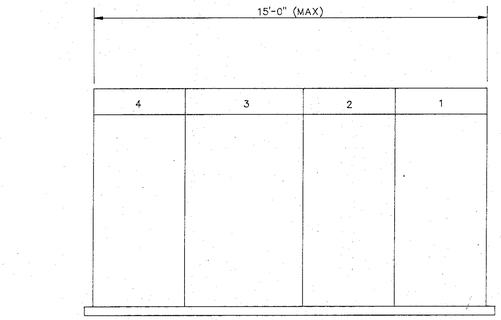
TP11-27

FOR REFERENCE ONLY

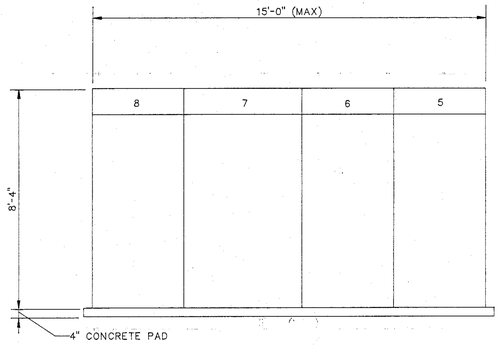


OXYGEN PLANTS
DEMOLITION PLAN - ELECTRICAL

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



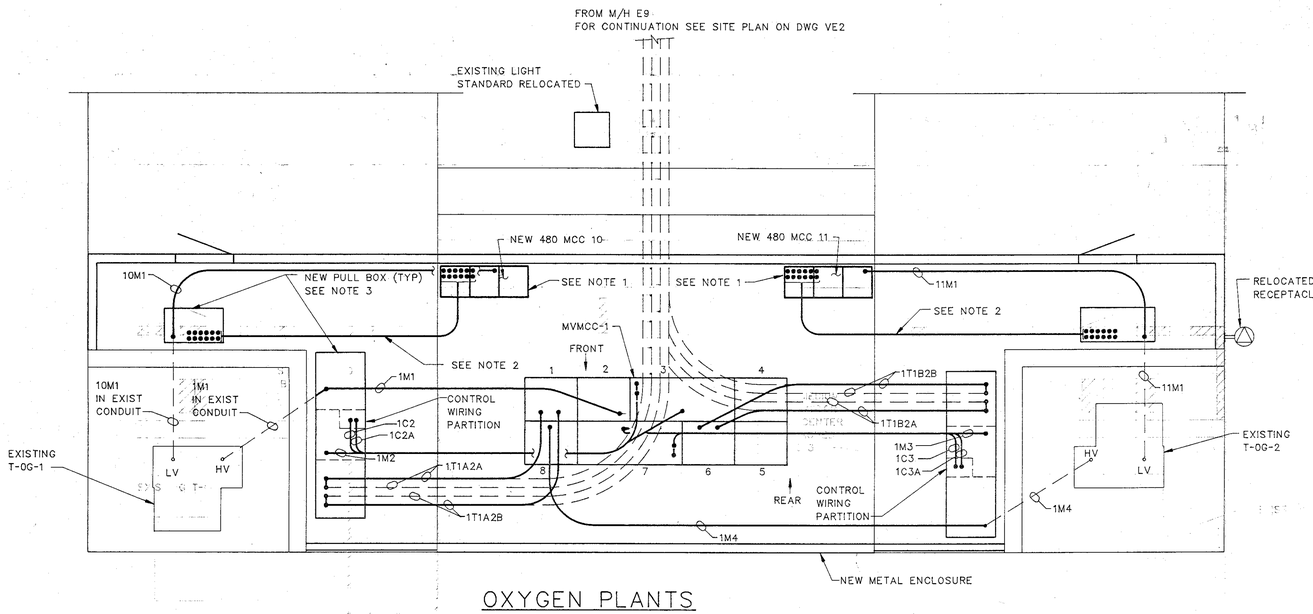
FRONT ELEVATION



REAR ELEVATION

MVMCC-1 ELEVATIONS

SCALE: 3/8"= 1'-0"



OXYGEN PLANTS
MODIFIED PLAN - ELECTRICAL

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

NOTES:

1. PROVIDE NEW MOTOR CONTROL CENTER TO SERVE THE LOADS ASSOCIATED WITH EACH OXYGEN GENERATION PLANT.
2. PROVIDE REQUIRED WIRING BETWEEN NEW MOTOR CONTROL CENTERS AND PULL BOXES FOR POWER AND CONTROL FOR ALL EQUIPMENT SERVED.
3. THE CONTRACTOR MAY REUSE THE EXISTING MOTOR CONTROL CENTER ENCLOSURES FOR THE NEW PULL BOXES PROVIDED THE FOLLOWING MODIFICATIONS ARE MADE:
   A. GUT EACH PANEL BY REMOVING ALL EQUIPMENT AND WIRING.
   B. REPLACE EXISTING DOORS WITH BLANK COVERS.
   C. PROVIDE COVER PLATES OVER ALL OPENINGS.
   D. FABRICATE A NEW CONTROL WIRING PARTITION.
   E. PAINT ENTIRE ENCLOSURE.

TP11-28

GREELEY AND HANSEN ENGINEERS 1715 NORTH WESTSHORE BLVD. TAMPA, FLORIDA 33607-4135	DESIGNED BBK DRAWN BBK CHECKED BBK	APPROVED _____ DATE _____ _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	NO.	DATE	APPD	REVISION	SCALE 4 0 4 8 FT 1/4"=1'-0" 1 0 1 2 3 4 5 6 7 FT 3/8"=1'-0"	CITY OF TAMPA, FLORIDA HOOKERS POINT WASTEWATER TREATMENT PLANT OXYGEN GENERATION SYSTEM MODIFICATIONS	ELECTRICAL SWITCHGEAR AND 480-VOLT MOTOR CONTROL CENTER	DES W.O. 7714 CONST. W.O.	SHEET 12 OF 13

TP11-28

CONDUIT NUMBER	CONDUIT SIZE	CONDUCTOR QUANTITY & SIZE	FROM	TO	REMARKS
			13.2kV OUTDOOR SWITCHGEAR NO. 1		
1H1A1		3-350MCM, 15KV & 1#4/0, 600V GND.	13.2 KV SWGR NO. 1 BREAKER 1-52-1A	EX. T-1A-1 PRIMARY SWITCH	THROUGH EXISITNG UNDERGROUND DUCT
1H1A2 *	4	3-350MCM, 15KV & 1#4/0, 600V GND.	EX. T-1A-1 PRIMARY SWITCH	NEW TRANSFORMER T-1A-1	
1H1B1		3-350MCM, 15KV & 1#4/0, 600V GND.	13.2 KV SWGR NO. 1 BREAKER 1-52-1B	EX. T-1B-1 PRIMARY SWITCH	THROUGH EXISITNG UNDERGROUND DUCT
1H1B2 *	4	3-350MCM, 15KV & 1#4/0, 600V GND.	EX. T-1B-1 PRIMARY SWITCH	NEW TRANSFORMER T-1B-1	
			TRANSFORMER YARD CONDUITS		
IT1A1A	4	3-500MCM, 15KV & 1#4/0, 600V GND.	NEW TRANSFORMER T-1A-1	EXISTING 5KV SECONDARY SWITCHGEAR	
IT1A1B	4	3-500MCM, 15KV & 1#4/0, 600V GND.	NEW TRANSFORMER T-1A-1	EXISTING 5KV SECONDARY SWITCHGEAR	
IT1A2A	4	3-500MCM, 15KV & 1#4/0, 600V GND.	EXISTING 5KV SECONDARY SWITCHGEAR	NEW MVMCC-1	THROUGH EX UG DUCT & NEW CONDUIT
IT1A2B	4	3-500MCM, 15KV & 1#4/0, 600V GND.	EXISTING 5KV SECONDARY SWITCHGEAR	NEW MVMCC-1	THROUGH EX UG DUCT & NEW CONDUIT
IT1A3	4	3-500MCM, 15KV & 1#4/0, 600V GND.	NEW TRANSFORMER T-1A-1	NEW NEUTRAL GROUNDING RESISTOR	
IT1B1A	4	3-500MCM, 15KV & 1#4/0, 600V GND.	NEW TRANSFORMER T-1B-1	EXISTING 5KV SECONDARY SWITCHGEAR	
IT1B1B	4	3-500MCM, 15KV & 1#4/0, 600V GND.	NEW TRANSFORMER T-1B-1	EXISTING 5KV SECONDARY SWITCHGEAR	
IT1B2A	4	3-500MCM, 15KV & 1#4/0, 600V GND.	EXISTING 5KV SECONDARY SWITCHGEAR	NEW MVMCC-1	THROUGH EX UG DUCT & NEW CONDUIT
IT1B2B	4	3-500MCM, 15KV & 1#4/0, 600V GND.	EXISTING 5KV SECONDARY SWITCHGEAR	NEW MVMCC-1	THROUGH EX UG DUCT & NEW CONDUIT
IT1B3	4	3-500MCM, 15KV & 1#4/0, 600V GND.	NEW TRANSFORMER T-1B-1	NEW NEUTRAL GROUNDING RESISTOR	
C1	1	6#12 & 1#12 GND	NEW TRANSFORMER T-1A-1	EXISTING 5KV SECONDARY SWITCHGEAR	
C2	1	6#12 & 1#12 GND	NEW TRANSFORMER T-1B-1	EXISTING 5KV SECONDARY SWITCHGEAR	
			MEDIUM VOLTAGE MOTOR CONTROL CENTER MVMCC-1		
1M1	3	3#2, 5KV & 1#8, 600V GND	MVMCC-1	T-OG-1	SEE NOTE 1
1M2	3	3#4/0, 5KV & 1#4, 600V GND	MVMCC-1	MAC-1	SEE NOTE 1
1C2	1	SEE NOTE 2	MVMCC-1	JB NEAR MAC-1	SEE NOTE 1
1C2A	1	SEE NOTE 2	MVMCC-1	MAIN INSTRUMENT PANEL 1	SEE NOTE 1
1M3	3	3#4/0, 5KV & 1#4, 600V GND	MVMCC-1	MAC-2	SEE NOTE 1
1C3	1	SEE NOTE 2	MVMCC-1	JB NEAR MAC-2	SEE NOTE 1
1C3A	1	SEE NOTE 2	MVMCC-1	MAIN INSTRUMENT PANEL 2	SEE NOTE 1
1M4	3	3#2, 5KV & 1#8, 600V GND	MVMCC-1	T-OG-2	SEE NOTE 1
			TRANSFORMER T-OG-1 AND T-OG-2 FEEDERS		
10M1	4	3-500MCM& 1#1/0 GND	T-OG-1	MCC-10	SEE NOTE 1
11M1	4	3-500MCM& 1#1/0 GND	T-OG-2	MCC-11	SEE NOTE 1

NOTES:

1. REMOVE THE EXISTING ALUMINUM CABLES FROM OLD CONTROL CENTER TO MAIN AIR COMPRESSOR. INSTALL NEW CABLES VIA NEW EXPOSED CONDUITS FROM MVMCC-1 TO PULL BOX AND USE EXISITNG CONDUIT FROM PULL BOX TO MAIN AIR COMPRESSOR.
2. PROVIDE QUANTITY AND SIZE AS REQUIRED.
3. REMOVE THE EXISTING CONTROL WIRE FROM OLD CONTROL CENTER. INSTALL NEW WIRING VIA NEW EXPOSED CONDUITS FROM MVMCC-1 TO PULL BOX AND USE EXISITNG CONDUIT FROM PULL BOX TO CONTROL DEVICES AND PANELS.

FOR REFERENCE ONLY

TP11-29

GREELEY AND HANSEN
ENGINEERS
1715 NORTH WESTSHORE BLVD.
TAMPA, FLORIDA 33607-4135

DESIGNED BBK
DRAWN BBK
CHECKED BBK

APPROVED
_____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION

SCALE
NOT TO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
OXYGEN GENERATION SYSTEM MODIFICATIONS

ELECTRICAL
CABLE AND CONDUIT SCHEDULE

DES W.O. 7714
CONST. W.O.

SHEET 13 OF 13

TP11-29

FILE: N:\JOBS\PTCHKFILES\7714\11\7714_11A.dgn 4 NOV 1991 4:29

P&IDs YEAR 1998

AS-BUILT

PIPING AND INSTRUMENTATION DIAGRAM

00-5-3555-55.10
SEWERAGE TREATMENT PLANT
TWO 80 T/D
02 GENERATING PLANTS
HOOKERS POINT
TAMPA, FLORIDA

PROPRIETARY DATA

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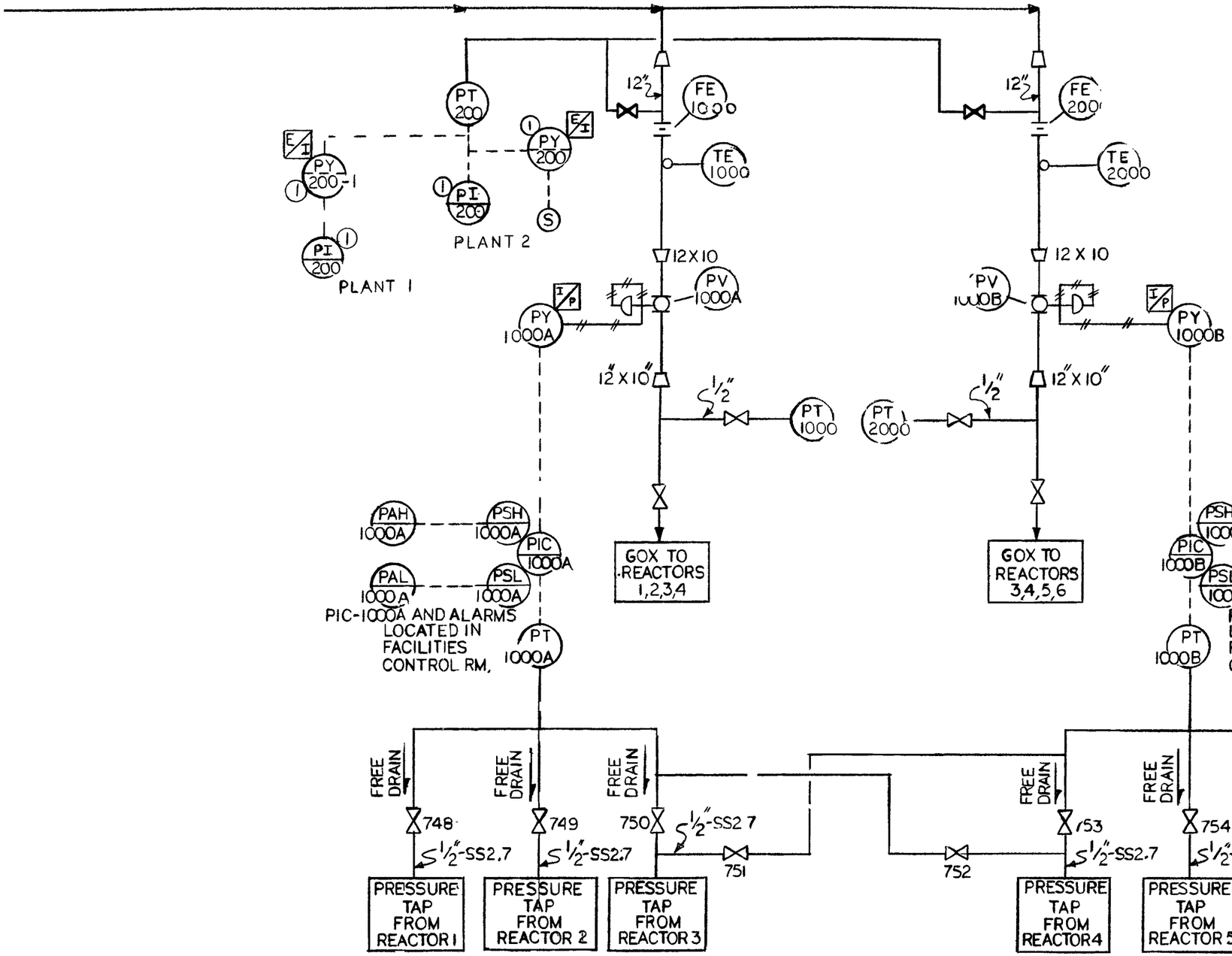
NOTES: 1. PLANT 1 IS THE LEFT MOST PLANT WHEN VIEWED FROM THE UNOX SYSTEM
2. REVISIONS 5, 6, 7, AND 8 WERE DONE FOR "RETROFIT PROJECT" "00-5-2364"
3. REVISION 9 SHOULD BE CONSIDERED "AS-BUILT" FOR PROJECT "00-5-2364
4. PLANT #2 DEPICTED,
PLANT #1 INSTALLED WITH REDUCED CAPACITY COMPONENT: MAC AERO-DYNAMIC DISCHARGE VENT VALVE -FV-1 AND SAFETY PSV-33 AS NOTED.

REVISIONS						APPROVED								
NO.	PFDCN	FCN'S	DATE	MADE	CHK'D	PROC.	PROCESS SYSTEMS	P&C	PROJ.	SAFETY	PROCESS CONT'L	MED	MACH. APPL.	MECH. SYSTEMS
4A	—	—	10OCT77	PRF	RLM									
5	—	—	4/24/95	GAK	RES									
6			6/24/96	CCM GAK	JLM	DTK	RSJ		RD		TSD			
7			1/30/97	KJB	GAK		RSJ		RD		TSD		JMB	OC
8			6/10/98	PWH	DKC									
9			8/14/98	KDH	DKC			JSV	BFL		GAM			

TPB008-072


PT 200
PY 200-1
PY 200
PI 200
PLANT 2
PLANT 1
12"
FE 1000
TE 1000
12X10
PV 1000A
PY 1000A
12"X10"
1/2"
PT 1000
GOX TO REACTORS 1,2,3,4
PAH 1000A
PSH 1000A
PIC 1000A
PAL 1000A
PSL 1000A
PIC-1000A AND ALARMS LOCATED IN FACILITIES CONTROL RM.
PT 1000A
FREE DRAIN
748
749
750
1/2"-SS2.7
751
PRESSURE TAP FROM REACTOR 1
PRESSURE TAP FROM REACTOR 2
PRESSURE TAP FROM REACTOR 3
FE 2000
TE 2000
12 X 10
PV 1000B
PY 1000B
PT 2000
GOX TO REACTORS 3,4,5,6
PSH 1000B
PAH 1000B
PIC 1000B
PSL 1000B
PAL 1000B
PIC-1000B AND ALARMS LOCATED IN FACILITIES CONTROL RM.
PT 1000B
752
753
754
755
PRESSURE TAP FROM REACTOR 4
PRESSURE TAP FROM REACTOR 5
PRESSURE TAP FROM REACTOR 6

TPB008-073

SHEET 8

16.20
LOX TANK
25,000 GAL.

17.30
ECONOMIZER COIL

17.20 A & B
PRODUCT VAPORIZER

PIPE CLOSE TOGETHER

PIPE CLOSE TOGETHER

COLD BOX INSTALLATION
LOX TANK INSTALLATION

FIELD CT2
16 20 SS2.7

FIELD
PLT Nº2

FROM
PLT Nº 2
COLD BOX

TRAILER
LOADING

VENT

GAS
FROM
PLT Nº2

COLD BOX INSTALLATION
LOX TANK INSTALLATION

PLANT #2
ONLY

FROM
8"-CW-185-CS1.5
SHT. 1A

PLUGGED
OPENING

PRESSURE
BUILD-UP
COIL

VACUUM
GAGE CONN.

TO
LIQUID
DEWARS

SD-3

TPB008-74

08.21 A & B
CRUDE O_2
ABSORBER

08.23
HEATER

1"O-178-CT2

PSV 80
VENT STACK
½"N-246-CT2
TO 08.51 SHT.5
1"N-201-CT2
707
½"
TIS 81
TO HEATER CONTROLS
KE 132
KAH 132
08.21 HYDROCARBON REACTIVATION
LV 75
F.C.
LY 75
FROM LIC-75 SHT.6
1½"O-184-CT2
706
08.23
1"N-200-CT2
CT2 SS2.7
FISL 83
705
703
704
½"-1A51.5
N2 FROM SHT. 3
708
702
701
1"-N-122-1A51.5
FE 83
PSV 84
VENT STACK
TSH 82
C.S. SS2.7
O.S. 1A51.5
TAH 82
½"N-264-CT2
709
TO HEATER CONTROLS
PSV 85
VENT STACK
¼"O-208-CT2
½"
715
1"N-193-CT2
1"N-200-CT2
¼"O-211-CT2
1"CT2 (TYPICAL)
PSV-58 (DISCHARGE TYPE)
PSV-116
PSV-86
PSV-78
PSV-84
PSV-77
PSV-85
PSV-80
VENT STACK
TO 6"O-141-CS01.5 SHT. 4
2"O-165-CT2
725
PSV 86
VENT STACK
1½"O-202-CT2
714
711
1½"O-184-CT2
PSV 116
VENT STACK
½"N-206-CT2
½"N-207-CT2
713
712
1"N-198-CT2
1"N-200 CT2
1½"N-268-CT2 SHT. 3
730
2"O-166-CT2
PSV 87
LV 71-2
F.C.
PSV 88
726
FI 89
2"-CT2
4"O-167-SS2.7
SD-1
S
XV 71-2
FROM LY-71 SHT. 6
2"O-165-CT2
NOTE:
VALVES INSTALLED WITH FLOW ARROW COUNTER TO DIRECTION OF FLOW. (TYPICAL)
08.21A
08.21B
TY 42-20
TY 42-9
S
TI 42-20
TI 42-9
1"N-194-CT2
1"N-193-CT2
720
728
1"N-193-CT2
1½"O-163-CT2
721
729
1½"O-196-CT
17.80
1"N-193-CT2
4"O-167-SS2.7
4"O-167-SS2.7
½"-CT2
724
1½"O-163-CT2
¼"O-211-CT2
1½"O-163-CT2
C.S.
O.S.
11"
½"
722
723
½"O-197-CT2
2"O-234-CT2
2"O-234-CT2
6"O-141-CS01.5

TPB008-075

SHEET 6

SHEET 6A

07.22
LP COLUMN

05.51
.STE N_2 SUBCOOLER

07.13
LOX HOLD-UP TANK

TO XV-71-2 SHT. 7

FILL/AUTO/ TRANSFER

LV-76-2 OPEN

VENT STACK

SD-1

SD-3

IAS

LIQUID DRAIN

TPB008-076

SHEET 5

05.55
HEAT PUMP

08.51
GUARD ADSORBER

12.20
SAMPLE, VAPORIZER

07.11
HP COLUMN

07.12
REBOILER CONDENSER

07.22

1½"-A-173-CT2

1½"-A-173-CT2

1½"-N-182-CT2

2"-N-216-CT2

1½"-O-229-CT2

1½"-O-230-CT2

1½"-O-180-AA1.5

1½"-A-181-AA1.5

1½"-O-179-CT2

1"-A-161-CT2

6"A-135-AA1.5

1"-A-161-CT2

1"-A-160-CT2

2"-A-159-AA1.5

1"-A-164-CT2

6"-O-141-CS01.5

6"-O-172-AA1.5

6"-N-171-AA1.5

1"-O-175-CT2

1"-O-214-CT2

2"-A-245-CT2

1"-O-215-CT2

1"-A-161-AA1.5

2"-O-162-AA1.5

1"-O-254-CT2

2"-O-234-CT2

1/4"-O-211-CT2

1/4"-O-238-CT2

1/4"-O-232-ICT-4

1/4"-O-228 ICT4

1/4"-O-217-ICT4

1/4"-O-218-ICT4

1/4"-O-226-ICT4

1/4"-O-227-ICT4

1/4"-O-133-ICT4

1/4"-N-224-ICT4

1/4"-N-225-ICT4

1/4"-N-237-ICT4

1/4"-N-219 ICT4

1/4"-N-220-ICT4

1/4"-O-211-CT2

1½"-O-260-CT2

1/2"-A-239-CT2

1/2"-N-255-CT2

1/2"-O-244-CT2

1"-N-201-CT2

1"-N-302-CT2

3"-N-247-AA1.5

1-O-203-ICT-4

1"-O-236-CT-2

1"-O-167-SS2.7

1/4"-O-211-CT2

1/4"-O-211-CT2

CT2 AA1.5

AA1.5 CT2

CB OS

SHUTDOWN BYPASS

SELF DRAINING

LOW POINT

VENT STACK

FROM 08.23 SHT.7

08.51 GUARD ADSORBER

O_2 CYLINDER FITTING FOR BATCH SAMPLING AND ACETYLENE TEST

TO SH

TPB008-077

SHEET 4

05.40
EXCHANGER

01.50
SILENCER

05.50
LIQUEFIER

OKS-35
SHT 2

TI 42-10

TY 42-16

TI 45-16

2½"

AA1.5 CT2

305

306

PSV 45

1½"-A-151-CT2

½" 307

1/2"-A-150-CT2

CT 2 AA1.5

3"N-143-AA1.5

2"-A-235 CT2

TY 42-14

TI 42-14

8"N-152-AA1.5

6"-O-147-AA1.5

501

3 N-143-AA1.5

6"A-135-AA1.5

503

1½"-A-173-CT2

2 A159-AA1.5

8

14

21

28

CT2 AA1.5

2½"-A-149-AA1.5

15

4"-N-148-AA1.5

4-N-148-AA1.5

506

1/4"-N 240 ICT4

507

1/4-O-242-ICT4

308

4"-N-148-AA1.5

4"-N-145-AA1.5

16

4"-N-144-AA1.5

4"N 158-AA1.5

425

TI 42-15

TY 42-15

309

1/4"-N-153-1CT4

TY 42-8

TI 42-8

TY 42-7

TI 42-7

TE 42-7

05.40

511

6"N-157-AA1.5

6"N-157-AA1.5

18

2"

13

05 50

505

CT2 AA1.5

FO 61

PSV 55

1/2" 504

1/2-A 262-CT2

4"-N-174-AA1.5

9

27

AA1.5 CT2

6"N-157-AA1.5

8"N-171-AA15

20

PSV 44

2"-A-235-CT2

½"-A-261 CT2

CB OS

6"

1½"

FROM OIL0 SHUTDOWN

XV 35

INSTR. AIR

VENT

½"-N-117 CT2 AA1.5

1½"-N-155-AA1.5

TY 42-22

TY 42-12

TI 42-12

TY 42-13

TI 42-13

6"N-139-AA1.5

TI 42-3

CB OS

318

TI 42-22

TE 42-22

½"-D-118-CT2

AA1.5 CB CS1.5 OS

AI 52-1 (O2)

316

1/2"

SKID FLD.

½"-CS1.5

2-1/2"CS1.5

310

LPT & PT

312

PT

AA1.5 C.B. CS1.5 OS

COLD BOX AA1.5 OUTSIDE CS01.5

TI 42-6

TY 42-6

TO FIC-2 SHT 1

FR 53

FIC 53-2

FY 53-4

E/I

I/P

FY 53-2

PY 53

FIC 53-1

SV-1

XV 53-3

VENT

01.50

FY 53-1

XV 53-1

SV-1

FROM SHT 7

2"O-165-CT2

PT 53

328

FE 53

313

FT 53

315

314

1/2"-CS1.5

TT 53

TE 53

TY 53

E/I

29

6"O-141-CS01.5

6"-O-134A-SS2.7

ZSL 53

ZA 53

SS2.7 FC CS01.5

R

FV 53-2

24"-O-134-CS01.5

FV 53-1

F.C.

6"O-141-CS01.5

327

TPB008-078

SHEET 3

10.10
EXPANSION TURBINE (ETAC-4)

SS 2.7 AA1.5
F.C.
4"-N-144-SS2.7
FILTER
17
N.V. 921
XV 921
VENT
420
1½"-N-268-CT2
PSV 134
AA1.5 CT2
1AS1.5 CT 2
½"-N-316-CT2
C B 421 O S
OEFROST OUT LOCAL VT
422
423
½"
424
HS 921 START/STOP
SD-2
EJ-1-0
T I 42-1
TY 42-1
C B C0
6"
INLET SCREEN
YAH 908-1
PCV 901
10.10 SILENCER
YAH 908-2
PAL 907-1
PAL 907-2
PSL 907
YS 908
PDCV 902
406 (8)
SV-2
432
FIELD 10.10
419 (23)
PI 909
1/4"-N-318-CT4
DPAL 904-1
DPAL 904-2
(11) 411
POI 903
OPSL 904
(12) 412
3"
FIELD 10.10
PI 906
FG 905
10.10 EXP.
4"
6"-N-159-SS2.7
OIL ACCUMULATOR
PI 910
1/4"-N-170-ICT4
410 (28)
409 (25)
10.10 FIELD
EJ-2-0
CO CB SS 2.7 AA1.5
CT2 AA1.5
T I 42-2
TY 42-2
11/2"-N-120-CT2
PSV 43
S1½"
OS CB
OIL FILTER
417 (24)
PSL 914
PI 913
TI 915
PCV 912
433
TCV 916
T1SLH 923
SD-2 VENT
PAL 914-2
PAL 914-1
1½"-CS1.5
OIL COOLER
PI 911
413 (26)
10.10 FIELD
428
429
½"-CS1.5
416
427
½"-CS1.5
1/2"-CW-169-CS1.5
1/2"-CW-168-CS1.5
TO 3"-CW-109 SHT. 1A
CW FROM 3"-CW-108 SHT. 1A
SCREEN
LI 917
TS 918
OIL SUMP
3/4"-C91.5
415
HS 1010 START/STOP
SD-2
6"-N-139-CS1.5
8"-A/N-129-CS1.5
8"-A/N-130-CS1.5
25

TY 42-11
T I 42-11
8"-A/N-131-AA1.5
6"
3"
6"-A-135-AA1.5
1¼"-A-136-ICT-4
4"-N-144-AA1.5
304
303
AI 46-1 (HC)
PCV 40
PT 310
TO
1000
8"-A-135-AA1.5
320
321
8"
301
8"
8"-A-135-AA1.5
¼"-A/N-132-ICT4
322
8"-N-152-AA1.5
323
8"-A/N-138-AA1.5
8"
22
8"-N-152-AA1.5
330
¼"-N-314-ICT4
TY 42-10
24
6"-N-157-AA1.5
FI 51
HIC 133
E/I
FY 51
I/P
HY 133
2 MIN TIME DELAY SD-1
XV 133
HV 133
F.C.
FT 51
326
324
325
1/2"
1/2"
FE 51
XV 135
NV 135
1½"-CT
TO 11/2"-N-120-IAS1.5 SHT. 2A
F.C.
FO 50
1AS1.5 CT 2 OS CB
¼"
TO 07.13 SHT. 6
317
1/2"-N-119-CT2
CS1.5 AA1.5 OUTSIDE COLO BOX
TY 42-3
8"-A/N-129-CS1.5
8"-A/N-130-CS1.5
L.PT.& P

TPB008-079

SHEET 2

SHEET 2A

03.10
INSTRUMENT AIR
PACKAGE

INSTR. AIR FROM CUSTOMER

1"-AIR (BY OTHERS)

HOSE CONN.

OTHERS
APCI

262

PCV 169

268

1"A -127-SS2.7

269

1"A -340-1AS1.5

229

217

203

1"-AIR (BY OTHERS)

PRODUCT VAPORIZER AREA

PCV 168 (PLT. 1)

PCV 167 (PLT. 2)

3/4"-A-314-1AS1.5

213

212

PLANT #2 AREA

TO FY-2-2 SHT 1

TO FV-2 SHT 1

746

747

1/2"

1/2"

1/2"

1"N-117A-CS1.5

1"-N-341-1AS1.5

270

TO FV-1

1"

367

TO LV-76-1

236

1½"-N-117-1AS1.5

APCI

OTHER

1½"-1AS1.5

204

HOSE CONN. (BY OTHERS)

272

TO PLANT #1 AREA SAME AS #2

1"-N-117-1AS1.5

7-1AS1.5

6"N-139-CS1.5

8"A/N-129-CS1.5

8"A/N-130-CS1.5

LV-71-2

250

½"

1½"-N-120-1AS1.5

200 NV 921 SHT. 3

231 LV-76-1 SHT. 6A

230 LV-76-2 SHT. 6A

207 LV-75 SHT. 7

257 LV-71-1 SHT. 6A

252 ACV-69-1

1½"-N-117-1AS1.5

205

½"

PI 48

206

PCV 47

EI 49

0.5 CB 1AS CT 2 1.5

COLD BOX PURGE N2

3/4"-N-121-1AS1.5

08.23 HEATER SHT. 7

TO TP-1 SHT. 1

TO TP-2 SHT. 1

TO TP-3 SHT. 1A.

AIR SUPPLY HEADER

222

224

½"

223

FROM 05.40 EXCHANGER "E" OUTLET SHT. 4

401

3/4"-N-274-1AS1.5

402

½"

403

PI 41

1"

FIELD 10.10

AIR OUT

FIELD 10.10

10. SIL

COMPRESSOR AIR IN

10.10

FIELD 10.10

6"A-267-SS 2.7

FH-4

SV-2

10.10

FIELD 10.10

6"A-267-SS 2.7

FH-3

407 #01

406 (9)

COMP.

SV-2

SAH 920-1

SAH 920-2

SSH 920

SI 920

TALH 922-1

TAL 922-2

TAH 922-2

SV-2

ELECTRIC HEATER

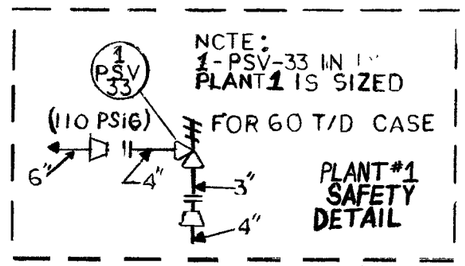
TS 918

TPB008-080

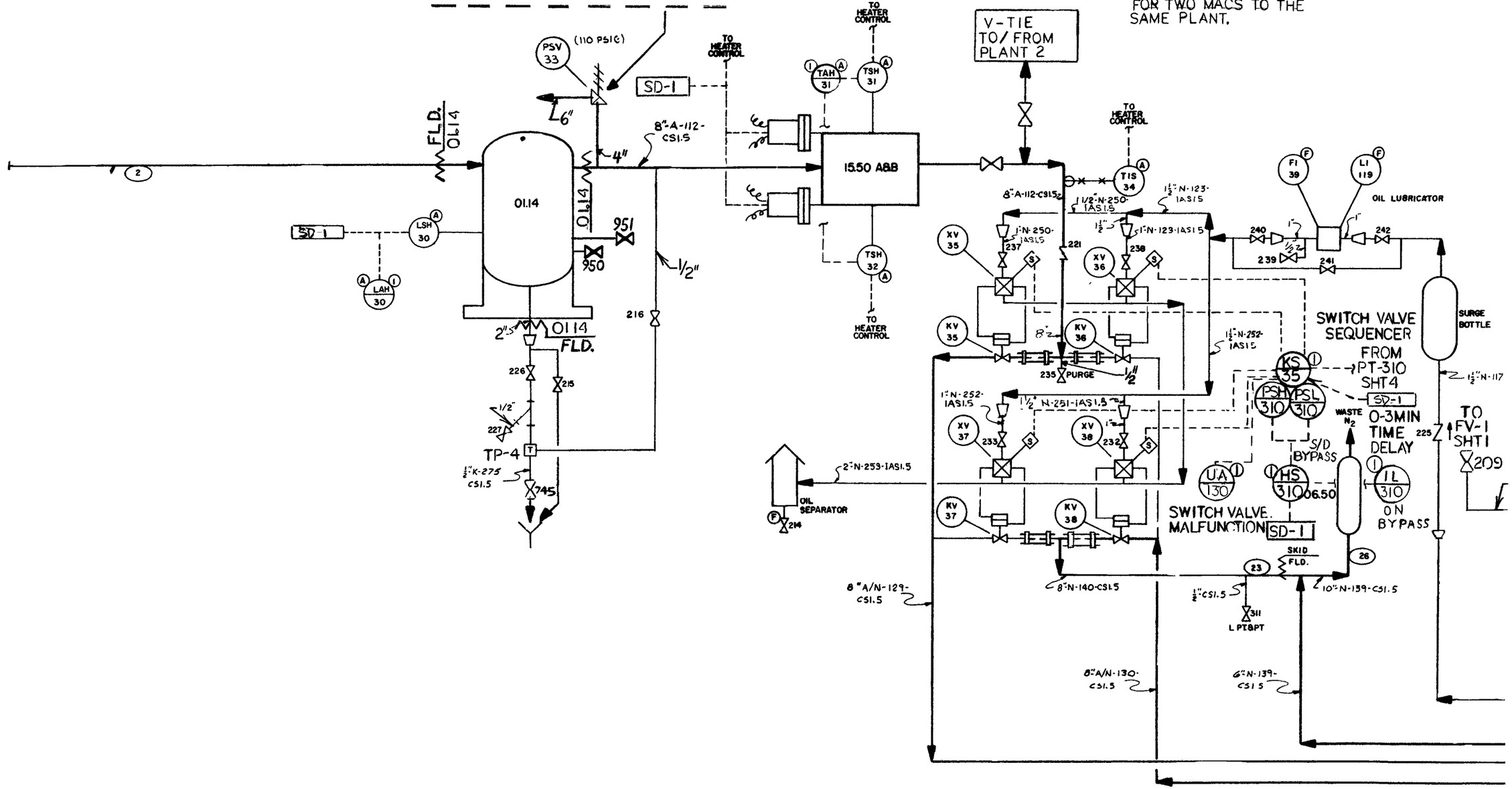
01.14
AFTERCOOLER SEPARATOR

15.50 A&B
DEFROST HEATER

06.50
SWITCH VALVE SILENCERS



NOTE:
PLANTS CAN ONLY RECEIVE AIR FLOW FROM ONE MAC. SAFETIES ARE NOT SIZED FOR TWO MACS TO THE SAME PLANT.



TPB008-081

SHEET 1

01.12 AIR FILTER	01.10A FIRST STAGE	01.10 AIR COMPRESSOR	01.10L LUBE OIL HEATER	01.11 AIR COMPRESSOR MOTOR	01.10B FIRST STAGE INTERCOOLER	01.10C SECOND STAGE	01.10D SECOND STAGE INTERCOOLER	01.10E THIRD STAGE	01.10M VACUUM BLOWER

01.12
DPAH 129
DPSH 129
20" (EPOXY COATED)
TO FIC-2 SHT 1A
4"-CW-272-CS1.5
6"-CW-273 CS1.5
4"CW 273 CS1.5
4" CW-105 CS1.5
2" CW 106-CS1.5
6"-CW-272 -CS1.5
6"-CW-273 -CS
FROM TT 1 SHT 1
TE 1
TT 1
1/2" 175
12"-A-100-CS1.5
SP-206
FLD. 01.10
WATER WASH
740
FY 2-1
FROM FIC-2 SHT 1A
FV 2
START/ STOP
HS 200
01.10A
M
3"L-760 CS1.5
FLD. 01.10
01.10M
LAH 7
LSL 7
TS 8
1 1/4" S
01.10L
HS 207 OFF/AUTO
1 1/2"-L-761A-CS1.5
LG 17
NEW 01.11 MTR BRGS
1 1/2-L-761-CS1.5
FLD.
2
135
1 1/2"-L-759A-SSL1.5
01.11 MAC AMPS
II 204
S
SD-1
SPACE HTR
01.11
TAH 12
TSH 12-1
T 12-1
TE 12-1
STATOR WINDING (TYPICAL FOR ITEMS 12-1 THRU 12-6)
TI 139
167
168
108
01.10B
FLD. 01.10
3/4" WATER WASH
363
01.10C
3/4"
AIR SUPPLY HDR.
TP-1
186
3/4"K-103-CS1.5
153
105
113
0.40 FLD.
1"
3/4"
HPT
121
122
169
170
01.10D
FLD. 01.10
3/4"
114
125
TP-2
361
01.10 FLD.
3/4"-K-104-CS1.5
152
UA 9
01.10 AIR SUPPLY HDR. MALF
HS 201 LOCAL STOP
HS 202 START
HS 203 STOP
YT 10A,B,C
YI 10ABC
YSH 10
YE 10A,B,C
TYPICAL FOR EACH STAGE
HS 10
YAH 10
HIGH VIB OR ON BYPASS
SHUTDOWN BYPASS
SD-1
(TYPICAL FOR ITEMS 128-1 THRU 128-6)
TE 128-1
TI 128-1
TSH 128-1
TAH 128
HS 12
SHUTDOWN BYPASS
BEARINGS (TYPICAL FOR ITEMS 11-1 & 11-2)
TAH 11
TSH 11-1
TI 11-1
TE 11-1
FO 210
2"
182
2 1/2"
1/4"
OIL RESERVOIR
PSV 209
(75 PSIG)
01.10H
SHAFT DRIVEN BY MAIN MOTOR
1 1/2"
362
.063 HOLE IN CHECK
2 1/4"
FO 208
TSH 5
TAH 5
SD-1
TI 140
PI 21
741
WATER WASH
01.10 FLD
6"
1/2"-CS1.5
01.10E
6x8
T1 27
PAL 14
PSL 14
RETURN TO SUMP
(20 PSIG)
PSV 19
TAH 18
TSH 18
PI 13
136
1/4"
1 1/2"
PSL 16
PERMISSIVE START
START AUX. L.O. PUMP SHT 1A
1/2"-L-759-SSL1.5
01.10 FLD.

TPB008-083

SD 2 EXPANDER	
SHUTDOWN	ACTION
TISLH 923 HIGH/LOW L O TEMP	SHUTDOWN 10 10 EXPANDER BY CLOSING NV 921
SSH 920 HIGH SPEED	
YSH 908 HIGH VIBRATION	
PSL 914 LOW L O PRESSURE	
PSL 907 LOW SEAL GAS PRESSURE	
DPSL 904 LOW SEAL GAS DIFF PRESSURE	
01 10 SHUTDOWN	
HS 921 EXPANDER STOP	
PSL 907 LOW SEAL GAS DIFF PRESSURE	SHUTDOWN LUBE OIL PUMP
HS 1010 L O PUMP STOP	

SD 3	
SHUTDOWN	ACTION
ASH 52 LOW GOX PURITY (HS52)	1) CLOSE VALVES A) LV 71 1 (LOX TO 07 13) B) LV 76 2 (GAN TO 07 13) 2) OPEN VALVES A) LV 76 1 (GOX TOLPC)
LSH 94 HIGH 16 20 LEVEL	

TPB008-084

EQUIPMENT LIST
00-5-3555-55 10

EQUIP NO	DESCRIPTION	SHEET
01 10	AIR COMPRESSOR	1
01 10A	FIRST STAGE	1
01 10B	FIRST STAGE INTERCOOLER	1
01 10C	SECOND STAGE	1
01 10D	SECOND STAGE INTERCOOLER	1
01 10E	THIRD STAGE	1
01 10H	MAIN LUBE OIL PUMP	1A
01 10J	LUBE OIL FILTER	1A
01 10K	AUX LUBE OIL PUMP	1A
01 10L	LUBE OIL HEATER	1
01 11	AIR COMPRESSOR MOTOR	1
01 12	AIR FILTER	1
01 13	THIRD STAGE AFTERCOOLER	1A
01 14	AFTERCOOLER SEPARATOR	2
01 17	SILENCER	1A
01 50	SILENCER	5
03 10	INTRUMENT AIR PACKAGE	2A
05 40	EXCHANGER	4
05 50	LIQUIFIER	5
05 51	WASTE N2 SUBCOOLER	6
05 55	HEAT PUMP	5
06 50	SWITCH VALVE SILENCERS	2
07 11	HP COLUMN	6
07 12	REBOILER CONDENSER	6
07 13	LOX HOLD-UP TANK	6A
07 22	LP COLUMN	6
08 21A&B	CRUDE O2 ADSORBER	7
08 23	HEATER	7
08 51	GUARD ADSORBER	5
10 10	EXPANSION TURBINE (ETAC-4)	3
12 20	SAMPLE VAPORIZER	6
15 50A&B	DEFROST HEATER	2
16 20	LOX TANK 25 000 GAL	8
17 20A&B	PRODUCT VAPORIZER	8
17 30	ECONOMIZER COIL	8
17 80	DISPOSAL VAPORIZER	7

SD-1 MAIN AIR COMPRESSOR	
SHUTDOWN	ACTION
YSH-10 HIGH VIBRATION (HS 10)	SHUTDOWN 01 10
TSH-12-1 THRU 12-6 HIGH MTR WINDING TEMP	
TSH-11-1/11-2 HIGH MTR BRG TEMP	
TSH-128-1 THRU 128-6 HIGH COMPRESSOR BRG TEMP	
LSL-7 LOW L O LEVEL	
TSH-18 HIGH L O TEMP	
PSL-14 LOW L O PRESSURE	
TSH-5 HIGH 3rd STG SUCTION TEMP	
PSL-114 LOW C W SUPPLY PRESSURE	
LSH-30 HIGH SEPARATOR LEVEL	
PSHL-310 SWITCH VALVE MALFUNCTION (HS310)	
LSLL-71 OR LSH-71 LOLO LPC LEVEL HIGH LPC LEVEL (HS71)	
10 10 S/D (HS71)	
PSL-16 L O PRESSURE(PERMISSIVE START)	
HS-203/HS-201 COMPRESSOR STOP	
01 10 SHUTDOWN	1) SHUTDOWN 01 10 A) 15 50 DEFROST HEATER B) 10 10 EXPANDER 2) CLOSE VALVES A) HV-133 (NON REVERSING WA B) KV-235 (SWITCH VALVES) C) FV-53-1 (GOX PROD) D) FV-53-1 (GOX VENT) E) LV-71-1 (LOX TO 07 13) F) LV-76-2 (GAN TO 07 13) G) LV-71-2 (LOX TO PUMP) 3) OPEN VALVES A)LV-76-1 (GOX TO LPC)
FSL-1 LOW COMPRESSOR FLOW (HS-1)	1) OPEN VALVES A) FV-1 (MAC VENT)

TPB008-085

LINE DESIGNATION

10"-O-980-SS2.7XSP

- 10" — LINE SIZE
- O — FLUID IN LINE
- 980 — APCI LINE IDENTIFICATION
- SS2.7XSP — PIPING SPEC.

FLUID ABBREVIATIONS

A	AIR
CW	COOLING WATER
D	DRAIN
F	FREON
FO	FUEL OIL
GL	GLYCOL
H	HYDROGEN
IA	INSTRUMENT AIR
K	CONDENSATE
LO	LUBRICATING OIL
N	NITROGEN
NG	NATURAL GAS
O	OXYGEN
PG	PURGE GAS
PW	POTABLE WATER
R	ARGON
S	STEAM
SA	SERVICE AIR
SS	SANITARY SEWER
VO	VENT GAS
UW	UTILITY WATER
WW	WASTE WATER

PIPING MATERIALS

AA	ALUMINUM ALLOY
BP	BRASS PIPE
BT	BRASS TUBE
CG	GALVANIZED
CI	CAST IRON
CISP	CAST IRON SOIL PIPE
CP	COPPER PIPE
CS	CARBON STEEL
CSO	CARBON STEEL (OXYGEN)
CT	COPPER TUBE
MNL	MONEL
SS	STAINLESS STEEL

MISC. ABBREVIATIONS

#CO	CARBON MONOXIDE ANALYZERD
COMP.	COMPUTER
COMPR.	COMPRESSOR
(HC)	HYDROCARBON ANALYZER
(N2)	NITROGEN ANALYZER
(O2)	OXYGEN ANALYZER
A.G.	ABOVEGROUND
A/M	AUTO-MANUAL STATION
C.B.	COLD BOX
C.O.	CROSSOVER
F.C.	FAIL CLOSE
F.I.P.	FAIL IN POSITION
FLD	FIELD
F.O.	FAIL OPEN
H.PT	HIGH POINT
IAS	INSTRUMENT AIR SUPPLY
I.S.	INSIDE
I/P	CURRENT TO PNEUMATIC TRANSDUCER
L.C.	LOCK CLOSED
L.O.	LOCK OPEN
L.PT	LOW POINT
M.H.	MANHOLE
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
O.S.	OUTSIDE
P.T.	PRESSURE TAP
RTD	RESISTANCE TEMPERATURE DEVICE
S.P.	SET POINT
T.S.	TO STACK
U.G.	UNDERGROUND
V.J	VACUUM JACKET
VSL	VENT TO SAFE LOCATION

REVISED: 2/5/99

INSULATION LEGEND

A	CALCIUM SILICATE
BB	FIBERGLASS W/LEAD JACKET
B	FIBERGLASS
C	FIBERGLASS
D	URETHANE
E	URETHANE
F	CELLULAR GLASS (FOAMGLAS)
G	CALCIUM SILICATE
H	URETHANE
J	CELLULAR GLASS (FOAMGLAS)
K	FIBERGLASS/CALCIUM SILICATE

LINES

- PROCESS LINE
- NON PROCESS OR UTILITY LINES
- PNEUMATIC LINE
- ELECTRICAL LINE
- INSTRUMENT CAPILLARY TUBING
- INSULATED LINE
- ELECTRICAL TRACED LINE (TEL)
- INSTRUMENT AIR SUPPLY
- HYDRAULIC SIGNAL LINE
- MECHANICAL LINKAGE
- SOFTWARE OR DATA LINKAGE
- STEAM TRACED LINE

MISCELLANEOUS

- ST- IN-LINE STRAINER
- STY- Y-STRAINER
- MATERIAL BALANCE POINT
- REDUCER
- EJ- EXPANSION JOINT
- DRESSER COUPLING(S)
- MISCELLANEOUS FLEXIBLE CONNECTION (OTHER THAN EJ, FH, OR DRESSER COUPLING)
- T TRAP
- OPEN FUNNEL DRAIN
- FH- FLEXIBLE HOSE
- UNION
- SPEC. BREAK
- FLANGES
- FLOW SIGHT GLASS
- DIFFUSER
- AREA BREAK
- END INSUL.
- CHEMICAL SEAL

VALVES

GATE	GATE EXTENDED
GLOBE	GLOBE EXTENDED
BUTTERFLY	BUTTERFLY EXTENDED
BALL	BALL EXTENDED
BALL THREE-WAY	BALL EXTENDED THREE-WAY
NEEDLE	NEEDLE EXTENDED
PLUG	PLUG EXTENDED
PLUG THREE-WAY	PLUG EXTENDED THREE-WAY
BELLOWS	BELLOWS EXTENDED
CHECK	CHECK W/PURGE CONN(S)
LOCK OUT	CHECK SWITCHING
THREE-WAY	FEMALE THREADED VALVE PLUGGED
FOUR-WAY	NONRETURN VALVE
ANGLE	DOUBLE BLOCK W/ BLEED CONN
MANIFOLD	

NEW INSTRUMENT

- (N) NEW INSTRUMENT
- (A) FURNISHED BY APCI (VENDOR AREA ONLY)
- (C) FURNISHED BY CUSTOMER
- (E) EXISTING INSTRUMENT
- (F) FURNISHED BY VENDOR (VENDOR AREA ONLY)
- (R) RELOCATED INSTRUMENT
- (W) WINTERIZATION/WET SERVICE
- LOCALLY MOUNTED INSTRUMENT
- PANEL MOUNTED INSTRUMENT W/DESIGNATION
- INSTRUMENT MOUNTED ON REAR OF PANEL W/DESIGNATION
- FI ROTAMETER
- TEMPERATURE ELEMENT W/WELL (LOCAL)
- TI TEMPERATURE INDICATOR (TI), REMOTE PANEL MONITORING (RECORDING OF TR), THERMOCOUPLE ELEMENT (TE) THERMOWELL. PANEL LOCATION PER MINI-BUBBLE

INSTRUMENT VALVES

- DIAPHRAGM
- DIAPHRAGM W/PURGE CONN(S)
- DIAPHRAGM W/PURGE VALVE
- DIAPHRAGM W/PURGE VALVES
- BELLOWS W/PURGE CONN(S)
- BELLOWS W/PURGE VALVE
- BELLOWS W/PURGE VALVES
- PRESSURE CONTROL VALVE
- TWO-WAY CONTROL VALVE
- SOLENOID CONTROL VALVE (3-WAY)
- PRESSURE RELIEF VALVE
- PRESSURE RELIEF VALVE (THERMAL)
- PRESSURE RELIEF DISC
- VACUUM RELIEF DISC
- VAC PRESS PRESSURE-VACUUM RELIEF VALVE
- S SWITCHING VALVE (4-WAY)
- EXPLOSION RELIEF DEVICE

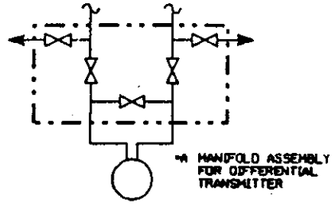
ACTUATORS

- M ROTARY MOTOR ACTUATOR
- PNEUMATIC DIAPHRAGM ACTUATOR
- S SOLENOID ACTUATOR
- DOUBLE ACTING ACTUATOR
- ELECTRO/PNEU POSITIONER
- PNEU POSITIONER
- CYLINDER ACTUATOR
- HAND ACTUATOR

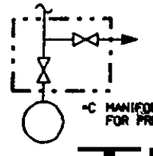
INSTRUMENTS

- Y COMPUTER RELAY (SQUARE ROOT EXTRACTOR)
- Y COMPUTER RELAY (MULTIPLIER)
- Y COMPUTER RELAY (DIVIDER)
- Y COMPUTER RELAY (SET RATIO STATION)
- Y LOW SELECTOR RELAY
- Y HIGH SELECTOR RELAY
- FO FLOW ORIFICE (FIXED RESTRICTION)
- ORIFICE
- ULTRASONIC METER
- VENTURI
- VORTEX METER
- ANNUBAR
- INSTRUMENT FUNCTION IN PES ACCESSIBLE FROM OPERATOR CONSOLE
- INSTRUMENT FUNCTION IN PES NOT NORMALLY ACCESSIBLE FROM OPERATOR CONSOLE
- SEQUENTIAL OR INTERLOCK FUNCTION IN PES ACCESSIBLE FROM OPERATOR CONSOLE
- SEQUENTIAL OR INTERLOCK FUNCTION IN PES NOT NORMALLY ACCESSIBLE FROM OPERATOR CONSOLE

- A ANALYZER
- -MAN- INSTRUMENT MANIFOLD VALVE
- TURBINE METER
- CRITICAL CONTROL CIRCUIT
- COMP COMPUTER DATA LOGGER
- P PRESS. TAP-PLUGGED



*A MANIFOLD ASSEMBLY FOR DIFFERENTIAL TRANSMITTER



*C MANIFOLD ASSEMBLY FOR PRESSURE TAP

INSTRUMENT IDENTIFICATION INDEX

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED VARIABLE	MODIFIER	PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER				
C	CONDUCTIVITY			CONTROLLER	
D	DENSITY	DIFFERENTIAL			
E	VOLTAGE		ELEMENT		
F	FLOW	RATIO			
G	GAUGING		GLASS		
H	HAND				HIGH
I	ELECTRICAL		INDICATOR		
J	POWER	SCAN			
K	TIME				
L	LEVEL		LIGHT		LOW
M	HUMIDITY		MONITOR		MIDDLE
N	EMERGENCY				
O			ORIFICE		
P	PRESSURE		POINT		
Q	QUANTITY	INTEGRATE			
R	RADIOACTIVITY		RECORDER		
S	SPEED	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VISCOSITY			VALVE	
W	WEIGHT		WELL		
X	SOLENOID				
Y	VIBRATION			RELAY	
Z	POSITION			DRIVE	

NOTES:

(1) FOR ANY ADDITIONAL INSTRUMENT IDENTIFICATION AND SYMBOLS, REFER TO THE ISA STANDARDS, SECTION S5.1, OR THE FLOWSHEET GROUP.

(2) NEW INSTRUMENT NO.S SHOULD BE GENERATED FROM THE FLOWSHEET GROUP.

(3) *CV-FOR VALVE WITH INTERGRAL CONTROL
*V-FOR VALVE WITH SEPARATE CONTROLLER
*-IS THE LETTER FOR MEASURED VARIABLE

(4) ALL N2 PURGE CONNECTIONS TO FLAMMABLE GAS LINES SHALL CONFORM TO ENGR. DES. STD. 578.9

(5) (S) - - 4-20 MADC SIGNAL FOR SCADA SYSTEM

PANEL LEGEND

① 02 PLANT CONTROL PANEL
01.10 COMP CONTROL PANEL

③ 10.10 EXPANDER PANEL (LOCALLY MOUNTED)

④ 16.20 LOX BACK-UP STORAGE PANEL (LOCALLY MOUNTED)

⑤ ANALYZER PANEL

TPB008-086

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NO.	P'CN'S	DATE	MADE	CHK'D
P	—	xxxxxx	CAK	DRC

REVISIONS

PROC.	START-UP	OPER.	PROJ.	SAFETY	PROD. CONTR.	MECH. ENG.	MAINT. APPL.	VALVE & INSTR.

APPROVED

DRAWN: C. KOVACS
CHK'D: D. CHRISTMAN
APPR'D:
DESIGN FILE: AL_FRM

TITLE: STANDARD SYMBOLS, ABBREVIATIONS, NOTES, AND PANEL LEGEND
HOOKERS POINT
TAMPA FLORIDA

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ALLENTOWN, PENNSYLVANIA

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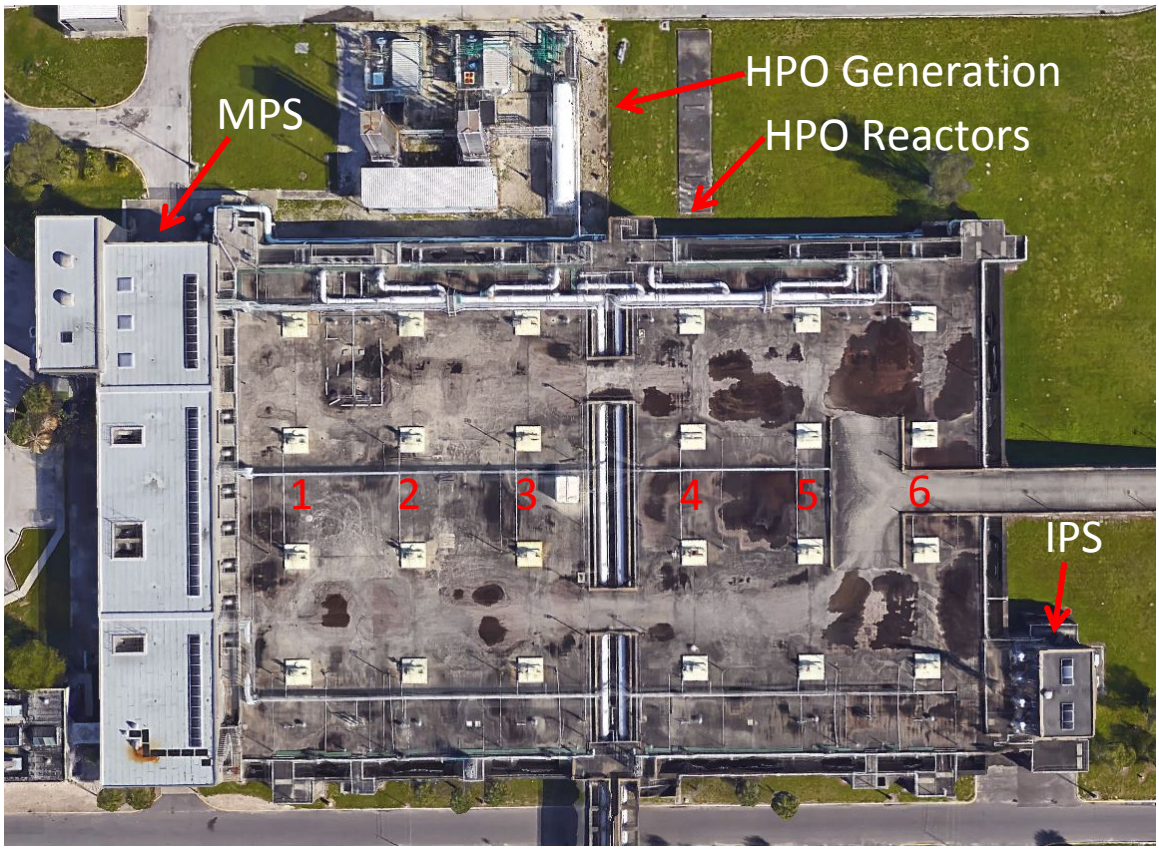
DWG. NO. 00-5-3555-55.10X
SHEET L

3.2 Secondary Treatment

3.2.1 HPO Reactors



3.2.1.1 Purpose and Description

The first stage of biological treatment at the HFC AWTP is accomplished by a High Purity Oxygen (HPO) activated sludge process. The HPO system consists of the Main Pumping Station (MPS), six HPO reactors, two 60 ton/day cryogenic HPO generation systems, and the intermediate pumping station. The MPS combines primary effluent, raw sewage, residual recycle and dewatering flow from the Main Drain to be pumped to the HPO reactors or DARs for carbonaceous BOD removal and nitrification. Seven main sewage pumps are located in the MPS to provide a firm pumping capacity of 250 MGD. The HPO system was designed to operate in three separate modes: carbonaceous BOD and suspended solids (SS) removal, two-stage nitrification, or single-stage nitrification. The six HPO reactors are grouped into stages to accomplish each of the three operational goals. HPO reactors 1 and 2 are designated for carbonaceous BOD and SS removal, reactor 3 is a swing tank to be used for either carbonaceous BOD and SS removal or nitrification, and reactors 4 – 6 are designated as nitrification reactors. Each reactor is completely covered, has a volume of 1.27 million gallons, and is separated into four zones by full height baffle walls with openings beneath water level and in the gas headspace to allow water and gas flow between zones. High purity oxygen provided by the cryogenic generation systems is fed into the first zone of each reactor at 95% oxygen. Mechanical surface aerators in each zone transfer oxygen from the reactor headspace into the wastewater to provide an oxygen rich environment for biological

carbonaceous BOD consumption and/or nitrification. Return sludge from FSTs 1 – 12 is pumped to the first zone of each reactor to maintain the population of active biomass.

The HPO reactors were originally designed to provide either two-stage nitrification or single-stage nitrification during high flow. When operating the HPO reactors for two-stage nitrification, influent from the MPS is treated by HPO reactors 1 and 2, passes through FSTs 1 – 6, and is returned to HPO reactors 3 through 6 for nitrification by the intermediate pumping station. The intermediate pumping station consists of four 40 MGD pumps for a firm pumping capacity of 120 MGD. HPO reactor 3 may be used in this operation for either carbonaceous BOD removal or nitrification. Influent wastewater to the reactors may also be fed directly from the MPS discharge channel into the nitrification reactors by the 48-inch supplemental nitrification stage conduit to the northeast corner of the HPO reactors. All nitrification stage effluent from reactors 4 – 6 then passes through FSTs 7 – 12 and on to the DARs. When single-stage nitrification is desired, all HPO reactors operate identically in parallel to remove carbonaceous constituents and to provide nitrification, and all HPO effluent is settled by FSTs 1 – 12. Following the construction of the DARs and FSTs 13 – 20, the HPO reactors could also be operated in fully carbonaceous BOD and SS removal mode. All HPO reactors and FSTs 1 – 12 are available to provide carbonaceous BOD and SS removal prior to separate stage nitrification in the DARs.

3.2.1.2 Process Evaluation

The HPO reactors have been used mainly for the removal of carbonaceous BOD since the addition of the DARs for separate stage nitrification. Reactors 1 and 2 have been used most often, with reactor 3 mainly being used in high flow situations for improved hydraulics and carbonaceous removal. Key process parameters for the HPO reactors have been calculated and determined from the 5 year historical monitoring data provided. These parameters are summarized in **Table 3-16** for 2013 through 2015. Data prior to 2013 is not shown because it does not accurately represent the current operation of the biological processes.

Table 3-16 – HPO Reactors Key Process Parameters

Year	MLSS (mg/L)	SRT[(1)] (days)	F/M Ratio[(1)] (mg BOD/mg MLSS*d)	BOD Reduction (% removed)[(2)]
2013	1,342	0.59	2.3	72.6%
2014	1,375	0.60	2.6	86.6%
2015	1,378	0.52	2.4	86.2%
2013-2015 Average	1,365	0.57	2.4	81.8%

[(1)]Values are calculated from historical monitoring data and therefore approximate.

[(2)]Based on MPS influent BOD and FST 1 – 12 effluent BOD.

Nitrification is not required in the HPO reactors because of the DARs, and as a result the two-stage nitrification operation of the HPO reactors is unnecessary to meet Class I reliability. Despite the minimal SRT, some nitrification has been observed in the HPO reactors due to the presence of nitrate in the HPO

effluent. Previous engineering reports have indicated this is most likely due to the wastage of DAR sludge to the HPO system, thereby introducing acclimated nitrifying organisms to the HPO activated sludge. This is a viable hypothesis and the most likely cause of this phenomenon because the nitrifying organisms contained in the DAR waste sludge have a significantly greater cell residence time compared to the heterotrophic organisms in the HPO reactors. Therefore, nitrification in the HPO reactors is somewhat detached from the HPO SRT and a direct function of DAR wastage to the HPO system.

The mechanical aerators in the first zone of reactors 1 and 2 are of greater capacity than those installed in the first zone of reactors 3 through 6. This results in variations in operation and treatment capacity when reactors 3 through 6 are used. Several of the mechanical aerator motors for reactors 4 through 6 have been removed. Also, treatment plant operations staff indicated to McKim & Creed that the motors for the mechanical aerators in the first zone of the reactors become overloaded at high flows. This is likely due to exceeding the maximum submergence of the impellers under high flow, and the age of the aerator motors. This issue may be alleviated by modifying the height of the impellers or by installing impellers with a greater submergence allowance. In addition, the step feed equipment installed in reactors 1 and 2 cannot be used to send all influent flow to the second zone of the HPO reactors because the oxygen requirement will exceed the oxygen transfer rate of the installed mechanical aerators in zone 2. As a result, the step feed equipment is currently used to send approximately 40% of the influent flow to the second zone of reactors 1 and 2.

The HPO generation plants were observed to be in poor overall condition as seen in **Figure 3-13** and **Figure 3-14** and as noted by Solutionwerks, Inc. in their June 2014 evaluation. A large majority of the oxygen generation equipment and piping is original to the facility and in need of repairs, replacement, and protective coatings. Oxygen Generation Plant No. 2 has been offline since around 2004 and construction for the rehabilitation of this plant is currently underway. Rehabilitation of Oxygen Generation Plant No. 2 is focused on major components and controls to return the plant to operation. However, many of the smaller components such as valves and piping remain original to the equipment and are not planned to be replaced as part of the rehabilitation. Failure of control valves or piping is likely to cause complete shutdown of the plant despite rehabilitation of major equipment. Previous studies by Solutionwerks, Inc. and Greeley and Hansen have indicated that the HPO generation at the HFC AWTP significantly outpaces the requirements of the HPO reactors at times. DO concentrations in the HPO reactors as high as 20 mg/L were consistently observed by Solutionwerks, Inc., and the observed oxygen demand during turndown testing was between 30 to 35 tons/day. A DO level of 20 mg/L is far above the basis of design concentration of 7.0 mg/L and above the recommended high DO alarm levels of 14 mg/L. Since the HPO generation system is one of the largest energy consuming processes at the facility, a significant cost savings can be realized by overhauling the controls of oxygen supply and mechanical aeration in the HPO reactors. Controls will be overhauled for Oxygen Generation Plant No. 2 to allow load following capability as part of the rehabilitation project. Solutionwerks, Inc. indicated that Oxygen Generation Plant No. 1 is capable of a turndown range from 60 tons/day to 28 tons/day.

Figure 3-13 – West Elevation View of HPO Generation System

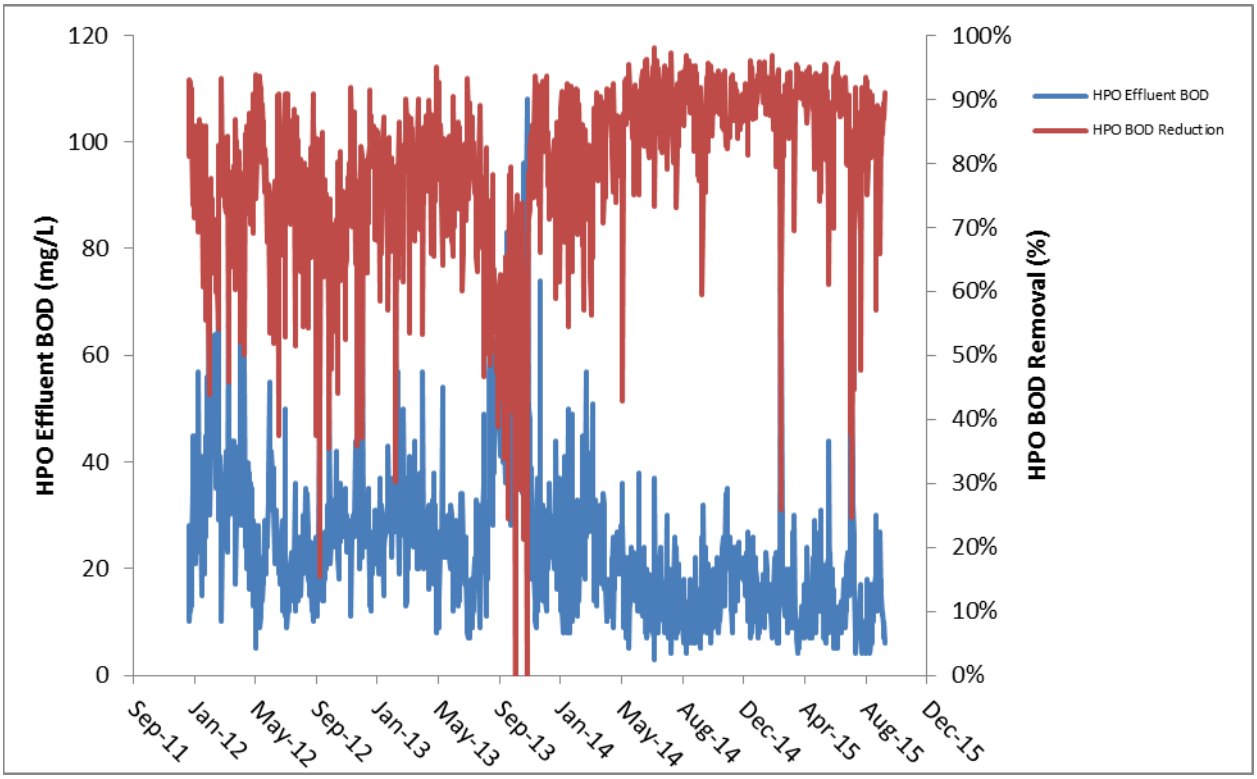
Figure 3-14 – LOX Storage Tank and Piping

Currently, DO is only monitored in the last zone (Zone 4) of each HPO reactor. The rate of HPO supplied is controlled based on the pressure in the headspace of the first zone of each HPO reactor, and the vent gas purity from the fourth zone of each reactor. Oxygen generation and supply is manually controlled for the most part and control in the HPO reactors is not directly linked to the DO concentration in each zone. Rather, the control scheme is based upon the fact that as oxygen demand increases the headspace gas pressure in the first zone of the reactors will decrease and the vent gas purity from the fourth zone of each reactor will decrease. This is corrected by increasing the oxygen supply and opening the vent gas valves gradually until headspace gas pressure and vent gas purity reach operator selected values. The opposite is true in response to decreased oxygen demand. Combustible gas and oxygen purity is also monitored in the first and fourth zones of each reactor by a combined system that monitors the HPO reactors in groups of reactors 1 – 3 and reactors 4 – 6. The combustible gas and oxygen purity analyzers are located centrally on the reactor deck and sample lines from each reactor are of considerable lengths. The length of the sample lines may result in inaccurate results due to sample degradation by biofilms within the sample lines and/or by dilution due to mixing within the sample piping. The result of

inaccuracy in these measurements may be unnecessarily high oxygen supply due to oxygen purity measured lower than actual purity, and late response to a build-up of combustible gases in the reactors.

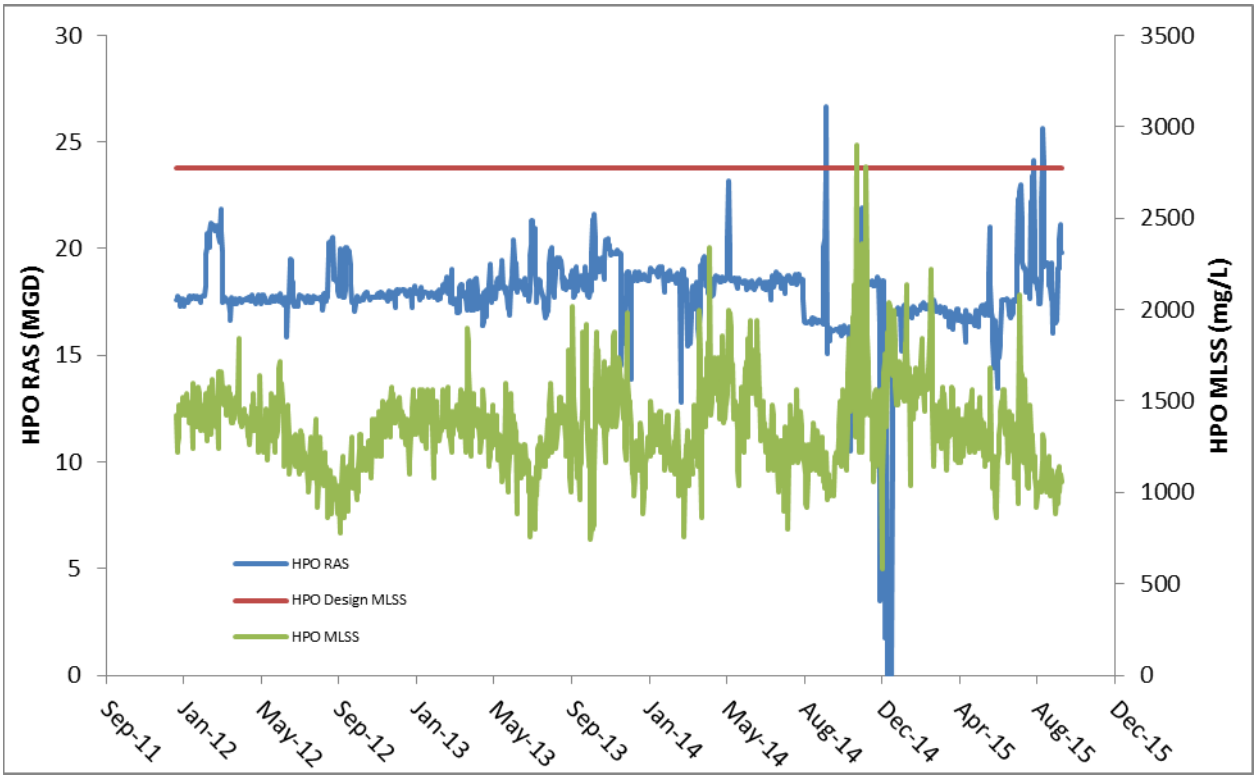
The basis of design for the HPO reactors reported by the 1999 Greeley and Hansen Operations & Maintenance Manual indicates that a maximum of four reactors are to be used at the design AADF of 96 MGD (121 MGD with residuals recycles) for carbonaceous BOD removal. Historical monitoring data and the modeling performed by Tetra Tech for the DAR evaluation and the Arcadis Operation and Maintenance Performance Report suggest that the existing HPO reactors are sufficiently sized to provide carbonaceous BOD removal at the current and design AADF. However, there has been significant variation in the BOD removal efficiency for the HPO reactors (**Figure 3-15**) and may indicate that the current operation should be evaluated for modifications to improve consistency.

Figure 3-15 – HPO Reactors Effluent BOD and BOD Removal Efficiency



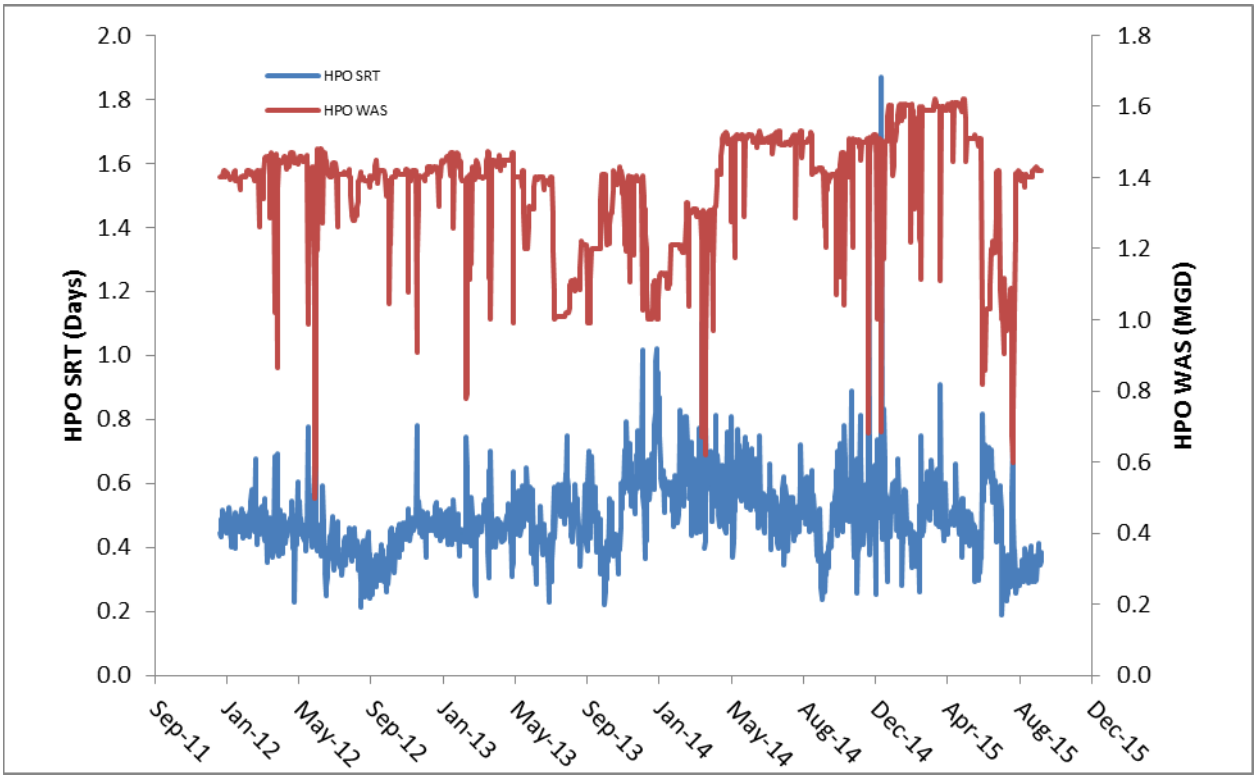
The basis of design reported by the Operations & Maintenance manual indicates a design HPO MLSS concentration of 2775 mg/L and a design SRT of 0.8 days. **Figure 3-16** illustrates the historical MLSS concentration data and RAS flow.

Figure 3-16 – Historical HPO MLSS Concentration and RAS Flow



The HPO reactors have been operated well below their design MLSS, which may contribute to the variability of the BOD removal efficiency. Operation at a greater MLSS will result in greater BOD removal and greater resiliency to shock organic loads. However, the influent BOD loading to the HPO reactors is less than that assumed by the basis of design, which accounts for some reduction in the biomass production because less carbonaceous substrate is available for growth. The operation of the HPO reactors at lower MLSS is also likely tied to the operation of the DARs for denitrification. This is because HPO effluent BOD will be greater at lower MLSS and provide more carbon for denitrifying organisms to convert nitrate and nitrite to nitrogen gas. As BOD removal and the HPO MLSS concentration has varied under the current operation, so has the HPO SRT. The HPO RAS flow rate has remained relatively constant while the WAS flow rate has experienced several short periods of significantly low flows. **Figure 3-17** shows the changes in the WAS flow rate and the resulting changes in the HPO SRT.

Figure 3-17 – HPO SRT and Wastage Flow



The variations in the HPO SRT as a result of the WAS flow rates, and the highly variable BOD removal and MLSS concentration appears to indicate insufficient monitoring information, controls, and automation available to the operators. These concerns should be evaluated further to determine their root causes and solutions to improve reliability in the HPO BOD removal efficiency.

Table 3-17 – Summary of Evaluation of High Purity Oxygen Reactors

Performance	
Performance Goals	Observed Performance[1]
Effluent BOD = 27 mg/L	Effluent BOD = Unavailable
Effluent SS = 16 mg/L	Effluent SS = 10.03 mg/L
Percent TKN Removal = 56%	Percent TKN Removal = 56.2%
Effluent TKN = 10.6 mg/L	Effluent TKN = 16.14 mg/L
Effluent NO_3 = 4.4 mg/L	Effluent NO_3 = 10.57 mg/L[2]
Percent Phosphorus Removal = 16.3%	Percent Phosphorus Removal = Unavailable
Effluent Phosphorus = 6.6 mg/L	Effluent Phosphorus = Unavailable
Design HPO Demand = 82.3 tons/day	2015 Average HPO Supply = 38.2 tons/day
	2015 Maximum HPO Supply = 58.3 tons/day
Design SRT = 0.8 days	2015 Average Estimated SRT = 0.47 days
Design Wastage Rate = 130,800 lbs/day	2015 Average Wastage Rate = 59,743 lbs/day

Evaluation Findings
• The main sewage pumps, motors, and drives at the MPS are in excess of 37 years of age • The air compressors in the MPS are aging and in need of replacement • The ventilation system in the MPS is in need of improvements. Ventilation Improvements are currently under design. • Current operation only uses HPO reactors 1 through 3 • Step feed equipment was installed in reactors 1 and 2 to alleviate hydraulics due to current operation, but step feed equipment cannot be used to full extent • Multiple mechanical aerators in reactors 4 – 6 have been removed or partially disassembled for parts. Some mechanical aerators have been replaced but many of the motors are the original motors and are in excess of 37 years of age. • HPO reactor oxygen and combustible gas sampling lines are too long to guarantee representative samples, sample dilution and biological degradation is likely to occur • Inadequate DO monitoring equipment to monitor and control oxygen transfer rate • Step feeding to zone two may result in oxygen demand exceeding the capacity of the installed mechanical aerators • Mechanical aerators in reactors 3, 4, 5, and 6 do not match the oxygen transfer capacity of those in 1 and 2. Motors and gearboxes for mechanical aerators in reactor 3 are currently being replaced to match the capacity of those installed in reactors 1 and 2. • Intermediate pumps are in excess of 37 years of age and have not been operated for quite some time due to the current operation of the HPO reactors for BOD removal only • Many components of the oxygen generation systems appear to be in poor condition and may pose a health and safety risk as well as an operational risk. Many of the original components to the Oxygen Generation Plants installed in 1978 are still in operation. Only Oxygen Generation Plant No. 1 is operable. Failure of control valves or piping original to the generation plants is likely to cause complete shutdown despite rehabilitation to major equipment. • Solutionwerks, Inc. noted dissolved oxygen concentration in the HPO reactors remained consistently near 20 mg/L, indicating significantly more oxygen production than needed. • HPO F/M ratio is consistent with a high rate activated sludge process for carbonaceous removal • HPO MLSS concentration and BOD removal efficiency has been highly variable, and may indicate a need for improved monitoring and control.
Recommendations
• Evaluate main sewage pumps, motors, and drives for repairs and replacement due to their age • Investigate the replacement of the process air blowers for channel mixing. Other air mixing systems used significantly less energy and are easier to operate. • Redirect scum from the HPO influent channel and FSTs 1 – 12 to gravity thickening, mixed sludge pumping station, or to disposal to prevent perpetual recirculation of foam inducing microorganisms such as Nocardia bacteria. • Consider a complete repair and replacement campaign of all oxygen generation system piping and equipment due to equipment age and condition. It is understood that Oxygen Generation Plant No. 2 is currently undergoing repairs to the major equipment based upon the recommendations of the

June 2014 report on site conditions by Solutionwerks, Inc. This is a high priority item due to the critical nature of oxygen generation at this facility.

- Investigate options to provide denitrification prior to denitrification filters. Most equipment and infrastructure required for process modifications may already be present, or require minor modifications. This recommendation shall be considered concurrently with repairs to the Oxygen Generation Plants to weigh the merit of a complete overhaul of the Oxygen Generation Plants. Modifications should be modeled to prove validity.
- Evaluate the intermediate pumping station in conjunction with process modifications as an option to provide internal recycle or other flows.
- Aging equipment should be investigated for replacement
- Consider replacing HPO mechanical aerators with newer, more efficient mixers and motors. Higher oxygen transfer rate/efficiency and higher mixer efficiency will reduce energy usage. Mechanical aerators should be of equivalent size and oxygen transfer rate/efficiency for each reactor to allow each reactor to be operated identically. There should not be variations in aerator capacity between reactors, but variation between zones is expected and recommended.
- Consider improving BOD, MLSS, DO monitoring
- Consider improving SCADA integration with operational controls
- Consider increasing the MLSS and SRT towards the design values to increase BOD removal efficiency and reliability.
- Model the HPO operation to determine more robust operational parameters to provide reliable and efficient BOD removal based on current operation.
- The mechanical aerator motors for reactors 4 through 6 should be placed back into operation or readily available and easily installed to enable the use of reactors 4 through 6 in the event of equipment failure in reactors 1 through 3.
- Consider purchasing additional gas analyzers and relocating existing analyzers adjacent to sampling locations to improve accuracy and oxygen generation control
- Consider redeveloping oxygen generation supply and control scheme to reduce oxygen production while maintaining necessary oxygen transfer rate. An automatic load following control system should be implemented to reduce energy usage. (To be completed for Oxygen Generation Plant No. 2 as part of rehabilitation project)
- Evaluate the replacement of oxygen supply and vent gas meters and valves due to age
- Replace 34 year old sample pumps
- Evaluate reactor sluice gates, weir gates, stop logs for replacement due to age

(1) Average values based on data from 5-year study period

(2) Previous studies have indicated inaccuracy in daily composite sample nitrate concentration

RFQ: 25-C-00024 DESIGN CRITERA PACKAGE
Howard F. Curren AWTP High Purity Oxygen Generation Facility Replacement

PREPARED BY:
Jacinto Ferras, P.E. – DESIGN DIVISION HEAD
WASTEWATER DEPARTMENT
CITY OF TAMPA
April 2025

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