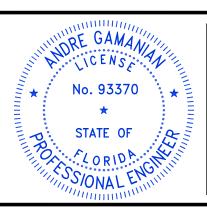


#### NOTES:-

ISSUED FOR CONSTRUCTION (REVISED)

- IF UNDERGROUND SERVICES ARE PRESENT. CALL 811 OR CONSULT WWW.SUNSHINE811.COM WELL BEFORE DRILLING OR EXCAVATION.
- 2) IMAGE USED FOR PLANNING PURPOSE ONLY. DIMENSIONAL ACCURACY SUBJECT TO PHOTO RESOLUTION, REGISTRATION AND CAMERA ANGLE DISTORTION.

DESCRIPTION CHK BY APRV BY PROFESSIONAL ENGINEER DATE ISSUED FOR BID ISSUED FOR CONSTRUCTION ANDRE GAMANIAN, P.E. ISSUED FOR CONSTRUCTION (REVISED) FL LICENSE NO.93370



EXP. 02/28/2025

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. 2023.09.25 17:53:16-07'00'



INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

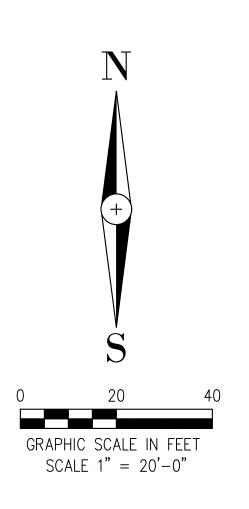
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

ISSUED FOR CONSTRUCTION

## LFG BLOWER SKID & FLARE **LOCATION PLAN**

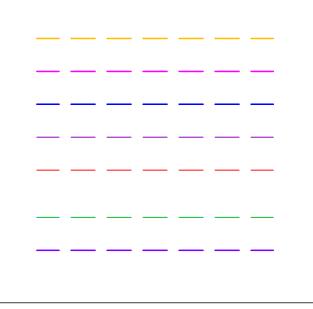
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

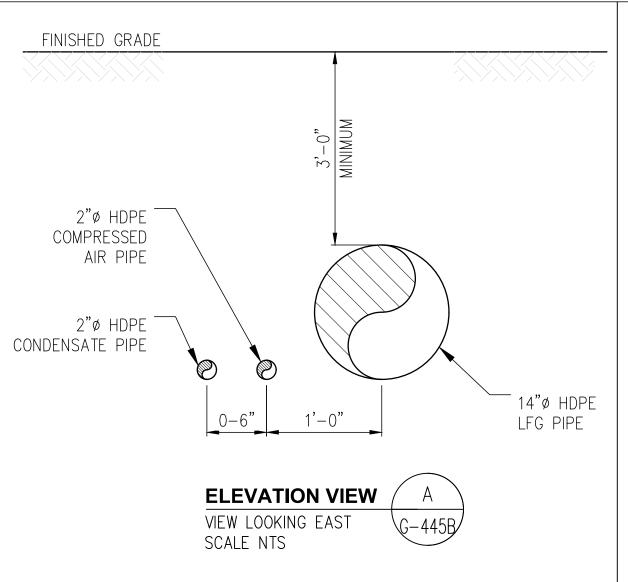
G-445A

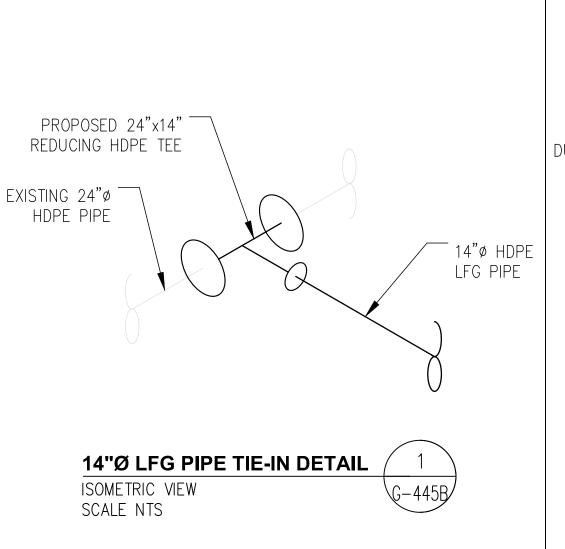


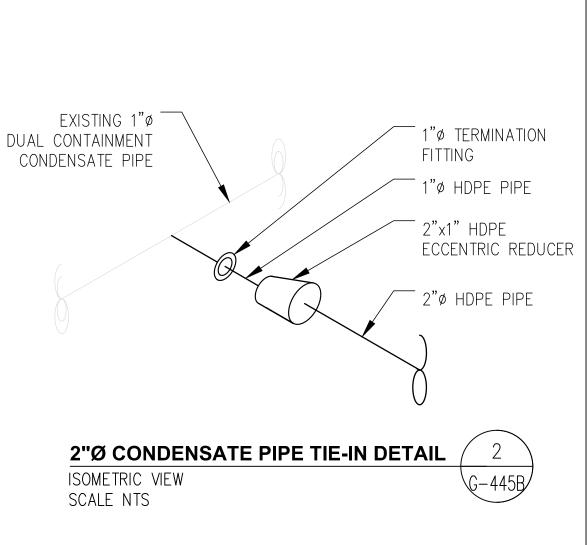
#### **LEGEND**

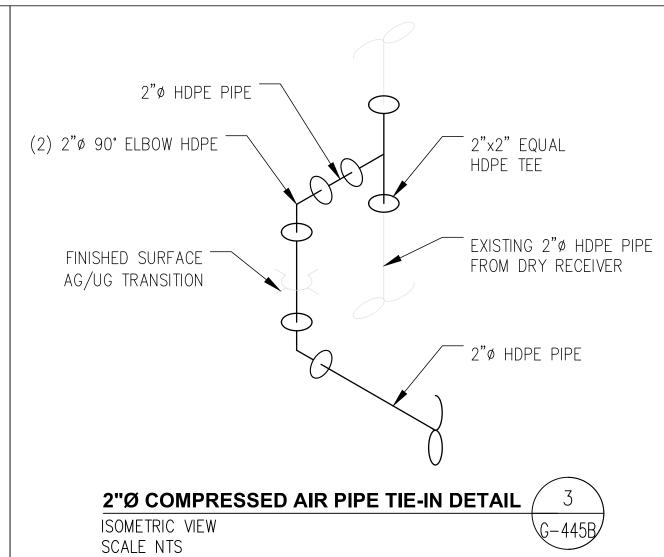
PROPOSED 14"Ø HDPE LFG PIPE PROPOSED 2" Ø HDPE CONDENSATE PIPE PROPOSED 2"Ø HDPE COMPRESSED AIR PIPE EXISITNG 24" Ø HDPE LFG PIPE EXISTING 1"Ø HDPE DUAL CONTAINMENT CONDENSATE PIPE EXISTING 2"Ø HDPE COMPRESSED AIR PIPE PROPOSED 2"ø/4"ø COMMUNICATION CONDUIT

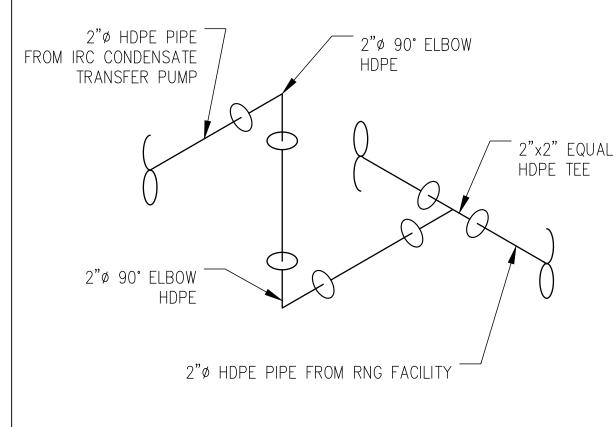












2"Ø IRC SKID CONDENSATE PIPE WITH RNG FACILITY CONDENSATE PIPE TIE-IN DETAIL G-445B ISOMETRIC VIEW SCALE NTS

#### **NOTES:-**

- 1) IF UNDERGROUND SERVICES ARE PRESENT. CALL 811 OR CONSULT WWW.SUNSHINE811.COM WELL BEFORE DRILLING OR EXCAVATION.
- 2) IMAGE USED FOR PLANNING PURPOSE ONLY. DIMENSIONAL ACCURACY SUBJECT TO PHOTO RESOLUTION, REGISTRATION AND CAMERA ANGLE DISTORTION.
- 3) EXACT TIE-IN LOCATION TO BE FIELD VERIFIED BY THE CONSTRUCTION CONTRACTOR.

ISSUED FOR CONSTRUCTION

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0	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINE
nioga	2.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
ונפו	3.0	02/03/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG	
ין אין	4.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	AK	TP	AG	ANDRE GAMANIAN, P.E.
5	5.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	FL <b>LICENSE</b> NO.93370 EXP. 02/28/2025

No. 93370 STATE OF

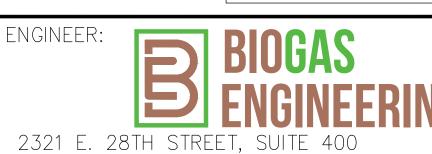




2023.09.25 17:53:16-07'00'



1325 74th AVE SW, VERO BEACH, FLORIDA 32968



EMAIL: INFO@BIOGASENG.COM

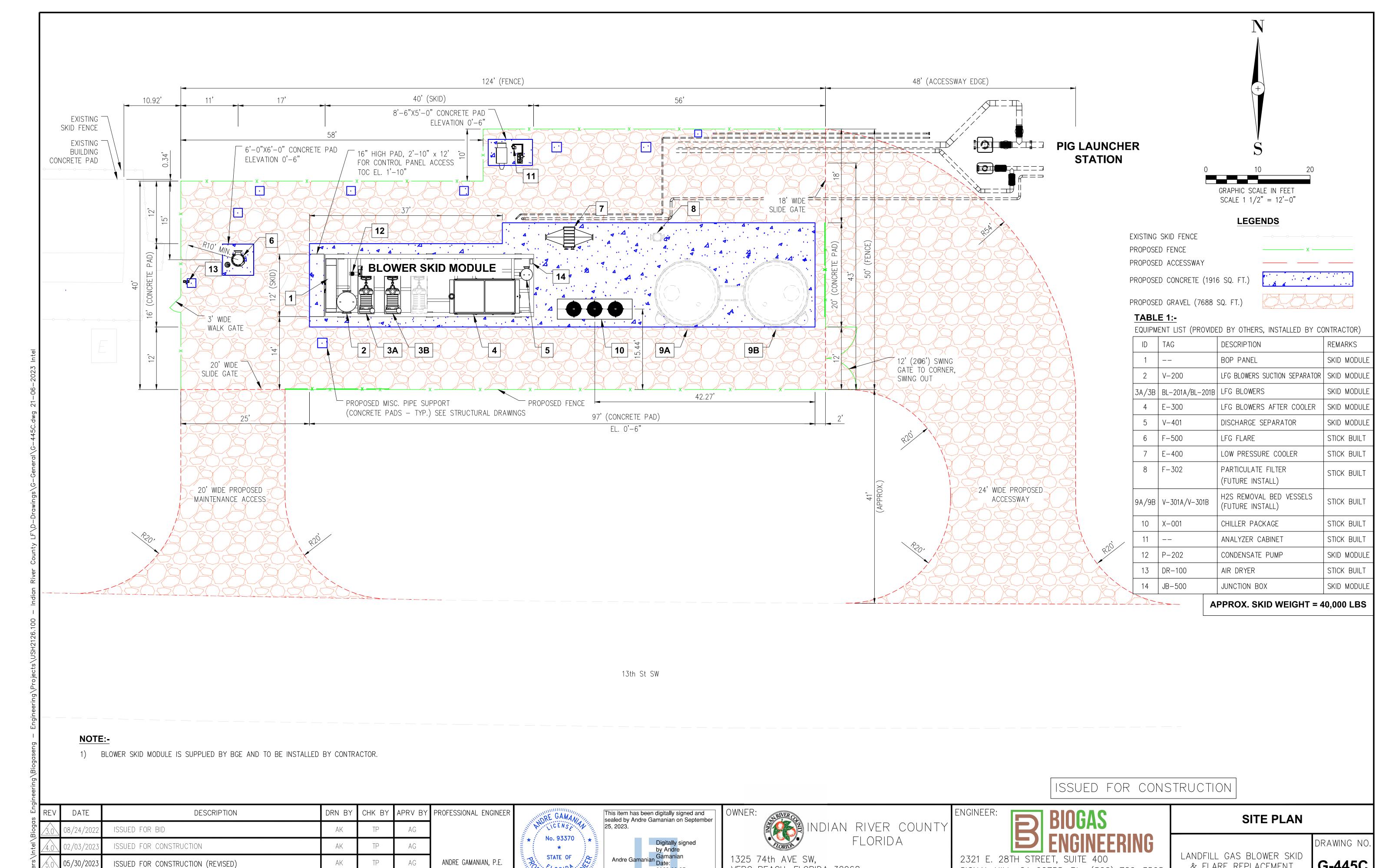
SIGNAL HILL, CA 90755, Ph: (562) 726-3565

PIPELINE INTERFACE PLAN DRAWING NO.

LFG BLOWER SKID

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

G-445B



VERO BEACH, FLORIDA 32968

ON LORIDA

SSIONAL ENGIN

FL LICENSE NO.93370

EXP. 02/28/2025

ISSUED FOR CONSTRUCTION (REVISED)

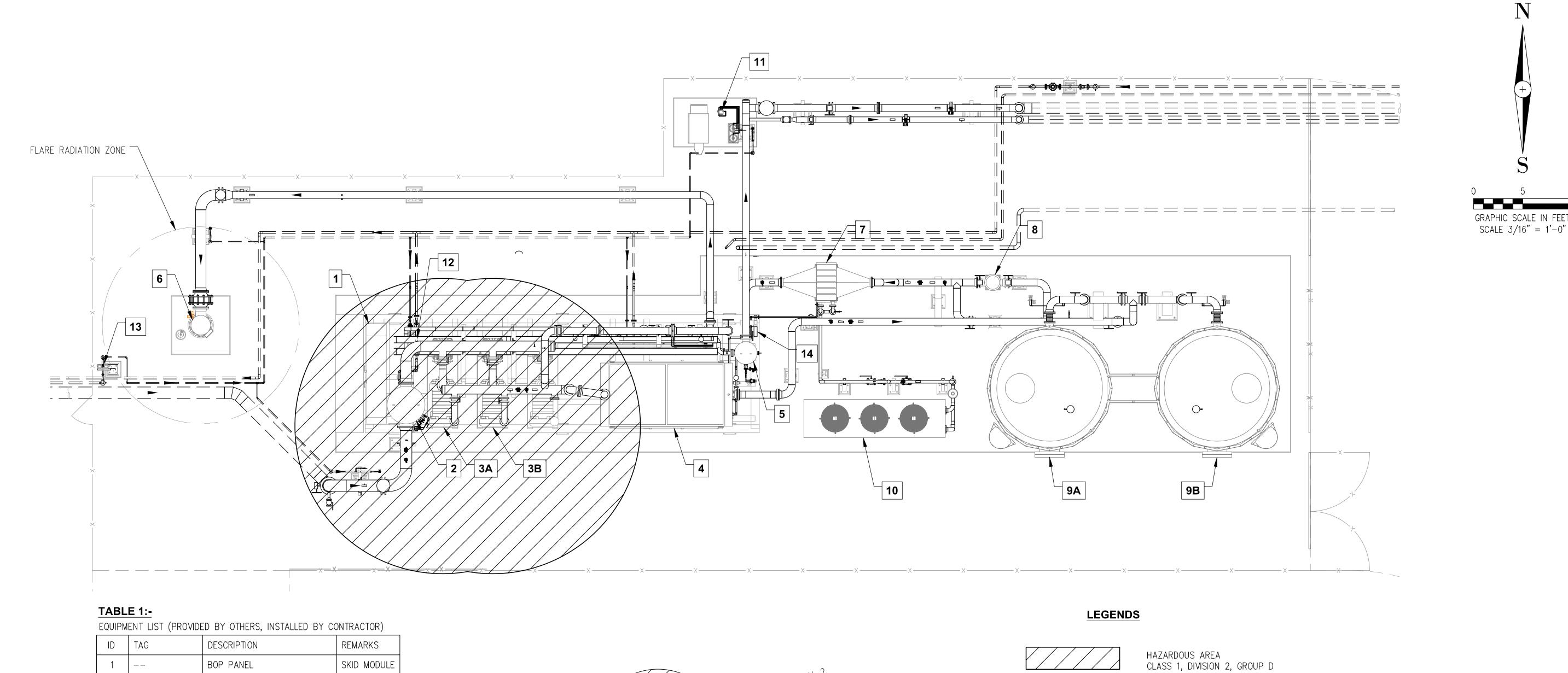
2023.09.25

17:53:16-07'00'

& FLARE REPLACEMENT | G-445C

SIGNAL HILL, CA 90755, Ph: (562) 726-3565

EMAIL: INFO@BIOGASENG.COM



ID	TAG	DESCRIPTION	REMARKS
1		BOP PANEL	SKID MODULE
2	V-200	LFG BLOWERS SUCTION SEPARATOR	SKID MODULE
3A/3B	BL-201A/BL-201B	LFG BLOWERS	SKID MODULE
4	E-300	LFG BLOWERS AFTER COOLER	SKID MODULE
5	V-401	DISCHARGE SEPARATOR	SKID MODULE
6	F-500	LFG FLARE	STICK BUILT
7	E-400	LOW PRESSURE COOLER	STICK BUILT
8	F-302	PARTICULATE FILTER (FUTURE INSTALL)	STICK BUILT
9A/9B	V-301A/V-301B	H2S REMOVAL BED VESSELS (FUTURE INSTALL)	STICK BUILT
10	X-001	CHILLER PACKAGE	STICK BUILT
11		ANALYZER CABINET	STICK BUILT
12	P-202	CONDENSATE PUMP	SKID MODULE
13	DR-100	AIR DRYER	STICK BUILT
14	JB-500	JUNCTION BOX	SKID MODULE

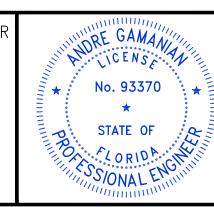
UNCLASSIFIED AREA

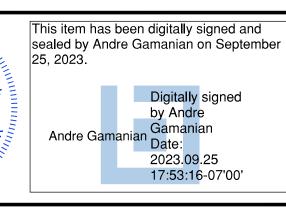
TYPICAL FOR ALL HYDROCARBON (RAW BIOGAS/METHANE) THREADED OR FLANGED PIPE FITTINGS

SCALE: NTS

ISSUED FOR CONSTRUCTION

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s En	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER	
Bioga	1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG		
ntel\	2.0	02/03/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG		
sers \	3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	AK	TP	AG	ANDRE GAMANIAN, P.E.	
₹\   	4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	FL LICENSE NO.93370 EXP. 02/28/2025	







NINDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

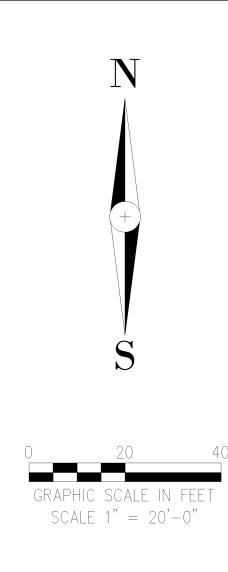


2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

AREA CLASSIFICATION
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LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

G-445D



#### NOTES:

- 1. FOR SITE SURVEY DETAILS REFER DRAWING NO. 6366-13A (3 SHEETS).
- 2. COORDINATE INSTALLATION OF THE LFG HEADER WITH OPERATIONS TO LIMIT TRAFFIC INTERFERENCE.
- 3. CONTRACTOR TO FIELD VERIFY THE UTILITY LOCATION AT SITE PRIOR TO DIGGING; CALL SUNSHINE 811 AT LEAST TWO DAYS PRIOR TO DIGGING IN CASE UTILITIES HAVE TO BE LOCATED AND MARKED.
- 4. THE CONTRACTOR SHALL MAINTAIN A MINIMUM COVER OF 3'-0" ON THE LFG HEADER AT ALL TIMES, UNLESS SHOWN OTHERWISE.
- 5. PROFILE FOR 12" DIAMETER RNG LFG HEADER IS NOT SHOWN SINCE THE CONSTRUCTION FOR THIS LINE WILL BE DONE BY OTHERS. THE PORTION OF SMALL SECTION OF THIS LINE, SHOWN ON THE PLAN, WILL BE DONE BY KIMLEY-HILL AVOID ANY DISTURBANCES WITHIN THE PROPOSED FLARE FACILITY FENCED AREA. THE PROFILE FOR THIS SMALL SECTION OF 12" DIAMETER HDPE LFG HEADER FOR RNG, WILL BE SIMILAR TO 8" LFG HEADER SHOWN ON SHEET C-445B WITH A MINIMUM COVER TO THE PIPE OF 3'-0".
- 6. ALL BELOW GRADE HDPE BENDS SHALL BE LONG SWEEP BENDS.
- 7. THE EXACT LOCATIONS FOR CONNECTIONS TO PIG LAUNCHING STATION WILL BE DETERMINED BY THE COUNTY/KIMLEY-HORN UPON COMPLETION OF THE GRADING WORK FOR THE PROPOSED FLARE FACILITY.
- 8. DUE TO UPCOMING GRADING WORK NEAR THE VICINITY OF THE PROPOSED FLARING SYSTEM, LINES AND GRADE ELEVATIONS SHOWN ON THE PROFILE SHEET (C-445B) AND IN FIELD MAY VARY. THE CONTRACTOR SHALL MAKE THE ADJUSTMENT AS NECESSARY.

#### **LEGEND**

PROPOSED IRC PIPING CORRIDOR 8"Ø HDPE SDR 17 LFG HEADER 4"Ø HDPE SDR 17 COMMUNICATION CONDUIT

PROPOSED RNG PIPING CORRIDOR 12"Ø HDPE SDR 17 LFG HEADER 2"Ø HDPE SDR 11 CONDENSATE LINE 2"Ø HDPE SDR 11 COMMUNICATION CONDUIT

**ISSUED FOR CONSTRUCTION** 

REV	DATE	DESCRIPTION	DRN BY	СНК ВҮ	APRV BY	1111
3.0	08/24/2022	ISSUED FOR BID	AK	RR	SK	
4.0	01/19/2023	ISSUED FOR CONSTRUCTION	SS	RR	SK	*
5.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	RR	SK	TRON
6.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	RR	SK	EXP. 02/2

NO. 54607 STATE OF

Heather Cavanagh Date: 2023.09.29 15:12:33 -04'00'

Digitally signed by Heather Cavanagh



**INDIAN RIVER COUNTY FLORIDA** 

1325 74th AVE SW, **VERO BEACH, FLORIDA 32968** 

NGINEER:		BIOGAS
	R	CNOINCEDI
		ENGINEEKI

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 **EMAIL: INFO@BIOGASENG.COM** 

SITE PLAN

LANDFILL GAS PIPELINE EXTENSION DRAWING NO. C-445A

SCALE: 1" = 50'-0" HORIZ. 1" = 5'-0" VERT.

ISSUED FOR CONSTRUCTION

REV DATE DESCRIPTION DRN BY CHK BY APRV BY

3.0 08/24/2022 ISSUED FOR BID

AK TP SK

4.0 01/19/2023 ISSUED FOR CONSTRUCTION

AK TP SK

5.0 05/30/2023 ISSUED FOR CONSTRUCTION (REVISED)

SS RR SK

EXF

Heather Cavanagh Cavanagh Date: 2023.09.29

Cavanagh Date: 2023.09.29

15:12:33 -04'00'



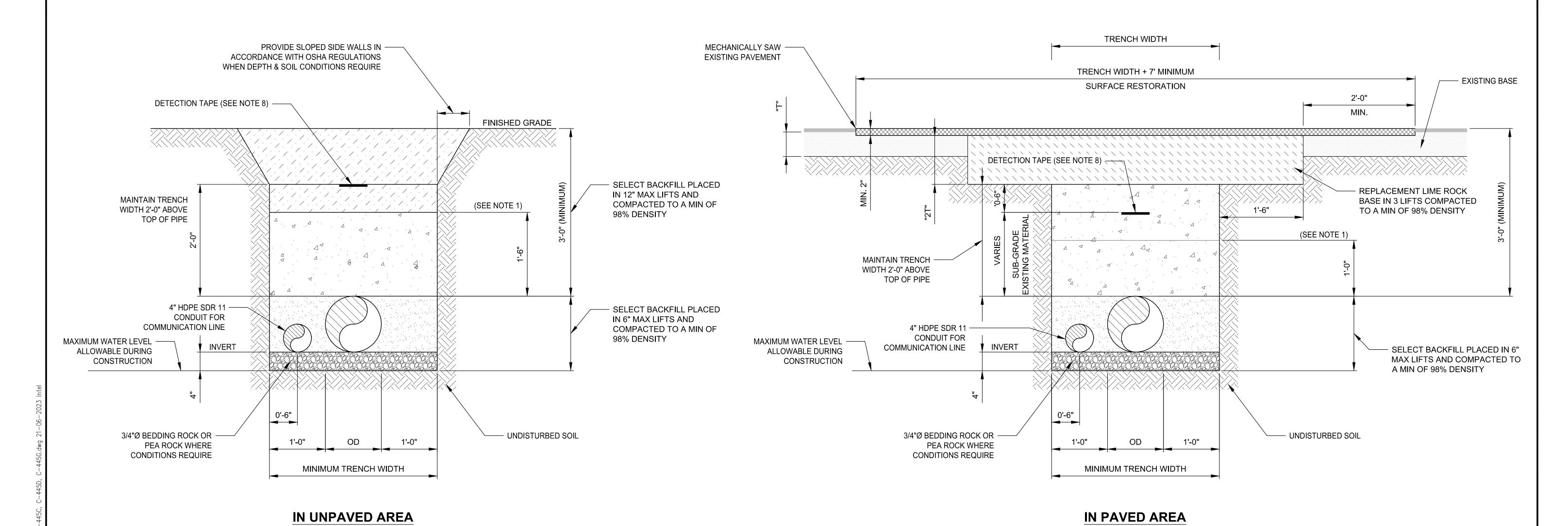
**VERO BEACH, FLORIDA 32968** 

BIOGAS ENGINEERI

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM 8" Ø LFG HEADER PROFILE STA. 0+00 TO STA. 2+00

LANDFILL GAS
PIPELINE EXTENSION

C-445B



**DETAIL - 8"Ø PIPE TRENCH (TYP)** SCALE: N.T.S. **C-445C** 

#### TRENCH DETAIL NOTES

- MECHANICAL COMPACTION SHALL NOT BE ALLOWED BELOW THIS LEVEL OTHER THAN HAND VIBRATORY MEANS.
- WHERE REQUIRED, AS DETERMINED IN FIELD BY THE ENGINEER, SHEETING AND SHORING SHALL BE IN ACCORDANCE WITH OSHA REGULATIONS. THE PIPE SHALL BE FULLY SUPPORTED FOR ITS ENTIRE LENGTH WITH APPROPRIATE COMPACTION UNDER THE PIPE HAUNCHES.
- THE PIPE SHALL BE PLACED IN A DRY TRENCH.
- BACKFILL SHALL BE DONE WITH APPROVED MATERIAL, CLEAN AND FREE OF ROCKS, MUCK AND OTHER DELETERIOUS MATTER.
- COMPACTION DENSITY PERCENTAGES SHOWN IN THE DETAILS, REFER TO AASHTO T-180 MODIFIED PROCTOR METHOD.
- COMPACTION DENSITY REPORT, SIGNED AND SEALED BY A FLORIDA LICENSED P.E., IS REQUIRED. 2" DETECTION TAPE WITH METALLIC BACKING SHALL BE INSTALLED AT THE LOCATION SHOWN ON THE DETAILS. THE DETECTION TAPE SHALL BE MARKED
- "CAUTION LANDFILL GAS LINE BELOW".
- ON COMPLETION OF THE WORK, THE AREAS SHALL BE RESTORED BACK TO THE ORIGINAL CONDITIONS. RESTORATION OF EASEMENTS OR RIGHT-OF-WAY OR WHEN REQUIRED BY OTHER JURISDICTIONAL AGENGIES SHALL CONFORM TO THE INDIAN RIVER COUNTY DEPARTMENT OF UTILITY SERVICES
- SPECIFICATIONS OR THE OTHER JURISDICTIONAL ANGENCY SPECIFICATIONS, WHICHEVER ARE MORE STRINGENT. 10. ALL PIPES SHALL BE LOCATED A MINIMUM OF 5'=0" O.C. FROM EDGE OF PAVEMENT.

**ISSUED FOR CONSTRUCTION** 

DATE CHK BY APRV BY **DESCRIPTION** ISSUED FOR BID ISSUED FOR CONSTRUCTION ISSUED FOR CONSTRUCTION (REVISED) ISSUED FOR CONSTRUCTION (REVISED)

STATE OF

Heather Cavanagh Date: 2023.09.29 15:12:33 -04'00'

Digitally signed by Heather Cavanagh



**INDIAN RIVER COUNTY FLORIDA** 

1325 74th AVE SW, **VERO BEACH, FLORIDA 32968** 



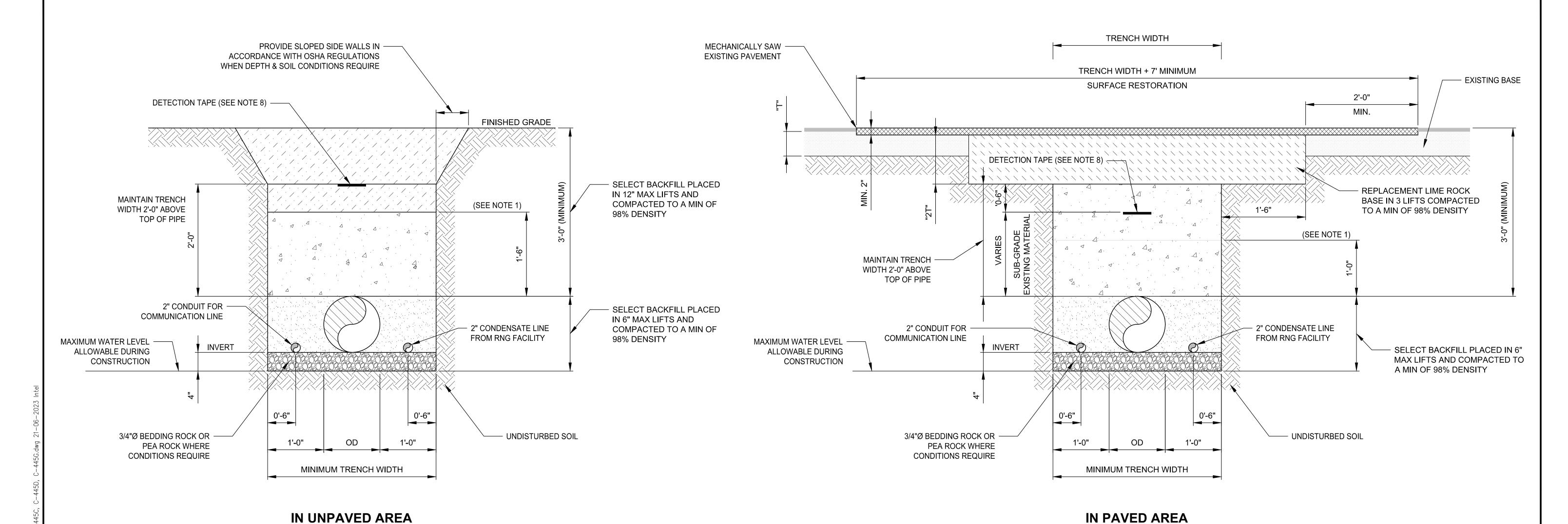
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 **EMAIL: INFO@BIOGASENG.COM** 

**MISCELLANEOUS DETAILS** 

LANDFILL GAS PIPELINE EXTENSION

DRAWING NO.

C-445C



**DETAIL - 12"Ø PIPE TRENCH (TYP)** SCALE: N.T.S. **C-445D** 

#### TRENCH DETAIL NOTES

- MECHANICAL COMPACTION SHALL NOT BE ALLOWED BELOW THIS LEVEL OTHER THAN HAND VIBRATORY MEANS.
- WHERE REQUIRED, AS DETERMINED IN FIELD BY THE ENGINEER, SHEETING AND SHORING SHALL BE IN ACCORDANCE WITH OSHA REGULATIONS. THE PIPE SHALL BE FULLY SUPPORTED FOR ITS ENTIRE LENGTH WITH APPROPRIATE COMPACTION UNDER THE PIPE HAUNCHES.
- THE PIPE SHALL BE PLACED IN A DRY TRENCH.
- BACKFILL SHALL BE DONE WITH APPROVED MATERIAL, CLEAN AND FREE OF ROCKS, MUCK AND OTHER DELETERIOUS MATTER.
- COMPACTION DENSITY PERCENTAGES SHOWN IN THE DETAILS, REFER TO AASHTO T-180 MODIFIED PROCTOR METHOD.
- COMPACTION DENSITY REPORT, SIGNED AND SEALED BY A FLORIDA LICENSED P.E., IS REQUIRED.
- 2" DETECTION TAPE WITH METALLIC BACKING SHALL BE INSTALLED AT THE LOCATION SHOWN ON THE DETAILS. THE DETECTION TAPE SHALL BE MARKED "CAUTION - LANDFILL GAS LINE BELOW".
- ON COMPLETION OF THE WORK, THE AREAS SHALL BE RESTORED BACK TO THE ORIGINAL CONDITIONS. RESTORATION OF EASEMENTS OR RIGHT-OF-WAY OR WHEN REQUIRED BY OTHER JURISDICTIONAL AGENGIES SHALL CONFORM TO THE INDIAN RIVER COUNTY DEPARTMENT OF UTILITY SERVICES SPECIFICATIONS OR THE OTHER JURISDICTIONAL ANGENCY SPECIFICATIONS, WHICHEVER ARE MORE STRINGENT.
- 10. ALL PIPES SHALL BE LOCATED A MINIMUM OF 5'=0" O.C. FROM EDGE OF PAVEMENT.

**ISSUED FOR CONSTRUCTION** 

Juleer	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	Julian Kari
US EIIG	3.0	08/24/2022	ISSUED FOR BID	AK	TP	SK	
gi (biog	4.0	01/19/2023	ISSUED FOR CONSTRUCTION	SS	TP	SK	**************************************
1 2 VIII LE	<u>/5.0\</u>	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	SK	TRO.
J. JUSE	6.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	SK	EXP. 02/28

NO. 54607

Heather Cavanagh Date: 2023.09.29 15:12:33 -04'00'

Digitally signed by Heather Cavanagh



**FLORIDA** 1325 74th AVE SW, **VERO BEACH, FLORIDA 32968** 

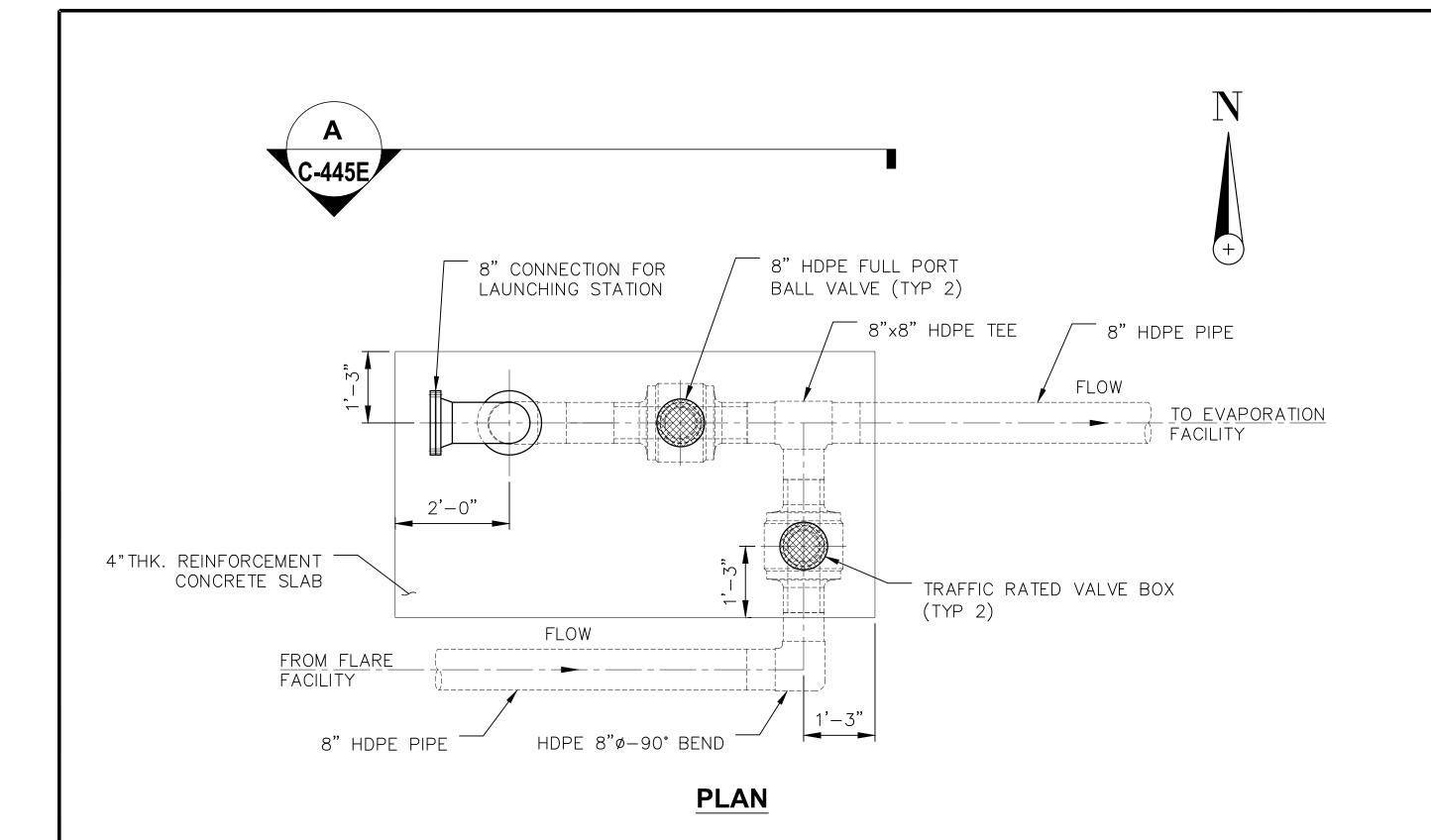


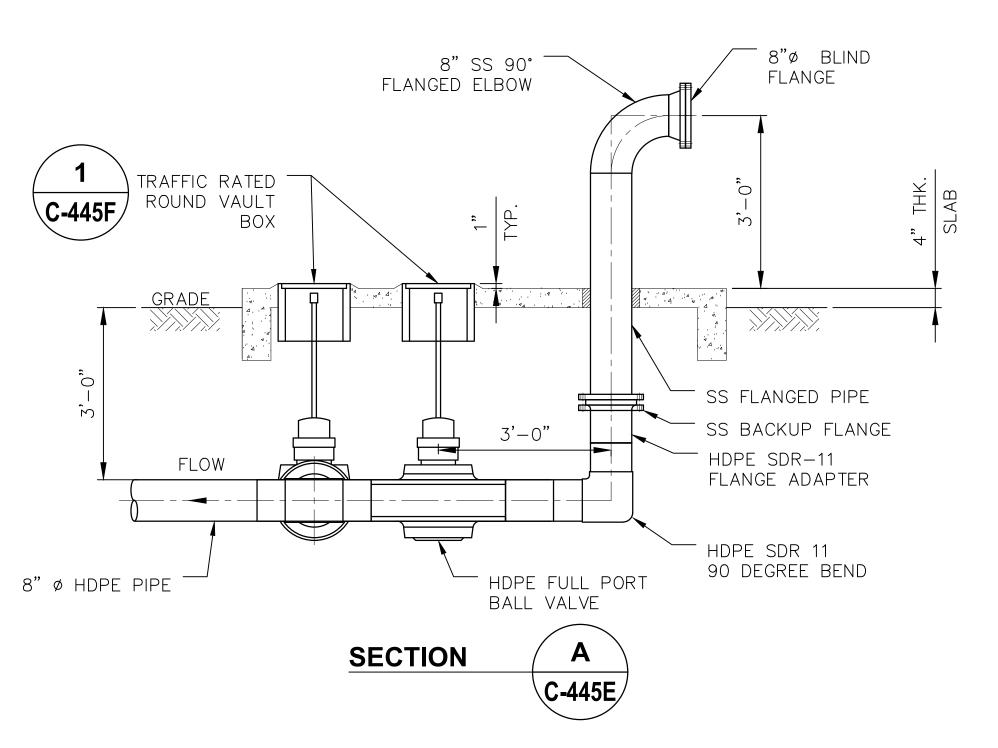
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 **EMAIL: INFO@BIOGASENG.COM** 

**MISCELLANEOUS DETAILS** 

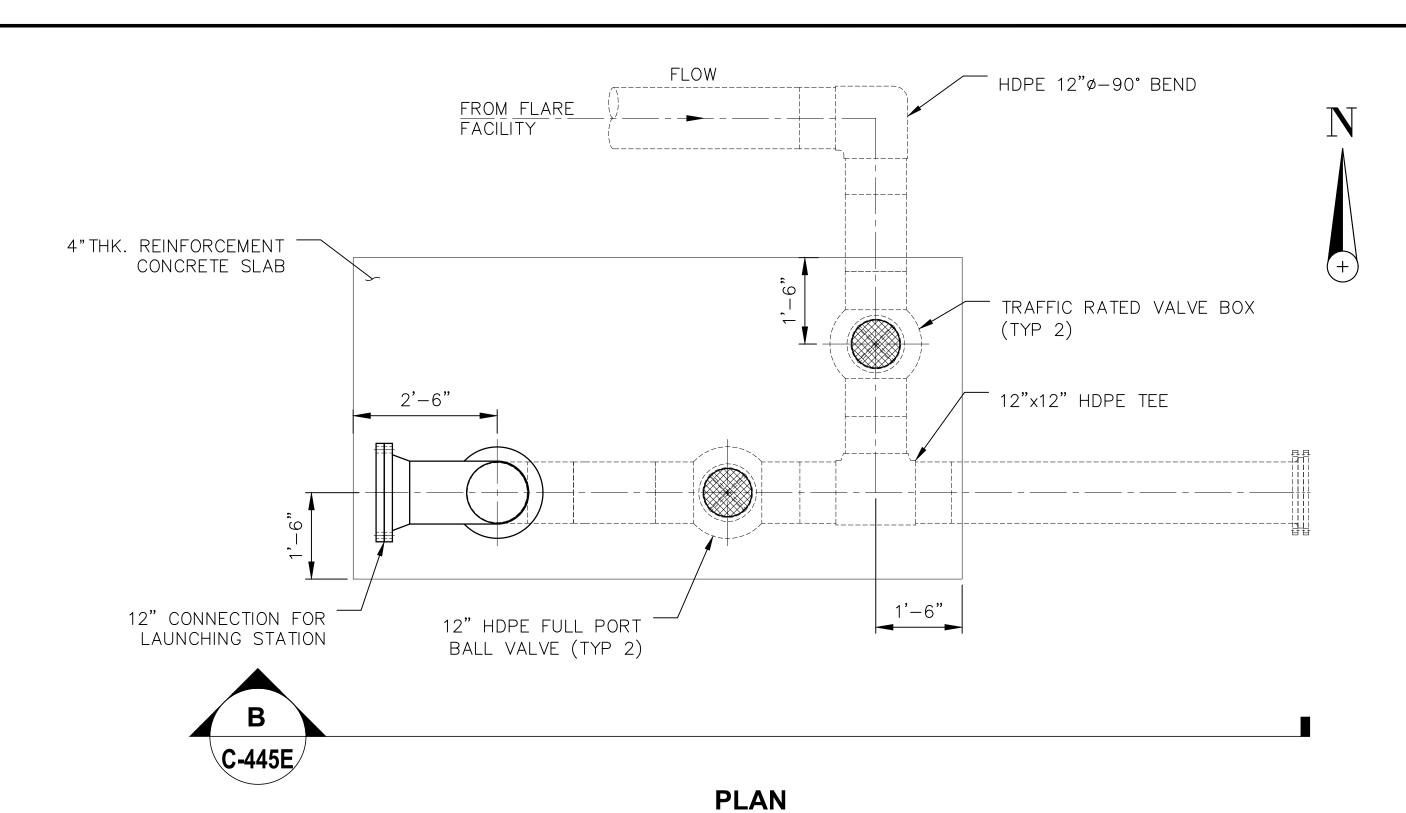
LANDFILL GAS PIPELINE EXTENSION

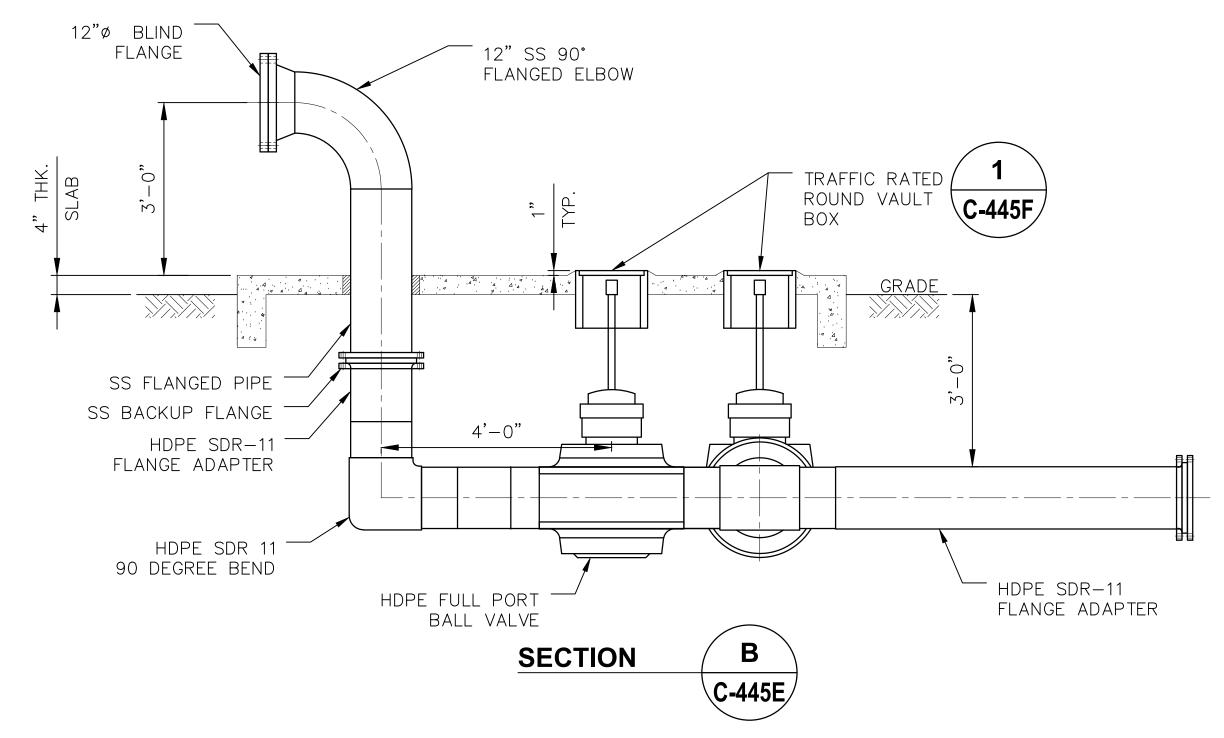
C-445D











**DETAIL - LAUNCHING STATION CONNECTION** SCALE: 1"=20" **C-445A** 

**ISSUED FOR CONSTRUCTION** 

REV	DATE	DESCRIPTION	DRN BY	СНК ВҮ	APRV BY	unith
1.0	03/01/2023	ISSUED FOR INTERNAL REVIEW	SS	TP	SK	MIII → N
2.0	01/19/2023	ISSUED FOR CONSTRUCTION	SS	TP	SK	*   '\
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	SK	THE ROLL
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	SK	EXP. 02/28/

NO. 54607 STATE OF

Heather Cavanagh Date: 2023.09.27

Digitally signed by Heather Cavanagh Date: 2023.09.29



**INDIAN RIVER COUNTY FLORIDA** 

1325 74th AVE SW, **VERO BEACH, FLORIDA 32968** 



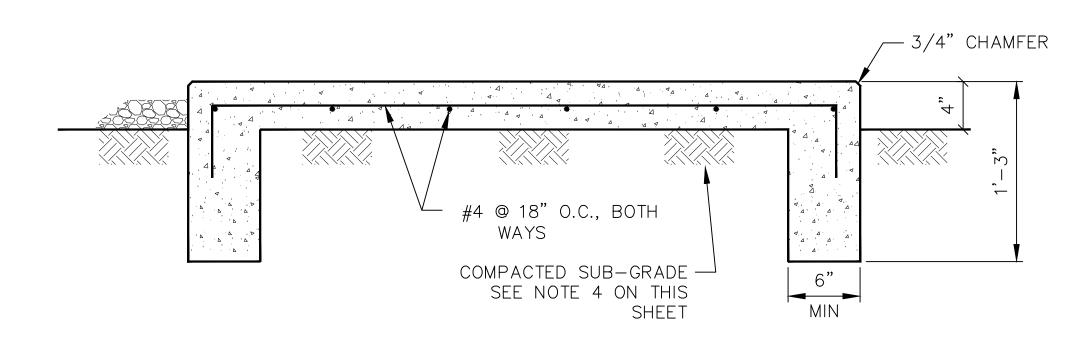
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

MISCELLANEOUS DETAILS

LANDFILL GAS PIPELINE EXTENSION

C-445E





## DETAIL - 4" THK. REINF. CONCRETE SLAB AT CONNECTION FOR PIG LAUNCHER/RECEIVER STATION

C-445F

SCALE: NTS

## **STRUCTURAL NOTES:**

- 1. REINFORCING STEEL ASTM A615, GRADE 60.
- 2. CONCRETE FOR FOOTINGS f' > 3000 psi CEMENT TYPE V SPECIAL INSPECTIONS FOR ALL CONCRETE WORK SHALL BE REQUIRED.
- 3. DESIGN SOIL PRESSURE = 1000 psi
- 4. SUBGRADE AREAS FOR THE REINFORCED CONCRETE SLAB/PAD SHALL BE SCARIFIED AND EXCAVATED TO A MINIMUM OF 12 INCHES BELOW THE CONCRETE/GRAVEL LEVEL THE EXCAVATED AREAS SHALL BE BACKFILLED WITH THE EXCAVATED MATERIAL IN TWO LAYERS. EACH LAYER SHALL BE MECHANICALLY COMPACTED TO 95 PERCENT DRY DENSITY BY ASTM D1557, METHOD D.
- 5. ALL THE STRUCTURE SLABS AND THE PADS SHALL BE CROWNED TO DRAIN AWAY WATER, MIN. SLOPE SHALL BE 1%.

**ISSUED FOR CONSTRUCTION** 

MISCELLANEOUS DETAILS

DATE DRN BY | CHK BY | APRV BY **DESCRIPTION** 03/01/2023 ISSUED FOR INTERNAL REVIEW SS 01/19/2023 ISSUED FOR CONSTRUCTION SS ISSUED FOR CONSTRUCTION (REVISED) SS SK ISSUED FOR CONSTRUCTION (REVISED) SS

STATE OF

Heather Cavanagh 15:12:33 -04'00'

Digitally signed by Heather Cavanagh Date: 2023.09.29



1325 74th AVE SW, **VERO BEACH, FLORIDA 32968**  **ENGINEER:** 

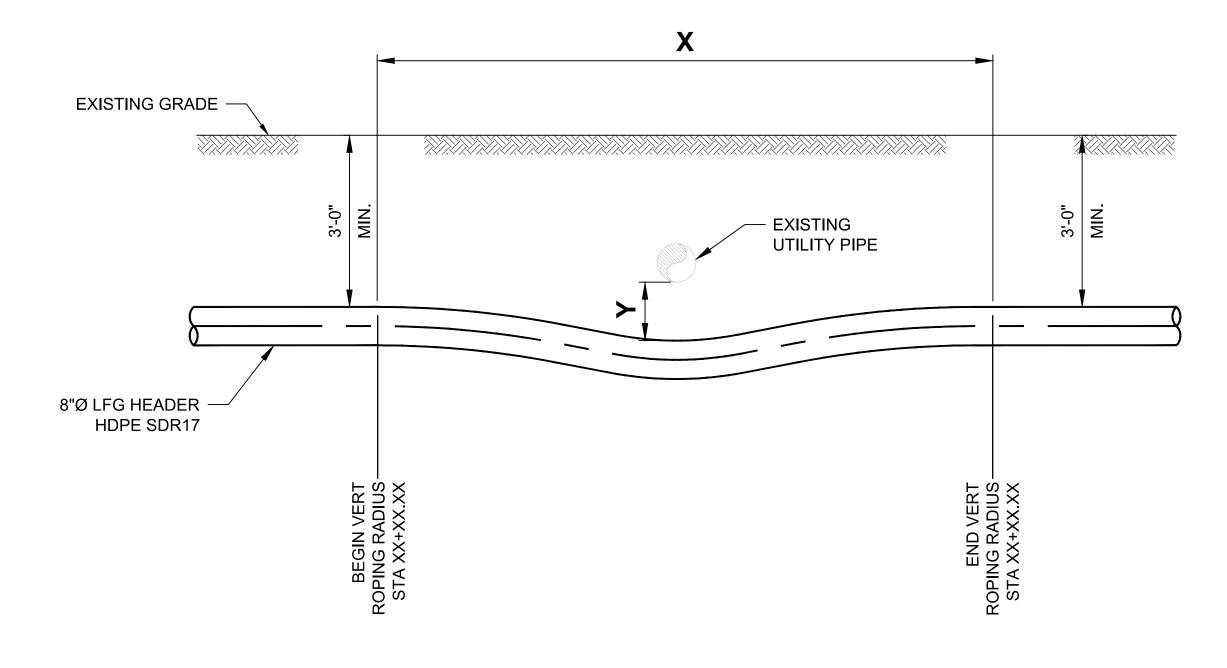
2321 E. 28TH STREET, SUITE 400

EMAIL: INFO@BIOGASENG.COM

SIGNAL HILL, CA 90755, Ph: (562) 726-3565

LANDFILL GAS PIPELINE EXTENSION

C-445F



(TYP.) GALVANIZED STEEL **BOLTS AND NUTS** PVC SCH. 80 BLIND FLANGE HDPE PIPE HDPE FLANGE ADAPTER (TYP.)

D.I. FLANGE

D.I. FLANGE (TYP.) GALVANIZED STEEL **BOLTS AND NUTS** HDPE PIPE HDPE PIPE HDPE FLANGE ADAPTER (TYP.)

NOTE

1. REFER TO ROPING TABLE THIS SHEET

**DETAIL - TYPICAL UTILITY CROSSING** SCALE: NTS

**DETAIL - INSTALLATION OF BLIND FLANGE** ON HDPE PIPE SCALE: NTS

**DETAIL - INSTALLATION OF FLANGE ADAPTER** ON HDPE PIPE SCALE: NTS

<b>8" ROPING TABLE</b>				
Y (FT)	X (FT)			
1.0	16.0			
2.0	20.0			
3.0	24.0			
4.0	28.0			
5.0	32.0			

12" ROPII	12" ROPING TABLE			
Y (FT)	X (FT)			
1.0	20.0			
2.0	24.0			
3.0	28.0			
4.0	32.0			
5.0	36.0			

**ISSUED FOR CONSTRUCTION** 

DATE DRN BY CHK BY APRV BY **DESCRIPTION** ISSUED FOR BID ISSUED FOR CONSTRUCTION ISSUED FOR CONSTRUCTION (REVISED) ISSUED FOR CONSTRUCTION (REVISED)

STATE OF

Heather Cavanagh Date: 2023.09.29 15:12:33 -04'00'

Digitally signed by Heather Cavanagh



1325 74th AVE SW, **VERO BEACH, FLORIDA 32968** 



2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

MISCELLANEOUS DETAILS

LANDFILL GAS PIPELINE EXTENSION DRAWING NO. C-445G

- DIMENSION SHOWN ON THESE DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION FROM SEVERAL SOURCES AND SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO COMMENCING THE WORK.
- THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES, PROPERTY LINES, AND OTHER SUBSTRUCTURES IS NOT GUARANTEED TO BE ACCURATE OR ALL-INCLUSIVE, UNLESS OTHERWISE NOTED. CONTRACTOR IS RESPONSIBLE FOR AIMING ALL DETERMINATIONS AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AND OTHER SUBSTRUCTURES AS NECESSARY TO AVOID DAMAGE OR ENCROACHMENTS.
- PROSPECTING IS REQUIRED AHEAD OF WORK. ALL OFFSETS OR ROPING WILL BE NEED TO BE APPROVED BY THE DESIGN ENGINEER, AND REDLINED DETAILS SHOWN ON PROFILE AND CONSTRUCTION DETAIL SHEETS OF EACH ADDITIONAL STRUCTURE.
- CONTRACTOR SHALL COORDIDINATE WITH THE APPROPRIATE GOVERNING AGENCY OR UTILITY COMPANY FOR ALL UTILITY RELOCATES PRIOR TO ANY WORK TO BE DONE.

### SITE SAFETY & PROTECTION NOTES

- THE DUTY OF THE ENGINEER, INDIAN RIVER COUNTY (COUNTY) OR ITS AGENTS TO CONDUCT CONSTRUCTION REVIEW OF THE CONTRACTOR'S PERFORMANCE AND THE UNDERTAKING OF THE INSPECTION OR THE GIVING OF THE INSTRUCTIONS AS AUTHORIZED HEREIN IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES IN, ON, OR NEAR THE CONSTRUCTION SITE AND SHALL NOT BE CONSTRUCTED AS SUPERVISION OF THE ACTUAL CONSTRUCTION NOR THE MAKE THE ENGINEER, COUNTY OR ITS AGENTS RESPONSIBLE FOR PROVIDING A SAFE PLACE FOR THE PERFORMANCE OF WORK BY THE CONTRACTOR, SUBCONTRACTORS, OR FOR ACCESS, VISITS, USE, WORK, TRAVEL OR OCCUPANCY BY ANY PERSON.
- THE CONTRACTOR SHALL HAVE AT THE WORK SITE, COPIES OR SUITABLE EXTRACTS OF CONSTRUCTION SAFETY ORDERS, ISSUED BY OSHA. CONTRACTOR SHALL COMPLY WITH PROVISIONS OF THESE AND ALL OTHER APPLICABLE LAWS, ORDINANCES AND REGULATIONS. THE CONTRACTOR MUST COMPLY WITH PROVISIONS OF THE SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION, PROMULGATED BY THE SECRETARY OF LABOR UNDER SECTION 107 OF THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT. AS SET FORTH IN TITLE 29 C.F.R.
- TO PROTECT THE LIVES AND HEALTH OF CONTRACTOR'S EMPLOYEES UNDER THE CONTRACT. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT PROVISIONS OF THE "MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION" ISSUED BY THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC., AND SHALL MAINTAIN AN ACCURATE RECORD OF ALL CASES OF DEATH, OCCUPATIONAL DISEASE, AND INJURY REQUIRING MEDICAL ATTENTION OR CAUSING LOSS OF TIME FROM WORK, ARISING OUT OF AND IN THE COURSE OF EMPLOYMENT OR WORK UNDER THE CONTRACT.
- THE CONTRACTOR ALONE SHALL BE RESPONSIBLE FOR THE SAFETY, EFFICIENCY AND ADEQUACY OF CONTRACTOR'S FACILITIES, APPLIANCES, AND METHODS AND FOR ANY DAMAGE WHICH MAY RESULT FROM THEIR FAILURE OR THEIR IMPROPER CONSTRUCTION, MAINTENANCE OR OPERATION.
- THE CONTRACTOR AGREES THAT IT SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE COUNTY, BIOGAS ENGINEERING, AND THEIR RESPECTIVE AGENTS HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF OWNER, ENGINEER, OR THEIR RESPECTIVE AGENTS.
- THE COUNTY AND IT'S AGENTS SITE RESPONSIBILITIES ARE LIMITED SOLELY TO THE ACTIVITIES OF THEIR EMPLOYEES ON SITE. THESE RESPONSIBILITIES SHALL NOT BE INFERRED BY ANY PARTY TO MEAN THAT THE OWNER OR ITS AGENTS HAVE RESPONSIBILITY FOR SITE SAFETY. SAFETY IN, OR ABOUT THE SITE IS THE SOLE AND EXCLUSIVE RESPONSIBILITY OF THE CONTRACTOR ALONE. THE CONTRACTOR'S METHODS OF WORK PERFORMANCE, SUPERINTENDENCE AND THE CONTRACTOR'S EMPLOYEES, AND SEQUENCING OF CONSTRUCTION ARE ALSO THE SOLE AND EXCLUSIVE RESPONSIBILITIES OF THE CONTRACTOR ALONE.

#### **GENERAL NOTE**

COUNTY SHALL BE CONTACTED AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF

- USED MATERIAL, REJECTS MISFITS OR SECONDS, ETC. WILL NOT ACCEPTABLE FOR USE ON LANDFILL GAS PIPELINE EXTENSION PROJECT.
- ALL CONSTRUCTION SHALL BE IN CONFORMANCE WITH THESE PLANS, PROJECT SPECIFICATIONS AND COUNTY SPECIFICATIONS.
- ALL NUTS, BOLTS, AND WASHERS USED TO SECURE UNDERGROUND FITTINGS SHALL BE STAINLESS STEEL, AFTER INSTALLATION, ALL STAINLESS STEEL HARDWARE SHALL BE WRAPPED WITH 4 MIL POLYETHYLENE SHEETING, AND SECURE WITH PVC TAPE.
- ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE HEALTH AND SAFETY LAWS OF THE STATE OF FLORIDA AND OSHA STANDARD.
- TRENCH BACKFILL SHALL BE COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS.
- RESTORATION AND CLEAN UP: A. RESTORATION OF PUBLIC STREET, SIDEWALKS, CURBS, ETC., DAMAGED DURING CONSTRUCTION, SHALL BE IN ACCORDANCE WITH THE LATEST CITY, COUNTY, OR AGENCY STANDARDS.
- ALL EXCESS MATERIAL AND/OR DEBRIS SHALL BE REMOVED UPON COMPLETION OF INSTALLATION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE DUST CONTROL AT ALL TIMES.
- CONTRACTOR SHALL SUBMIT A STORM WATER POLLUTION PREVENTION PLAN TO MITIGATE IMPACTS OF SOIL EROSION OFFSITE, AND SHALL OBTAIN AN N.P.D.E.S. CONSTRUCTION PERMIT FROM THE RWQCB. SUBMIT A COPY OF THIS PERMIT TO THE COUNTY. CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEAN UP OF SOIL EROSION FROM THE SITE THROUGHOUT THE ONE YEAR WARRANTY PERIOD FOLLOWING COUNTY ACCEPTANCE OF THE IMPROVEMENTS.
- CONTRACTOR IS RESPONSIBLE FOR OBTAINING FOR ALL PERMITS, INSPECTIONS, AND MATERIALS TESTING. ANY INSPECTION TO BE PERFORMED BY COUNTY SHALL REQUIRE A 24-HOUR NOTICE.
- CONTRACTOR SHALL EXPOSE ALL EXISTING PIPELINES OR OTHER UNDERGROUND OBSTRUCTION'S TO VERIFY THAT THERE ARE NO GRADE CONFLICTS PRIOR TO LAYING ANY PIPELINES UPSTREAM OF SAID PIPELINES OR OBSTRUCTIONS.
- THE CONTRACTOR SHALL PROVIDE FOR INGRESS AND EGRESS FOR PROPERTY ADJACENT TO WORK THROUGHOUT THE PERIOD OF CONSTRUCTION.
- ALL FIELD CHANGES REQUIRE A WRITTEN APPROVAL FROM COUNTY/ENGINEER.

#### **ABBREVIATIONS**

ACRONYM	DEFINITION
AB	AGGREGATE BASE
ABN	ABANDON
AC	ASPHALT CONCRETE
API	AMERICAN PETROLEUM INSTITUTE
APN	ASSESSOR'S PARCEL NUMBER
APPROX	APPROXIMATE
AVE	AVENUE
ARC	ABRASION RESISTANT COATING
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS
BBCL	BELL BELL CHILL RING
BC	BEGIN CURVE
BD	BLOWDOWN
BEG	BEGIN
BKF	BACKFILL
BLDG	BUILDING
BLVD	BOULEVARD
BM	BENCH MARK
BMP	BEST MANAGEMENT PRACTICE
BOM	BILL OF MATERIAL

## **ABBREVIATIONS**

ACRONYM

BR

BTU

CATS

CCV

CMP

CNG

CO

CONC

COND

CP

CPT

CROP

CTS

CULV

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DET

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DEFINITION

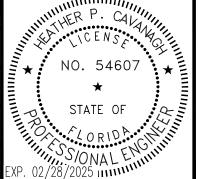
DEFINITION	ACRONYM	DEFINITION
BRIDGE	MOI	METHOD OF INSTALLATION
BRITISH THERMAL UNITS	MON	MONUMENT
BALL VALVE	MOP	MAXIMUM OPERATING PRESSURE
BACK OF WALK	MP	MILE POINT
COMPUTER AUTOMATED TEST STATION		MAXIMUM STOPPING PRESSURE
CORROSION CONTROL VOLUME	MT	METER WORKING MONITOR
CAST IRON CENTERLINE	MW MWP	WORKING MONITOR MAXIMUM WORKING PRESSURE
CORRUGATED METAL PIPE	N	NORTH
COMPRESSED NATURAL GAS	NDE	NON-DESTRUCTIVE EXAMINATION
COUNTY	NOP	NORMAL OPERATING PRESSURE
CONCRETE	NPC	NON-PROTECTED/NATIVE COUPON
CONDUIT	NTS	NOT TO SCALE
CATHODIC PROTECTION	OD	OUTSIDE DIAMETER
CATCH POINT	OG	ORIGINAL GROUND
CONDITIONAL REDUCTION OF PRESSURE	OH	OVERHEAD
COUPON TEST STATION COPPER	P D //	PIPELINE
CULVERT	P/L PC	PROPERTY LINE POINT OF CURVATURE
DEPTH	PCF	PRESSURE CONTROL FITTING
DEAD END	PKWY	PARKWAY
DEGREE	PL	PLASTIC
DETAIL	PLC	PROGRAMMABLE LOGIC CONTROLLERS
DRAINAGE INLET	PPI	PLASTIC PIPE INSTITUTE
DIAMETER	PSI	POUNDS PER SQUARE INCH
DISTRIBUTION DAMAGE PREVENTION VOLUME	PV	PLUG VALVE
DISTRIBUTION REGULATOR	PVMT	PAVEMENT
DOUBLE SUBMERGED ARC-WELDED	QTY R	QUANTITY RADIUS
DEEP WELL ANODE	RCP	REINFORCED CONCRETE PIPE
DRIVEWAY	RD	ROAD
EAST	RDWY	ROADWAY
EASEMENT	REG	REGULATOR
END CURVE	REL	RELOCATE
ELBOW ELECTRIC	REPL	REPLACE
ELEVATION	REV RR	REVISION RAILROAD
ELECTRONIC MARKER	RT	RIGHT
ENGINEERING MATERIAL SPECIFICATION	RTE	ROUTE
ENGINEER	R/W	RIGHT OF WAY
EDGE OF PAVEMENT	S	SOUTH
EQUATION	SAWH	SUBMERGED ARC-WELDED HELICAL
ELECTRIC RESISTANCE WELDED ENVIRONMENTALLY SENSITIVE AREA	SAWL	SUBMERGED ARC-WELDED LONGITUDINAL
ELECTROLYSIS TEST STATION	SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
EDGE OF TRAVELED WAY	SCP SD	SURVEY CONTROL POINT
FILTER	SG	STORM DRAIN SUBGRADE
FRAME AND COVER	SHT	SHEET
FUSION BONDED EPOXY	SMLS	SEAMLESS
FACE OF CURB	SMYS	SPECIFIED MINIMUM YIELD STRENGTH
FUTURE DESIGN PRESSURE FINISHED GRADE	SPEC	SPECIFICATION
FIRE HYDRANT	SS	SANITARY SEWER
FIGURE	SSAW ST	SINGLE SUBMERGED ARC—WELDED STREET
FLOW LINE	STA	STATION
FLANGE	STD	STANDARD
FREEWAY	STL	STEEL
NATURAL GAS SERVICE	T	TIED (CONNECTED TO SYSTEM)
GATE VALVE NATURAL GAS WELL	TCE	TEMPORARY CONSTRUCTION EASEMENT
HORIZONTAL	TCP	TRAFFIC CONTROL PLAN
HORIZONTAL DIRECTIONAL DRILL	TEL	TELEPHONE
HIGH FREQUENCY WELD	TEMP TG	TEMPORARY TOP OF GRADE
HIGH PRESSURE REGULATOR	TT	TOP TAP
HIGHWAY	TYP	TYPICAL
INSIDE DIAMETER IN-LINE INSPECTION	UG	UNDERGROUND
INVERT	USA	UNDERGROUND SERVICE ALERT
IRRIGATION	UT	ULTRA-SONIC TEST
JOINT POLE	V VEDT	VALVE VERTICAL
JOINT TRENCH	VERT VIF	VERITUAL VERIFY IN FIELD
LATITUDE	VOL	VOLUME
LANE	W	WATER
LIQUID NATURAL GAS LOCATION	WT	WALL THICKNESS
LONGITUDE	WV	WATER VALVE
LEFT	W/	WITH
MONITOR	W/O	WITHOUT
MAXIMUM ALLOWABLE OPERATING PRESSURE		
MAXIMUM		
MANHOLE		
MINIMUM		

ACRONYM

DEFINITION

**ISSUED FOR CONSTRUCTION** 

DATE **DESCRIPTION** DRN BY CHK BY APRV BY 08/24/202 ISSUED FOR BID 01/19/202 ISSUED FOR CONSTRUCTION SS SS SK ISSUED FOR CONSTRUCTION (REVISED) ISSUED FOR CONSTRUCTION (REVISED)



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Digitally signed by Heather Cavanagh Date: 2023.09.29



1325 74th AVE SW,

**INDIAN RIVER COUNTY FLORIDA** 

LOC

MAX

MIN

MISCELLANEOUS

**VERO BEACH, FLORIDA 32968** 



2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 **EMAIL: INFO@BIOGASENG.COM** 

**NOTES AND ABBREVIATIONS** 

LANDFILL GAS

PIPELINE EXTENSION

- ALL WORK SHALL BE IN CONFORMANCE WITH THE INDIAN RIVER COUNTY (COUNTY) STANDARDS. THESE CONSTRUCTION PLANS, AND AS DIRECTED BY THE ENGINEER
- PRIOR TO INITIATING CONSTRUCTION ACTIVITIES THE CONTRACTOR SHALL SCHEDULE A PRECONSTRUCTION MEETING AT THE PROJECT SITE TO DISCUSS PROPOSED WORK. INCLUDED IN THIS MEETING WILL BE REPRESENTATIVES OF COUNTY BIOGAS ENGINEERING, THE ENGINEER, THE CONTRACTOR AND HIS JOB SUPERINTENDENT, THE CONTRACTOR'S SUBCONTRACTORS AND THEIR SUPERINTENDENTS, REPRESENTATIVES OF AFFECTED UTILITY AUTHORITIES. AND OTHER INTERESTED AGENCIES OR INDIVIDUALS.
- CONTRACTOR SHALL NOT PROCEED WITH CHANCES TO THE WORK IN THESE PLANS WITHOUT APPROVAL FROM THE ENGINEER. ANY CHANGES TO THE APPROVED SET OF PLANS WITHOUT NOTIFYING THE ENGINEER PRIOR TO SUCH CHANGES ABSOLVES SAID ENGINEER FROM ANY AND ALL RESPONSIBILITY WITH RESPECT TO THE LIABILITY, DAMAGE OR EXTRA WORK RESULTING FROM SAID CHANGES.
- THE CONTRACTOR SHALL OBTAIN ANY NECESSARY PERMITS AS REQUIRED BY THE COUNTY FOR WORK WITHIN THEIR PROPERTY. THE CONTRACTOR SHALL OBTAIN ALL OTHER PERMITS REQUIRED TO PERFORM THE WORK AND SHALL ABIDE BY THE CONDITIONS OF THE PERMITS AND SHALL PERFORM ALL WORK ORDERED BY SAID PERMITS, IN CONFORMANCE THEREWITH AND AS DIRECTED BY THE FNGINEER.
- BEFORE COMMENCING EXCAVATION, THE CONTRACTOR SHALL NOTIFY ALL UTILITY AUTHORITIES OF UTILITY COMPANIES HAVING INTEREST IN THE WORK OF THE CONTRACTORS INTENTION TO EXCAVATE PROXIMATE TO THE LOCATION. DEPTH AND SIZE OF ALL UTILITIES IN THE WORK AREA.
- DIRT OR DEBRIS TRACKED ONTO EXISTING COUNTY ROADS FROM THIS PROJECT SHALL BE CLEANED OFF AT THE END OF EACH WORKING DAY TO THE SATISFACTION OF THE COUNTY INSPECTOR.
- TRENCH CUTS IN THE EXISTING STREETS THAT ARE NOT TO BE RECONSTRUCTED OR OVERLAID SHALL HAVE PERMANENT TRENCH RESURFACING INSTALLED WITHIN SEVEN (7) DAYS AFTER ANY INITIAL STREET CUT.
- PERMANENT TRENCH RESURFACING TO BE PER COUNTY STANDARD OR AS DETAILED. TEMPORARY TRENCH RESURFACING TO BE A MINIMUM 4" COLD MIX.
- UTILITY INFORMATION SHOWN HEREIN IS BASED ON RECORD INFORMATION SUPPLIED TO THE ENGINEER BY THE COUNTY. THE ENGINEER CAN MAKE NO GUARANTEE AS TO THE ACCURACY OR COMPLETENESS OF THE UTILITY FACILITIES AND THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN EXCAVATING TO THE BIOGAS LINE IN PROXIMITY OF EXISTING FACILITIES.
- ALL STATIONING IS ALONG PIPE CENTERLINE UNLESS INDICATED OTHERWISE.
- PROPER BEDDING AND ENVELOPE SHALL BE PROVIDED FOR THE UTILITY PIPES, IMPORTED OR NATIVE GRANULAR MATERIAL, 100% PASSING THE NO. 4 SIEVE AS BEDDING AND PIPE ENVELOPE. PIPE BACKFILL MATERIAL SHALL BE COMPACTED, EXCAVATED SITE SANDY SOILS MAY BE USED AS BACKFILL PROVIDED THEY DO NOT CONTAIN ROCK FRAGMENTS OR CEMENTED PARTICLES GREATER THEN 3 INCHES IN THE GREATEST DIMENSION AS APPROVED BY THE ENGINEER.
- ALL STAKING SHALL BE DONE BY THE CONTRACTOR AND APPROVED, IN WRITING. BY THE COUNTY/ENGINEER. ANY STAKES DISTURBED OR REMOVED, PRIOR TO COMPLETION OR INSPECTION, SHALL BE REPLACED BY THE CONTRACTOR ON HIS OWN EXPENSE.
- COMPACTION REQUIREMENTS FOR THE PIPELINE AND STRUCTURE BACKFILL SHALL BE IN CONFORMANCE WITH THE COUNTY, DEPT. OF UTILITY SERVICES, THE DETAILS SHOWN ON THESE CONSTRUCTION PLANS, THE ENGINEER. COMPACTION TESTING SHALL BE PROVIDED BY A LICENSED GEOTECHNICAL FIRM APPROVED BY THE ENGINEER AND THE MERCED COUNTY. THE LOCATION AND DEPTHS OF COMPACTION TESTING SHALL BE DETERMINED BY THE ENGINEER AND COUNTY INSPECTOR. ALL COST ASSOCIATED WITH COMPACTION TESTING SHALL BE RESPONSIBILITY OF THE CONTRACTOR.
- INSPECTION SHALL BE IN CONFORMANCE WITH THE COUNTY REQUIREMENTS. THE CONTRACTOR SHALL ALSO BE REQUIRED TO COMPLY WITH AND COORDINATE THE WORK OF THIS PROJECT IN CONFORMANCE WITH THE INSPECTION REQUIREMENTS OF ALL UTILITY AUTHORITIES AND OTHER PERMITTING AGENCIES AFFECTED BY THE WORK OF THIS PROJECT.
- SIGNING AND FLAGGING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS SET FORTH IN THE CURRENT AMENDED VERSION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR USE IN FLORIDA.
- THE CONTRACTOR WILL BE RESPONSIBLE FOR THE PREPARATION OF A STORM WATER POLLUTION PREVENTION PLAN (SWPPP). CONDUCTING SITE MONITORING, REPORTING, IMPLEMENTING, FOLLOWING, MAINTAINING, AND REMOVING BEST MANAGEMENT PRACTICES SET FORTH IN THE SWPPP.
- THE CONTRACTOR WILL BE RESPONSIBLE FOR THE PREPARATION AND OBTAINING APPROVAL OF A DUCT CONTROL PLAN FROM THE COUNTY. THE CONTRACTOR SHALL CONDUCT SITE MONITORING, REPORTING, IMPLEMENTING, FOLLOWING, MAINTAINING THE CONSTRUCTION AREA IN CONFORMANCE WITH THE APPROVED DUCT CONTROL PLAN.
- PRIOR TO TRENCH BACKFILLING, THE CONTRACTOR SHALL CONDUCT PIPELINE PRESSURE TESTING AT A TEST PRESSURE EQUAL TO 10 PSIG FOR A PERIOD OF 1 HOUR, IF LEAKS ARE LOCATED, DEPRESSURIZE THE LINE PRIOR TO MAKING REPAIRS, WAIT A MINIMUM OF 8 HOURS PRIOR TO RETESTING THE REPAIRED PIPELINE.

#### TRENCH NOTES

- PIPE INSTALLATIONS SHALL BE IN COMPLIANCE WITH THE REQUIREMENTS OF THE INDIAN RIVER COUNTY, DEPARTMENT OF UTILITY SERVICES (IRCDUS).
- WHERE SOIL CONDITIONS CANNOT BE MAINTAINED AS SHOWN IN THE DETAILS, PROVIDE METHOD OF CONSTRUCTION TO IRCDUS FOR APPROVAL.
- SHEETING WILL BE REQUIRED AS DETERMINED IN THE FIELD IN ACCORDANCE WITH OSHA REGULATIONS.
- COMPACTION PERCENTAGES SHOWN, ON TRENCH DETAILS, REFER TO AASHTO T-180 MODIFIED PROCTOR METHOD.
- COMPACTION TEST REPORTS SHALL BE PROVIDED TO THE COUNTY.
- ALL RESTORATION IN EASEMENT OR RIGHT-OF-WAY OR WHEN REQUIRED BY ANOTHER JURISDICTIONAL AGENCY, SHALL CONFORM TO IRCDUS SPECIFICATIONS OR OTHER JURISDICTIONAL AGENCY SPECIFICATIONS.
- THE PIPELINE SHALL BE LOCATED MINIMUM 5'-0" O.C. (TYP) FROM EDGE OF THE PAVEMENT.

#### PIPE SPECIFICATIONS

PIPE MATERIALS SHALL BE AS FOLLOWS:

PIPE	LOCATION	MATERIAL
LANDFILL GAS (LFG)	EXPOSED	STAINLESS STEEL
PIPELINE	BURIED	HDPE

- HIGH DENSITY POLYETHYLENE (HDPE) PIPE SHALL BE SDR 17 MOLECULAR WEIGHT, HIGH DENSITY POLYETHYLENE, IN CONFORMANCE WITH AWWA C906, PPI DESIGNATION PE4710 AND HAVE A CELL CLASSIFICATION OF PE 445474C AS DESCRIBED IN ASTM D3350. ALL JOINTS FOR BURIED PE PIPE SHALL BE THERMAL FUSION TYPE. PE FITTINGS SHALL CONFORM TO ASTM D3261. EACH FITTING SHALL BE CLEARLY LABELED TO IDENTIFY ITS SIZE AND DIMENSION RATIO. ALL BENDS SHALL BE LONG SWEEP BENDS.
- ALL HDPE PIPES SHALL BE JOINED USING HEAT FUSION. BUTT FUSION JOINTS IN HDPE GAS PIPING SHALL BE MADE USING PROCEDURES IN ACCORDANCE WITH ASTM F2620. ELECTRO-FUSION COUPLINGS ARE NOT PERMITTED FOR JOINING HDPE PIPES/FITTINGS. ALL THE INTERNAL FUSION BEAD OF THE PIPELINE SHALL BE REMOVED AND INSPECTED BY THE CLIENT/ENGINEER. IS IS MORE PRODUCTIVE TO DEBEAD (REMOVE) THE INTERNAL FUSION BEAD DURING THE COOLING STAGE OF THE FUSION PROCESS. DEBEADING TRIMMER SHALL BE MODEL BEAD TRIMMER II MANUFACTURED BY R & I MANUFACTURING, INC., OR APPROVED EQUAL.
- THE CONTRACTOR SHALL ENSURE THAT ALL PERSONS MAKING HEAT FUSION JOINTS HAVE BEEN QUALIFIED TO MAKE JOINTS IN ACCORDANCE WITH THE APPROVED QUALIFIED FUSION PROCEDURE AS SPECIFIED.
- STAINLESS STEEL PIPE SHALL BE A MINIMUM OF SCHDULE 10S SEAMLESS PIPE, PER ASTM A312 AND ASME B36.19M. FITTINGS SHALL BE STAINLESS STEEL, SOCKET WELDED PER ANSI B16.11.
- CONNECTIONS TO FITTINGS MAY EITHER BE FUSION WELDED, FLANGED, OR RESTRAINED MECHANICAL JOINTS. ALL MECHANICAL JOINT FITTINGS ARE TO BE RESTRAINED. MECHANICAL JOINTS RESTRAINTS SHALL BE EBAA MEGALUG, OR APPROVED EQUIVALENT. CONCRETE THRUST BLOCKS WILL NOT BE ALLOWED.
- ALL NUTS. BOLTS. AND WASHERS SHALL BE STAINLESS STEEL.
- SUBMIT MANUFACTURER'S CATALOG DATA INCLUDING WALL THICKNESS, MATERIALS OF CONSTRUCTION, COATINGS, AND REFERENCE STANDARDS, AS APPLICABLE. WORK PERFORMED BEFORE APPROVAL OF THE SUBMITTAL, OR NOT CONFORMING TO APPROVED SUBMITTALS, SHALL BE AT CONTRACTOR'S OWN RISK.

#### PNEUMATIC PIPELINE TESTING

- THE CONTRACTOR SHALL CONDUCT A PNEUMATIC PRESSURE TEST ON INSTALLED HDPE HEADER. HE SHALL FURNISH ALL NECESSARY EQUIPMENTS AND MATERIALS, AND MAKES ALL TAPS IN THE PIPE, AS REQUIRED. THE COUNTY SHALL BE NOTIFIED AT LEAST 72 HOURS IN ADVANCEOF TESTING. THE TEST SHALL BE WITNESSED BY THE COUNTY.
- ALL INSTALLED PIPES SHALL BE SUBJECTED TO A MINIMUM AIR TEST PRESSURE OF 20 PSIG FOR A PERIOD OF 1 HOUR. DURING THIS PERIOD, NO LOSS OF PRESSURE SHALL BE OBSERVED.
- THE PIPING, EXCEPT AT THE JOINTS AND THE FLANGED CONNECTIONS, SHALL BE BACKFILLED PRIOR TO AIR TESTING. UPON THE APPROVAL OF ENGINEER AND AFTER PASSING THE AIR TESTING PROGRAM, THE JOINTS SHALL BE BACKFILLED.
- ANY SECTION OF PIPE, WHICH FAILS TO MEET THE STIPULATED PRESSURE TEST, SHALL BE CHECKED BY THE CONTRACTOR AND CORRECTIVE MEASURES TAKEN. THE TEST SHALL THEN BE REPEATED, AT NO ADDITIONAL COST TO THE COUNTY, UNTIL TEST RESULTS MEET THE SPECIFIED REQUIREMENTS.
- NO PIPE INSTALLATION WILL BE ACCEPTED UNLESS AND UNTIL IT MEETS THE PRESSURE TEST REQUIREMENTS.
- EQUIPMENT. THE CONTRACTOR SHALL PROVIDE THE FOLLOWING EQUIPMENT FOR THE PRESSURE TEST:
  - PNEUMATIC COMPRESSOR SEPARATOR-DRYER SYSTEM CAPABLE OF PROVIDING OIL-FREE DRY AIR AND EQUIPPED WITH ONE OR MORE FULL CAPACITY SAFETY RELIFE VALVES SET AT A PRESSURE OF NOT MORE THAN 105 PERCENT OF THE REQUIRED TEST PRESSURE.
  - PRESSURE GAUGES OF SUITABLE SIZES.
- PROCEDURE:
  - PNEUMATIC TESTING SHALL BE PERFORMED USING ACCURATELY CALIBRATED INSTRUMENTS AND OIL-FREE, DRY AIR. TESTS SHALL BE PERFORMED ON PIPING AFTER THE PIPING HAS BEEN COMPLETELY INSTALLED. ALL PARTS OF THE PIPING SYSTEM SHALL BE SUBJECTED TO THE TEST PRESSURE, AS INDICATED ABOVE, FOR PERIOD OF 1 HOUR. DURING THIS PERIOD, NO LOSS OF PRESSURE SHALL BE OBSERVED. THE CONTRACTOR SHALL RECOGNIZE THE HAZARDS ASSOCIATED WITH AIR TESTING AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT TEST PERSONNEL. ALL PIPING TO BE TESTED SHALL BE SECURED TO PREVENT DAMAGE TO ADJACENT PIPING AND EQUIPMENT IN THE EVENT OF A JOINT FAILURE. ANY APPURTENANT INSTRUMENTS OR DEVICES THAT COULD BE DAMAGED BY THE TEST SHALL BE REMOVED FROM THE PIPING OR SUITABLY ISOLATED PRIOR TO APPLYING THE TEST.
  - TEST RECORDS: RECORDS SHALL BE MADE OF EACH PIPING SYSTEM INSTALLATION DURING THE TEST. THESE RECORDS SHALL INCLUDE:
    - DATE OF TEST
    - DESCRIPTION AND IDENTIFICATION OF PIPING TESTED
    - TEST PRESSURE
  - REMARKS, TO INCLUDE SUCH ITEMS AS:
    - LEAKS (TYPE, LOCATION)
    - REPAIRS MADE ON LEAKS.
  - CLARIFICATION BY CONTRACTOR AND SIGNED ACKNOWLEDGMENT BY COUNTY.

BIOGAS CONTENTS					
GAS	%				
METHANE	60-69%				
OXYGEN	0-2%				
NITROGEN	0-8%				
HYDROGEN SULFIDE	0-4000 ppm				
CARBON DIOXIDE	BALANCE				

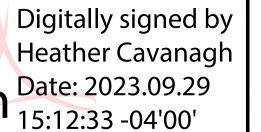
**ISSUED FOR CONSTRUCTION** 

**SPECIFICATIONS** 

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ers\Inte	3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	SK	
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1325 74th AVE SW, **VERO BEACH, FLORIDA 32968** 

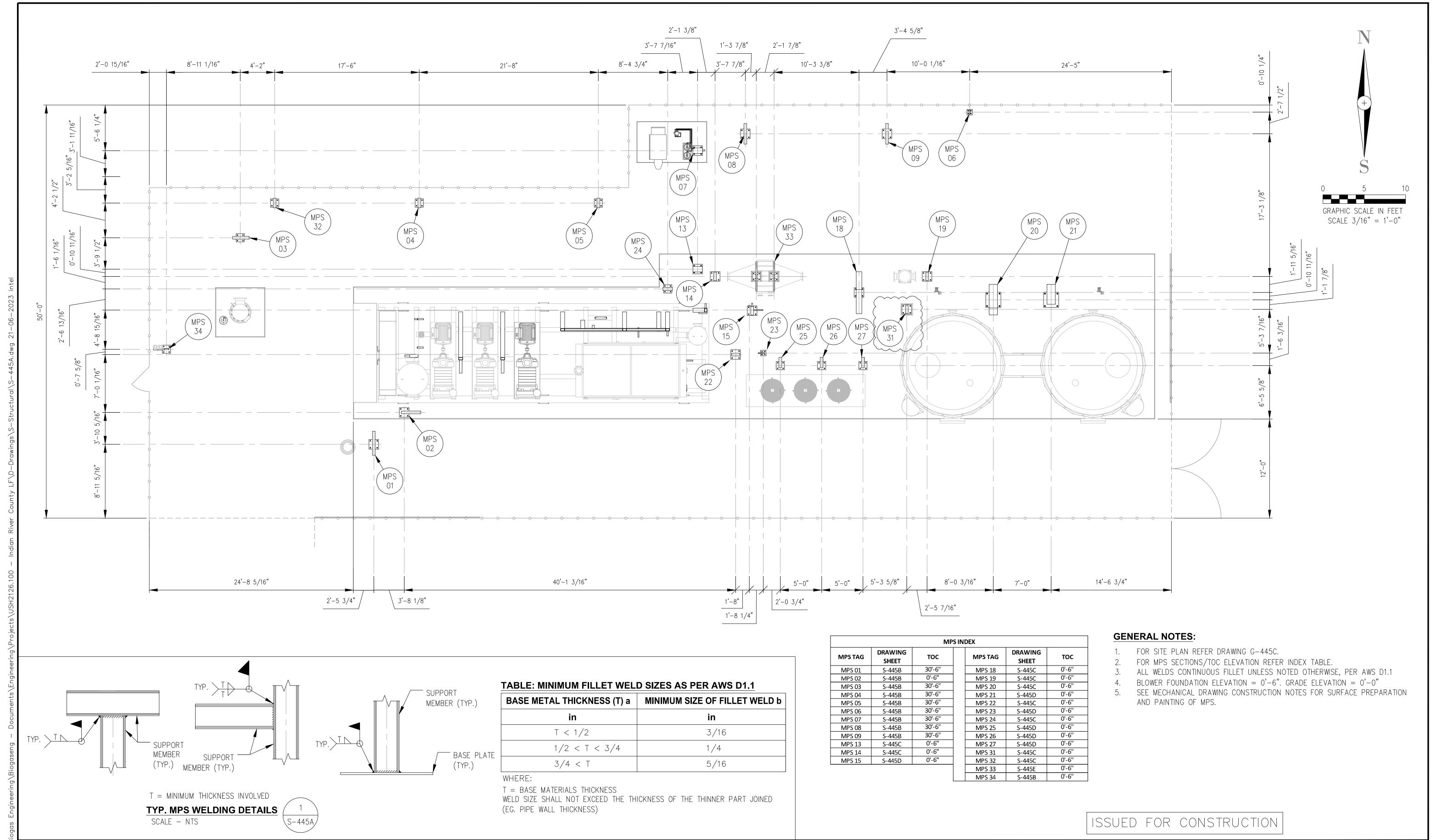


2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 **EMAIL: INFO@BIOGASENG.COM** 

LANDFILL GAS PIPELINE EXTENSION

**DRAWING NO.** 

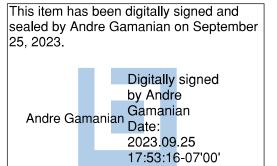
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DATE DESCRIPTION APRV BY PROFESSIONAL ENGINEER 08/24/202 ISSUED FOR BID ISSUED FOR CONSTRUCTION ISSUED FOR CONSTRUCTION (REVISED) SS ISSUED FOR CONSTRUCTION (REVISED)

No. 93370 STATE OF ANDRE GAMANIAN, P.E. FL **LICENSE** NO.93370 EXP. 02/28/2025

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VERO BEACH, FLORIDA 32968

INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW,

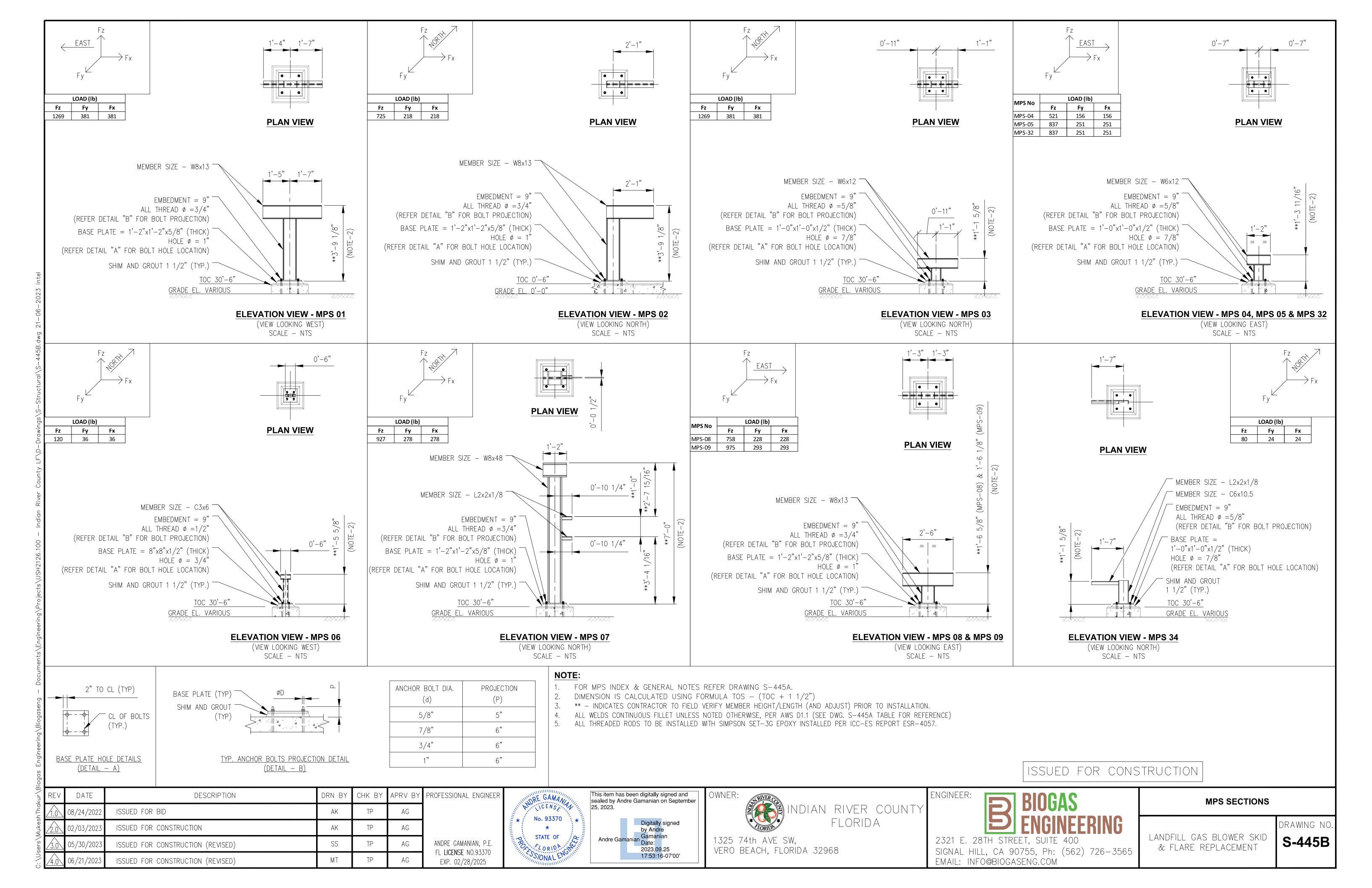
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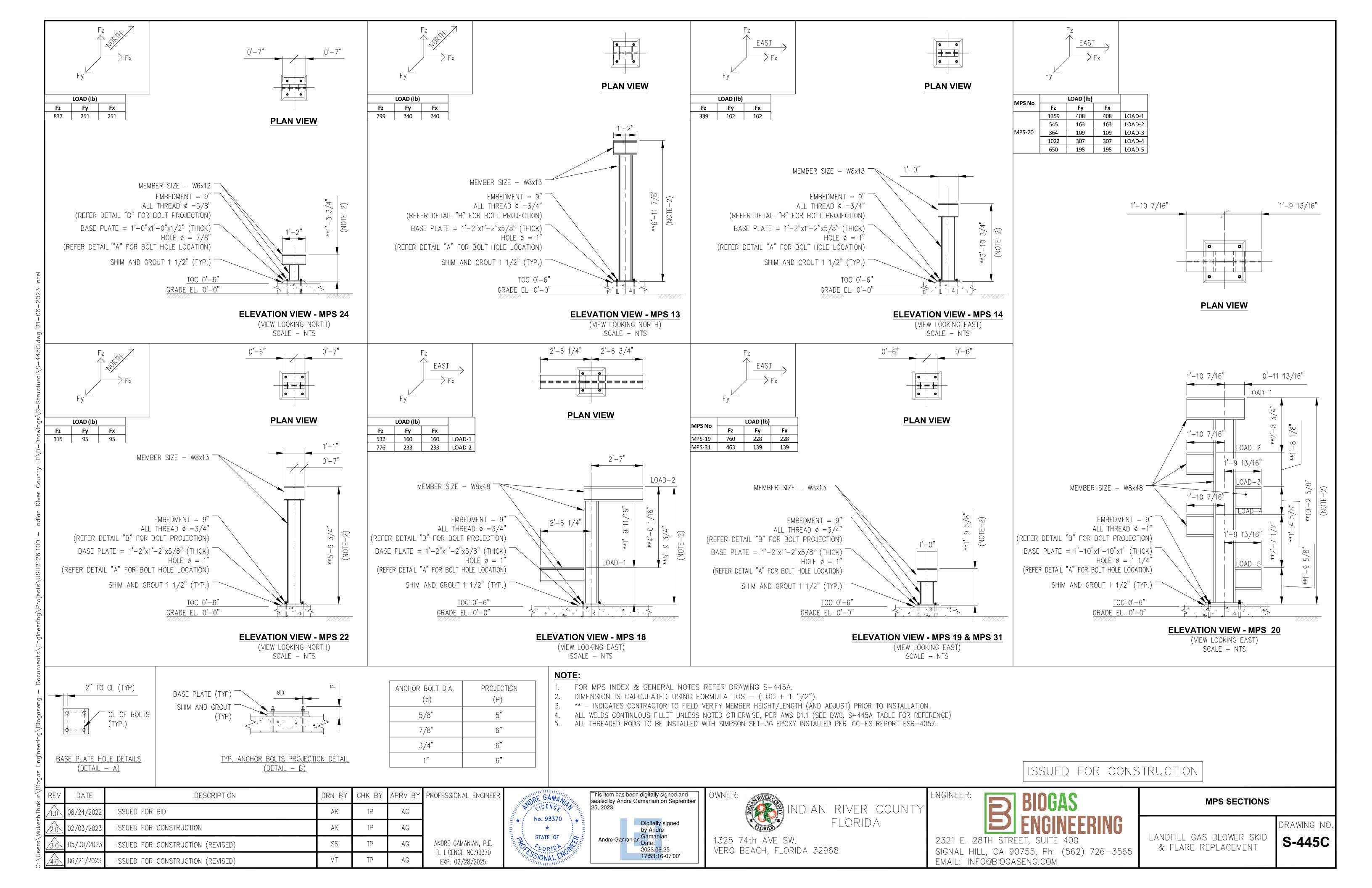
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

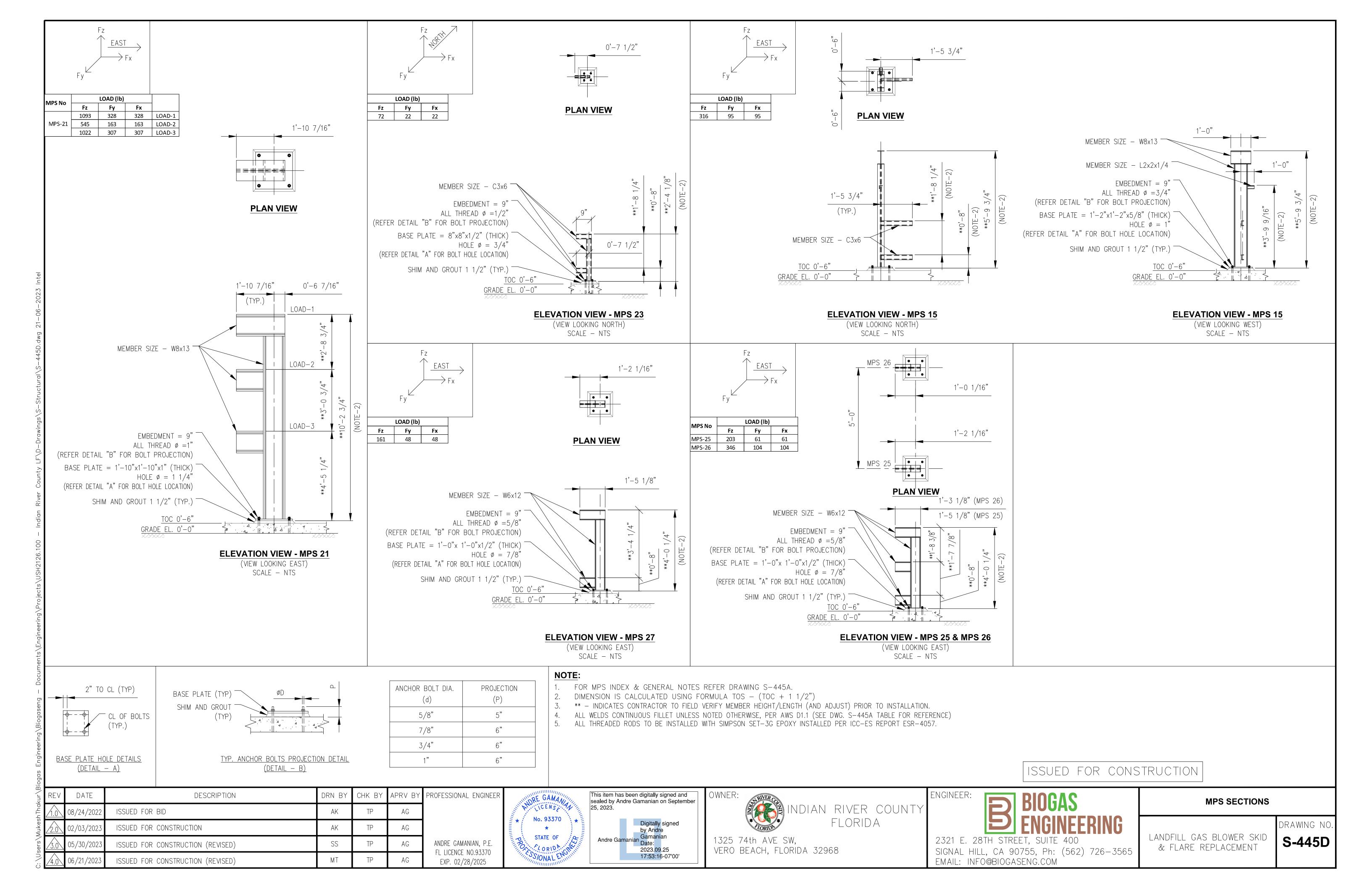
MPS LOCATION PLAN

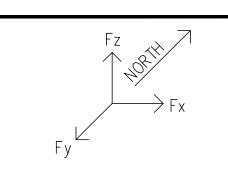
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

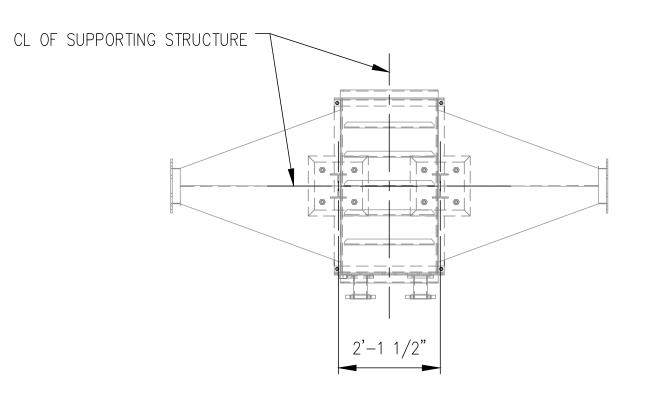
S-445A



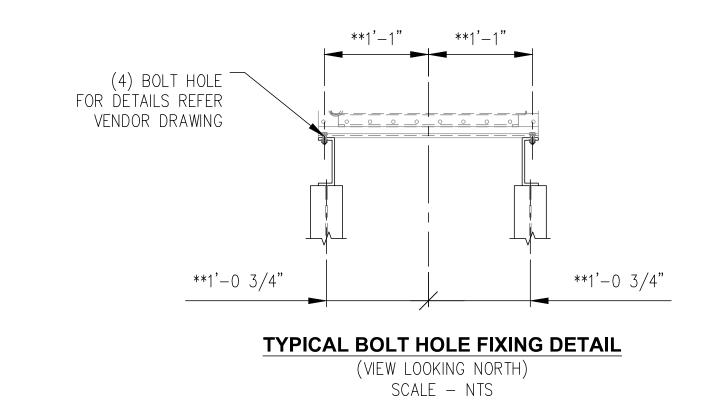


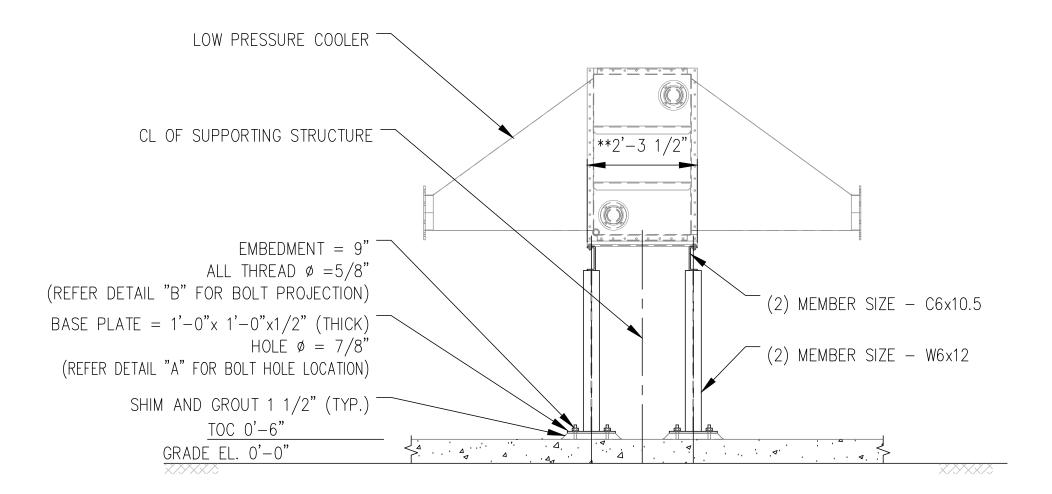




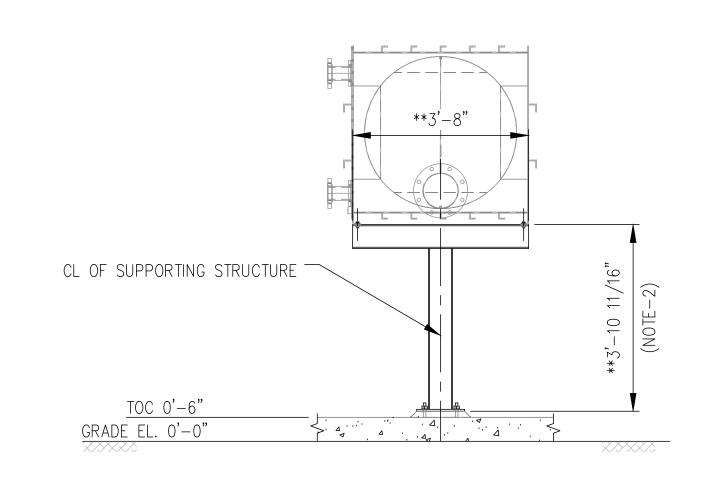


**PLAN VIEW** SCALE - NTS

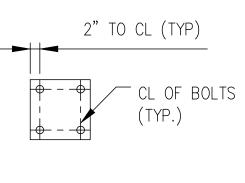




**ELEVATION VIEW** (VIEW LOOKING NORTH) SCALE - NTS



**SIDE VIEW - MPS 33** (VIEW LOOKING WEST SCALE - NTS



BASE PLATE HOLE DETAILS

(DETAIL - A)

BASE PLATE (TYP) SHIM AND GROUT TYP. ANCHOR BOLTS PROJECTION DETAIL

ANCHOR BOLT DIA. (d)	PROJECTION (P)
5/8"	5"
7/8"	6"
3/4"	6"
1"	6"

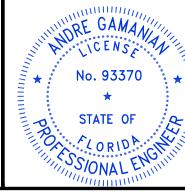
### NOTE:

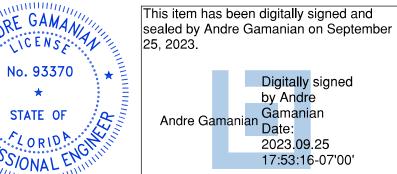
- 1. FOR MPS INDEX & GENERAL NOTES REFER DRAWING S-445A.
- 2. DIMENSION IS CALCULATED USING FORMULA TOS (TOC + 1 1/2")
- 3. \*\* INDICATES CONTRACTOR TO FIELD VERIFY MEMBER HEIGHT/LENGTH (AND ADJUST) PRIOR TO INSTALLATION.
- 4. ALL WELDS CONTINUOUS FILLET UNLESS NOTED OTHERWISE, PER AWS D1.1 (SEE DWG. S-445A TABLE FOR REFERENCE)
  5. ALL THREADED RODS TO BE INSTALLED WITH SIMPSON SET-3G EPOXY INSTALLED PER ICC-ES REPORT ESR-4057.

ISSUED FOR CONSTRUCTION

-								
בי בי	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER	
-	1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG		
	2.0	02/03/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG		
	3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.	
, ,	4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025	

(DETAIL - B)







1325	74th AV	Æ SW,		
VERO	BEACH,	FLORIDA	32968	

ENGINEER:	BIOGAS Engineer	RINO

2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
FMAIL: INFO@RIOGASFNG.COM

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO S-445E

GRAPHIC SCALE IN FEET SCALE 3/16" = 1'-0"

#### **GENERAL NOTES**:

- CONFIRM ANCHOR LOCATIONS WITH EQUIPMENT/SKID PRIOR TO DRILLING EPOXY ANCHORS.
- ARRANGE REBAR TO AVOID DRILLED ANCHOR LOCATIONS.
- SEE EQUIPMENT VENDOR INSTALLATIONS INSTRUCTIONS.
   FOR SITE PLAN REFER DRAWING G-445C.

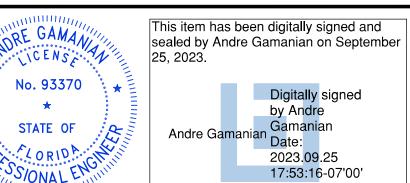
#### TABLE 1

FOUNDATION CORNERS CO-ORDINATES						
TAG	EASTING					
P1	1180438.674	822499.821				
P2	1180448.593	822483.131				
Р3	1180469.695	822534.111				

ISSUED FOR CONSTRUCTION

kur\Bi	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
eshThakı	1.0	02/03/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG	
Mukes	2.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	
sers/I	3.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	ANDRE GAMANIAN, P.E. FL LICENCE NO.93370
) ) (							EXP. 02/28/2025

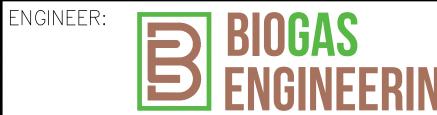
No. 93370 STATE OF







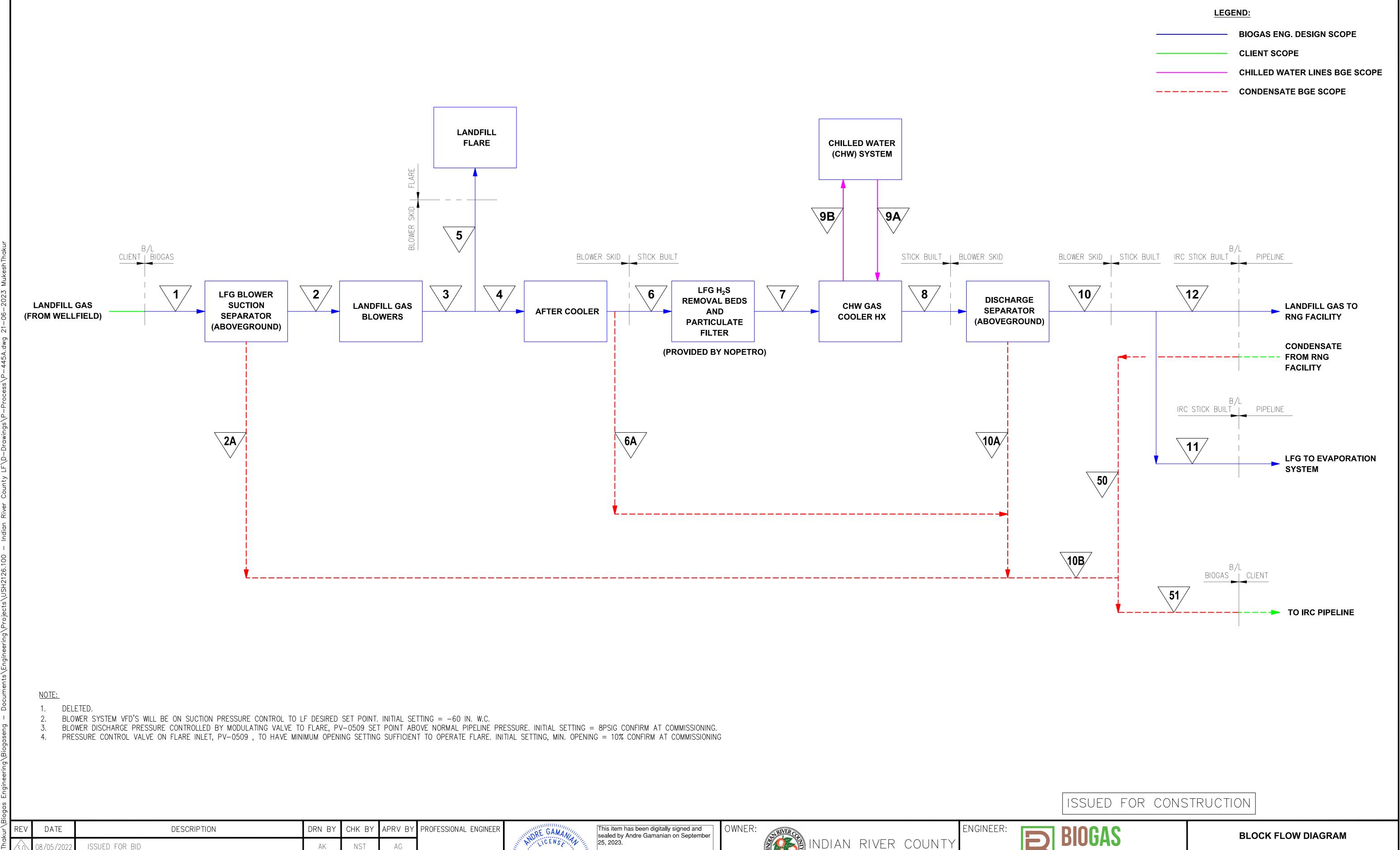
1325 74th AVE SW, VERO BEACH, FLORIDA 32968



2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM **EQUIPMENT ANCHOR BOLT LOCATION PLAN** 

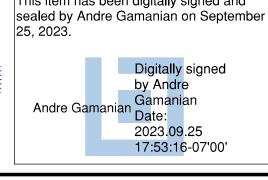
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. S-445F



ISSUED FOR BID ISSUED FOR CONSTRUCTION ANDRE GAMANIAN, P.E. ISSUED FOR CONSTRUCTION (REVISED) FL LICENCE NO.93370 ISSUED FOR CONSTRUCTION (REVISED) EXP. 02/28/2025

No. 93370 STATE OF ORIDA



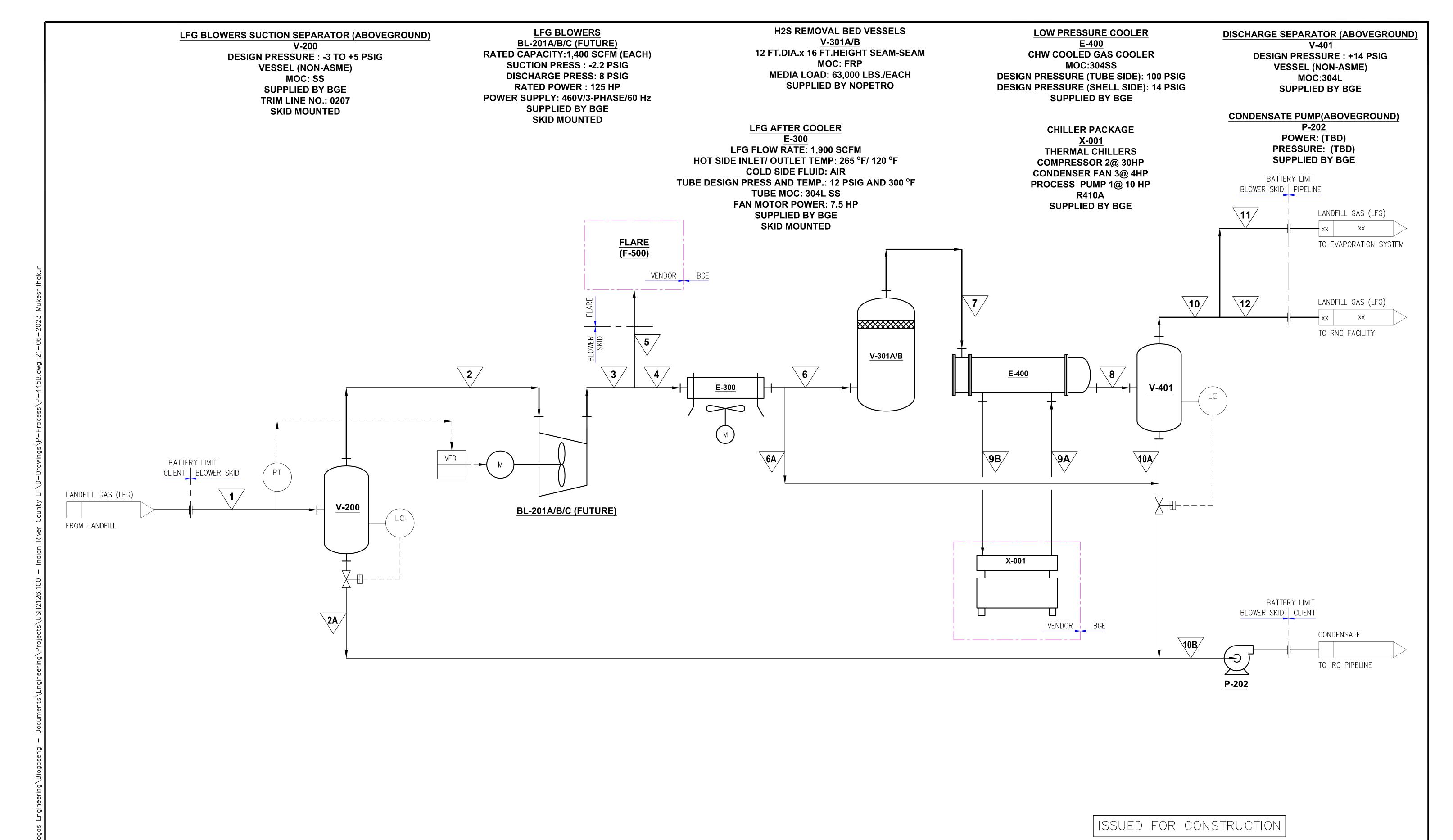
FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

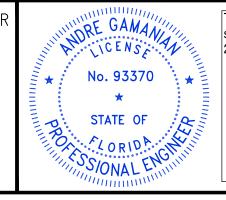
2321 E. 28TH STREET, SUITE 400

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

P-445A



REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER	
2.0	08/11/2022	ISSUED FOR BID	AK	NST	AG		1111
3.0	01/18/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG		инни
4.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	AK	TP	AG	ANDRE GAMANIAN, P.E.	1111.
5.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МΤ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025	











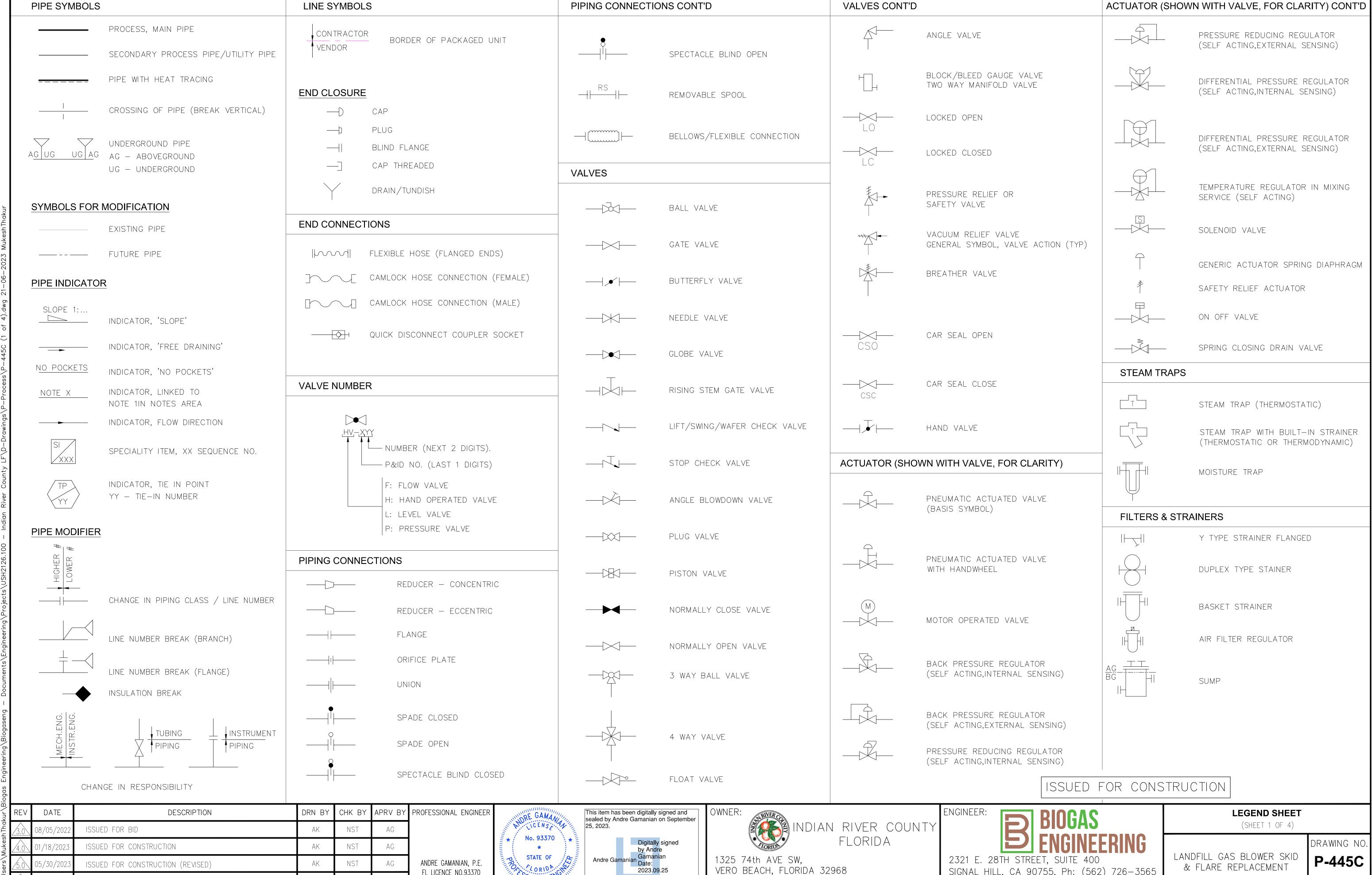
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

ENGINEER:

PROCESS FLOW DIAGRAM

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

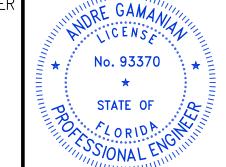
P-445B



17:53:16-07'00'

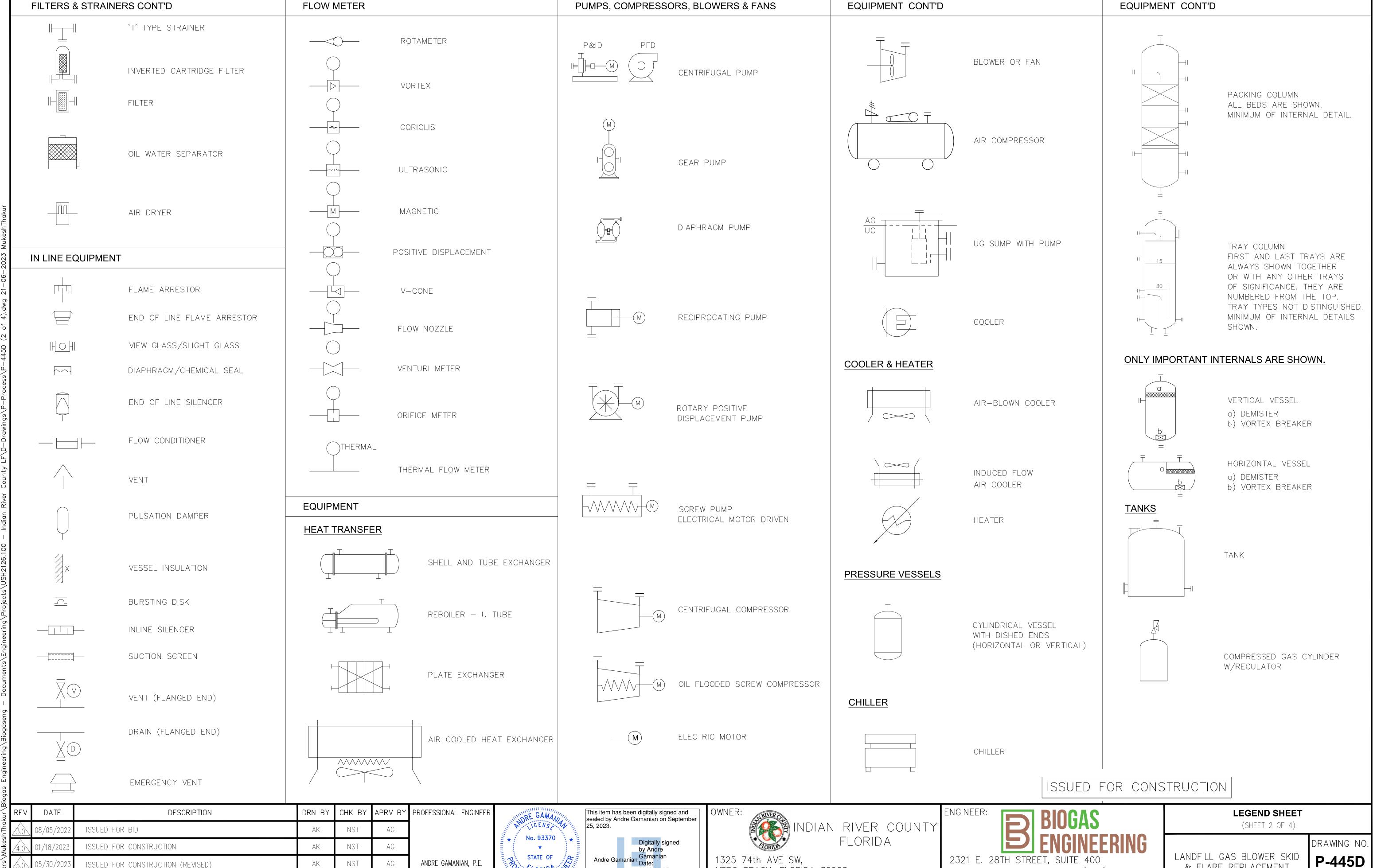
FL LICENCE NO.93370 EXP. 02/28/2025

ISSUED FOR CONSTRUCTION (REVISED)



SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

& FLARE REPLACEMENT



2023.09.25 17:53:16-07'00'

VERO BEACH, FLORIDA 32968

ON LORIDA

FL LICENCE NO.93370

EXP. 02/28/2025

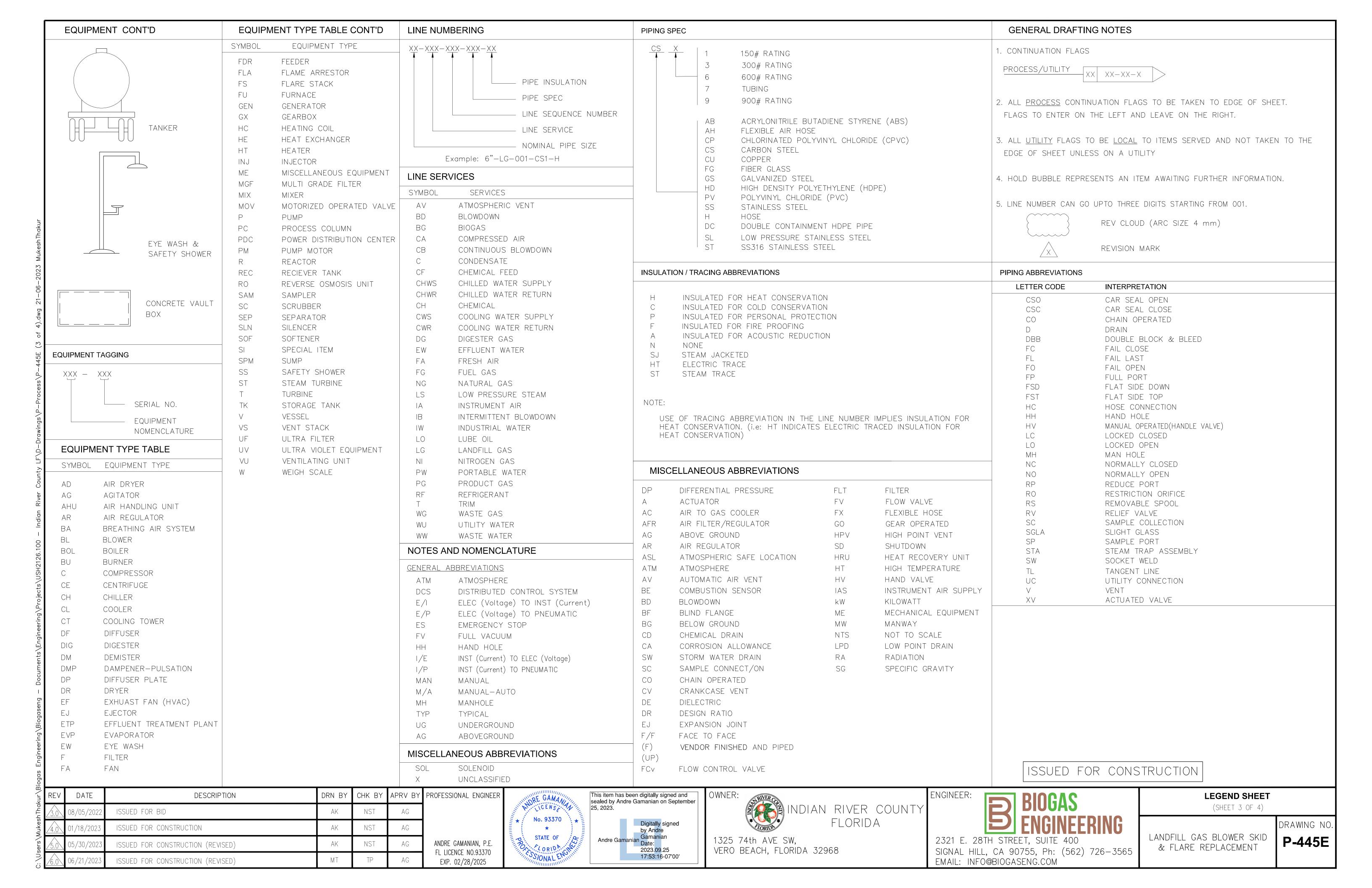
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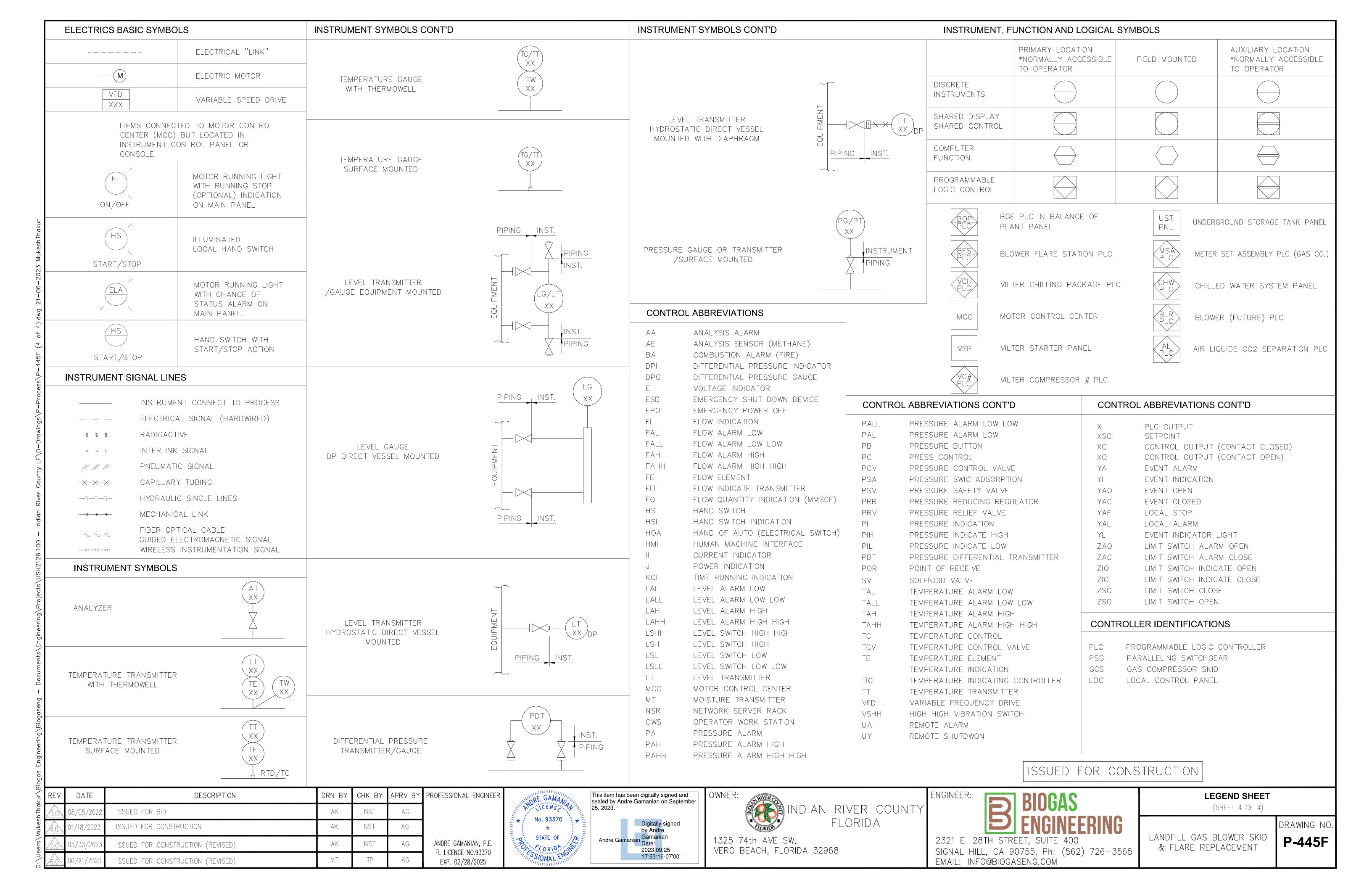
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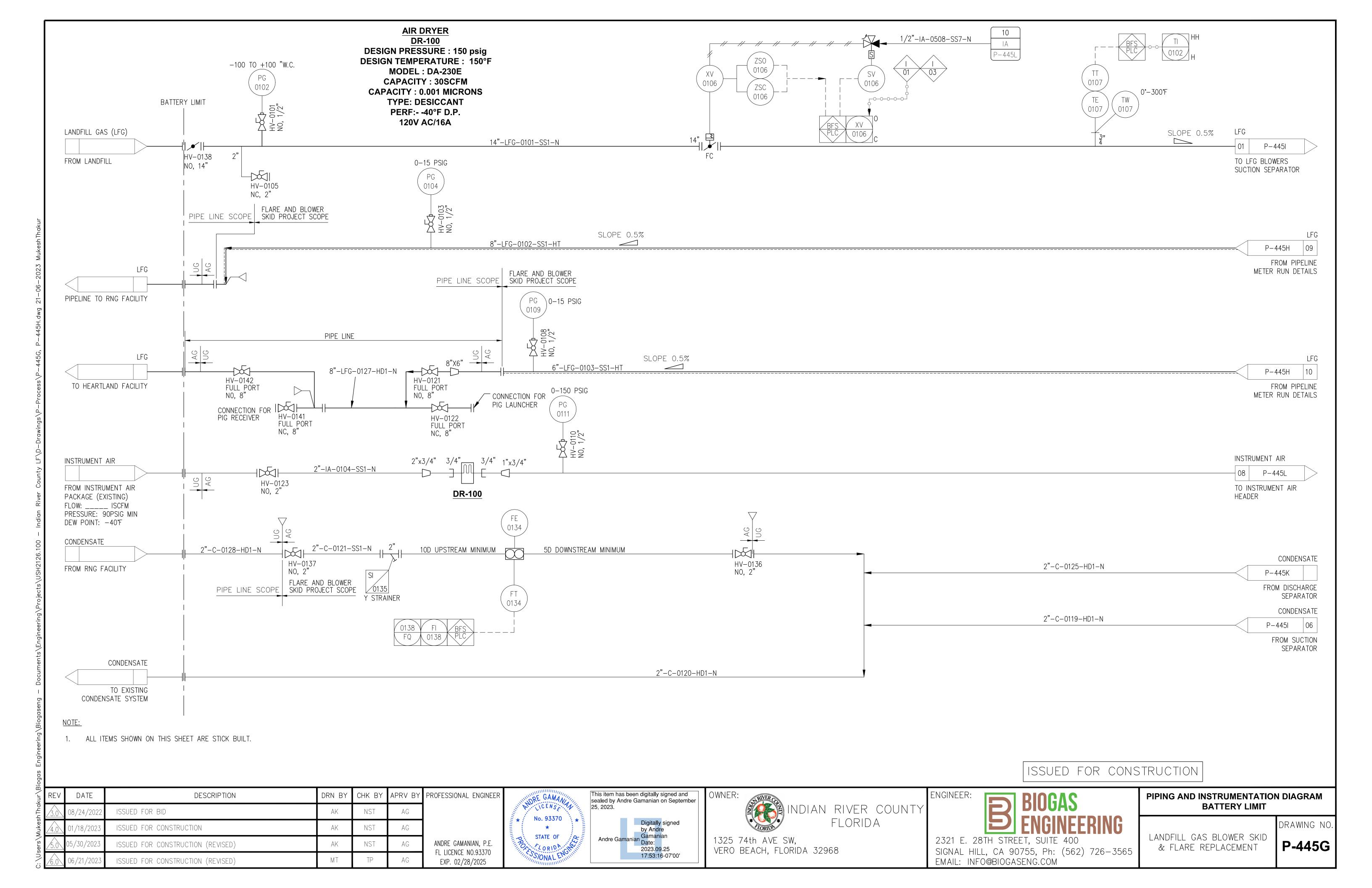
P-445D & FLARE REPLACEMENT

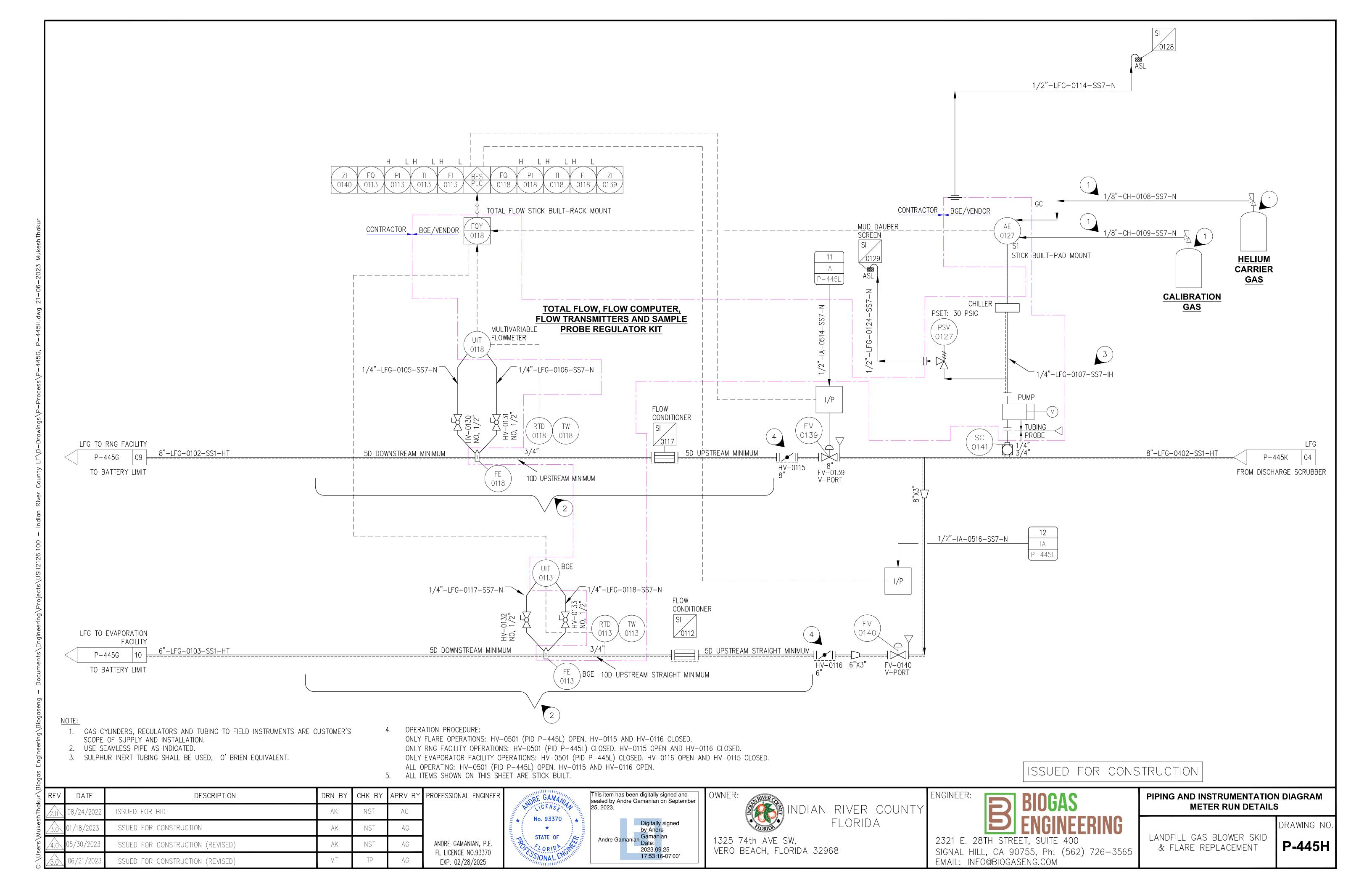
SIGNAL HILL, CA 90755, Ph: (562) 726-3565

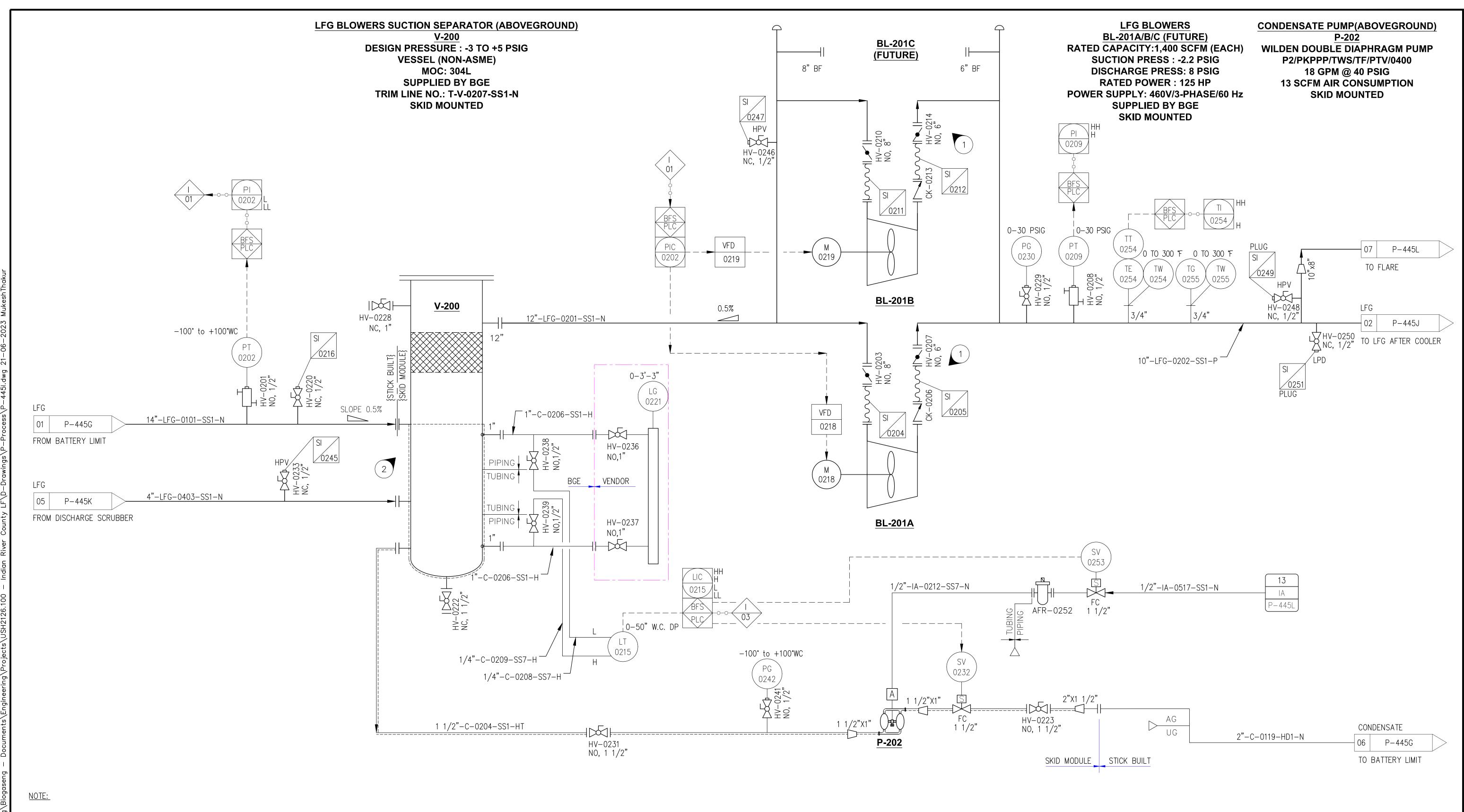
EMAIL: INFO@BIOGASENG.COM











- 1. INSULATE FOR PERSONNEL PROTECTION. 1" FIBERGLASS WITH AL. CLADDING, UP TO 8FT ABOVE GRADE.
- 2. HEAT TRACE AND INSULATE SEPARATOR FROM BOTTOM OF 14" INLET PIPE DOWN

ISSUED FOR CONSTRUCTION (REVISED)

ISSUED FOR CONSTRUCTION (REVISED)

DATE CHK BY APRV BY PROFESSIONAL ENGINEER DESCRIPTION ISSUED FOR BID ISSUED FOR CONSTRUCTION

ORE GAMANI CENS No. 93370 STATE OF CORIDA

ANDRE GAMANIAN, P.E.

FL LICENCE NO.93370

EXP. 02/28/2025

This item has been digitally signed and sealed by Andre Gamanian on September VERO BEACH, FLORIDA 32968 2023.09.25 17:53:16-07'00'



INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

# ENGINEER:

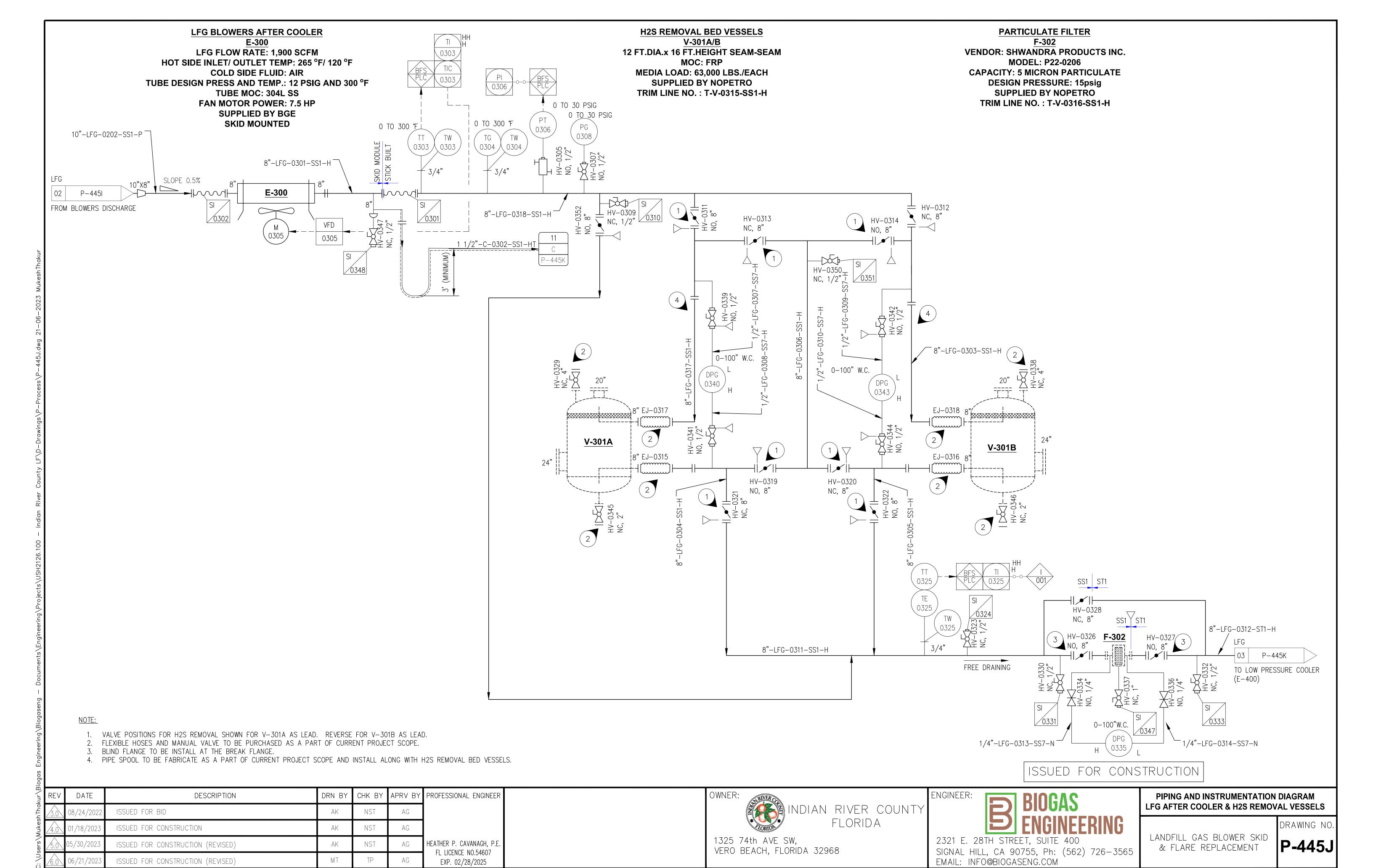
ISSUED FOR CONSTRUCTION

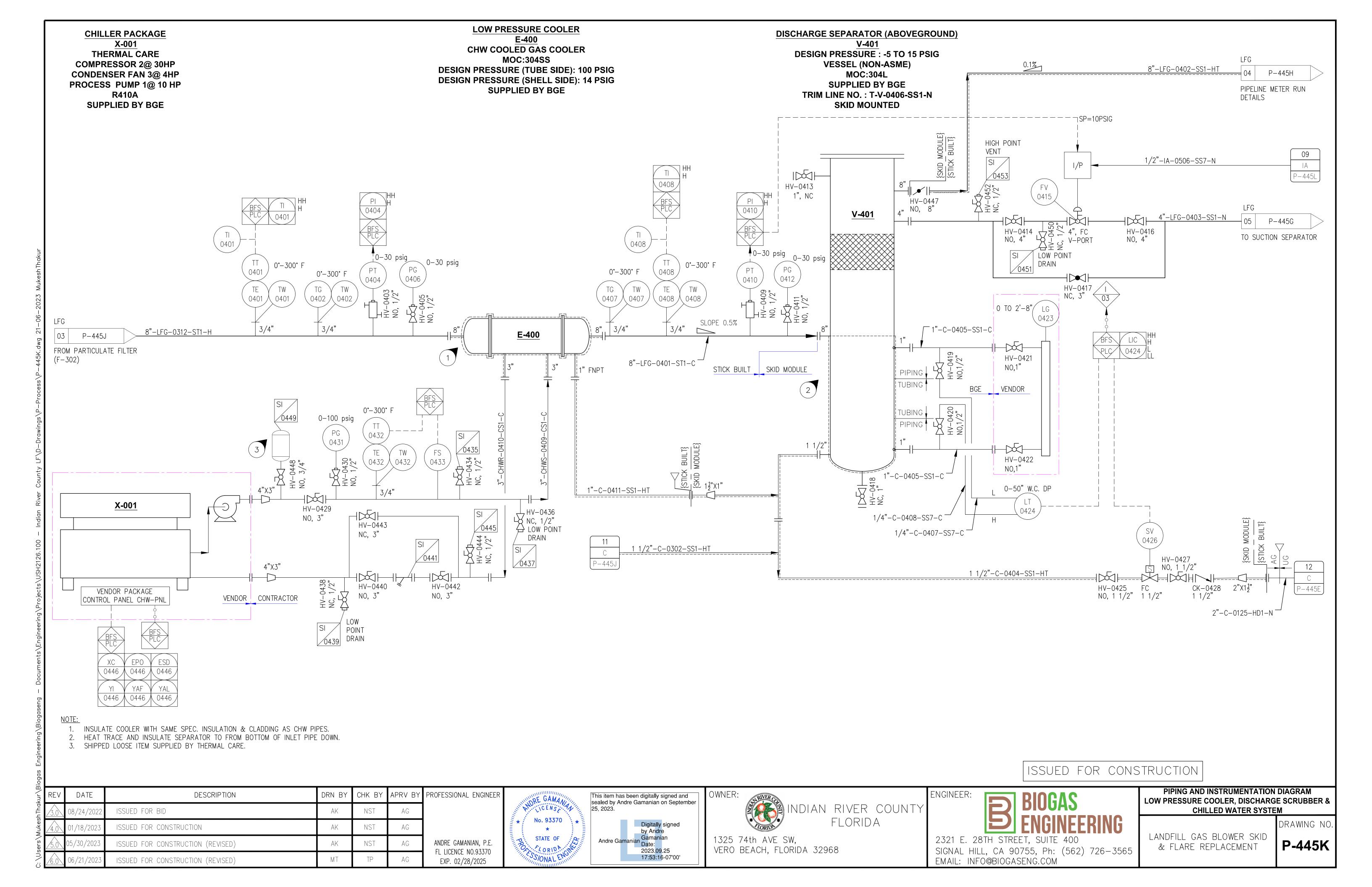
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

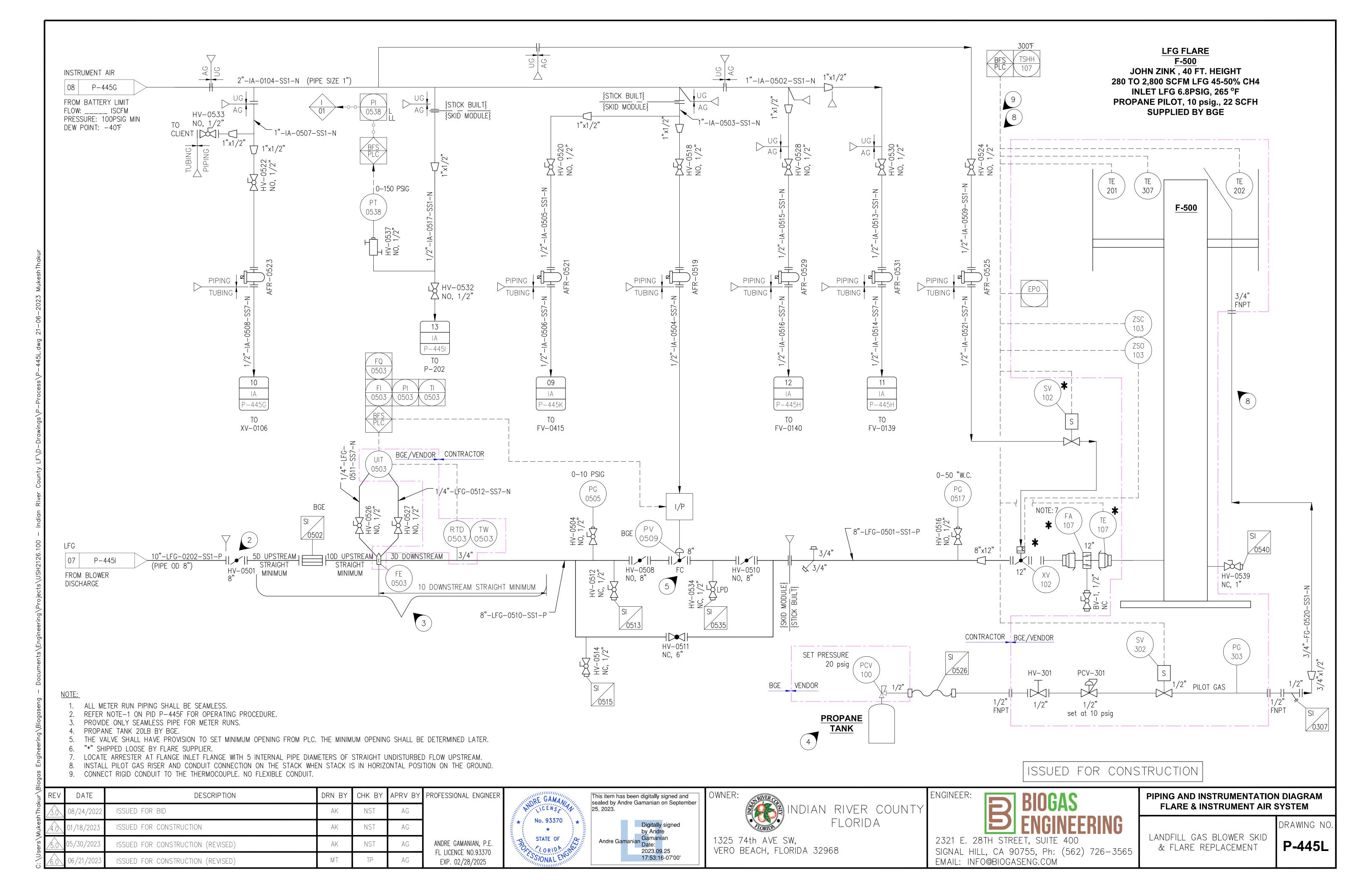
PIPING AND INSTRUMENTATION DIAGRAM **SUCTION SEPARATOR & BLOWER SYSTEM** 

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

P-445I







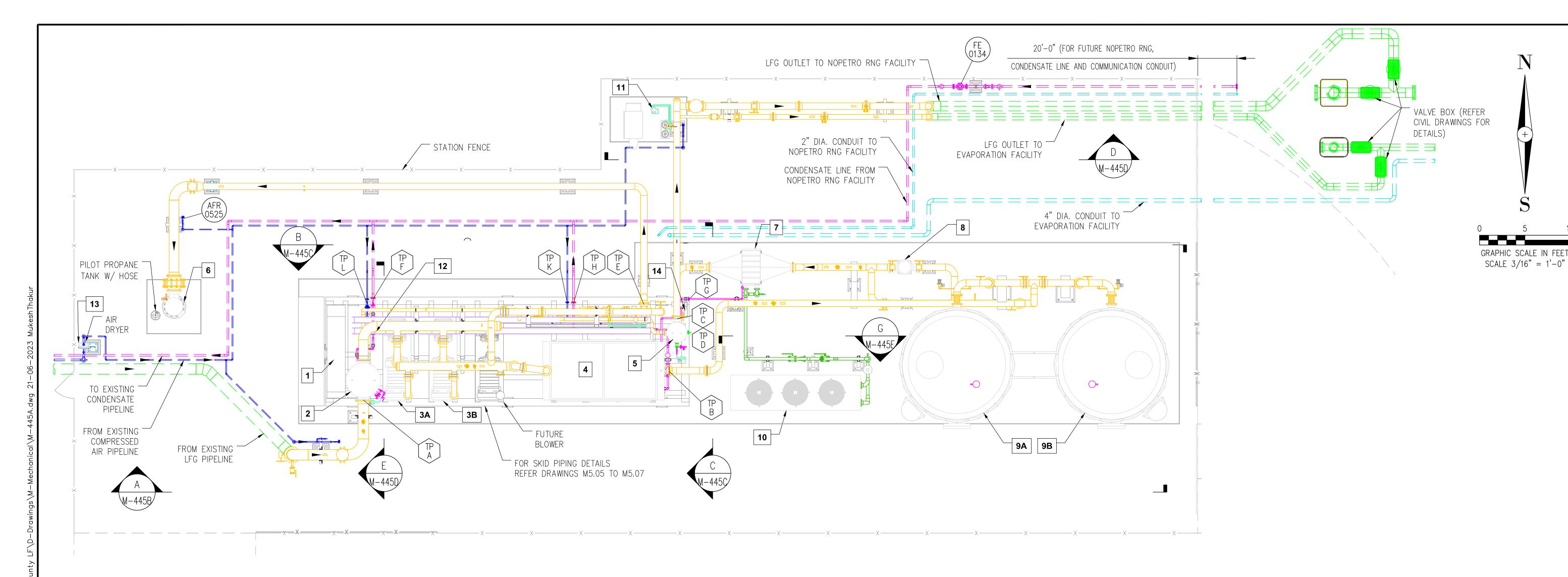


TABLE 1:-EQUIDMENT LICT

EQUIPMEN	EQUIPMENT LIST							
ID	TAG	DESCRIPTION	REMARKS					
1		BOP PANEL	SKID MODULE					
2	V-200	LFG BLOWERS SUCTION SEPARATOR	SKID MODULE					
3A/3B	BL-201A/BL-201B	LFG BLOWERS	SKID MODULE					
4	E-300	LFG BLOWERS AFTER COOLER	SKID MODULE					
5	V-401	DISCHARGE SEPARATOR	SKID MODULE					
6	F-500	LFG FLARE	STICK BUILT					
7	E-400	LOW PRESSURE COOLER	STICK BUILT					
8	F-302	PARTICULATE FILTER	(FUTURE INSTALL) STICK BUILT					
9A/9B	V-301A/V-301B	H2S REMOVAL BED VESSELS	(FUTURE INSTALL) STICK BUILT					
10	X-001	CHILLER PACKAGE	STICK BUILT					
11		ANALYZER CABINET	STICK BUILT					
12	P-202	CONDENSATE PUMP	STICK BUILT					
13	DR-100	AIR DRYER	STICK BUILT					
14	JB-500	JUNCTION BOX	STICK BUILT					

#### **TABLE 2:-**

TIE-IN SCHEDULE (BLOWER SKID TO STICK BUILT)

SE ON SEPARATOR (LFG INLET) FTER COOLER (OUTLET) ARGE SEPARATOR (INLET)	LINE SIZE  14"  8"	FLANGE FACE RF	FLANGE RATING 150
TER COOLER (OUTLET)			
,	8"	RF	450
DOE SEDADATOD (INILET)			150
ANGE SEFANATON (INLET)	8"	RF	150
ARGE SEPARATOR (OUTLET)	8"	RF	150
ARE	8"	RF	150
N SEPARATOR CONDENSATE (OUTLET)	1 1/2"	RF	150
RESSURE COOLER CONDENSATE (INLET)	1"	RF	150
ARGE SEPARATOR CONDENSATE (OUTLET)	1 1/2"	RF	150
ESSED AIR (INLET)	1"	RF	150
ESSED AIR (INLET)	1"	RF	150
	RE N SEPARATOR CONDENSATE (OUTLET) RESSURE COOLER CONDENSATE (INLET) RGE SEPARATOR CONDENSATE (OUTLET) ESSED AIR (INLET)	RESSURE COOLER CONDENSATE (OUTLET) 1 1/2"  RESSURE COOLER CONDENSATE (INLET) 1"  REGE SEPARATOR CONDENSATE (OUTLET) 1 1/2"  ESSED AIR (INLET) 1"	RE 8" RF  N SEPARATOR CONDENSATE (OUTLET) 1 1/2" RF  RESSURE COOLER CONDENSATE (INLET) 1" RF  RGE SEPARATOR CONDENSATE (OUTLET) 1 1/2" RF  ESSED AIR (INLET) 1" RF

#### **LEGEND**

STATION FENCE	XX
UNDERGROUND LFG PIPELINE	
UNDERGROUND CONDENSATE PIPELINE	
UNDERGROUND COMPRESSED AIR PIPELINE	
UNDERGROUND COMMUNICATION CONDUIT	
LANDFILL GAS (LFG)	
CONDENSATE (C)	
CONDENSATE (C)	
INSTRUMENT AIR	
CHILLED WATER (CHWS/CHWR)	
SS TUBING	

## NOTES:

- FOR SITE PLAN REFER DRAWING G-445C.
- 2. ALL PIPING AND ITS FITTING IN THE PROJECT SHALL BE SS 304. EXCEPT BETWEEN THE PARTICULATE FILTER (F-302) AND DISCHARGE SEPARATOR (V-401) WHICH WILL BE SS 316.

1	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
	2.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
	<u>/3.0\</u>	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
)	4.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
	5.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025

ONAL ENGINEER No. 93370 STATE OF

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. 2023.09.25 17:53:16-07'00'

INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968 ENGINEER:

EMAIL: INFO@BIOGASENG.COM

2321 E. 28TH STREET, SUITE 400

SIGNAL HILL, CA 90755, Ph: (562) 726-3565

ISSUED FOR CONSTRUCTION

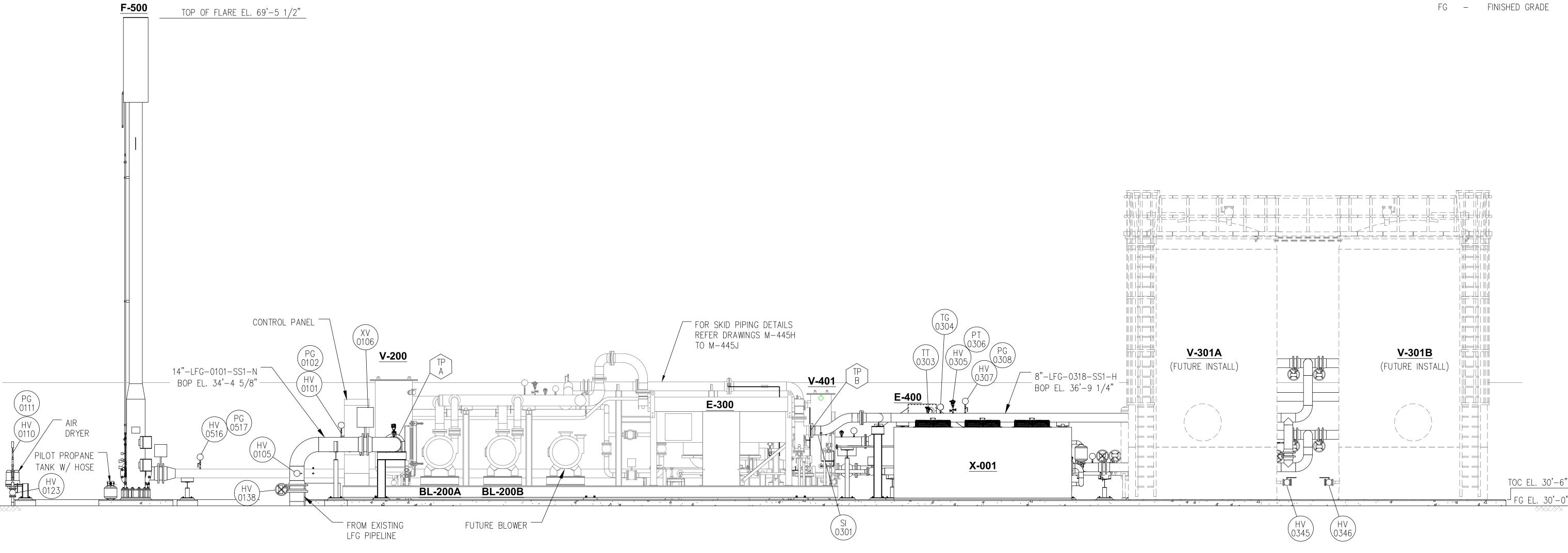
**OVERALL PIPING LAYOUT** 

DRAWING NO. LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445A

## **LEGEND**

TOC - TOP OF CONCRETE BOTTOM OF PIPE TOS - TOP OF STEEL



**ELEVATION VIEW** VIEW LOOKING NORTH SCALE 1/4"=1'-0"

### NOTES:

- FOR P&ID REFER DRAWING P-445G TO P-445L.
- ALL PIPING AND ITS FITTING IN THE PROJECT SHALL BE SS 304. EXCEPT BETWEEN THE PARTICULATE FILTER (F-302) AND DISCHARGE SEPARATOR (V-401) WHICH WILL BE SS 316.
- REFER VALVE/SP-ITEM LIST & INSTRUMENT LIST DRAWING M-445S TO M-445AE (13 SHEETS) FOR THE SCOPE OF SUPPLY OF INSTRUMENTS, GAUGES, VALVES AND SP-ITEM

ISSUED FOR CONSTRUCTION

OWNER: INDIAN RIVER COUNTY FLORIDA
1325 74th AVE SW.

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

ENGINEER:

PIPING LAYOUT **SECTIONS & DETAILS** 

> LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445B

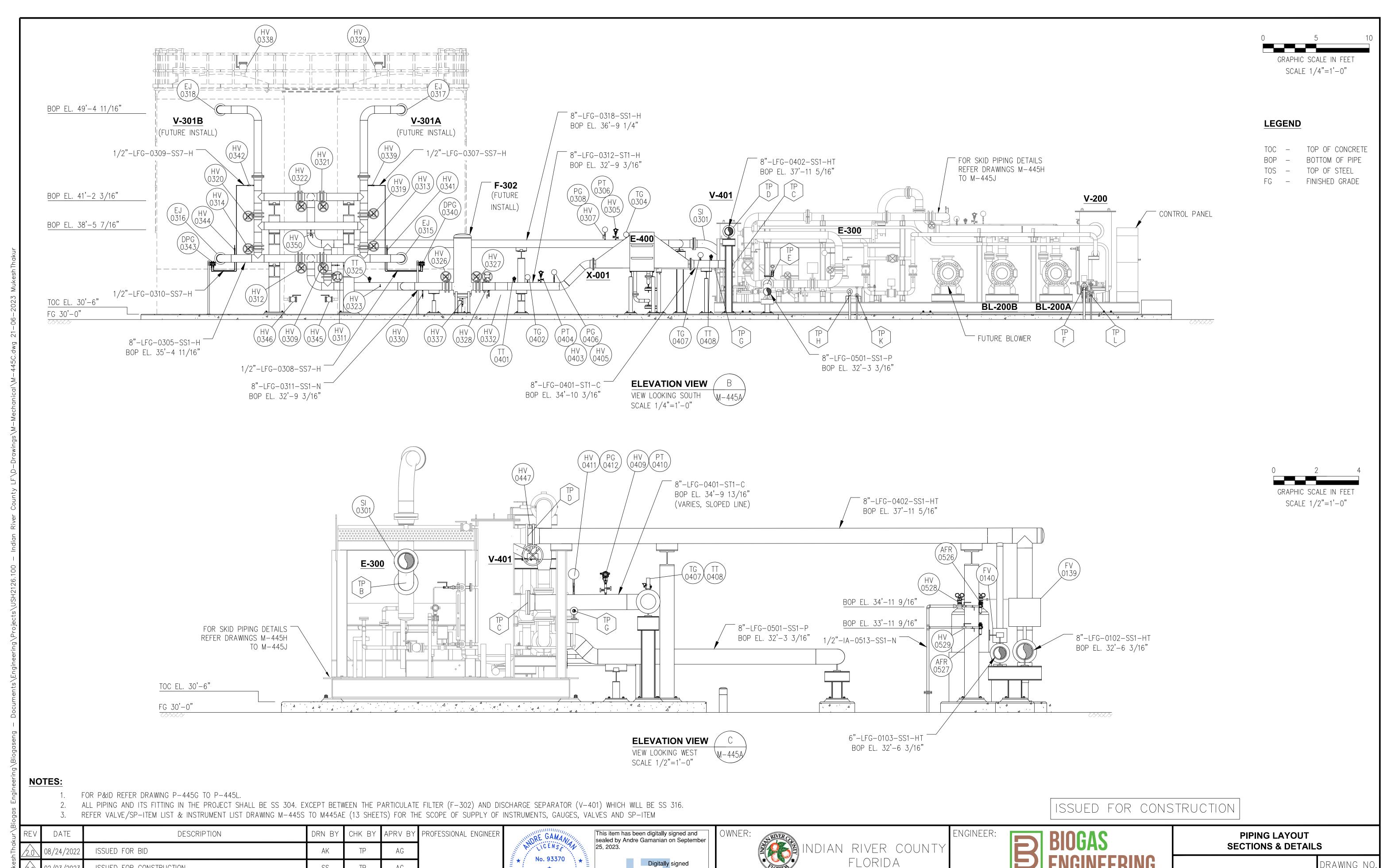
DRAWING NO.

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
2.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
3.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
4.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
5.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025

CENSERA No. 93370 STATE OF ANDRE GAMANIAN, P.E. ONLYORIDA FL LICENCE NO.93370 EXP. 02/28/2025



1325 74th AVE SW, VERO BEACH, FLORIDA 32968



1325 74th AVE SW,

2023.09.25 17:53:16-07'00'

VERO BEACH, FLORIDA 32968

02/03/202

ISSUED FOR CONSTRUCTION

ISSUED FOR CONSTRUCTION (REVISED)

ISSUED FOR CONSTRUCTION (REVISED)

SS

SS

STATE OF

CORIDA

ANDRE GAMANIAN, P.E.

FL LICENCE NO.93370

EXP. 02/28/2025

2321 E. 28TH STREET, SUITE 400

EMAIL: INFO@BIOGASENG.COM

SIGNAL HILL, CA 90755, Ph: (562) 726-3565

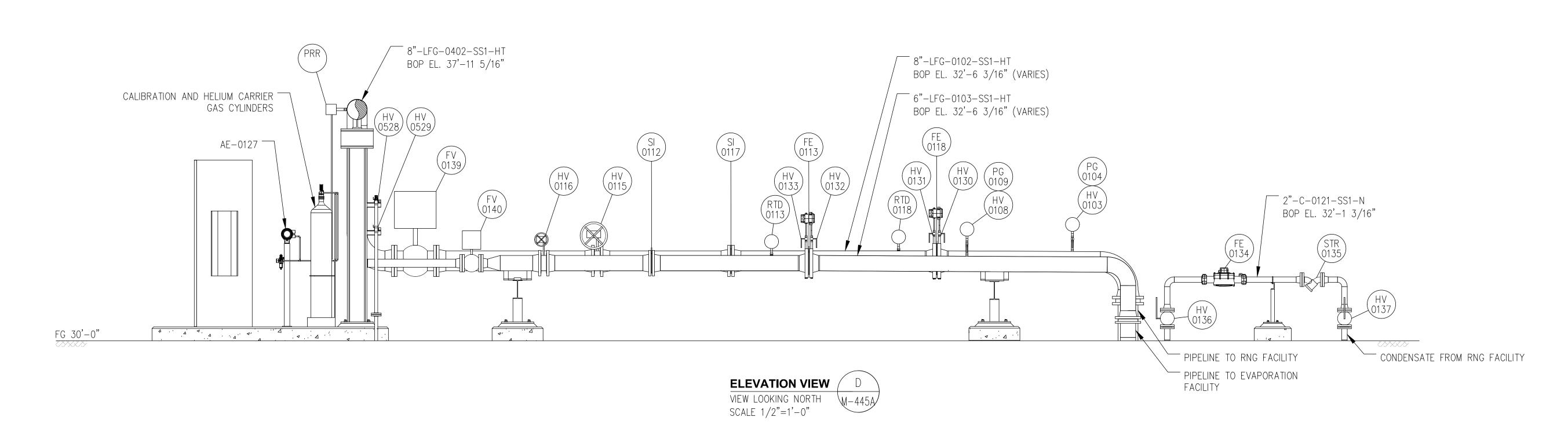
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

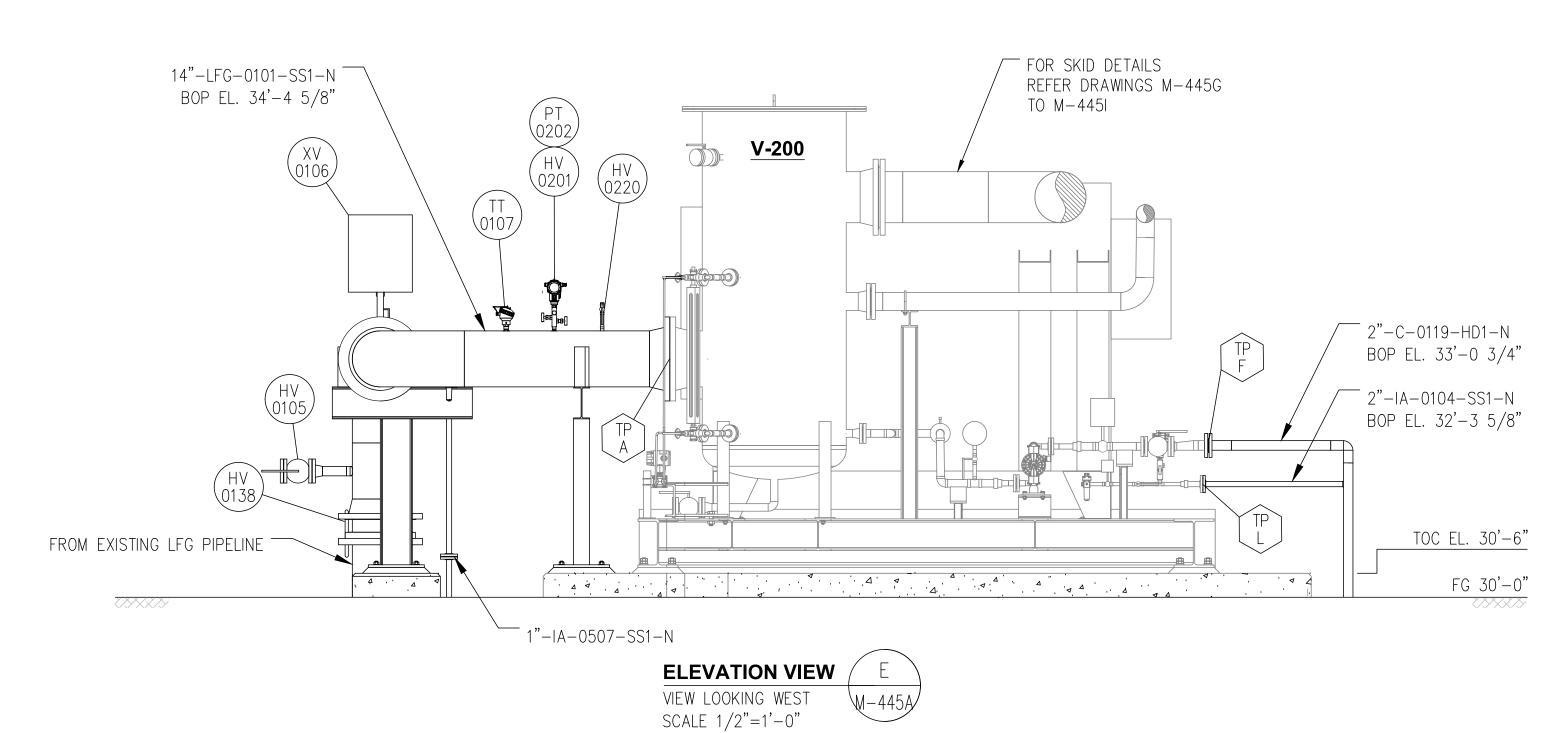
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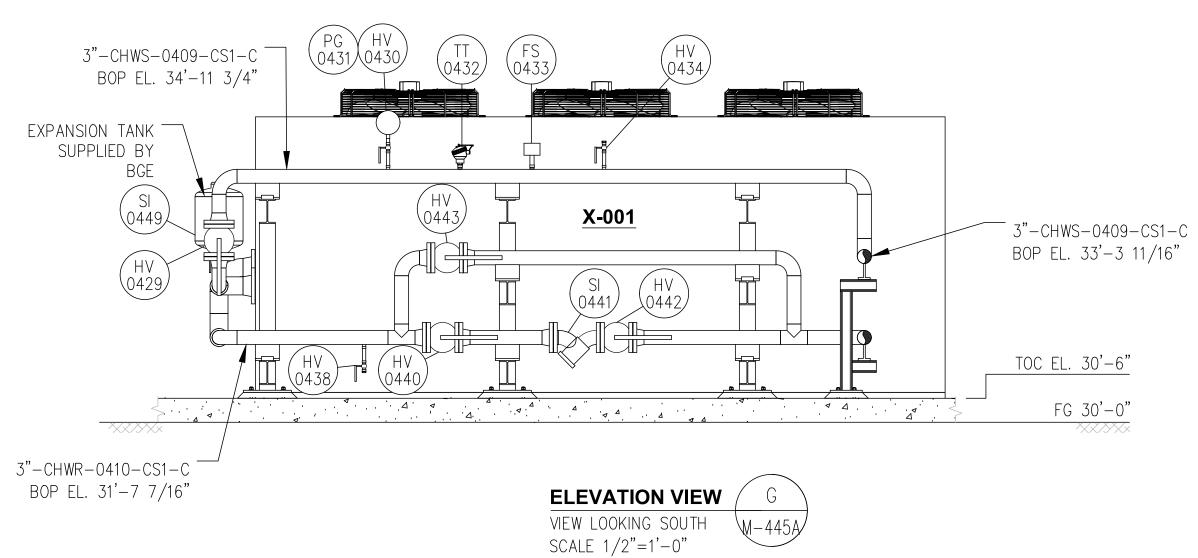
M-445C

### **LEGEND**

TOC - TOP OF CONCRETE BOP - BOTTOM OF PIPE TOS - TOP OF STEEL FG - FINISHED GRADE







## NOTES:

- FOR P&ID REFER DRAWING P-445G TO P-445L.
- ALL PIPING AND ITS FITTING IN THE PROJECT SHALL BE SS 304. EXCEPT BETWEEN THE PARTICULATE FILTER (F-302) AND DISCHARGE SEPARATOR (V-401) WHICH WILL BE SS 316.
- 3. REFER VALVE/SP-ITEM LIST & INSTRUMENT LIST DRAWING M-445S TO M445AE (13 SHEETS) FOR THE SCOPE OF SUPPLY OF INSTRUMENTS, GAUGES, VALVES AND SP-ITEM

IER:	INDIAN **FORTURE	RIVER CO FLORIDA	UNTY	ENGINEER:	B	BIOGA ENGIN

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING LAYOUT **SECTIONS & DETAILS** 

ISSUED FOR CONSTRUCTION

DRAWING NO. LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445D

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
2.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
3.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
4.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
5.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025

No. 93370 STATE OF ANDRE GAMANIAN, P.E. LORIDA FL LICENCE NO.93370 EXP. 02/28/2025

CENS

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. 2023.09.25 17:53:16-07'00'

1325 74th AVE SW, VERO BEACH, FLORIDA 32968 ALL FABRICATION, INSTALLATION, CONSTRUCTION, TESTING OF PIPING SYSTEMS SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE DOCUMENTS, AND ALL DOCUMENTS REFERENCED THEREIN, AS APPLICABLE. ABBREVIATIONS USED IN THIS DOCUMENT ARE GIVEN IN PARENTHESIS.

- a. BIOGAS ENGINEERING INC. PIPING & INSTRUMENTATION DIAGRAM (PID)
- b. BIOGAS ENGINEERING INC. ALL DRAWINGS ISSUED FOR CONSTRUCTION (IFC DRAWINGS)
- c. BIOGAS ENGINEERING PIPING MATERIAL SPECIFICATIONS (PMS)
- d. ASME 31.3 PROCESS PIPING (31.3)
- e. NFPA 54, NATIONAL FUEL GAS CODE (NFGC)
- f. ASME 31.9 BUILDING SERVICES PIPING (31.9)
- g. PIPE FABRICATION INSTITUTE STANDARD ES-3, FABRICATION TOLERANCES (ES-3)
- h. STEEL STRUCTURES PAINTING COUNCIL (SSPC)
  - i. SYSTEMS AND SPECIFICATIONS, STEEL STRUCTURES PAINTING MANUAL, VOLUME 2
  - ii. GOOD PAINTING PRACTICE, VOLUME 1
- i. VENDOR DRAWINGS, MANUALS AND RELEVANT DOCUMENTS

#### 2. RESPONSIBILITIES

USING THE DEFINITIONS IN 31.3 FOR OWNER AND DESIGN AGENCY THE FOLLOWING RESPONSIBILITIES ARE APPLICABLE.

- a. OWNER INDIAN RIVER COUNTY IS THE OWNER AND DESIGN AUTHORITY
- b. DESIGNER BIOGAS ENGINEERING, INC. IS THE DESIGN AGENCY AND DESIGNER
- c. CONTRACTOR OWNER'S SELECTED CONSTRUCTION ENTITY WITH RESPONSIBILITIES PER THE CONTRACT DOCUMENTS. GENERALLY, TO INCLUDE THE FOLLOWING.
  - SAFETY TRAINING, EQUIPMENT, PROCEDURES AND DOCUMENTATION
  - ii. SUBMITTAL OF MATERIAL DATA PRIOR TO PROCUREMENT
  - iii. PROCUREMENT OF MATERIALS AFTER SUBMITTALS ARE APPROVED
  - iv. SHOP FABRICATION
  - v. FIELD FABRICATION
  - vi. INSTALLATION
  - vii. INSPECTION & TESTING
  - viii. DOCUMENTATION OF ALL ABOVE TASKS INCLUDING BUT NOT LIMITED TO
    - 1. AS-BUILT DRAWING MARKUPS (RED-LINES)
    - 2. PRESSURE TEST REPORTS
    - 3. INSPECTION REPORTS
    - 4. RFI LOG

#### CONFLICTS, QUESTIONS OR EXCEPTIONS

CONTRACTOR SHALL DOCUMENT AND BRING TO THE OWNER AND DESIGNERS ATTENTION BY ISSUANCE OF A REQUEST FOR INFORMATION (RFI);

- a. ANY CONFLICTS BETWEEN THE CONTRACT DOCUMENTS AND/OR THE ABOVE REFERENCED DOCUMENTS.
- b. ANY QUESTIONS AS TO INTERPRETATION OF THE CONTRACT DOCUMENTS AND/OR THE ABOVE REFERENCED DOCUMENTS.
- GENERAL NOTES

DATE

- a. WELDING ALL WELDING SHALL CONFORM TO THE REQUIREMENTS OF 31.3.
- b. BENDING NO BENDING OF PIPING IS INCLUDED IN THE DESIGN. USE OF PREFABRICATED PIPE ELBOWS AND FITTINGS IS REQUIRED.
- c. TOLERANCES ON FABRICATION SHALL BE PER THE PIPE FABRICATION INSTITUTE STANDARD ES-3.
- TOLERANCES FOR INSTALLATION FIT UP SHALL BE PER ASME B31.3 CODE PARAGRAPH 335.1.1. "ALIGNMENT".
- e. PIPING IS NOT TO BE DISTORTED TO BRING IT INTO ALIGNMENT FOR JOINT ASSEMBLY.
- WEDGES ARE NOT BEING USED TO LATERALLY CONTAIN OR POSITION PIPE FOR CLOSURE FIT-UPS.
- g. SUPPORT LOCATIONS, TYPE, AND RESTRAINT DIRECTION SHALL BE AS SPECIFIED IN THE DESIGN DRAWINGS.

- h. PIPE SLOPE SHALL BE MAINTAINED IN THE DIRECTION SPECIFIED BY THE SLOPE ARROW AND/OR WORK POINT ELEVATION INDICATED ON THE DESIGN DRAWINGS.
- i. CHANGES IN PIPING ELEVATION SHALL NOT IMPACT SLOPE REQUIREMENTS, HIGH POINT VENTS, OR LOW POINT DRAINS.
- . VALVES AND OTHER COMPONENTS SHALL BE ORIENTED AS SHOWN IN DESIGN DOCUMENTS OR MANUFACTURER'S REQUIREMENTS.
- k. INSULATION SHALL BE INSTALLED AS SPECIFIED. COORDINATION WITH HEAT TRACE INSTALLATION PRIOR TO INSULATION IS REQUIRED.
- I. THERE SHALL BE NO VISIBLE DEFECTS, MISSING OR DAMAGED PARTS IN PIPING, COMPONENTS, OR PIPING SUPPORTS.
- m. ALLOWABLE NOZZLE LOADS OF VESSELS, EQUIPMENT OR COMPONENTS SHALL NOT BE EXCEEDED.
- n. ALL MATERIALS SHALL BE ASBESTOS, LEAD AND MERCURY FREE.

#### 5. MECHANICAL JOINTS

- a. THREADS IN THE BOLTS AND NUTS SHALL BE FREE FROM NICKS, BURRS, GRIT, CHIPS, AND DIRT AND WELL LUBRICATED PRIOR TO MAKEUP.
- b. BOLTS SHALL EXTEND COMPLETELY THROUGH THEIR NUTS.
- c. MANUFACTURER'S AND DESIGNER'S INSTALLATION INSTRUCTIONS FOR EXPANSION JOINTS SHALL BE FOLLOWED, AND ALL FACTORY INSTALLED SHIPPING BARS, BRACKETS, OR OTHER LOCKING DEVICES ARE IN PLACE AND REMAIN IN PLACE UNTIL AFTER PIPING SYSTEM CLOSURES ARE COMPLETE.
- d. ANY DAMAGE TO THE GASKET SEATING SURFACE WHICH WOULD PREVENT GASKET SEATING SHALL BE REPAIRED, OR THE FLANGE REPLACED.
- e. THE NUTS SHALL BE TIGHTENED IN A STAGGERED CRISSCROSS PATTERN AND IN INCREMENTS OF NOT MORE THAN 1/3 THE TOTAL REQUIRED TORQUE.
- f. NO MORE THAN ONE GASKET SHALL BE USED BETWEEN CONTACT FACES IN ASSEMBLING A FLANGED JOINT.
- g. GALVANIZED FLANGES MUST BE REFACED WITH THE APPROPRIATE SURFACE FINISH AFTER GALVANIZING IN COMPLETE.
- h. PRIOR TO BOLT UP, FLANGE FACES SHALL BE ALIGNED WITHIN 1/16" in./ft. (0.5%) MEASURED ACROSS ANY DIAMETER AND FLANGE BOLT HOLES SHALL BE ALIGNED WITHIN 1/8" MAXIMUM OFFSET.
- i. SEALING SURFACES OF COMPRESSION OR FLARE OF FLARED TUBING JOINTS SHALL BE EXAMINED FOR IMPERFECTIONS BEFORE ASSEMBLY.
- i. Where the manufacturer's instructions call for a specified number of turns of the NUT, THESE SHALL BE COUNTED FROM THE POINT AT WHICH THE NUT BECOMES FINGER TIGHT.
- k. THREADED COMPONENTS SHALL BE EXAMINED BEFORE ASSEMBLY FOR CLEANLINESS AND CONTINUITY OF THREADS AND FOR CONFORMANCE OF THREADS WITH APPLICABLE STANDARDS.
- I. COMPOUND OR LUBRICANT USED ON THREADS (FOR COMPONENTS AND BOLTS) SHALL BE SUITABLE FOR THE SERVICE CONDITIONS AND SHALL NOT REACT UNFAVORABLY WITH EITHER THE SERVICE FLUID OR THE PIPING MATERIAL.

#### 6. PAINTING

DRN BY CHK BY APRV BY PROFESSIONAL ENGINEER

ANDRE GAMANIAN, P.E.

FL LICENCE NO.93370

EXP. 02/28/2025

- a. ALL NON-INSULATED PIPING, SUPPORTS, SHOES, ANCHORS AND OTHER REQUIRED CARBON STEEL ITEMS INSTALLED BY THE CONTRACTOR SHALL BE PREPARED AND PAINTED AS FOLLOWS.
  - i. SURFACE PREPARATION PER SSPC SP-6, COMMERCIAL BLAST.
  - ii. ONE COAT PRIMER: CARBOGUARD 890 OR APPROVED EQUAL TO 4-6 MIL. DFT.
  - iii. ONE OR MORE TOP COAT: CARBOTHANE 134HG OR APPROVED EQUAL TO 2-3 MIL. DFT.
  - iv. PIPING COLOR AS FOLLOWS UNLESS NOTED OTHERWISE.
    - 1. GAS PIPING: SAFETY YELLOW (CARBOLINE #7676)
    - 2. CONDENSATE, WASTE-WATER: SAFETY GREY (CARBOLINE #3773)
    - 3. HANDRAILS, LADDERS: SAFETY YELLOW (CARBOLINE #7676)
    - 4. INSTRUMENT / COMPRESSED AIR: SAFETY GREY (CARBOLINE #3773)
    - 5. ALL OTHER NON-PIPE, CARBON STEEL TO BE COAT COLOR OF SAFETY GREY (CARBOLINE #3773) OR BGE APPROVED EQUAL, UNLESS OTHERWISE NOTED.
  - v. ALL OTHER, NON-PIPE, CARBON STEEL TO BE TOP COAT COLOR OF SAFETY GREY (CARBOLINE #3773) OR BGE APPROVED EQUAL, UNLESS OTHERWISE NOTED.
- b. ALL INSULATED ABOVE GRADE CARBON STEEL PIPING SHALL BE PREPARED AND PAINTED PER ABOVE BUT WITH NO TOP COAT, PRIMER ONLY. INSPECT AND TEST THICKNESS PRIOR TO INSULATION.
- c. ALL BELOW GRADE CARBON STEEL PIPING SHALL BE COATED AS FOLLOWS. SURFACE PREPARATION PER SSPC SP-6, COMMERCIAL BLAST
  - ii. ONE OR MORE COATS: CARBOLINE BITUMASTIC 50 OR APPROVED EQUAL TO
  - 18 MIL. DFT iii. HOLIDAY TEST PER ASTM-G62-14

#### 6. PAINTING

- d. ALL STAINLESS-STEEL PIPING AND COMPONENTS SHALL NOT BE PAINTED.
- e. GALVANIZED MATERIALS SHALL NOT BE PAINTED EXCEPT FOR MINOR TOUCH UP WITH COLD-GALVANIZING PAINT.
- f. PIPE MARKERS PER ASME A13.1 2015 GUIDELINES:

i. FIRE QUENCHING FLUIDS: - WHITE ON RED

**COLOR SCHEME** 

WHITE ON RED

**BLACK ON ORANGE** 

iii. FLAMMABLE & OXIDIZING FLUIDS: - BLACK ON YELLOW

ii. TOXIC & CORROSIVE FLUID: - BLACK ON ORANGE

**BLACK ON YELLOW** 

iv. COMBUSTIBLE FLUIDS: - WHITE ON BROWN

WHITE ON BROWN

v. POTABLE, COOLING & OTHER WATER: - WHITE ON GREEN

WHITE ON GREEN

vi. COMPRESSED AIR: - WHITE ON BLUE

WHITE ON BLUE

#### 7. INSULATION

- a. PAINT ALL CARBON STEEL INSULATED PIPING, TEST AND INSPECT PAINT PRIOR TO INSULATION.
- b. ALL INSULATION MATERIALS SHALL BE PROTECTED FROM WEATHER PRIOR TO AND DURING INSTALLATION INCLUDING CLADDING TO A WATERPROOF CONDITION
- c. ALL INSULATION AND OTHER MATERIALS SHALL BE ASBESTOS, LEAD AND MERCURY FREE.
- d. H AND HT = HOT AND HEAT TRACED 1" FIBERGLASS, 3.5 TO 5.5 LB/CU.FT. UNLESS NOTED OTHERWISE. CLAD WITH STUCCO EMBOSSED ALUMINUM JACKETING TO MAKE WATERPROOF SEAL CONTAINING THE INSULATION.
- e. C = COLD WATER RESISTANT, ELASTOMERIC INSULATION WITH CORROSIONINHIBITOR, 1" THICK UNLESS NOTED OTHERWISE. ARMAFLEX OR OWNER APPROVED EQUAL. CLAD WITH STUCCO EMBOSSED ALUMINUM JACKETING TO MAKE WATERPROOF SEAL CONTAINING THE INSULATION.
- f. P = PERSONNEL PROTECTION TYPE AND THICKNESS AND CLADDING PER H & HT ABOVE,HOWEVER ONLY INSTALLED FROM GRADE TO 8FT ABOVE GRADE OR OTHER AREAS WHERE PERSONNEL CAN TOUCH THE PIPING WHEN STANDING ON GRADE OR WORKING SURFACE SUCH AS PLATFORMS OR ON TOP OF VESSELS. CLAD WITH STUCCO EMBOSSED ALUMINUM TO MAKE WATERPROOF SEAL CONTAINING THE INSULATION.

#### 8. JACKETING

ALL INSULATED PIPE AND EQUIPMENT SHALL HAVE INSULATION AND JACKETING INSTALLED IN WATERPROOF MANNER.

- a. PIPE DIAMETER LESS THAN OR EQUAL 6"-0.016" (0.4MM) MINIMUM JACKET THICKNESS
- b. PIPE DIAMETER GREATER THAN 6" 0.024" (0.6MM) MINIMUM JACKET THICKNESS
- c. JACKETING TO BE HELD WITH 0.5" X 0.020" STAINLESS STEEL BANDING AT EACH JOINT AND SPACED NOT TO EXCEED 24" BETWEEN BANDS. NO SCREWS OR OTHER PENETRATING FASTENERS SHALL BE USED
- THE FOLLOWING ITEMS, WHEN INSTALLED IN INSULATED PIPE RUNS, SHALL BE PROVIDED WITH REMOVABLE BLANKET INSULATION CONSISTING OF FIBERGLASS INSULATION OF THE SAME OR GREATER THICKNESS THAN THE ADJACENT PIPE, COVERED IN SILICONE COATED FIBERGLASS CLOTH. REMOVABLE BLANKETS SHALL BE FASTENED WITH STAINLESS STEEL CLIPS AND WIRE OR OTHER OWNER'S ENGINEER APPROVED EQUAL. FIBERGLASS CLOTH INSULATION THICKNESS WITHIN THE REMOVABLE BLANKET SHALL, AS A MINIMUM, THE SAME AS THE ADJACENT PIPE INSULATION.
  - i. VALVES LARGER THAN 2" NPS
  - ii. METERING ORIFICE PLATE ASSEMBLIES
  - iii. INLET DG METERING PIPE RUN WITH ALTERNATE SIZE PIPE ASSEMBLIES PROVIDED
  - iv. OTHER EQUIPMENT OR DEVICES AS NOTED ON THE CONTRACT DRAWINGS AND DOCUMENTS.

#### **NOTES CONT ON SHEET-2**

ISSUED FOR CONSTRUCTION

CONSTRUCTION NOTES (SHEET 1 OF 3) DRAWING NO.

**MECHANICAL, FABRICATION AND** 

M-445E

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

& FLARE REPLACEMENT

ISSUED FOR BID 02/03/202 TP ΑG ISSUED FOR CONSTRUCTION SS 05/30/202 SS ISSUED FOR CONSTRUCTION (REVISED) ISSUED FOR CONSTRUCTION (REVISED)

DESCRIPTION

RE GAMAN CENS No. 93370 STATE OF CORIDA SSIONAL EX

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Digitally signed by Andre Andre Gamanian Gamanian Date: 2023.09.25 17:53:16-07'00'

OWNER:

FLORIDA 1325 74th AVE SW, VERO BEACH, FLORIDA 32968

INDIAN RIVER COUNTY

ENGINEER:

LANDFILL GAS BLOWER SKID

## 9. CLEANING

ALL PIPING SHALL BE CLEANED AFTER FABRICATION AND INSTALLATION, PRIOR TO PRESSURE TESTING AND BEING PUT INTO SERVICE. THE METHOD FOR CLEANING DEPENDS UPON THE TYPE OF INTERNAL CONTAMINATION PRESENT. SEE THE TABLE BELOW.

PROPER PROCUREMENT, HANDLING, STORAGE AND FABRICATION METHODS SHALL BE USED TO PREVENT RUST, WELD SPATTER, SCALE OR SLAG WHICH MUST BE REMOVED WITH THE MORE EXTENSIVE CLEANING METHODS LISTED.

TABLE 1 - Contami	nation Types and Removal Methods
Types of Contamination	Cleaning Methods
Dirt, Metal Chips, and Filings	Λ-1, Λ-2, Β
Oil, Paint, Grease Wax, Varnish	В
Moisture in refrigerant piping	D-1, D-2
Weld Spatter, Rust, Scale, Slag	C-1, C-2, E-1

## CLEANING METHODS

- a. METHOD A-1, WATER FLUSH.
  - i. FLUSH PIPE WITH CLEAN WATER, ON STAINLESS STEEL USE ONLY WATER HAVING A CHLORIDE CONTENT LESS THAN 50 PPM FOR THE FINAL FLUSH. (NOTE: DOMESTIC WATER GENERALLY CONTAINS LESS THAN 2 PPM CHLORIDES).
  - ii. DRY TO CONFORM TO SYSTEM REQUIREMENTS USING METHOD A-2
- b. METHOD A-2. STEAM OR AIR BLOW
  - i. BLOW PIPE WITH CLEAN, DRY, COMPRESSED AIR OR STEAM. USE SUFFICIENT VOLUME OF AIR TO CREATE A HIGH VELOCITY STREAM IN THE PIPE. IF AIR IS SUPPLIED FROM COMPRESSORS, THEY SHALL BE EQUIPPED WITH MOISTURE SEPARATORS, OIL SEPARATORS, TRAPS, AND/OR FILTERS, AS REQUIRED TO ENSURE THAT THE AIR IS CLEAN AND DRY.
- c. METHOD B, STEAM CLEANING.
  - i. USE STEAM AT PRESSURES FROM 50 TO 75 PSI IN CONJUNCTION WITH CLEANING AGENTS SUCH AS EMULSIONS, DETERGENTS, SOLVENTS, AND ALKALIS. PROPRIETARY CLEANERS MAY CONTAIN HARMFUL INGREDIENTS SUCH AS CHLORIDES OR SULFUR, WHICH MAY ADVERSELY AFFECT THE MATERIAL TO BE CLEANED, ESPECIALLY IN THE CASE OF STAINLESS STEEL. THE MANUFACTURER OF THE CLEANING AGENT SHOULD BE CONTACTED PRIOR TO ITS USE WHEN ANY DOUBT EXISTS.
  - ii. DRAIN THE PIPE AND FLUSH WITH CLEAN WATER, USE CHLORIDE FREE WATER ON STAINLESS STEEL. (SEE METHOD A-1) BLOW DRY WITH CLEAN, DRY, COMPRESSED AIR. (SEE METHOD A-2)
- d. METHOD C-1, BLAST CLEANING
  - i. CLEAN, PREVIOUSLY UNUSED GLASS BEADS, IRON FREE SILICA, WALNUT SHELLS, OR ALUMINA SAND ARE REQUIRED FOR ABRASIVE BLASTING OF STAINLESS STEEL PIPE. FOR CARBON STEEL PIPE USE SAND, STEEL SHOT, OR STEEL GRIT. BLAST CLEAN INSIDE AND OUTSIDE SURFACES AS REQUIRED.
  - ii. USE CLEAN, DRY, COMPRESSED AIR. (SEE METHOD A-2) FOLLOW WITH PROCEDURE A-1 OR A-2.
- e. METHOD C-2, MECHANICAL CLEANING
  - i. WIRE BRUSHING, SANDING, AND GRINDING ARE SUITABLE METHODS FOR LOCALIZED REMOVAL OF SCALE AND SPATTER LEFT BY WELDING. STAINLESS STEEL WIRE BRUSHES ARE REQUIRED FOR USE ON STAINLESS STEEL PIPE. GRINDING WHEELS, WIRE BRUSHES, AND SANDING MATERIALS CONTAINING IRON, IRON OXIDE, OR ZINC, OR THOSE PREVIOUSLY USED ON OTHER METALS, SHALL NOT BE USED TO CLEAN STAINLESS STEEL PIPE.
  - ii. USE CLEAN, DRY, COMPRESSED AIR. (SEE METHOD A-2) FOLLOW WITH PROCEDURE A-1 OR A-2.
- f. METHOD D-1, DEHYDRATION OF CARBON STEEL PIPE FOR LOW TEMPERATURE SERVICE USING NITROGEN
  - i. THIS PROCEDURE IS RECOMMENDED FOR REMOVAL OF SMALL AMOUNTS OF MOISTURE THAT MAY EXIST IN A NOMINALLY DRY SYSTEM.
  - ii. EVACUATE SYSTEM TO AN ABSOLUTE PRESSURE OF 5 MM OF MERCURY OR LESS. IF IT IS NECESSARY TO DEHYDRATE AN OUTDOOR SYSTEM WHEN THE TEMPERATURE IS LESS THAN 360 F, SPECIAL PRECAUTIONS MUST BE TAKEN TO ENSURE PROPER DEHYDRATION. THESE MAY INCLUDE SWEEPING WITH DRY GAS, CIRCULATING WARM WATER OR BRINE, BLANKETING OF EQUIPMENT, OR USING ELECTRIC RESISTANCE HEATERS.
  - DIFFICULTY IN ACHIEVING THE REQUIRED VACUUM MAY BE DUE TO PRESENCE OF EXCESS MOISTURE IN THE SYSTEM, LEAKAGE OF AIR INTO THE SYSTEM, A FAULTY OR INADEQUATE VACUUM PUMP, OR THE PRESENCE OF ABSORBED REFRIGERANT OR MOISTURE IN THE VACUUM PUMP OIL.

- iv. IF A LEAK IS THE SUSPECTED CAUSE OF INSUFFICIENT VACUUM, PERFORM A LEAK TEST OF THE REQUIRED SENSITIVITY TO LOCATE THE LEAK(S) AND REPAIR.
- v. WHEN THE REQUIRED VACUUM IS REACHED, ISOLATE THE VACUUM PUMP AND LET THE SYSTEM STAND FOR A MINIMUM OF 4 HOURS. A PRESSURE RISE OF NOT MORE THAN .4MM OF MERCURY DURING THIS PERIOD WILL INDICATE SUFFICIENT DEHYDRATION. AFTER THE SYSTEM IS COMPLETELY DEHYDRATED, CHARGE IT WITH AN INERT DRY GAS SUITABLE TO THE USE OF THE LINE. BUILD UP PRESSURE TO 50% OF DESIGN PRESSURE, TAG AND SEAL THE SYSTEM UNTIL START—UP.
- g. METHOD D-2, DEHYDRATION OF CARBON STEEL PIPE FOR LOW TEMPERATURE SERVICE BY THE ALCOHOL METHOD
  - i. THIS PROCEDURE IS RECOMMENDED WHERE SMALL AMOUNTS OF WATER ARE SUSPECTED IN THE SYSTEM, SUCH AS IN POCKETS, FITTINGS, AND VALVES.
  - ii. DRAIN AND DRY THE SYSTEM WITH CLEAN, DRY, COMPRESSED AIR. USE RESISTANCE TESTING TO ENSURE THAT THE SYSTEM IS COMPLETELY STATICALLY GROUNDED.
- h. METHOD E-1, SULFURIC ACID CLEANING OF CARBON STEEL PIPE
  - i. ACID CLEANING IS NOT EFFECTIVE FOR REMOVAL OF GREASES, OILS, AND WAXES. SURFACES SHOULD BE PRE-CLEANED USING METHOD B.
  - ii. PICKLE WITH A SOLUTION CONTAINING 5 TO 10 WEIGHT PERCENT INHIBITED SULFURIC ACID UNTIL ALL SCALE AND RUST ARE REMOVED (PICKLING TIMES OF 15 TO 20 MINUTES ARE NORMAL). HEAT AND MAINTAIN PICKLING SOLUTION BETWEEN 1600F AND 1800F.
  - iii. PUMP SOLUTION THROUGH PIPE OR IMMERSE IN A PICKLING TANK. IMMEDIATELY FLUSH WITH CLEAN WATER FOLLOWED BY A HOT WATER RINSE CONTAINING ONE HALF OUNCE PER GALLON OF SODIUM CARBONATE (NA2CO3) OR TRI-SODIUM PHOSPHATE (TSP -- NA3PO4).
  - iv. Flush with Rust inhibitor consisting of 0.5% sodium nitrite (nano2), 0.25% disodium phosphate (na2hpo4) and 0.25% monosodium phosphate (nah2po4). Dry to conform to system requirements.

## 10. INSPECTION, EXAMINATION & TESTING

THE ASME B31.3 CODE REQUIRES LEAK TESTING FOR ALL COMPONENTS. TESTING SHALL BE CARRIED OUT BY QUALIFIED PERSONNEL AS SPECIFIED BY 31.3.

## a. EXAMINATION

"EXAMINATION" IS NOT LIMITED TO WELDS. RECORDS, MATERIALS, FABRICATION, ERECTION PRESSURE TESTING, AS—BUILT, MUST ALSO BE EXAMINED AS SPECIFIED BY CODE. REFER TO THE TABLE BELOW FOR A LIST OF EXAMINATION ATTRIBUTES AND THE EXTENT OF REQUIRED EXAMINATION.

31.3 Fluid Service	Material	Fabrication	Fabrication of Longitudinal Welds	Mechanical Joints	Erection	Complete system Meets Design (2)	Other Examinations
Category D	Random	Random	Random	Random	Random	Random	Random (3)
Normal	Random	5%(5)	100%	Random(1)	Random	Random	5% Vol. (4)
Category M	Random	100%	100%	100%	Random	Random	20% Vol.
High Pressure	100%	100%	100%	100%	Random	Random	100% Rad.
Severe Cyclic	Random	100%	100%	100%	100%	Random	100% Vol.
Notes: (1) When pneumatic to be examined. (2) Includes any additication (3) Category D System	onal examination	or testing required	d by engineering.	(5) Socket welds red	quire 5% visual exa etric weld examir	n-process examination amination of final weld. nation such as a radio	·

# b. TESTING

i. THE TABLE BELOW IS A SUMMARY OF THE LEAK TEST REQUIREMENTS OF B31.3.

Fluid Service/		Тур	e of Test		
Piping Type	Hydrostatic	Pneumatic	Combined Hydro/Pneumatic	Alternative	Sensitive
Normal Fluid Service Metallic	Primary leak test method	May be substituted in lieu of the hydrostatic method when approved by the Owner.	May be substituted in lieu of the hydrostatic method when approved by the Owner.	May be substituted for the hydrostatic or pneumatic leak tests (1.)	Part of the Alternative Leak Test
Normal Fluid Service Non- Metallic	Primary leak test method	May be substituted in lieu of the hydrostatic method when approved by the Owner.	May be substituted in lieu of the hydrostatic method when approved by the Owner.	Not Applicable	Not Applicable

a) The Owner has determined a hydrostatic test would damage linings or internal insulation, or contaminate a process which would be hazardous, corrosive, or inoperative in the presence of moisture, or would present the danger of brittle fracture due to low metal temperature during the test.
b) The Owner has determined a pneumatic test would present undue hazard of possible releases of energy stored in

the system, or would present the danger of brittle fracture due to low metal temperature during the test. In either case approval of the Owner or Owner's representative is required.

- ii. TEST METHODS SHALL BE IN ACCORDANCE WITH ASME 31.3 AND SHALL USE THE TEST PRESSURES PROVIDED IN THE BIOGAS ENGINEERING LINE LIST.
- iii. BELOW IS AN EXAMPLE PRESSURE TEST RECORD. ALTERNATE FORMS MAY BE SUBMITTED FOR REVIEW.

## PRESSURE TEST RECORD

[SAMPLE - EDIT TO SUIT BUT CAPTURE ALL DATA REQUIRED FOR ASME B31 COMPLIANCE]

PROJECT NAME:  TEST INFORMATION  SYSTEM DESCRIPTION:  DESCRIPTION OF TEST BOY  DESIGN TEMPERATURE:  TEST METHOD: • HYDRO  TEST FLUID:  TEST REQUIREMENT  REQUIRED TEST PRESSURI  REQUIRED TEST DURATION  GAUGE PRESSURE CONVERSION FACTOR:  PLUS REQUIRED TEST PRESSURE  EQUALS REQUIRED GAUGE PRESSURE  TEST RESULTS  TEST DATE:  ACTUAL GAUGE PRESSURI  TEST EQUIPMENT  TYPE:	UNDARIES: ( DSTATIC  E: DN: CALCULAT TWEEN GAUGH  JRE: RESSURE: STAN	• PNEUMATIC:	DESIGN P :  APPLICAT  TEST FLU  AMBIENT	PRESSURE BLE CODE TID TEMPER TEMPER	ERATURE:	ecommended)
SYSTEM DESCRIPTION:  DESCRIPTION OF TEST BOU  DESIGN TEMPERATURE:  TEST METHOD: • HYDRO  TEST FLUID:  TEST REQUIREMENT  REQUIRED TEST PRESSURI  REQUIRED TEST DURATIO  GAUGE PRESSURE C.  ELEVATION DIFFERENCE BET  X CONVERSION FACTOR:  PLUS REQUIRED TEST PRESSU  EQUALS REQUIRED GAUGE PRESSURE  TEST RESULTS  TEST DATE:  ACTUAL GAUGE PRESSURI  TEST EQUIPMENT	UNDARIES: ( DSTATIC  E: DN: CALCULAT TWEEN GAUGH  JRE: RESSURE: STAN	PNEUMATIC:  FION  E AND HIGH POI  RT TIME:	DESIGN P :  APPLICAT  TEST FLU  AMBIENT	PRESSURE BLE CODE TID TEMPER TEMPER	ERATURE: ATURE:	ecommended)
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ELEVATION DIFFERENCE BET X CONVERSION FACTOR: PLUS REQUIRED TEST PRESSUEQUALS REQUIRED GAUGE PREST RESULTS TEST DATE:  ACTUAL GAUGE PRESSURITEST EQUIPMENT	JRE: RESSURE: STA	E AND HIGH POI	INT:			
X CONVERSION FACTOR: PLUS REQUIRED TEST PRESSU EQUALS REQUIRED GAUGE PRESSULTS TEST DATE:  ACTUAL GAUGE PRESSURI TEST EQUIPMENT	JRE: RESSURE:	RT TIME:				
PLUS REQUIRED TEST PRESSUEQUALS REQUIRED GAUGE PREST RESULTS TEST DATE:  ACTUAL GAUGE PRESSURITEST EQUIPMENT	RESSURE:					
TEST RESULTS  TEST DATE:  ACTUAL GAUGE PRESSURI  TEST EQUIPMENT	STA					
TEST DATE:  ACTUAL GAUGE PRESSURI  TEST EQUIPMENT						
ACTUAL GAUGE PRESSURI						
TEST EQUIPMENT	FINI	SH TIME:			• PM	
TEST EQUIPMENT				• AM	- 1 1/1	
	.E:					
	RANGE:	C	CAL. DATE:		CAL. DUE:	
REMARKS:						
TEST ACCEPTANCE						
CODE EXAMINER:				DATE:		
CODE INSPECTOR:				DATE:		
CODE INOLECTOR.						

11. SHIM & GROUT

CONSTRUCTOR SHALL PROVIDE THE SHOWN SHIM ALLOWANCE AND SHALL GROUT ALL MISCELLANEOUS PIPE SUPPORTS

THE FOLLOWING ITEMS DO NOT HAVE SHIM ALLOWANCE OR GROUT REQUIREMENT. CONSULT VENDOR DRAWINGS FOR EQUIPMENT MOUNTING DETAILS. UNLESS NOTED OTHERWISE, EPOXY NON-SHRINK GROUT IS REQUIRED.

- a. H2S REMOVAL VESSELS
- b. FLARE STACK
- 12. APPROVALS AND INSPECTIONS
  - a. SUBMIT ALL CONTRACTOR SUPPLIED MATERIALS TO OWNER/ENGINEER FOR APPROVAL PRIOR TO PURCHASING AND CONSTRUCTION.
  - b. FOR SOME TASKS (FOR EXAMPLE EPOXY ANCHORS) SPECIAL INSPECTIONS MAY BE REQUIRED, CONFIRM WITH AHJ PRIOR TO CONSTRUCTION AND COORDINATE WITH INSPECTING PARTY.
- 13. CONSTRUCTORS SHALL FIELD VERIFY ALL DIMENSIONS OF EXISTING ITEMS, SHOP FABRICATED AND MANUFACTURED EQUIPMENT PRIOR TO CONSTRUCTION. CONSULT OWNER AND ENGINEER, PRIOR TO CONSTRUCTION, IF ANY DISCREPANCIES ARE FOUND.

ISSUED FOR CONSTRUCTION

DATE DESCRIPTION APRV BY PROFESSIONAL ENGINEER 08/24/202 ISSUED FOR BID 02/03/202 SS TP ΑG ISSUED FOR CONSTRUCTION SS ANDRE GAMANIAN, P.E. ISSUED FOR CONSTRUCTION (REVISED) FL LICENCE NO.93370 ISSUED FOR CONSTRUCTION (REVISED) EXP. 02/28/2025

No. 93370 \*

STATE OF

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This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.

Digitally signed by Andre Gamanian Date: 2023.09.25 17:53:16-07'00'



NDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968 BIOGAS BIOGAS ENGINEERI 2321 E. 28TH STREET, SUITE 400

EMAIL: INFO@BIOGASENG.COM

2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

CONSTRUCTION NOTES (SHEET 2 OF 3

MECHANICAL, FABRICATION AND

IDRAWING ID

M-445F

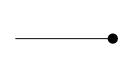
# ISOMETRIC SYMBOLS LEGEND:

FIXED PIPE SUPPORT





PIPE GUIDE



CONTINUATION TO ANOTHER SHEET OR DRAWING OR TIE IN POINT

MISCELLANEOUS PIPE SUPPORT

(SEE STRUCTURAL DRAWINGS)

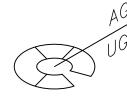


MPS-XXX

TIE IN POINT PER PROCESS DRAWINGS



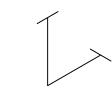
FLOW ARROW



FLOOR OR WALL PENETRATION



NOZZLE CONNECTION



THREADED CONNECTION



BUTT WELD CONNECTION



DUMMY LEG REST

# MECHANICAL ISOMETRIC GENERAL NOTES:

## 1. GENERAL NOTES:

SOCKET WELD CONNECTION

PIPE CLASS LIMIT

FIT FIELD WELD

SLOPE

EXP. 02/28/2025

- a. CONTRACTOR TO MAKE PROVISIONS FOR VARIATIONS IN FIELD DIMENSIONS AND FIT UP.
- b. WORK THIS DRAWING WITH PROCESS, MECHANICAL, CIVIL, STRUCTURAL, VENDOR DRAWINGS AND OTHER CONTRACT DOCUMENTS.
- c. CONFIRM WITH PIPING MATERIAL SPECIFICATIONS (PMS) AND OTHER CONTRACT DOCUMENTS PRIOR TO ORDERING, FABRICATION AND INSTALLATION.
- d. ITEM MARKED \* SUPPLIED BY CONTRACTOR/FABRICATOR.
- e. BILL OF MATERIAL PIPE LENGTHS ARE APPROXIMATE MINIMUM ORDERING LENGTHS.
- f. STUD BOLT LENGTH MENTIONED ON THE ISOMETRIC IS A MINIMUM VALUE; THE CONTRACTOR MAY USE A LONGER BOLT LENGTH PER SITE REQUIREMENT.

ISSUED FOR CONSTRUCTION

DRN BY CHK BY APRV BY PROFESSIONAL ENGINEER DESCRIPTION DATE ISSUED FOR CONSTRUCTION ISSUED FOR CONSTRUCTION (REVISED) SS HEATHER P. CAVANAGH, P.E. 06/21/2023 ISSUED FOR CONSTRUCTION (REVISED) ΜТ FL LICENCE NO.54607

INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

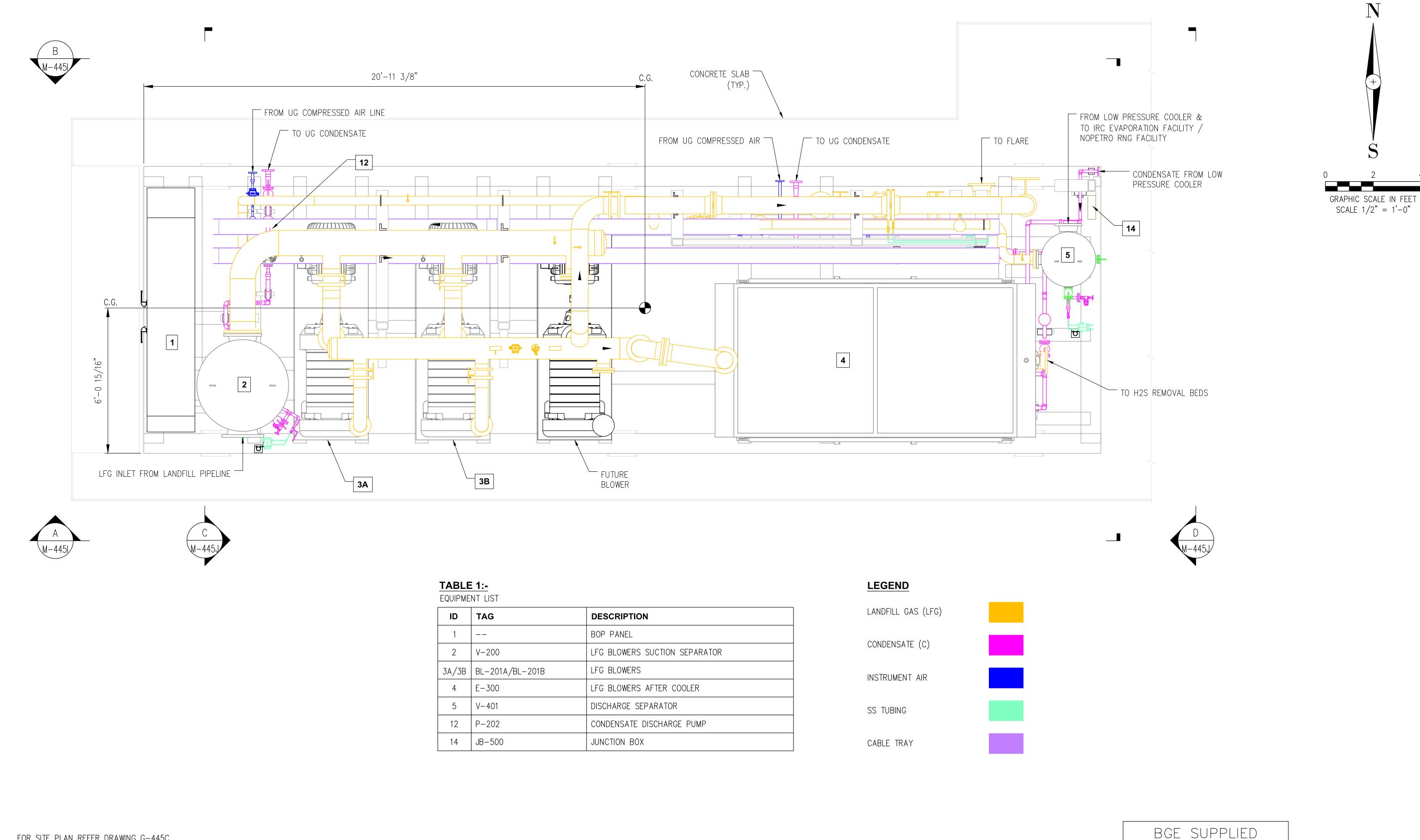


2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

**MECHANICAL ISOMETRIC GENERAL** NOTES AND LEGEND (SHEET 3 OF 3)

> DRAWING NO. M-445G

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT



FOR SITE PLAN REFER DRAWING G-445C.

ALL PIPING AND ITS FITTING IN THE PROJECT SHALL BE SS 304. EXCEPT BETWEEN THE PARTICULATE

FILTER (F-302) AND DISCHARGE SEPARATOR (V-401) WHICH WILL BE SS 316. 3. THIS DRAWING IS FOR INFORMATION PURPOSES ONLY.

DATE DESCRIPTION DRN BY CHK BY APRV BY PROFESSIONAL ENGINEER 08/24/2022 ISSUED FOR BID 02/03/202 ISSUED FOR CONSTRUCTION SS ANDRE GAMANIAN, P.E. SS ISSUED FOR CONSTRUCTION (REVISED) FL LICENCE NO.93370 ISSUED FOR CONSTRUCTION (REVISED) EXP. 02/28/2025

ORE GAMANIA CENSERA No. 93370 TO RIDA CHAMINA

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Andre Gamanian Date: 2023.09.25 17:53:16-07'00'



NDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968



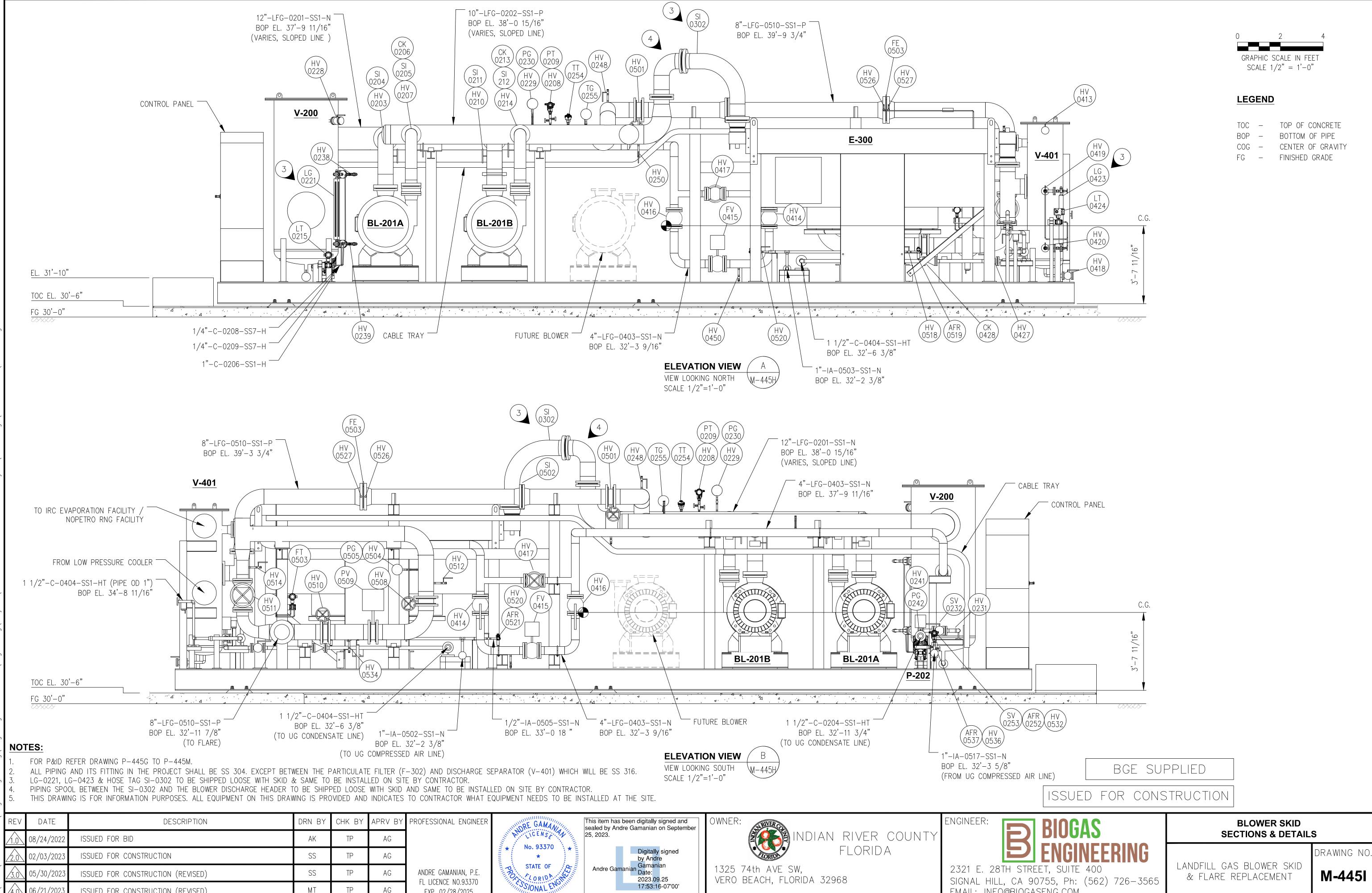
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

ISSUED FOR CONSTRUCTION

**BLOWER SKID PIPING LAYOUT** 

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. M-445H



17:53:16-07'00'

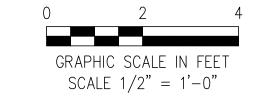
EXP. 02/28/2025

ISSUED FOR CONSTRUCTION (REVISED)

M-445I

EMAIL: INFO@BIOGASENG.COM

SCALE 1/2"=1'-0"



## **LEGEND**

TOC - TOP OF CONCRETE BOTTOM OF PIPE CENTER OF GRAVITY

FG - FINISHED GRADE

4"-LFG-0403-SS1-N  $\begin{pmatrix} HV \\ 0414 \end{pmatrix}$ (HV 0511 1 1/2"-C-0404-SS1-HT BOP EL. 34'-8 11/16" (CONDENSATE FROM LOW PRESSURE COOLER)

**ELEVATION VIEW** VIEW LOOKING WEST W-445H/ SCALE 1/2"=1'-0"

 $\begin{pmatrix}
SV \\
0426
\end{pmatrix}
\begin{pmatrix}
HV \\
0420
\end{pmatrix}
\begin{pmatrix}
LG \\
0423
\end{pmatrix}
\begin{pmatrix}
HV \\
0418
\end{pmatrix}$ 

(HV 0419)

(HV 0526)

V-401

10"-LFG-0202-SS1-P BOP EL. 39'-4 13/16"

**V-200** 

E-300

10"-LFG-0202-SS1-P

(HV 0228)

8"-LFG-0301-SS1-H

BOP EL. 35'-8 7/8"

1 1/2"-C-0302-SS1-HT

TOC EL. 30'-6"

FG 30'-0"

(TO H2S VESSELS)

# NOTES:

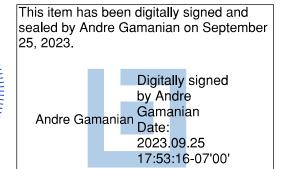
- FOR P&ID REFER DRAWING P-445G TO P-445M.
- 2. ALL PIPING AND ITS FITTING IN THE PROJECT SHALL BE SS 304. EXCEPT BETWEEN THE PARTICULATE FILTER (F-302) AND DISCHARGE SEPARATOR (V-401) WHICH WILL BE SS 316.
- LG-0221, LG-0423 & HOSE TAG SI-0302 TO BE SHIPPED LOOSE WITH SKID & SAME TO BE INSTALLED ON SITE BY CONTRACTOR. PIPING SPOOL BETWEEN THE SI-0302 AND THE BLOWER DISCHARGE HEADER TO BE SHIPPED LOOSE WITH SKID AND
- SAME TO BE INSTALLED ON SITE BY CONTRACTOR. 5. THIS DRAWING IS FOR INFORMATION PURPOSES. ALL EQUIPMENT ON THIS DRAWING IS PROVIDED AND INDICATES TO CONTRACTOR WHAT EQUIPMENT NEEDS TO BE INSTALLED AT THE SITE.

BGE SUPPLIED

ISSUED FOR CONSTRUCTION

_							
	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEE
	1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
200	2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
\ c   c	3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
, ,	4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025







NDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968



2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

**BLOWER SKID SECTIONS & DETAILS** 

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445J

# **Piping Material Specifications**

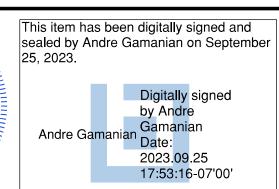
## SERVICE INDEX (PIPING)

S.No.	Spec.	Service	Fluid Symbol	Max. opt temp (°F)	Max. opt pressure psig	Press. Class (ASME)	MOC	REMARKS
		Chilled Water Supply & Return	CHWS/CHWR	+47 /+54	58			MOC of Chilled water piping shall be Carbon Steel (ERW) pipes with PUF Insulation & Aluminium sheet cladding and inside clean room SS cladding
		Cooling Water Supply & Return	CWS/CWR	92-99	43.5			
1	CS1	Hot water Supply & Return	HWS/HWR	40-55	58	150#	CS (ERW)	MOC of Hot water piping shall be Carbon Steel (ERW) pipes with Rock wool insulation and with Aluminium she cladding  Note: Max. continious operating range is for HVAC only
		Product Gas (BioMethane)	PG	77	202			
		High Speed Diesel	HSD	140	58			
2	CS3	Product Gas (BioMethane	PG	77	202	300#	CS (ERW)	
3	CS6	Product Gas (BioMethane	PG	278	975	600#	CS (ERW)	
4	GS1	Potable water	PW	Amb.	58	150#	Galvanized Carbon	MOC shall be GI Pipe for the lines running on Piperack and CPVC for lines within the Water Treatmnt plant. SS 304 ERW (SS1) for clean room Area.
4	GST	Raw water	RW	Amb.	58	150#	Steel (ERW)	
		Nitrogen (Gas)	N	Amb.	2			*MOC of Nitrogen in clean room shall be SS 316 ERW (SS5)
5	CP1	Potable Water  Jacket Pipe for	WP	Amb.	58	150#	CPVC	
		Liquid Nitrogen	JLN 	-	-	-		
		Compressed Air	CA	Amb.	116			'MOC of compressed air line shall be SS316L tubing (SS4) after 0.2 micron filter wherever applicable (SS6).
		Instrument Air	IA	Amb.	87	  -		
		Nitrogen (Gas)	N	Amb.	2			*MOC of Nitrogen in clean room shall be SS 316 ERW (SS5)
6	SS1	Liquid Nitrogen	LN	-99.4	58	150#	Stainless Steel ERW	Jacketed pipe shall be of SS 304 ERW (SS1) with vacuum insulation. Perlite insulation
		Breathing Air	ВА	Amb.	-			
		Digester Gas	DG LO	248	25 3.1	_		
		Lube Oil Process Effluent	PE	Amb	-	-		*Shall be SS304 for all above ground pipes *Shall be HDPE with Concrete Casing for Underground Piping
		Potable water	PW	Amb.	58	_		SS 304 ERW for clean room Area.
		Digester Gas	DG	248	206			
7	SS3	Lube Oil	LO	248	206	300#	Stainless Steel ERW	'MOC of compressed air line shall be SS316L tubing (SS4) after 0.2 micron filter wherever applicable (SS6).
		Lab Gas	GAS	Amb	145			*For lab gases. *Compression tubing/fittings equivalent to Swagelok/parker.
8	SS7	Compressed Air	CA	Amb	116	150#	SS 316L TUBE	MOC of compressed air line shall be SS316L tubing after 0.2 micron filter wherever applicable.
		Process Piping	PR	-	-			Internal surface finish Ra ≤0.38µ Electropolished and external finish as matte finish
		Leachate	LH	Amb	145			
9	HD1	Water	CA	Amb	116	150#	High Density Polyethylene	
		Digester Gas	DG	70	5			
		Leachate Water	LH CA	Amb	145	_		
		Natural Gas	NG	Amb	110	-	High Donoits	
10	HD2	Waste Gas	WG	Amb		150#	High Density Polyethylene	
		Product Gas	PG	Amb				
	1	Digester Gas	DG	70	5			
11	ST1	Compressed Air	CA	Amb	116	150#	SS 316 (ERW)	MOC of compressed air line shall be SS316L tubing (SS304) after 0.2 micron filter wherever applicable (SS6).
		Digester Gas	DG	248	25	_	ĺ	
		Lube Oil	LO	40	3.1			

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
1	08/24/2022	ISSUED FOR BID	AK	TP	AG	
2	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
3	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025

No. 93370





INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968



PIPING MATERIAL SPECIFICATION

(SHEET 1 OF 5)

DRAWING NO. LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT



						Pi	ping	Mate	rial S	Speci	fica	tions	5						
MATER	RIAL:	CARBON STEE	L (ERW	)						SPEC:	CS1							(	Class: 150#
Servic	es: (	Chilled Water,	Product	t Gas(E	ioMeth	ane)													
Design	Press	ure (psig)	285	260	230	215	NA	NA	NA			Са	lculatio	n Refe	rence	:			
Design	Temp	erature ( F)	100	200	300	350	NA	NA	NA				Code	of Ref	erence	:		B31	.3 - 2008
Minimun	n Tem	perature ( F)	-20	-20	-20	-20	NA	NA	NA					1	<i>N</i> aterial	:		Car	bon Steel
Minimun	n Test	Pressure (psig)	430	390	345	323	NA	NA	NA				Pr	essure	Rating	:		Cl	ass 150
Maximu	m Tes	t Pressure (psig)				820	<u> </u>	<u> </u>				Ext	ternal Pr	essure	Rating	:			15 psi
Max Co	rrosic	n Allow ance:			C	.0625"										<u> </u>			
Non	ninal F	Pipe Size (in)(	1/2	3/4	1	1½	2	2½	3	4	6	8	10	12	14	16	18	20	
		Pipe Size (NB)	15	20	25	40	50	65	80	100	150	200	250	300	350	400	450	500	
,	THK.	dule Table		SCH	30 PE					ME 36.1		SCH 40	D BE						
PIPE	TYP								ERV	√(NOTE	9)								
		NDARD ERIAL				Α:	A53 53 GR E	3							A53 3 GR B	<u> </u>			
		TYPE	SW RA	AISED F	ACE, Sei	rated				WELDI	NECK I	RAISEE	FACE,	Serrate	ed				
S	LINES	CLASS MATERIAL								150# TM A 10	)5								
LANGES		DIM STD								ME B 16									
FL	BLINDS	CLASS								RF, Ser									
	BLI	MATERIAL DIM STD								TM A 10 ME B 16									
SS	TYP		Thread		ket Weld	,Smls.		BW	, Seaml	ess				BW	, Welde	d			
FITTINGS	CLA:	SS NDARD		300 ASME								SCH 40 ASME E							
<u></u>	MAT	ERIAL		ASTM							AST	M A 234	Gr WPI	3					
LF IGS	TYP	Ξ		Socke	t Weld														
FULL/ HALF COUPLINGS	CLA:				00#														
<u> </u>		NDARD ERIAL		ASME ASTM															
BOLTIN	G							olt : AS					ed 1E 18.2.2	,					
GASKE	TS		SPIRA	L WOU	ND GAS				WINDIN	IG MAT					4SS 15	0, RF	, ASM	EΒ	
		TYPE	_		IPT, Lock		Regula	ar bore,		16.20 inged E	-	-	ASMEE	-	Manual	Leve	r Lock	able	
		CLASS	Operato	or (NOT	E 4,5,8,1	0)				150#	Ope	rator (I	NOTE 4)						
	BALL	MATERIAL				Body	- ASTM			/I A216- E or RTI			SS 304 o	r 316					
	GATE	TYPE			B) (NOT) for gate		(as	per AS	MEB1			-	nd,Serra <b>E4</b> is onl		cable fo	or gat	e valve	⇒)	
		CLASS				,				150#		•						,	
	GLOBE/	MATERIAL			TRIM 13 CED SEA				ASTM A	.216 W	CB, Tr	im-13%	CR, HA	RD FA	CED SE	AT			
		TYPE	LI	FT TYP	E B 16.5	1)			Wafe	er (Dua			_oaded). /IE B 16.5		errated				
	HECK	CLASS	<u>'</u>	u Aoivi						150#	as p		10.						
	SH	MATERIAL		-	TM A 105 S 316, S			Body	: ASTN	/I A 216	WCB	, Disc 8	& Trim-S	S 316,	Spring:	SS31	6		
	<u> </u>	TYPE					WA	FER					LUG T	/PE					
	BUTTERFLY	CLASS										150	)#						
	BUT	MATERIAL					BODY	'-ASTM	A216 V	VCB, S	PINDLE	E & DIS or 31	C-SS 30 16	4 or 31	6, BOD	Y SE	AT: SS	304	
2. No A 3. Exter 4. Use f 5. For s 6. Highe 7. For s 8. Use f 9. Use s 10. SS I TESTIN 1.DP/M 2. Radio 3. Hydro 3. Hydro	strfly V sbest nded s full bo izes er ratii izes ( flange seaml body IG: P - 10 pgrapl otest	falve 8" and abovos or its Ingradier stem ball valve share for pressure re 1/2" to 1 1/2" use, and flange to be used valve when spess pipe when speall valve can be 1% of Weld joint and yet and spressure = 1.5 X.  Test Pressure = 1	nt to be used lief system of the second of t	ed for C tem end con atch the live to be mention y mention is econ e-inchar	any part chilled wanection, counter e used a ned in the oned in the oned in the	ater sei for inst flange s on-of e P&ID	rvices. trument, requirei f valve	, vents a ment on only w	ly hen spe	ecified i	n the ∣	P&ID							

							P9			Speci	- Iouti							
MATE	RIAL:	CARBON STEE	L (ERW)	)					,	SPEC:	CS3						(	Class: 300#
		Product Gas(Bio	Methan	e)														
Design	Press	sure (psig)	740	675	655	645	NA	NA	NA			Calc	ulation	Refe	ence:			
Design	Temp	erature (F)	100	200	300	350	NA	NA	NA				Code c	f Refe	rence:		B3′	1.3 - 2008
Vlinimu	m Terr	nperature (F)	-20	-20	-20	-20	NA	NA	NA					M	aterial:		Car	bon Steel
Vlinimu	m Tes	t Pressure (psig)	1110	1015	985	968	NA	NA	NA				Pre	ssure	Rating:		Cl	ass 300
Vlaxim	um Tes	st Pressure (psig)				1320		l				Exte	nal Pre	ssure	Rating:			15 psi
Vlax Co	orrosio	on Allow ance:			0	.0625"												
No	minal	Pipe Size (in)	1/2	3/4	1	1½	2	2½	3	4	6	8	10	12	14	16	18 20	
No		Pipe Size (NB)	15	20	25	40	50	65	80	100	150	200	250	300	350	400	450 500	
	Sched THK.	dule Table	-	SCH 8	0 PF			Si	AS  CH 80 E	ME 36.1	0	SCH 5	STD BE		SCF	1 40 BE	=	
PIPE	TYP									(NOTE	10)	0011				140 DE	-	
₫		NDARD					A53								\53			
	MAT	ERIAL TYPE	SWRA	ISED FA	CE. Ser		53 GR E	3		WELDN	IECK RA	AISED F	ACE, S		GRB d			
	LINES	CLASS					<u> </u>			300#								
GES		MATERIAL DIM STD								TM A 10								
FLANG	S	CLASS								ME B 16. RF, Serr								
	BLINDS	MATERIAL								TM A 10								
	TYP	DIM STD	Thread	ed/Sock	et Weld	Smls		BW	ASI Seaml,	MEB 16.	5			BW	Welded	1		
FITTINGS	CLA		- Tim Gua	3000		,011101			CH 80 E			SCH	STD BE			- 140 BE		
FIT		NDARD		A SME E								SME B1						
	TYP	ERIAL =		ASTM							ASTM	A234 (	er WPB					
HALF INGS	CLA			300														
FULL/ HALF COUPLINGS		NDARD		ASMEE														
шО	МАТ	ERIAL		ASTM	A 105													
BOLTI	NG					I				93 Gr Bi HPTFE								
GASKI	ΞΤS		SPIRA	L WOU	ND GAS	KET, 1/	8" THK,	SS304		IG MATE 16.20	ERIAL, (	CS OUT	ER RING	3, CLA	SS 150	), RF, A	SMEB	
		TYPE	Regular				Regula	ar bore,			-	-		16.5) N	/lanual	Lever L	_ockable	
	BALL	CLASS	Operator	r (NOTE	4,5,9,1	1)				300#	Opera	ator ( <b>NC</b>	) I E 4)					
	BA	MATERIAL				Body	: ASTM	A105 o		1 А216-\ ГFМ( <b>NO</b> '		all- SS	304 or 3	316				
	ATE	TYPE		OTE 5,9			(00	nor A C	MED 1				,Serrate		oblo fo	r gata i	(alva)	
	BE/ GA	CLASS	only app	, IICADIE I	or yale	valve)	<u>l (as</u>	pei AS	vi∟ D	6.5) <b>(NO</b> 300#	· L 3) (	1401E4	· io Utily	appilo	abic 10	yaie V	aiv Cj	
	GLOBI	MATERIAL	ASTM A						A MTS	.216 WC	B Trim	<u>-13% (</u>	CR HAF	D FA	ED SE			
				RD FAC				,		er (Dual								
	\ \ \	TYPE		RFASME							as per	_						
	CHECK	CLASS		ody: AS	TN // A / A / A					300#								
		MATERIAL		Trim-SS SS3	316, S <sub>l</sub>			Body	: ASTN	/I A 216	WCB, [	Disc & T	rim-SS	316, S	Spring: \$	SS316		
		TYPE					WA	FER				L	UG TY F	Æ				
	FLY	CLASS					D0=:		A 0.40	A/OD 05		300#	00.00			/ 0=:=	. 0000	
	BUTTERFLY						1 6(11)	- A S I M	ムフィドハ	MIR SE	411111111111111111111111111111111111111	& DISC-	55 304	Or :316				

**Piping Material Specifications** SPEC: CS6 Class: 600# MATERIAL: CARBON STEEL (ERW) Services: Product Gas(BioMethane) Design Pressure (psig) | 1350 | 1315 | 1270 | 1200 | 1095 | 1075 | NA Calculation Reference: Design Temperature (F) 200 | 300 | 400 | 500 | 600 | 650 | NA B31.3 - 2008 Code of Reference: Minimum Temperature (F) -20 | -20 | -20 | NA Carbon Steel | Minimum Test Pressure (psig) | 2025 | 1975 | 1905 | 1900 | 1900 | NA Pressure Rating: Class 600 Maximum Test Pressure (psig) External Pressure Rating: 15 psi Max Corrosion Allow ance: 0.0625" 4 6 8 10 12 14 16 18 20 Nominal Pipe Size (in) 20 | 25 | 40 | 50 | 65 | 80 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | Nominal Pipe Size (NB) Schedule Table SCH 160 PE SEAMLESS ERW(NOTE 8) STANDARD A53 A53 GR B MATERIAL TYPE SW RAISED FACE, Serrated WELDNECK RAISED FACE, Serrated CLASS 600# MATERIAL ASTMA 105 DIM STD ASME B 16.5 600#, RF, Serrated CLASS MATERIAL ASTMA 105 DIM STD ASME B 16.5 BW, Welded Threaded/Socket Weld, Smls. BW, Seamless CLASS 6000# Sch. 160 ASME B16.9 STANDARD ASME B16.11 MATERIAL ASTMA105 ASTM A234 Gr WPB Socket Weld 6000# CLASS STANDARD ASME B16.11 ASTMA105 MATERIAL Bolt: ASTM A-193 Gr B7 PTFE coated BOLTING Nut: ASTM A194 Gr 2H PTFE coated, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, CS OUTER RING, CLASS 150, RF, ASME B GASKETS 16.20 TYPE CLASS MATERIAL RF, Flanged end, Serrated TYPE (as per ASME B 16.5)(**NOTE 5**) (**NOTE 4** is only applicable for gate valve) CLASS ASTM A 105N, TRIM 13% CR, 5 MATERIAL ASTM A216 WCB, Trim-13% CR, HARD FACED SEAT HARD FACED SEAT LIFT TYPE (Spring) Wafer (Dual Disc Spring Loaded), RF, Serrated RF ASME B 16.5 as per ASMEB 16.5 CLASS Body: ASTM A105, Disc & Trim-SS 316, Spring: Body: ASTM A 216 WCB, Disc & Trim-SS 316, Spring: SS316 MATERIAL SS316 TYPE WAFER LUG TYPE CLASS BODY-ASTM A216 WCB, SPINDLE & DISC-SS 304 or 316, BODY SEAT: SS304 MATERIAL or 316 1. Butterfly Valve 8" and above Gear Operated 2. No Asbestos or its Ingradient to be used in any part of valve / gasket 3. Extended stem ball valve shall be used for Chilled water services. 4. Use full bore for pressure relief system 5. For sizes 1/2" to 1 1/2" use, SW X NPT(F) end connection, for instrument, vents and drains 6. Higher rating flange to be used to match the counter flange requirement only 7.For sizes 6" and smaller butterfly valve to be used as on-off valve only when specified in the P&ID 8. Use seamless pipe when specifically mentioned in the P&ID and/or in isometric drawings TESTING:

ISSUED FOR CONSTRUCTION

DATE APRV BY PROFESSIONAL ENGINEER DESCRIPTION ISSUED FOR BID )2/03/202 ISSUED FOR CONSTRUCTION ANDRE GAMANIAN, P.E. ISSUED FOR CONSTRUCTION (REVISED) SS FL LICENCE NO.93370 ISSUED FOR CONSTRUCTION (REVISED) EXP. 02/28/2025



1 .DP/MP - 10% of Weld joint

2. Radiography - As decided by the site-incharge 3. Hydrotest pressure = 1.5 X Design pressure 4. Pneumatic Test Pressure= 1.1 X Design Pressure

> This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. by Andre Andre Gamanian Date: 2023.09.25 17:53:16-07'00'



INDIAN RIVER COUNTY FLORIDA

PIPING MATERIAL SPECIFICATION (SHEET 2 OF 5)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445L

DRAWING NO.

1325 74th AVE SW, VERO BEACH, FLORIDA 32968 ENGINEER:

1 .DP/MP - 10% of Weld joint

2. Radiography - As decided by the site-incharge 3. Hydrotest pressure = 1.5 X Design pressure

4. Pneumatic Test Pressure= 1.1 X Design Pressure

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

						Pi	ping	Mate	rial S	Speci	ficati	ions		
MATER	RIAL :	CARBON STEE	L L (GLV.	)					,	SPEC:	GS1		С	lass: 150#
Servic	es: P	otable water												
Design	Pressi	ure (psig)	232	232	NA	NA	NA	NA NA	NA			Calculation Reference:		
Design	Tempe	erature ( F)	149	149	NA	NA NA	NA	NA NA	NA NA			Code of Reference:	B31.	3 - 2008
Minimun	n Temp	perature ( F)	-20	-20	NA.	NA.	NA.	NA NA	NA			Material:	Galvanize	d Carbon steel
Minimun	n Test	Pressure (psig)	348	348	NA NA	NA NA	NA	NA NA	NA NA			Pressure Rating:		ss 150
Maximu	m Tes	t Pressure (psig)		340	IVA	375	IVA	144	INA			External Pressure Rating:		
Max Co	rrosio	n Allow ance:										External Pressure Rating.		5 psi
			1/	3/		0		L 01/	l ,			I		
		ipe Size (in)( ipe Size (NB)	½ 15	<sup>3</sup> ⁄ <sub>4</sub> 20	1 25	1½ 40	2 50	2½ 65	3 80	100	6 150			
		ule Table					ME 36.1							
	THK.					5	SCH 10							
PIPE	TYPE	IDARD	ERW	, Screw	ed, NPT	• •	E Galvani	ERW, Sc	rew ed	, NPT(M	)			
_	MATE						53 GRB							
		TYPE			Screv	v ed, Ni	PT(F),S∈	errated,	RF					
W	LINES	CLASS MATERIAL					150# A 105 (	(Chy.)						
FLANGES		DIM STD					ME B16	-						
₽.		CLASS					RF, Serr							
	BLIND	MATERIAL DIM STD					A 105 ( ME B16							
ω	TYPE				Sı		rew ed,							
FITTINGS	CLAS						2000#							
	STAN	IDARD FRIAT					ЛЕ В16. А105 (							
	TYPE						ed, NP							
HAL= LING	CLAS						2000#							
FULL/ HAL= COUPLINGS		IDARD				ASN	/IE B16.	11						
ш О	MATE	ERIAL					A105 (							
BOLTIN	G		Bolts AS		93 GR B aded Bol						coated			
GASKE	TS					m Thk. <i>i</i>	ASMEE	3 16.21.		•			40145.0	
		TYPE	2 Pie	ce Bras	ss Ball V Typ	alve-Le e,NPT (		e, Ihread	ded	Regula	r bore,	2-Piece, RF, Flanged Ends (A: 16.5)(NOTE 3)	s per ASMEB	
	BALL	CLASS	ľ		cturer's( : Forged					15	0#			
		MATERIAL	Ball: St	-	Steel or			-	Seat:			TM A216-WCB, Ball: SS 304, S	Seat: PTFE	
	эАТЕ	TYPE	Lead	Free Br	onze Va	lve,Thr	eaded T	Γype,NP	T (F)	RF, Fl end,Se				
	LOBE/G	CLASS			cturer's(					15	0#			
	CLC	MATERIAL	,		ASTM ASTM B		•	350 (ln G	Blobe			S WCB, Trim-13% CR, HARD F	ACED SEAT	
		TYPE		ee Che	ck Valve NPT(F),		-	SWIN	g rype Er	ter, Fiz nd,			<b>'</b>	
	CHECK	CLASS	Manufad						15	SME B16 0#				
	등	MATERIAL	Body: A ASTM	B584 A	84 Alloy lloy C87 S, Disc: I	850., S			Trim: 1	<del>32 16 G</del> 3% Cr., 31 410, E				
	<b>&gt;</b>	TYPE			_, 2,00. 1			<u> </u>	A1 WAFER	045 R				
	ERFL	CLASS					150	0# (Nibe			ual)			
	BUTTERFLY	MATERIAL						ASTM A	4536 , I	Disc: Al	um. Brz	. ASTM B148 Alloy 955 & Spir		
NOTE:		<u></u>						Steel A	ASTM A	\582 Ty	pe 416,	, Body Liner Material - EPDM R	ubber	
2. No A 3. Exter 4. Use f 5. Highe 6. For s TESTIN 1. Hydro	rfly Vasbestonded solull borer rationizes 6  Geographic contest potential contest po	alve 8" and above os or its Ingradier tem ball valve sh re for pressure re og flange to be us " and smaller but oressure = 1.5 X Test Pressure=1	nt to be u all be use elief syst eed to ma terfly val	ressure	ny part hilled wa counter e used a	ater ser flange	vices.	ment on	-	ecified i	າ the P8	\$.ID		

ble Water (psig) ure ( F)							;	SPEC:	CP1	Class: 150#
(psig)										
ure ( F)	150	136.5	123	97.5	75	60	43.5		Calculation Reference:	
									Code of Reference:	NA NA
ature ( F)	73	90	100	120	140	160	170			
ssure (psig)	32	32	32	32	32	32	32		Material:	C-PVC
essure (psig)	150	150	150	150	112.5	90	65.3		Pressure Rating:	Class 150
				150					External Pressure Rating:	15 psi
				0						
	1/2		1	1½	2		3	4		
Size (INB)	15	20	25			65	80	100		
.RD			Metric, I	EN ISO	15493,	Series (	S6.3, SI	DR 13.6		
\ 1	S4, S	DR 9			-					
PE	Γ <b>ν</b>	J J, G	.5,9115(			appi OV 6	oqua	-11		
ASS										
ATERIAL MISTD	P\	/C-C, G					ed equa	al		
ASS										
TERIAL	P\	/C-C, G					ed equa	al		
MISTD			Metr			93				
RD			<u>'</u>							
\L	PV	/ C-C, Ge	eorg Fisc			approve	ea equa	31.		
				Sched	ule 80					
.RD		Me	etric, EN	ISO 15	493 / IS	O 727-1	1			
\L	PV	′C-C, Ge	org Fisc	cher or	ow ner	approve	ed equa	al.		
			So	lvent Ce			TN 1 A 4	02 C* D	7 DTEC analod	
				İ						
	3mm	thick. A	SME B1	6.5 Cla	ss 150	FF. Rate				
EMENT	As furni	ished by	fittings	manufa	acturer.	Alterna	tives: (	(ow ner	approved) Cement: Henkel, Tangit Cleaner: Tangit	
PE		EN	ISO 161	35, Tru	e double	e-union,	Socke	t, Locka	ble handle. Stem extension if insulated.	
ASS								150#		
N TERIAL	Geo	org Fisch	er type	546 or	ow ner	approve	ed equa	al. PVC-	C Valve body and ball, PTFE seal, Viton O-Ring	
PE				ENI	SO 161	37. Ball	checki	type. Tr	ue double union, Socket	
ASS								150#		
TERIAL	Georg F	ischer t	/pe 562	or ow r	ner appr	oved e	•		live body and ball, Viton (FPM) seal. Stainless Stee	I
PE									•	
ASS					iric	rement	S C/W S	ax teetii	150#	
					Georg	Fische	r type 5	67 or o	w ner approved equal. PVC-C Valve body and ball,	
ATERIAL									Viton (FPM) seal.	
	RD L  BMENT PE ASS .TTERIAL  ASS .TTERIAL  RD .L  BMENT PE ASS .TTERIAL  PE ASS .TTERIAL  PE ASS .TTERIAL	Size (in) 1/2 Size (NB) 15  Metric, RD 15493, S4, S L PV PE ASS TERIAL PA ISTD  RD L PV  RD RD L PV  RD	Size (in)  Size (NB)  Size (NB)  Metric, EN ISO 15493, Series S4, SDR 9  L PVC-C, Ge ASS TERIAL PVC-C, Ge Metric EN ISO 15493, Series S4, SDR 9  L PVC-C, Ge ASS TERIAL AS furnished by PE ASS TERIAL Georg Fischer ty PE ASS TERIAL Georg Fischer ty	Size (in)         ½         ¾         1           Size (NB)         15         20         25           RD         15493, Series S4, SDR 9         Metric, ISO ISO IS4, SDR 9         Metric, ISO IS4, SDR 9           ASS         ASME BASS         ASME BASS ASS ASME BASS ASS ASME BASS ASS ASME BASS ASS ASS ASS ASS ASS ASS ASS ASS AS	Size (in)   ½	Size (in)   1/2   3/4   1   11/2   2	Size (in)   ½   ¾   1   1½   2   2½	Size (in)   ½	Size (in)   1/2   3/4   1   11/2   2   21/2   3   4	Size (n)

WATER	RIAL:	POLYETHYLEN	 E						SPE	EC: HD	1							Class: 150#
		/ater, Digester																
		ure (psig)	100	80	NA	NA	NA	NA	<u> </u>		doulati	on Pot	ferenc	٥:		1		
Design <sup>-</sup>	Tempe	erature ( F)			NA NA	NA NA	NA NA	NA NA						e.				NIA
		perature ( F)	73	73	NA NA	NA NA	NA NA	NA NA			Code							NA 
		Pressure (psig)	0	0	NA NA	NA NA	NA NA	NA NA			<u> </u>	<b>/l</b> aterial	:					HDPE
			150	120	IVA	IVA	IVA	IWA			Pres	sure Ra	ating:					100 Psi
		t Pressure (psig)								Б	ternal l	Pressu	re Ratin	ıg:				15 psi
/lax Cor	rrosio	n Allow ance:																
		Pipe Size (in)	3/4	1	1½	2	2½	3	4	6	8	10	12	14	16	18	20	
		lipe Size (NB)	20	25	40	50	65	80	100	150	200	250	300	350	400	450	500	
	THK.	lule Table					HL	OPE IRO	N PIPES SDF		5) PE34	.08						
	TYPE								Plain									
PIPE	STAI	NDARD							ASTM	D3035								
	MATI	ERIAL In one							TM D30:									
	S	TYPE CLASS							Back up #150, F									
ရှု	LINES	MATERIAL						•	ASTM									
FLANGES	٠	DIM STD							ASME	B16.5,								
- F	NDS	CLASS							#150, F									
	BLIN	MATERIAL DIM STD						AS	TM D30: ASME		408							
w	TYPE							В	utt Fusi		g							
= 1	CLAS								SDF									
MATERIAL ASTM D1248 P34 (PE3408)																		
<u> </u>	MATERIAL ASTM D1248 P34 (PE3408)																	
TYPE   Butt Fusion Fitting																		
CLASS SDR 17 STANDARD ASTM D3261																		
CAP		ERIAL						ASTM	D1248		3408)							
BOLTING	 G							: ASTM										
DA CIVE	TO.						Nut	: ASTM			SIVIE 18.	.2.2						
GASKE	15 —	1							Neop	erie								
		TYPE			Regula	ır bore,	2-Piece	e, FF, Fla	anged E	nds (A	s per A	SMEB	16.5) <b>(N</b>	IOTE 3	)			
	BALL	CLASS	Pody	· A C TRA	A 106				15	0#								
MATERIAL Ball: SS 304, Seat: Body: ASTM A216-WCB, Ball: SS 304, Seat: PTFE  Body: ASTM A216-WCB, Ball: SS 304, Seat: PTFE																		
	TYPE FF, Flanged end, Serrated ( <b>NOTE 3</b> is only applicable for gate valve)																	
	図 CLASS 150#																	
	CLASS  O  MATERIAL  ASTM A105N, TRIM 13% CR, HARD FACED  ASTM A216 WCB, Trim-13% CR, HARD FACED SEAT																	
	\ \ *	TYPE		TYPE(S SMEB				l	Flanged	l (Sw ing	type),	FF, AS	SMEB1	6.5				
	CHECK	CLASS				T			15	0#								
	S	MATERIAL	Trim 13	: ASTM. 3% Cr., 0, Disc:	Spring:	Boo	ly: AST	MA 216	WCB,	Seat &	Trim 13'	% Cr., :	Spring:	AISI 41	IO, Disc	c: A10	45	
	<u>-۲</u> ۲	TYPE									WAFE	R						
	BUTTERFLY	CLASS									150#	!						
BODY-ASTM A216 WCB, SPINDLE & DISC-SS 304, BODY SEAT: SS304										R SDIN			0.004		SEAT: (	55304		

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
1	08/24/2022	ISSUED FOR BID	AK	TP	AG	
2	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
3	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025

No. 93370 STATE OF

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Andre Gamanian Date: 2023.09.25 17:53:16-07'00'





1325 74th AVE SW, VERO BEACH, FLORIDA 32968



3. Use full bore for pressure relief system1.

1. Hydrotest pressure = 1.5 X Design pressure 2. Pneumatic Test Pressure= 1.1 X Design Pressure

4. Higher rating flange to be used to match the counter flange requirement only

5. For sizes 6" and smaller butterfly valve to be used as on-off valve only when specified in the P&ID

(SHEET 3 OF 5)

DRAWING NO. M-445M

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING MATERIAL SPECIFICATION

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

						Pi	ping	Mate	rial S	Speci	ficati	ons							
MATER	RIAL:	SS 304 (ERW)								SPEC:	SS1							C	Class: 150#
Servic	es: C	ompressed Air	, Diges	ter Ga	s, Lube	Oil											1		
Design	Press	ure (psig)	230	195	175	170	NA	NA	NA			Calc	ulation	Refe	rence:				
Design	Tempe	erature (F)	100	200	300	350	NA	NA	NA				Code	of Refe	erence:			B31	.3 - 2008
Minimur	n Tem	perature ( F)	-425	-425	-425	-425	NA	NA	NA					M	laterial:			Stair	nless Steel
		Pressure (psig)	345	295	265	255	NA	NA	NA				Pre	ssure	Rating:			Cla	ass 150
		t Pressure (psig)		440 f	or NPS ≤	6, 360	for NPS	S > 6				Exte	rnal Pre	ssure	Rating:				15 psi
Max Co	rrosio	n Allow ance:			0	.0625"													
		Pipe Size (in)	1/2	3/4	1	11/2	2	2½	3	4	6	8	10	12	14	16	18	20	
		ipe Size (NB) Iule Table	15	20	25	40	50	65	80 AS	100 ME 36.1	150 9	200	250	300	350	400	450	500	
	THK.			Sch 80S, BE         Sch 40S, BE         Sch 10S, BE           ERW(NOTE 8)															
PIPE	TYPE	NDARD		ASME A312															
	MATE			ASTM A312 Gr TP 304															
	ဖွ	TYPE CLASS	150#																
ES	LINES	MATERIAL		150#  ASTM A 182 Gr F304  ASME B 16.5															
FLANGES		DIM STD CLASS																	
	BLINDS	MATERIAL	ASTM A 182 Gr F304																
	TYPE	DIM STD	ASTM A 182 Gr F304  ASME B 16.5  Socket Weld, Smls. BW, SMLS BW, Welded																
NGS	CLAS			300			Sch			:h 40S,	BE				ch 10S				
FITTINGS	STAN	NDA RD					80S		AS	ME B16	.9								
		ERIAL	AS	TM A 18	32 Gr F30	)4				,	ASTM A	403 G	r WP 30	)4					
HALF	CLAS																		
FULL/ HALF COUPLINGS		NDARD																	
шО	MATE	ERIAL																	
BOLTIN	IG				Во	lts AST	M A-19	3 Gr B8	, Hex r	uts AS	TM A 19	4 Gr 8,	ASME	B 18.2.	2				
GASKE	TS			SG	SASKET,	1/8" TH	IK, 316	SS COF	RE, GRA	APHITE	FACED,	CLAS	S 150, F	RF, ASI	ME B16	.20			
		TYPE	-		NPT, Loc		Regula	ar bore,	RF, Fla	inged E	-	-	SME B TE 4,5)	-	<i>l</i> lanual	Lever	Locka	ble	
	BALL	CLASS								150#									
	_	MATERIAL			Bod	y- AST	M A 182			STM A3 E or RTF			ill- SS 3	04 or 3	316				
	GATE	TYPE			7) ( <b>NOTE</b> for gate		(as	per AS	MFR1		F, Flang				able fo	r gate	valve		
		CLASS	<u> </u>		. or gate	• • • • • • • • • • • • • • • • • • • •	(40	<b>POI</b> 7 10		150#				- cappilo		. gate			
	GLOBE/	MATERIAL			В	ody- A	STM A1			ASTM.			Disc- S	S 316,					
		TYPE			Spring) I			000		er (Dual	Disc sp	oring Lo		RF, Se	rrated				
	HECK	CLASS		geu, A	SIVIE D I	5.5				150#	as per	ASIVIE	В 16.5						
	뿡																		
		MATERIAL				AS	TM A35	1 Gr. Cl	=8, Disc	c & Trim	SS 316	S, Sprin	g SS 3′	16					
	FLY	TYPE					WA	FER				L	UG TY	PE					
	BUTTERFLY	CLASS					RODV	ASTMA	\ 351 C	FRM S	DINIDI E	150#		1 or 31	6 BOD	V SE	∆ T. CC	304	
	B	MATERIAL					BOD1-	AOTIVIA	1331 0	i olvi , o		or 316		+ 01 31	0, 000	1 30	11. 00	JU4	
2. No A 3. Exter 4. Use 1 5. For s 6. Highe 7. Use 1 8. Use s TESTIN 1. DP/M 2. Radio	erfly V sbeste nded s full boo sizes 1 er ratir flange seame IG: IP - 10 ograph	alve 8" and above os or its Ingredier stem ball valve sh- re for pressure re /2" to 1 1/2" use, ng flange to be us d valve w hen spi ess pipe w hen sp % of Weld joint ny - As decided b	nt to be used all be used lief syst NPT(F) ed to made cifically becifically by the site.	sed in a ed for C em end con atch the mention mention	iny part of thilled was nection, counter ned in the ned in the	ater ser for ins flange P&ID	vices. trument requirer	, vents ment on	ly										
3. Hydr	otest	oressure = 1.5 X	Design p	ressure	)														

L: SS 304 (ERW Digester Gas, ssure (psig) Imperature (F) Emperature (F) Est Pressure (psig Est Pressure (psig Sion Allow ance: Il Pipe Size (NB) Inedule Table IlK.	600 100 -425 900 1/ <sub>2</sub>	505 200 -425 760 440 fc	455 300 -425 680	440				SPEC:								Class: 300#
ssure (psig)  Inperature (F)  Imperature (F)  Imperature (F)  Imperature (Psignal Fressure (Psignal Fressure (Psignal Fressure (Psignal Fressure (Psignal Fressure (Psignal Fressure (In))  In Pipe Size (In)  In Pipe Size (NB)  Interdule Table	600 100 -425 900 1)	200 -425 760	300	440												
emperature (F) est Pressure (psig est Pressure (psig sion Allow ance: al Pipe Size (in) Il Pipe Size (NB) nedule Table	100 -425 900 0)	200 -425 760	300	770	NA	NA	NA			Calc	ulation	Refer	ence.			
est Pressure (psignest Pressure	-425 900 0 1)	- <b>4</b> 25	-425	350	NA NA		NA NA			Jaio	Code				D3′	.3 - 2008
est Pressure (psignest Pressure	900	760				NA 					Code c					
est Pressure (psignsion Allow ance:  al Pipe Size (in)  Il Pipe Size (NB)  nedule Table	1/2		680	-425	NA	NA ———	NA						aterial:			nless Steel
sion Allow ance: al Pipe Size (in) al Pipe Size (NB) nedule Table	1/2	440 fc		660	NA	NA	NA					ssure l				ass 300
al Pipe Size (in) Il Pipe Size (NB) nedule Table			rNPS≤		for NPS	S > 6 ———				Exter	nal Pre	ssure l	Rating:			15 psi
Il Pipe Size (NB) nedule Table			0.	.0625"												
nedule Table		<sup>3</sup> ⁄ <sub>4</sub> 20	1 25	1½ 40	2 50	2½ 65	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16	18 20 450 500	
 K.	15	20	25	40	50	00		ME 36.1		200	250	300	350	400	450 500	
		Scl	n 80S, B	E				h 40S, I				S	ch 10S	, BE		
PE								(NOTE								
ANDARD ATERIAL						А		ME A 31. 312 Gr								
TYPE	SW RA	ISED FA	CE, Ser	rated			~ i IVI /\			AISED F	ACE, S	errated	d l			
CLASS																
						A										
CLACC																
MATERIAL																
DIMISTO		ASME B 16.5														
	Sc				Sch				<u> </u>							
ANDARD		3000	<i>)</i> π		80S									, DL		
ATERIAL	AS	TM A 18	2 Gr F30	)4						403 Gr	- WP 30	4				
PE																
ASS																
ANDARD																
ATERIAL																
			Во	lts AST	M A-19	3 Gr B8										
							, Hex n	uts AS	ΓM A 194	4 Gr 8,	ASME	3 18.2.	2			
		SG	ASKET,	1/8" T⊦	ŀK, 316									.20		
TYPE	_	r bore, N	NPT, Loc	kable		SS COF	RE, GRA	\PHITE F	FACED,	CLASS per A	SME B	RF, ASM	/IE B16		Lockable	
	_	r bore, N		kable		SS COF	RE, GRA	\PHITE F	FACED,	CLASS per A	SME B	RF, ASM	/IE B16		Lockable	
	_	r bore, N	NPT, Loc OTE 4,5	kable 8)	Regula	SS COF	RE, GRARE, Fla	NPHITE F	FACED, nds, (As Operat	CLASS per A or ( <b>NO</b>	S 300, F SME B TE 4,5)	RF, ASM	∕IEB16 ¶anuall		Lockable	
CLASS MATERIAL	Ope SW,(N	r bore, N	Bod	kable (8) y- AST	Regula M A 182	SS COF ar bore,	RE, GRA RF, Fla  4 or AS Seat-	APHITE F  anged Er  anged F  a	FACED,  Operate  To Gr. Cote 6)	CLASS per A or (NO	S 300, F SME B TE 4,5)	2F, ASM 16.5) M 24 or 3	/IE B16 l'anual I	_ever I		
CLASS MATERIAL TYPE	Ope	r bore, N	Bod	kable (8) y- AST	Regula M A 182	SS COF ar bore,	RE, GRA RF, Fla  4 or AS Seat-	APHITE Finged Endinged nded Endinged En	FACED,  Operate  To Gr. Cote 6)	CLASS per A or (NO	S 300, F SME B TE 4,5)	2F, ASM 16.5) M 24 or 3	/IE B16 l'anual I	_ever I		
CLASS  MATERIAL  TYPE  CLASS	Ope SW,(N	r bore, N rator (N OTE 5,8	Bod  (NOTE	kable 8) y- AST 4 is valve)	Regula M A 182 (as	SS COF ar bore, Gr F30 per AS	RE, GRA  RF, Fla  4 or AS  Seat-1	APHITE F anged Er 300# STM A38 IFM(No1 RI 6.5)(NO 300#	FACED, nds, (As Operation 51 Gr. Cte 6) F, Flang TE 5) (M	CLASS per A or (NO	S 300, F SME B TE 4,5) II- SS 30 Serrate	RF, ASM 16.5) M D4 or 3 ed applica	/IE B16 l'anual I 16 able for	_ever I		
CLASS  MATERIAL  TYPE  CLASS  MATERIAL	SW,(N only app	r bore, N rator (N OTE 5,8 blicable t	Bod	kable 8) y- AST 4 is valve)	Regula M A 182 (as	SS COF ar bore, Gr F30 per AS	RE, GRA RF, Fla 4 or AS Seat-1 ME B 16	APHITE F anged Er 300# STM A38 IFM(No1 RI 6.5)(NO 300#	FACED, ands, (As Operation of the Company of the Co	CLASS per A or (NO CF8. Ba ed end NOTE 4	S 300, F SME B TE 4,5) II- SS 30 Serrate is only	D4 or 3 applicate & Tri	/IE B16  Ilanual I  16  able for	_ever I		
CLASS  MATERIAL  TYPE  CLASS  MATERIAL  TYPE	SW,(N only app	r bore, N rator (N OTE 5,8 blicable t	Bod  (NOTE for gate	kable 8)  y- AST  4 is valve)  MA182	Regula M A 182 (as	SS COF ar bore, Gr F30 per AS	RE, GRARE, Fla  4 or AS Seat-1  ME B 16  Wafe	APHITE F anged Er 300# STM A 38 FFM( <b>No</b> 1 Ri 6.5)( <b>NO</b> 300# 51 Gr. C	FACED, ands, (As Operation of the Company of the Co	CLASS s per A or (NO CF8. Ba ed end NOTE 4	S 300, F SME B TE 4,5) II- SS 30 Serrate is only	D4 or 3 applicate & Tri	/IE B16  Ilanual I  16  able for	_ever I		
CLASS  MATERIAL  TYPE  CLASS  MATERIAL  TYPE  CLASS	SW,(N only app	r bore, N rator (N OTE 5,8 blicable t	Bod  (NOTE for gate  Spring) I	kable 8)  y- AST  4 is valve)  MA182	Regula M A 182 (as	SS COF ar bore, Gr F30 per AS	RE, GRARE, Fla  4 or AS Seat-1  ME B 16  Wafe	APHITE F anged Er ang	FACED,  Inds, (As Operation  51 Gr. Cte 6)  F, Flang  TE 5) (N	CLASS s per A or (NO CF8. Ba ed end NOTE 4	S 300, F SME B TE 4,5) II- SS 30 Serrate is only	D4 or 3 applicate & Tri	/IE B16  Ilanual I  16  able for	_ever I		
CLASS  MATERIAL  TYPE  CLASS  MATERIAL  TYPE	SW,(N only app	r bore, N rator (N OTE 5,8 blicable t	Bod  (NOTE for gate  Spring) I	kable 8) y- AST 4 is valve) MA182 RF, 3.5	Regula M A 182 (as	SS COF ar bore, Gr F30 per AS	RE, GRARE, Fla	APHITE F anged Er 300# STM A 38 FFM( <b>No</b> 1 Ri 6.5)( <b>NO</b> 300# 51 Gr. C	FACED,  Inds, (As Operation  To a first control  F, Flang  TE 5) (N  CF8. Disc  Disc Sp  as per	CLASS s per A or (NO CF8. Ba ed end NOTE 4 c- SS 3 ring Lo A SME	S 300, F SME B TE 4,5) II- SS 30 Serrate is only	D4 or 3 applica	/IE B16  Ilanual I  16  able for	_ever I		
CLASS  MATERIAL  TYPE  CLASS  MATERIAL  TYPE  CLASS  MATERIAL	SW,(N only app	r bore, N rator (N OTE 5,8 blicable t	Bod  (NOTE for gate  Spring) I	kable 8) y- AST 4 is valve) MA182 RF, 3.5	Regula M A 182 (as	SS COF ar bore, Gr F30 per AS	RE, GRARE, Fla	APHITE F anged Er 300# STM A 38 FFM( <b>No</b> 1 RI 6.5)( <b>NO</b> 300# 51 Gr. C	FACED,  Inds, (As Operation  To a first control  F, Flang  TE 5) (N  CF8. Disc  Disc Sp  as per	CLASS s per A or (NO CF8. Ba ed end NOTE 4 c- SS 3 ring Lo A SME	S 300, F SME B TE 4,5) II- SS 30 Serrate is only	D4 or 3 applica	/IE B16  Ilanual I  16  able for	_ever I		
CLASS  MATERIAL  TYPE  CLASS  MATERIAL  TYPE  CLASS  MATERIAL  MATERIAL	SW,(N only app	r bore, N rator (N OTE 5,8 blicable t	Bod  (NOTE for gate  Spring) I	kable 8) y- AST 4 is valve) MA182 RF, 3.5	Regula M A 182  (as	SS COF ar bore, c Gr F30 per AS 4 or AS	RE, GRARE, Fla	APHITE F anged Er ang	FACED, ands, (As Operation of the Grand of t	CLASS s per A or (NO CF8. Ba ed end NOTE4 c- SS 3 ring Lo ASME	S 300, F SME B TE 4,5)  II- SS 30 ,Serrate is only  316, Sea aded), B 16.5	D4 or 3	//E B16  //anual I	gate v		
/ / / / / / / / / / / / / / / / / / /	CLASS MATERIAL DIM STD CLASS MATERIAL DIM STD PE ASS ANDARD TERIAL PE ASS	CLASS MATERIAL DIM STD CLASS MATERIAL DIM STD  PE SC ASS ANDARD TERIAL AST ASS ANDARD	CLASS MATERIAL DIM STD  CLASS MATERIAL DIM STD  PE Socket We ASS ANDARD  TERIAL ASTM A 18.  PE ASS ANDARD	CLASS MATERIAL DIM STD CLASS MATERIAL DIM STD  PE Socket Weld, Smls. ANDARD TERIAL ASS ANDARD TERIAL ASS ANDARD TERIAL Bo	CLASS MATERIAL DIM STD CLASS MATERIAL DIM STD  E Socket Weld, Smls. ASS ANDARD TERIAL ASTM A 182 Gr F304  DE ASS ANDARD TERIAL TERIAL TERIAL	CLASS MATERIAL DIM STD  CLASS MATERIAL DIM STD  PE Socket Weld, Smls. ASS 3000# 80S  ANDARD  TERIAL ASTM A 182 Gr F304  PE ASS ANDARD  TERIAL TERIAL	CLASS  MATERIAL  DIM STD  CLASS  MATERIAL  DIM STD  PE  Socket Weld, Smls.  ASS  3000#  Sch 80S  ANDARD  TERIAL  ASTM A 182 Gr F304  PE  ASS  ANDARD  TERIAL  TERIAL	CLASS  MATERIAL  DIM STD  CLASS  CLASS  MATERIAL  DIM STD  ASTM A  BW, S  ANDARD  ASTM A  ASTM	CLASS  MATERIAL  DIM STD  CLASS  CLASS  ASTM A 182 Gr  ASME B 16.  CLASS  MATERIAL  DIM STD  ASTM A 182 Gr  ASME B 16.  DE  Socket Weld, Smls.  BW, SMLS  ASS  ANDARD  ASTM A 182 Gr F304  ASTM A 182 Gr F304  ASS  ANDARD	CLASS         300#           MATERIAL         ASTM A 182 Gr F304           DIM STD         ASME B 16.5           CLASS         300#, RF, Serrated           MATERIAL         ASTM A 182 Gr F304           DIM STD         ASME B 16.5           PE         Socket Weld, Smls.         BW, SMLS           ASS         3000#         Sch 80S         Sch 40S, BE           ANDARD         ASTM A 182 Gr F304         ASTM A           PE         ASTM A 182 Gr F304         ASTM A	CLASS         300#           MATERIAL         ASTM A 182 Gr F304           DIM STD         ASME B 16.5           CLASS         300#, RF, Serrated           MATERIAL         ASTM A 182 Gr F304           DIM STD         ASME B 16.5           DE         Socket Weld, Smls.         BW, SMLS           ASS         3000#         Sch 80S         Sch 40S, BE           ANDARD         ASTM A 182 Gr F304         ASTM A 403 Gr           DE         ASTM A 182 Gr F304         ASTM A 403 Gr	CLASS   300#     MATERIAL   ASTM A 182 Gr F304     DIM STD   ASME B 16.5     CLASS   300#, RF, Serrated     MATERIAL   ASTM A 182 Gr F304     DIM STD   ASME B 16.5     DE	CLASS 300#  MATERIAL ASTM A 182 Gr F304  DIM STD ASME B 16.5  CLASS 300#, RF, Serrated  MATERIAL ASTM A 182 Gr F304  DIM STD ASME B 16.5  PE Socket Weld, Smls. BW, SMLS B'  ASS 3000# Sch 80S Sch 40S, BE Sch 80DARD ASME B16.9  TERIAL ASTM A 182 Gr F304  ASS ANDARD  ASS ANDARD  ASS ANDARD	CLASS 300#  MATERIAL ASTM A 182 Gr F304  DIM STD ASME B 16.5  CLASS 300#, RF, Serrated  MATERIAL ASTM A 182 Gr F304  DIM STD ASME B 16.5  PE Socket Weld, Smls. BW, SMLS BW, Well  ASS 3000# Sch 40S, BE Sch 10S  ANDARD ASTM A 182 Gr F304  ASTM A 182 Gr F304  ASTM A 182 Gr F304  ASS 3000# Sch 40S, BE Sch 10S  ANDARD ASTM A 182 Gr F304  ASTM A 403 Gr WP 304  ASS  ANDARD	CLASS   300#     MATERIAL   ASTM A 182 Gr F304     DIM STD   ASME B 16.5     CLASS   300#, RF, Serrated     MATERIAL   ASTM A 182 Gr F304     DIM STD   ASME B 16.5     DEE   Socket Weld, Smls.   BW, SMLS   BW, Welded     ASS   3000#   Sch   80S   Sch 40S, BE   Sch 10S, BE     ANDARD   ASTM A 182 Gr F304   ASTM A 403 Gr WP 304     DEE   ASS   ANDARD     ASS   ANDARD   TERIAL   ASTM A 182 Gr F304   ASTM A 403 Gr WP 304     TERIAL   ASTM A 403 Gr	CLASS         300#           MATERIAL         ASTM A 182 Gr F304           DIM STD         ASME B 16.5           CLASS         300#, RF, Serrated           MATERIAL         ASTM A 182 Gr F304           DIM STD         ASME B 16.5           DE         Socket Weld, Smls.         BW, SMLS         BW, Welded           ASS         3000#         Sch 80S         Sch 40S, BE         Sch 10S, BE           ANDARD         ASTM A 182 Gr F304         ASTM A 403 Gr WP 304           DE         ASS         ANDARD

MATERIA	AL: SS 316L TUE	E						,	PEC: SS7	Class: 150#
SERVICE	: Product Gas(E	ioMethar	ne), Cor	npress	ed Air	, Diges	ter Ga	s		l .
Design Pro	essure (psig)	2000	2000	1890	1675	1555	1425	930	Calculation Reference:	
Design Te	mperature (F)	100	300	400	600	800	900	1000	Code of Reference:	B31.3 - 2008
Minimum T	emperature (F)	-425	-425	-425	-425	-425	-425	-425	Material:	Stainless Steel
Minimum T	est Pressure (psiç	) 3000	3000	3055	3110	3140	3025	2080	Pressure Rating:	2000 PSI
Vlaximum i	Test Pressure (ps	g)	ı		3330	l	l		External Pressure Rating:	15 psi
Vlax Corro	osion Allow ance:				.01"					
	e OD Size (in)	1/8	1/4	3/8	1/2	3/4	1			
	e OD Size (mm)	6	8	10 N/-	12.7	19.05	25.4			
	HK. MM	0.035	0.065	0.065		0.109	0.12			
₩ ⊢	YPE			mless,						
	TANDARD ———————————————————————————————————		I6L, Har	TM A26 dness 8	0 HRB,	Cold dra				
	YPE			att finish compre	_			errule (0	ompression fittings) Hardness 80	
z L	LASS	1				NA	HRE	3		
	MTERIAL IM STD					v agelok SS 316L				
<u> </u>	LASS					3 3 10L				
$\mathbb{R} = \mathbb{R}$	IATERIAL IM STD									
SS	YPE	Double	ferrule	compre	ssion ty	pe w ith	back fo		ompression fittings) Hardness 80	
⊢ ⊢	LASS HK./END			ļ	Suitable	NA e for sw	aging			
	ATERAL					SS 316L	aging			
GS LT	YPE									
$\supset$ $\subseteq$ $\vdash$	LASS									
	TANDARD MTERIAL	-								
GA SKETS		4mm O	-Ring PT	FE (Foo	_	e) to con		th CFR	1.177.2600 /	
SEAL RIN	 G			s		= 00D G				
	TYPE					v ay Typ				
	CLASS		2500	)#, NPT(				rule en	<u> </u>	
	MATERIAL			, 111 1(		S 316L		100 011	S1	
	TYPE -:					v ay Typ				
ו עט	CLASS		2500	)#, NPT(			back fei	rule en	5,	
4LVE	MATERIAL	1			S	S 316L				
VALVES					Li 	ft Type				
\ \	TYPE			 TQIV #C	(Femal	e) w ith	back fe	rrule en	s	
\ \	TYPE  CLASS		2500	<i>)</i>						

ISSUED FOR CONSTRUCTION

DESCRIPTION CHK BY APRV BY PROFESSIONAL ENGINEER DATE ISSUED FOR BID ISSUED FOR CONSTRUCTION ANDRE GAMANIAN, P.E. ISSUED FOR CONSTRUCTION (REVISED) SS FL LICENCE NO.93370 ISSUED FOR CONSTRUCTION (REVISED) EXP. 02/28/2025

ICENS AND No. 93370 STATE OF TORIDA CHANGE

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Digitally signed by Andre Andre Gamanian Date: 2023.09.25 17:53:16-07'00'



INDIAN RIVER COUNTY FLORIDA

VERO BEACH, FLORIDA 32968

ENGINEER:

PIPING MATERIAL SPECIFICATION (SHEET 4 OF 5)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. M-445N

Radiography - As decided by the site-incharge
 Hydrotest pressure = 1.5 X Design pressure

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

							Pilig	Mate	rial Sp	pecii	licati	0113						
ATE	RIAL:	POLYETHYLEN	E						SPEC	C: HD2								Class: 150#
		/ater, Leachate	, Diges	ter Gas	5													
esign	Press	ure (psig)	200	193	160	128	110	NA		Ca	lculati	on Ref	erenc	е:				
esign	Tempe	erature (F)	73	73	73	73	73	NA			Code o	f Refe	ence:					NA
inimu	n Tem	perature ( F)	0	0	0	0	0	NA			N	/laterial	:					HDPE
linimu	n Test	Pressure (psig)	300	289.5	240	192	165	NA			Press	sure Ra	iting:					200 Psi
aximu	ım Tes	t Pressure (psig)		•				•		Ex	ternal F	ressui	e Ratin	g:				15 psi
ax Co	rrosio	n Allow ance:																
No	minal F	Pipe Size (in)	3/4	1	1½	2	2½	3	4	6	8	10	12	14	16	18	20	
		ipe Size (NB) dule Table	20	25	40	50	65	80 DE IDOI		150 TE (IDC	200	250	300	350	400	450	500	
	THK.						HL	JPE IRUI	N PIPE SIZ SDR		) PE34	U8 ———						
Щ	TYPE								Plain E									
PIPE	STAN	NDA RD							ASTMD	3035							$\overline{}$	
	MATI	ERIAL		ASTM D3035, PE3408														
		TYPE							Back up I									
45	LINES	CLASS						į	#150, Fla									
FLANGES	=	MATERIAL							ASTM A									
Ā		DIM STD							ASMEB									
Щ	NDS	CLASS MATERIAL			#150, Flat Face ASTM D3035, PE3408													
	BLIND	DIM STD							ASMEB		100							
	TYPE								utt Fusior		r						+	
NGS	CLAS								SDR		<b>.</b>						+	
FITTINGS		NDA RD							ASTMD									
正	МАТІ	ERIA L						ASTM	D1248 P	34 (PE	3408)							
9 N	TYPE	<u> </u>						В	utt Fusior	n Fitting	3							
CAP \ COUPLING	CLAS	SS							SDR	7								
D/0	STAI	NDARD							ASTMD	3261								
CA	MATI	ERIAL							D1248 P									
OLTIN	lG								A-307 G A563 Gr									
ASKE	ETS								Neopre									
	Ι	TYPE			Regula	r bore.	2-Piece	e. FF. Fla	anged En	ıds (As	per A	SME B	16.5)( <b>N</b>	OTE 3	<u> </u>			
	BALL	CLASS							150#		<u>'</u>							
	BA	MATERIAL		: ASTM. SS 304,				Body	: ASTMA	\216-V	VCB, Ba	all: SS :	304, Se	at: PTF	E			
	 	TYPE		PTFE	FF, F	l langed	end,Se	errated (	NOTE 3	is only	applica	able for	gate v	alve)				
	3E/ GATE	CLASS							150	#							$\dashv$	
	GLOBE/	MATERIAL	ASTM 13% CR	IA105N R, HARD				ASTM	4216 WC	CB, Trin	n-13% ∣	CR, HA	RD FA	CED SE	AT			
		TYPE	LIFT	TYPE (S SME B 1	pring)			ſ	Flanged (	(Sw ing	type),	FF, AS	MEB1	6.5				
	성	CLASS							150;	#								
	CHECK	MATERIAL	Trim 13	ASTM / 3% Cr., 9 0, Disc:	Spring:	Boo	y: AST	W A 216	WCB, Se		rim 13°	% Cr., \$	Spring:	AISI 41	0, Disc	:: A10	45	
		TYPE									WAFE	₹						
	ERF.	CLASS									150#							
	BUTTERFLY	MATERIAL				E	BODY-A	STM A2	216 WCB	, SPINE	DLE & D	DISC-S	304, E	BODY S	SEAT: S	SS304		
													, -					

3. Use full bore for pressure relief system1. 4. Higher rating flange to be used to match the counter flange requirement only 5. For sizes 6" and smaller butterfly valve to be used as on-off valve only when specified in the P&ID 1. Hydrotest pressure = 1.5 X Design pressure 2. Pneumatic Test Pressure= 1.1 X Design Pressure

Services:					۲ 	iping	wiatei	iai 5	µeCI1	icatio	اار ——						
	.: SS 316 (ERW)							S	SPEC: S	ST1							Class: 150#
Design Pres	Compressed A	ir, Diges	ter Ga	s, Lube	Oil												
	ssure (psig)	230	195	175	170	NA	NA	NA			Calc	ulation	Refer	ence:			
Design Tem	perature (F)	100	200	300	350	NA NA	NA	NA				Code o	of Refe	rence:			31.3 - 2008
Minimum Te	mperature ( F)	-425	-425	-425	-425	NA NA	NA NA	NA					M	aterial:		St	ainless Steel
Minimum Te	st Pressure (psig)		295	265	255	NA NA	NA NA	NA NA				Dro	ssure				Class 150
Maximum Te	est Pressure (psig							IVA			E.1-						
	ion Allow ance:		440 t			) for NPS	> 6				⊨xte	rnal Pre	ssure	⊰atıng:			15 psi
			1	(	).0625"	Γ											
	I Pipe Size (in)	1/2	3/4	1	1½	2	2½	3	4	6	8	10	12	14	16	18 2	
	Pipe Size (NB) edule Table	15	ASME 36.19												00		
THE			Sch 80S, PE Sch 40S, BE Sch 10S, BE														
TYF	PE		SEAMLESS ERW(NOTE 8)														
017	A NDA RD		ASME B 36.19  ASTM A312 Gr TP 316														
MA	TERIAL	CIALDA	SW RAISED FACE. Serrated.   WELD NECK RAISED FACE OR_ SLIP ON RAISE FACE OR_ LAP FLANGE WITH											H			
ပ္သ	TYPE	J SVV KA	CS RING, Serrated  150#														
ES	MATERIAL		ASTM A 182 Gr F316														
FLANGES	DIM STD		ASME B 16.5 150#, RF, Serrated														
lσ	CLASS	150#, RF, Serrated ASTM A 182 Gr F316															
BLIND	MATERIAL DIM STD		ASME B 16.5														
(O TYF		Socket \															
8	ASS	Socket Weld,SMLS (NOTE 11)         BW, SMLS         BW, Welded           3000#         SCH 80S         Sch 40S         Sch 10S, BE															
E ST/	ANDARD		ASME	316.11						AS	ME B16	5.9					
MA	TERIAL	AS <sup>-</sup>	TM A 18	2 Gr F3	16				Α	STMA	403 Gr	WP 316	8				
S LA	PE	soci	ket Weld	d (Note 1	1)												
<b>⊅</b> ≗ ⊢	ASS		300														
7 7 101/	ANDARD		ASME	316.11													
20 31/	TEDIAL	1 40-	TN // A 10	2 Cr E20	14												
IMA'	TERIAL	AS <sup>-</sup>	TM A 18	2 Gr F30		<b></b>											
IMA'	TERIAL	AS	TM A 18			TM A-19:	3 Gr B8,	Hex nu	uts AST	M A 194	Gr 8, <i>i</i>	A SME E	3 18.2.2	)			
BOLTING  GASKETS	TERIAL			В	olts AS	TM A-19:									SME B1	16.20	
BOLTING	TERIAL TYPE	SS	GASKE	Bo T, 1/8" T NPT, Loc	olts AS HK, 316 kable	6 SS COI	RE & OU	TER RI	NG, GRA	APHITE ds, (As	FACED	CLAS	S 150,	RF, AS		l6.20 Lockable	
BOLTING GASKETS	TYPE	SS	GASKE	B <sub>0</sub>	olts AS HK, 316 kable	6 SS COI	RE & OU	TER R <b>IN</b> RF, Flar	NG, GRA	APHITE	FACED	CLAS	S 150,	RF, AS			
BOLTING	TYPE CLASS	SS	GASKE	B <sub>1</sub> T, 1/8" T NPT, Loc <b>OTE 4,5</b>	HK, 319 Kable	6 SS COI	RE & OU	TER RIN	NG, GRA	APHITE ds, (As Operato	FACED per AS pr (NOT	, CLAS SME B 1 E <b>4,5)</b>	S 150, 6.5) Ma	RF, AS			
BOLTING GASKETS	TYPE CLASS MATERIAL	SS Regular Ope	GASKE r bore, f rator ( <b>N</b>	Boo T, 1/8" T NPT, Loc <b>OTE 4,5</b>	HK, 310 kable , <b>7</b> )	6 SS COI Regula	RE & OU	TER RIN	NG, GRA nged En 150# TM A35 or RTFE	APHITE  ds, (As  Operato  1 Gr. C	FACED per AS pr (NOT	, CLAS SME B 1 E <b>4,5)</b> - SS 31	S 150, 6.5) Ma 6 or 31	RF, AS			
BOLTING GASKETS	TYPE CLASS MATERIAL	SS Regular Ope	GASKE r bore, f rator (N	B <sub>1</sub> T, 1/8" T NPT, Loc <b>OTE 4,5</b>	HK, 316 kable ,7)	6 SS COI Regula	RE & OU	TER RIF RF, Flan	NG, GRA nged En 150# TM A35 or RTFE	APHITE  ds, (As Operato  1 Gr. C  or TFM  Flange	per AS per AS pr (NOT	SME B 1 - SS 31	S 150, 6.5) Ma 6 or 31	RF, AS	ever L	_ockable	
BOLTING GASKETS  BALL  GATE	TYPE CLASS MATERIAL TYPE	SS Regular Ope	GASKE r bore, f rator (N	Book Book Book Book Book Book Book Book	HK, 316 kable ,7)	6 SS COI Regula	RE & OU r bore, I Gr F316 Sea	TER RIF	NG, GRA nged En 150# TM A35 or RTFE	APHITE  ds, (As Operato  1 Gr. C  or TFM  Flange	per AS per AS pr (NOT	SME B 1 - SS 31	S 150, 6.5) Ma 6 or 31	RF, AS	ever L	_ockable	
BOLTING GASKETS	TYPE CLASS MATERIAL TYPE	SS Regular Ope	GASKE r bore, f rator (N	BOOK BOOK BOOK BOOK BOOK BOOK BOOK BOOK	HK, 314 kable ,7) dy- AS	6 SS COI Regula	RE & OU r bore, I Gr F316 Seat per ASM	TER RINGS or AS III-PTFE	NG, GRAING ASTM ASTM ASTM ASTM A	APHITE  ds, (As Operato  1 Gr. C  or TFM  Flange  FE 5) (N	per AS per (NOT F8. Ball A ed end, NOTE 4	SME B 1 - SS 31 - Serrate is only a	S 150, 6.5) Ma 6 or 31 d applica	RF, AS	ever L	_ockable	
BOLTING GASKETS  BALL  GATE	TYPE CLASS MATERIAL TYPE	SS Regular Ope SW,(Nonly app	GASKE r bore, I rator (N  IOTE 5,7  Dilicable	Boo OTE 4,5 Boo 7) (NOTE for gate	HK, 314 kable ,7) E4 is valve)	6 SS COF Regula TM A 182 (as	RE & OU r bore, I Gr F316 Seat per ASM	TER RINGS or AS to PTFE	NG, GRA  Iged En  I50#  TM A35  or RTFE  RF  .5)(NOT  I50#  ASTM A  or RTFI	APHITE  ds, (As Operato  1 Gr. C  E or TFM  Flange  FE 5) (N  351 Gr  E or TFI  Disc spi	per AS per (NOT F8. Ball floored control contr	SME B 1 FE 4,5) - SS 31 - SS 31 Serrate is only a	S 150, 6.5) Ma 6 or 31 d applica	RF, AS anual L	ever L	_ockable	
BOLTING GASKETS BALL BALL	TYPE CLASS MATERIAL TYPE CLASS MATERIAL TYPE	SS Regular Ope SW,(Nonly app	GASKE r bore, I rator (N  IOTE 5,7  Dilicable	Boo OTE 4,5 Boo 7) (NOTE	HK, 314 kable ,7) E4 is valve)	6 SS COF Regula TM A 182 (as	RE & OU r bore, I Gr F316 Seat per ASM	TER RINGS or AS to PTFE  316 or AS to PTFE  Wafel	NG, GRA  Iged En  I50#  TM A35 or RTFE  RF  .5)(NOT  I50#  ASTM A or RTFI	APHITE  ds, (As Operato  1 Gr. C  E or TFN  Flange  (E 5) (N	per AS per (NOT F8. Ball floored control contr	SME B 1 FE 4,5) - SS 31 - SS 31 Serrate is only a	S 150, 6.5) Ma 6 or 31 d applica	RF, AS anual L	ever L	_ockable	
BOLTING GASKETS  BALL  GATE	TYPE CLASS MATERIAL TYPE CLASS MATERIAL TYPE CLASS	SS Regular Ope SW,(Nonly app	GASKE r bore, I rator (N  IOTE 5,7  Dilicable	Boo OTE 4,5 Boo 7) (NOTE for gate	HK, 314 kable ,7)  E4 is valve)  Body- A	Regula TM A 182 (as	Gr F316 Sear per ASM 82 Gr F3	TER RINGS or AS 1- PTFE Wafei	NG, GRA  Iged En  I50#  TM A35 or RTFE  RF  .5)(NOT  I50#  ASTM A or RTFI r (Dual I	APHITE  ds, (As Operato  1 Gr. C  E or TFN  , Flange  E 5) (N  351 Gr  E or TFI  Disc spi as per	per AS pr (NOT F8. Ball ded end, NOTE 4  . CF8. I	SME B 1 FE 4,5) Serrate is only a Disc- SS aded), F3 16.5	S 150, 6.5) Ma 6 or 31 d applica S 316, RF, Ser	RF, AS anual L	ever L	_ockable	
BOLTING GASKETS  BOLTON  GASKETS  BALL  BALL	TYPE CLASS MATERIAL TYPE CLASS MATERIAL TYPE CLASS	SS Regular Ope SW,(Nonly app	GASKE r bore, I rator (N  IOTE 5,7  Dilicable	Boo OTE 4,5 Boo 7) (NOTE for gate	HK, 314 kable ,7)  E4 is valve)  Body- A	6 SS COF Regula TM A 182 (as	Gr F316 Sear per ASM 82 Gr F3	TER RINGS or AS 1- PTFE Wafei	NG, GRA  Iged En  I50#  TM A35 or RTFE  RF  .5)(NOT  I50#  ASTM A or RTFI r (Dual I	APHITE  ds, (As Operato  1 Gr. C  E or TFN  , Flange  E 5) (N  351 Gr  E or TFI  Disc spi as per	per AS pr (NOT F8. Ball ded end, NOTE 4  . CF8. I	SME B 1 FE 4,5) Serrate is only a Disc- SS aded), F3 16.5	S 150, 6.5) Ma 6 or 31 d applica S 316, RF, Ser	RF, AS anual L	ever L	_ockable	
BOLTING GASKETS  CHECK GLOBE/GATE BALL	TYPE CLASS MATERIAL TYPE CLASS MATERIAL TYPE CLASS MATERIAL	SS Regular Ope SW,(Nonly app	GASKE r bore, I rator (N  IOTE 5,7  Dilicable	Boo OTE 4,5 Boo 7) (NOTE for gate	HK, 314 kable ,7)  E4 is valve)  Body- A	Regula TM A 182 (as	Gr F316 Sear per ASM 82 Gr F3	TER RINGS or AS 1- PTFE Wafei	NG, GRA  Iged En  I50#  TM A35 or RTFE  RF  .5)(NOT  I50#  ASTM A or RTFI r (Dual I	APHITE  ds, (As Operato  1 Gr. C  E or TFN  , Flange  E 5) (N  351 Gr  E or TFI  Disc spi as per	per AS pr (NOT F8. Ball fled end, OTE 4  . CF8. I M ring Loa A SME I	SME B 1 FE 4,5) Serrate is only a Disc- SS aded), F3 16.5	S 150, 6.5) Ma 6 or 31 d applica S 316, RF, Ser	RF, AS anual L 6 ble for	ever L	_ockable	
BOLTING GASKETS  BOLTON  GASKETS  BALL  BALL	TYPE CLASS MATERIAL TYPE CLASS MATERIAL TYPE CLASS MATERIAL	SS Regular Ope SW,(Nonly app	GASKE r bore, I rator (N  IOTE 5,7  Dilicable	Boo OTE 4,5 Boo 7) (NOTE for gate	HK, 314 kable ,7)  E4 is valve)  Body- A	Regula TM A182  (as	Gr F316 Sear per ASM 82 Gr F3 Sea	TER RIF	NG, GRAID ING ASTM A STM	APHITE  ds, (As Operato  1 Gr. C  5 or TFN  7, Flange FE 5) (N  1351 Gr  E or TFI  Disc spi as per	FACED per AS or (NOT  F8. Ball A ed end, NOTE 4  . CF8. I M ring Loa ASME I  Spring  LUG T  150#	SME B 1 FE 4,5) Serrate is only a Disc- SS aded), F B 16.5 SS 316	S 150, 6.5) Ma 6 or 31 d applica	RF, AS	gate v	_ockable	

ISSUED FOR CONSTRUCTION

DATE CHK BY APRV BY PROFESSIONAL ENGINEER DESCRIPTION ISSUED FOR BID ISSUED FOR CONSTRUCTION ANDRE GAMANIAN, P.E. SS ISSUED FOR CONSTRUCTION (REVISED) FL LICENCE NO.93370 ISSUED FOR CONSTRUCTION (REVISED) EXP. 02/28/2025

TICENS AND SS/ONAL ENGINEERS STATE OF

2. Radiography - As decided by the site-incharge 3. Hydrotest pressure = 1.5 X Design pressure

> This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Andre Gamanian Gamanian Date: 2023.09.25 17:53:16-07'00'



INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968



SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

2321 E. 28TH STREET, SUITE 400

PIPING MATERIAL SPECIFICATION (SHEET 5 OF 5)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

| M-4450 |

Biog	gas Eng	gineering	IFC			IRC					LANDFILL (	GAS BLOW	ER SKID AND FL	ARE REPI	LACEMENT	7										
	<b>C</b>	ou							IAMETER			ATING DITION	DESIGN	CONDITIO	ONS	F	PIPE SYSTE	M DETAILS				PRES	SS. TEST	HEAT		
REVI	NO S	LINE NO	FROM	то	FLUID	COMMODITY DESCRIPTION	P&ID NO	PHASE	NOMINAL D	PIPING CLASS	APP. WOR.	WOR. TEMP.	PRESS.		темр.	MATERIAL	RATING	TRACING	INSULA	TION	/нт	ГҮРЕ	MIN PRESSURE	TRACE LENGTH FT	NOTES I	REMARKS
-									IN	<u> </u>	psig	°F	MIN MA	-+	N MAX °F				ТҮРЕ	THICK inch			psig	-		
1.0	0 01	14"-LFG-0101-SS1-N	BATTERY LIMIT LFG	V-200( LFG BLOWERS SUCTION SEPARATOR)	LFG	PROCESS GAS	P-445G	V	14"	SS1	-2.2	120	- 1		150	STAINLESS STEEL	150	NA	N		IA	Н	15			STICK BUILT (CONTRACTOR SCOPE)
1.0	0 01	.02 8"-LFG-0102-SS1-HT	8"-LFG-0402-SS1-HT	12"-LFG-0115-SS1-N	LFG	PROCESS GAS	P-445H	V	8"	SS1	5	40	- 1	4 24	150	STAINLESS STEEL	150	ETR	HT	1 1	JA	Н	21	58		STICK BUILT (CONTRACTOR SCOPE)
1.0	01	.03 6"-LFG-0103-SS1-HT	8"-LFG-0402-SS1-HT	6"-LFG-0116-SS1-N	LFG	PROCESS GAS	P-445H	V	6"	SS1	5	40	- 1	4 24	150	STAINLESS STEEL	150	ETR	HT	1 1	JA	——— Н	21	38		STICK BUILT (CONTRACTOR SCOPE)
1.0		.04 2"-IA-0104-SS1-N	BATTERY LIMIT INSTRUMENT SUPPLY	TO DISTRIBUTION HEADER	IA	INSTRUMENT AIR	P-445G	V	2"	SS1	90	40	- 10	00 24		STAINLESS STEEL	150	NA	N	NA I	IA	Н	150			STICK BUILT (CONTRACTOR SCOPE)
2.0	0 01	L05 1/4"-LFG-0105-SS7-N	8"-LFG-0102-SS1-HT	FE-0118	LFG	PROCESS GAS	P-445H	V	1/4"	SS7	5	40	- 1	4 24	150	SS TUBING	150	NA	N	NA I	JA	Н	21			STICK BUILT (CONTRACTOR SCOPE)
2.0		1/4"-LFG-0106-SS7-N	8"-LFG-0102-SS1-HT	FE-0118	LFG	PROCESS GAS	P-445H	V	1/4"	SS7	5	40	- 1	4 24	150	SS TUBING	150	NA	N	NA I	JA	Н	21			STICK BUILT (CONTRACTOR SCOPE)
.≟ 1.0	01	1/4"-LFG-0107-SS7-N	8"-LFG-0402-SS1-HT	F-0126 GENE FILTER	LFG	PROCESS GAS	P-445H	V	1/4"	SS7	5	40	- 1	4 24	150	SS TUBING	150	NA	N	NA I	JA	Н	21			STICK BUILT (CONTRACTOR SCOPE)
된 1.0		1/4"-CH-0108-SS7-N	HELIUM CARRIER GAS CYL	AE-0127		HELIUM GAS	P-445H	V	1/4"	SS7	265	95		00 24	150	SS TUBING	150	NA	N		JA	Н	450			STICK BUILT (CONTRACTOR SCOPE)
1.0		1/4"-CH-0109-SS7-N	CALIBRATION GAS CYL	AE-0127		CALIBRATION GAS		V	1/4"	SS7	65	70	- 12	25 24	150	SS TUBING	150	NA NA	N		JA .	H	187.5			STICK BUILT (CONTRACTOR SCOPE)
2 1.0		1/4"-LFG-0110-SS7-N	AE-0127 AE-0127	1/2"-LFG-0114-SS7-N	LFG		P-445H P-445H	V	1/4"	SS7	5	40	- 1	4 24	150	SS TUBING	150	NA NA	N	NA I	<u> </u>	NA	NA NA			STICK BUILT (CONTRACTOR SCOPE)
1.0	$\begin{array}{c c} 0 & 01 \\ \hline 0 & 01 \\ \end{array}$	111 1/4"-LFG-0111-SS7-N 112 1/4"-LFG-0112-SS7-N	AE-0127	1/2"-LFG-0114-SS7-N 1/2"-LFG-0114-SS7-N	LFG	PROCESS GAS PROCESS GAS	P-445H	V V	1/4	SS7	5	40	- 1	4 24	150	SS TUBING SS TUBING	150 150	NA NA	N N	NA I		NA NA	NA NA			STICK BUILT (CONTRACTOR SCOPE) STICK BUILT (CONTRACTOR SCOPE)
90 10			AE-0127	1/2"-LFG-0114-SS7-N	_	PROCESS GAS	P-445H	\ \ \ \ \	1/4"	SS7	5	40	- 1	4 24	150		150	NA NA	N			NA	NA NA			STICK BUILT (CONTRACTOR SCOPE)
		1/2"-LFG-0114-SS7-N	AE-0127	VENT		PROCESS GAS	P-445H	V	1/2"	SS7	5	40	- 1		150	SS TUBING	150	NA NA	N		<del></del>	NA	NA NA			STICK BUILT (CONTRACTOR SCOPE)
6 × 2.0		12"-LFG-0115-SS1-N	8"-LFG-0102-SS1-HT	BATTERY LIMIT PIPELINE RNG- FACILITY	LFG	PROCESS GAS	P-445G	¥	12"	SS1	5	40	- 1	4 24	150	STAINLESS STEEL	<del>150</del>	NA	N	NA I	<del>IA</del>	H	<del>15</del>	6	HEAT TRACE ABOVEGROUND PORTIO	NA
<del>7.0</del> <del>2.0</del>	01	8"-LFG-0116-SS1-N	6"-LFG-0103-SS1-HT	BATTERY LIMIT PIPELINE EVAP- FACILITY	LFG	PROCESS GAS	P-445G	¥	8"	SS1	5	40	- 1	4 24	150	STAINLESS STEEL	<del>150</del>	NA	н	NA I	<del>I</del> A	Ħ	<del>15</del>	6	HEAT TRACE ABOVEGROUND PORTIO	NA
≥ 2.0	01	1/4"-LFG-0117-SS7-N	6"-LFG-0103-SS1-HT	FE-0113	LFG	PROCESS GAS	P-445H	V	1/4"	SS7	5	40	- 1	4 24	150	SS TUBING	150	NA	N	NA I	IA	Н	21			STICK BUILT (CONTRACTOR SCOPE)
2.0	01	1/4"-LFG-0118-SS7-N	6"-LFG-0103-SS1-HT	FE-0113	LFG	PROCESS GAS	P-445H	V	1/4"	SS7	5	40	- 1	4 24	150	SS TUBING	150	NA	N	NA I	JA	Н	21			STICK BUILT (CONTRACTOR SCOPE)
1.0	01	119 2"-C-0119-HD1-N	1 1/2"-C-0204-SS1-HT	2"-C-0120-HD1-N	С	CONDENSATE	P-445G	L	2"	HD1	15	60	- 1	5 24	150	HDPE	150	NA	N	NA I	JA	Н	15			STICK BUILT (CONTRACTOR SCOPE)
1.0	0 01	2"-C-0120-HD1-N	2"-C-0121-SS1-N	BATTERY LIMIT CONDENSATE PIPELINE	С	CONDENSATE	P-445G	L	2"	HD1	15	60	- 1	5 24	150	HDPE	150	NA	N	NA I	IA	Н	15			STICK BUILT (CONTRACTOR SCOPE)
1.0	01	2"-C-0121-SS1-N	BATTERY LIMIT CONDENSATE PIPELINE FROM RNG	2"-C-0120-HD1-N	С	CONDENSATE	P-445G	L	2"	SS1	15	60	- 1	5 24	150	STAINLESS STEEL	150	NA	N	NA I	JA	Н	15			STICK BUILT (CONTRACTOR SCOPE)
2.0	01	1/4"-C-0122-SS7-N	2"-C-0121-SS1-N	FE-0134	E	CONDENSATE	P-445G	F	1/4"	SS7	15	60	- 1	5 24	150	SS TUBING	150	NA	H	NA I	<del>I</del> A	Ħ	15			NA
∑ <del>2.0</del>	01	1/4"-C-0123-SS7-N	2"-C-0121-SS1-N	FE-0134	E	CONDENSATE	P-445G	F	1/4"	<del>SS7</del>	<del>15</del>	60	- 1	5 <del>2</del> 4	150	SS TUBING	<del>150</del>	NA	H	NA I	<del>IA</del>	Ħ	<del>15</del>			NA
sb 1.0	01	124 XX-LFG-0124-SS7-N	PSV-01XX	VENT	LFG	PROCESS GAS	P-445H	V	XX	SS7	5	40	- 1	4 24	150	SS TUBING	150	NA	N	NA I	JA	NA	NA			STICK BUILT (CONTRACTOR SCOPE)
.⊆ ≥ 1.0	01	2"-C-0125-HD1-N	1 1/2"-C-0404-SS1-HT	2"-C-0120-HD1-N	C	CONDENSATE	P-445G	L	2"	HD1	5	60	- 1	5 24	150	HDPE	150	NA	N	NA I	JA	Н	15	1		STICK BUILT (CONTRACTOR SCOPE)
<u>ک</u> ر 2.0	01	8"-LFG-0126-SS1-N	8"-LFG-0127-HD1-N	TO EVAP FACILITY	LFG	PROCESS GAS	P-445G	¥	8"	SS1	5	40	- 1	4 <del>2</del> 4	150	STAINLESS STEEL	<del>150</del>	NA	44	t AH	₩	Ħ	<del>15</del>			NA
2 1.0	01	27 8"-LFG-0127-HD1-N	6"-LFG-0103-SS1-HT	BATTERY LIMIT	LFG	PROCESS GAS	P-445G	V	8"	HD1	5	40	- 1	4 24	150	HDPE	150	NA	N	NA I	IA	Н	15			STICK BUILT (CONTRACTOR SCOPE)
1.0	02	201 12"-LFG-0201-SS1-P	V-200( LFG BLOWERS SUCTION SEPARATOR)	BL-201A/B (LFG BLOWER)	LFG	PROCESS GAS	P-445I	V	12"	SS1	-2.2	120	- 1	0 24	150	STAINLESS STEEL	150	NA	Р	1	IA	Н	15			SKID MODULE (BGE SCOPE)
1.0 je	02	202 10"-LFG-0202-SS1-N	BL-201A/B (LFG BLOWER)	E-300 (LFG BLOWERS AFTER COOLER)	LFG	PROCESS GAS	P-445I	V	10"	SS1	7	265	- 1	4 24	300	STAINLESS STEEL	150	NA	N	NA I	IA	Н	21			SKID MODULE (BGE SCOPE)
1.0	02	204 1 1/2"-C-0204-SS1-HT	P-202 (CONDENSATE PUMP)	2"-C-0119-HD1-N	С	CONDENSATE	P-445I	L	1 1/2"	SS1	15	120	- 1	5 24	150	STAINLESS STEEL	150	ETR	нт	1	IA .	Н	22.5	10		SKID MODULE (BGE SCOPE)
9ip   1.0	02		V-200( LFG BLOWERS SUCTION SEPARATOR)		С	CONDENSATE	P-445I	L	1"	SS1	15	120	- 1	5 24	150	STAINLESS STEEL	150	NA	н	1	IA	Н	22.5			SKID MODULE (BGE SCOPE)
1.0	02	207 TRIM-V-0207-SS1-N	V-200( LFG BLOWERS SUCTION SEPARATOR)	N TRIM	V	CONDENSATE	P-445I	L	TRIM	SS1	15	120	- 1	5 24	150	STAINLESS STEEL	150	NA	N	NA I	JA	Н	22.5			SKID MODULE (BGE SCOPE)
1.0		208 1/4"-C-0208-SS7-H	1"-C-0206-SS1-N	LT-0215	С	CONDENSATE	P-445I	L	1/4"	SS7	15	120	- 1	5 24		SS TUBING	150	NA	Н		JA	Н	22.5			SKID MODULE (BGE SCOPE)
1.0		209 1/4"-C-0209-SS7-H	1"-C-0206-SS1-N	LT-0215	C	CONDENSATE	P-445I	L	1/4"	SS7	15	120	<del>                                     </del>	5 24		SS TUBING	150	NA NA	H		IA I	H	22.5			SKID MODULE (BGE SCOPE)
1.ts/1.0	)   U2	212  1/2"-IA-0212-SS7-N	1"-IA-0517-SS1-N	P-202 (CONDENSATE PUMP)	IA	INSTRUMENT AIR	P-445I	l V	1/2"	SS7	90	40	-   10	00 24	100	SS TUBING	150	NA	N	NA I	IA	Н	150			SKID MODULE (BGE SCOPE)
e l																										

NOTE:-

IN THE REMARK COLUMN,

IF IT IS MENTIONED "SKID MODULE", IT IS BGE SCOPE OF SUPPLY.

AND IF IT IS MENTIONED "STICK BUILT", IT IS CONTRACTOR SCOPE OF SUPPLY.

DATE DRN BY CHK BY APRV BY PROFESSIONAL ENGINEER DESCRIPTION ISSUED FOR BID ISSUED FOR CONSTRUCTION ISSUED FOR CONSTRUCTION (REVISED) SS ISSUED FOR CONSTRUCTION (REVISED)

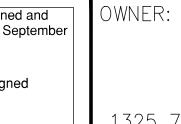
ICENS AND No. 93370 TAIL OF A STANDARD ST STATE OF

ANDRE GAMANIAN, P.E.

FL LICENCE NO.93370

EXP. 02/28/2025

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Digitally signed by Andre Andre Gamanian Date: 2023.09.25 17:53:16-07'00'





INDIAN RIVER COUNTY FLORIDA

VERO BEACH, FLORIDA 32968



ISSUED FOR CONSTRUCTION

LINE LIST (SHEET 1 OF 3)

DRAWING NO. LANDFILL GAS BLOWER SKID

M-445P & FLARE REPLACEMENT

1325 74th AVE SW,

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

Biog	as Engine	ering	IFC			IRC					LANDFILL (	GAS BLOW	ER SKID ANI	D FLARE RI	PLACE	MENT												
	ou :								IAMETER		OPER. COND	ATING DITION	DESI	IGN CONDI	TIONS		F	PIPE SYSTE	M DETAILS				PRES	S. TEST	HEAT			
REV	Sequence	LINE NO	FROM	ТО	FLUID	COMMODITY DESCRIPTION	P&ID NO	PHASE	OMINAL D	PIPING CLASS	APP. WOR. PRESS.	WOR. TEMP.	PRES	is.	TEM	Р.	MATERIAL	RATING	TRACING	INSU	LATION	PWHT	TYPE	MIN PRESSURE	TRACE LENGTH, FT	NOT	ΓES	REMARKS
									IN	<u> </u>	psig	°F		MAX I	VIIN I	°F				TYPE	THICK inch			psig	-			
2.0	0301	8"-LFG-0301-SS1-H	E-300 (LFG BLOWERS AFTER COOLER)	8"-LFG-0318-SS1-H	LFG	PROCESS GAS	P-445J	V	8"	SS1	7	120	-	14	24	150	STAINLESS STEEL	150	NA	Н	1	NA	н	21				SKID MODULE (BGE SCOPE)
1.0	0302	1 1/2"-C-0302-SS1-HT	8"-LFG-0301-SS1-H	1 1/2"-C-0404-SS1-HT	С	CONDENSATE	P-445J	L	1 1/2"	SS1	7	120	-	14	24	150	STAINLESS STEEL	150	ETR	нт	1	NA	н	21	14			SKID MODULE (BGE SCOPE)
1.0	0303	8"-LFG-0303-SS1-H	8"-LFG-0318-SS1-H	V-301B H2S REMOVAL BED VESSEL	LFG	PROCESS GAS	P-445J	V	8"	SS1	7	120	-	14	24	150	STAINLESS STEEL	150	NA	н	1	NA	Н	21				STICK BUILT (CONTRACTOR SCOPE)
1.0	0304	8"-LFG-0304-SS1-H	V-301A H2S REMOVAL BED VESSEL	8"-LFG-0311-SS1-H	LFG	PROCESS GAS	P-445J	V	8"	SS1	7	120	-	14	24	150	STAINLESS STEEL	150	NA	Н	1	NA	Н	21	(	99		STICK BUILT (CONTRACTOR SCOPE)
1.0	0305	8"-LFG-0305-SS1-H	V-301B H2S REMOVAL BED VESSEL	8"-LFG-0311-SS1-H	LFG	PROCESS GAS	P-445J	V	8"	SS1	7	120	-	14	24	150	STAINLESS STEEL	150	NA	Н	1	NA	Н	21				STICK BUILT (CONTRACTOR SCOPE)
보 1.0	0306	8"-LFG-0306-SS1-H	8"-LFG-0303-SS1-H	8"-LFG-0305-SS1-H	LFG	PROCESS GAS	P-445J	V	8"	SS1	7	120	-	14	24	150	STAINLESS STEEL	150	NA	Н	1	NA	Н	21				STICK BUILT (CONTRACTOR SCOPE)
<u>5</u> 1.0	0307	1/2"-LFG-0307-SS7-H	V-301A H2S REMOVAL BED	DPG-0340	LFG	PROCESS GAS	P-445J	V	1/2"	SS7	7	95	-	50	24	150	SS TUBING	150	NA	Н	1	NA	NA	NA				STICK BUILT (CONTRACTOR SCOPE)
1.0	0308	1/2"-LFG-0308-SS7-H	V-301A H2S REMOVAL BED VESSEL	DPG-0340	LFG	PROCESS GAS	P-445J	V	1/2"	SS7	5	84	-	14	24	150	SS TUBING	150	NA	н	1	NA	н	21				STICK BUILT (CONTRACTOR SCOPE)
1.0	0309	1/2"-LFG-0309-SS7-H	V-301B H2S REMOVAL BED VESSEL	DPG-0343	LFG	PROCESS GAS	P-445J	V	1/2"	SS7	5	120	-	125	24	150	SS TUBING	150	NA	н	1	NA	н	187.5				STICK BUILT (CONTRACTOR SCOPE)
1.0	0310	1/2"-LFG-0310-SS7-H	V-301B H2S REMOVAL BED VESSEL	DPG-0343	LFG	PROCESS GAS	P-445J	V	1/2"	SS7	5	120	-	125	24	150	SS TUBING	150	NA	н	1	NA	Н	187.5				STICK BUILT (CONTRACTOR SCOPE)
3 0 1.0	0311	8"-LFG-0311-SS1-H	8"-LFG-0304-SS1-H	F-302 FILTER	LFG	PROCESS GAS	P-445J	V	8"	SS1	7	120	-	14	24	150	STAINLESS STEEL	150	NA	Н	1	NA	Н	21				STICK BUILT (CONTRACTOR SCOPE)
2.0	0312	8"-LFG-0312-ST1-H	F-302 FILTER	E-400 LOW PRESSURE COOLER	LFG	PROCESS GAS	P-445J	V	8"	ST1	7	120	-	14	24	150	STAINLESS STEEL 316	150	NA	Н	1	NA	Н	21				STICK BUILT (CONTRACTOR SCOPE)
≥ 1.0		1/4"-LFG-0313-SS7-N	F-302 FILTER	DPG-0335	_	PROCESS GAS	P-445J	V	1/4"	SS7	7	120	-	14	-	150	SS TUBING	150	NA	N	NA	NA	Н	21				STICK BUILT (CONTRACTOR SCOPE)
1.0	0314	1/4"-LFG-0314-SS7-N	F-302 FILTER	DPG-0335	LFG	PROCESS GAS	P-445J	V	1/4"	SS7	7	120	-	14	24	150	SS TUBING	150	NA	N	NA	NA	H	21				STICK BUILT (CONTRACTOR SCOPE)
2.0.	0315	TRIM-V-0315-SS1-H	V-301A/B H2S REMOVAL BED VESSEL	TRIM VALVES	LFG	PROCESS GAS	P-445J	V	TRIM	SS1	7	120	-	14	24	150	STAINLESS STEEL	150	NA	Н	1	NA	н	21				STICK BUILT (CONTRACTOR SCOPE)
2.0   2.0	0316	TRIM-V-0316-SS1-H	F-302 PARTICULATE FILTER	TRIM VALVES	LFG	PROCESS GAS	P-445J	V	TRIM	SS1	7	120	-	14	24	150	STAINLESS STEEL	150	NA	н	1	NA	Н	21				STICK BUILT (CONTRACTOR SCOPE)
2.0 Wechai	0317	8"-LFG-0317-SS1-H	8"-LFG-0318-SS1-H	V-301A H2S REMOVAL BED VESSEL	LFG	PROCESS GAS	P-445J	V	8"	SS1	7	120	-	14	24	150	STAINLESS STEEL	150	NA	н	1	NA	Н	21				STICK BUILT (CONTRACTOR SCOPE)
	0318	8"-LFG-0318-SS1-H	8"-LFG-0301-SS1-H	8"-LFG-0317-SS1-H & 8"-LFG- 0303-SS1-H	LFG	PROCESS GAS	P-445J	V	8"	SS1	7	120	_	14	24	150	STAINLESS STEEL	150	NA	н	1	NA	Н	21				STICK BUILT (CONTRACTOR SCOPE)
2.0	0401	8"-LFG-0401-ST1-C	E-400 LOW PRESSURE COOLER	V-401(DISCHARGE SEPARATOR)	LFG	PROCESS GAS	P-445K	V	8"	ST1	5	120	-	14	24	150	STAINLESS STEEL 316	5 150	NA	С	1	NA	Н	21				STICK BUILT (CONTRACTOR SCOPE)
1.0	0402	8"-LFG-0402-SS1-HT	V-401(DISCHARGE SEPARATOR	8"-LFG-0102-SS1-HT	LFG	PROCESS GAS	P-445K	V	8"	SS1	5	120	-	14	24	150	STAINLESS STEEL	150	ETR	HT	1	NA	Н	21	30			STICK BUILT (CONTRACTOR SCOPE)
1.0	0403	4"-LFG-0403-SS1-N	V-401(DISCHARGE SEPARATOR	V-200( LFG BLOWERS SUCTION SEPARATOR)	LFG	PROCESS GAS	P-445K	V	4"	SS1	5	120	-	14	24	150	STAINLESS STEEL	150	NA	N	NA	NA	Н	21				SKID MODULE (BGE SCOPE)
1.0	0404	1 1/2"-C-0404-SS1-HT	V-401(DISCHARGE SEPARATOR	R) 2"-C-0125-HD1-N	С	CONDENSATE	P-445K	L	1 1/2"	SS1	5	120	-	14	24	150	STAINLESS STEEL	150	ETR	HT	1	NA	н	21	26			SKID MODULE (BGE SCOPE)
1.0	0405	1"-C-0405-SS1-C	V-401(DISCHARGE SEPARATOR	R) LG-0423	С	CONDENSATE	P-445K	L	1"	SS1	5	120	-	14	24	150	STAINLESS STEEL	150	NA	С	1	NA	н	21				SKID MODULE (BGE SCOPE)
1.0	0406	TRIM-V-0406-SS1-N	V-401(DISCHARGE SEPARATOR	TRIM VALVES	V	PROCESS GAS	P-445K	V	TRIM	SS1	5	120	-	14	24	150	STAINLESS STEEL	150	NA	N	NA	NA	Н	21				SKID MODULE (BGE SCOPE)
1.0	0407	1/4"-C-0407-SS7-C	V-401(DISCHARGE SEPARATOR	R) LT-0424	С	CONDENSATE	P-445K	L	1/4"	SS7	5	120	-	14	24	150	SS TUBING	150	NA	С	1	NA	Н	21				SKID MODULE (BGE SCOPE)
1.0 1.0	0408	1/4"-C-0408-SS7-C	V-401(DISCHARGE SEPARATOR	R) LT-0424	С	CONDENSATE	P-445K	L	1/4"	SS7	5	120	-	14	24	150	SS TUBING	150	NA	С	1	NA	н	21				SKID MODULE (BGE SCOPE)
0.1 acts	0409	3"-CHWS-0409-CS1-C	X-001 CHILLER PACKAGE	E-400 LOW PRESSURE COOLER	CHWS	CHILLED WATER SUPPLY	P-445K	L	3"	CS1	80	40	-	100	24	100	CARBON STEEL	150	NA	С	1	NA	н	150				STICK BUILT (CONTRACTOR SCOPE)
1.0	0410	3"-CHWR-0410-CS1-C	E-400 LOW PRESSURE COOLER	X-001 CHILLER PACKAGE	CHWR	CHILLED WATER RETURN	P-445K	L	3"	CS1	80	60	-	100	24	100	CARBON STEEL	150	NA	С	1	NA	Н	150				STICK BUILT (CONTRACTOR SCOPE)
1.0	0411	1"-C-0411-SS1-HT	E-400 LOW PRESSURE COOLER	1 1/2"-C-0404-SS1-HT	С	CONDENSATE	P-445K	L	1"	SS1	5	120	-	14	24	150	STAINLESS STEEL	150	ETR	HT	1	NA	H	21	23			STICK BUILT (CONTRACTOR SCOPE)
ngi																												

NOTE:-

IN THE REMARK COLUMN,

IF IT IS MENTIONED "SKID MODULE", IT IS BGE SCOPE OF SUPPLY.

AND IF IT IS MENTIONED "STICK BUILT", IT IS CONTRACTOR SCOPE OF SUPPLY.

DATE DRN BY CHK BY APRV BY PROFESSIONAL ENGINEER DESCRIPTION ISSUED FOR BID ISSUED FOR CONSTRUCTION ISSUED FOR CONSTRUCTION (REVISED) SS ISSUED FOR CONSTRUCTION (REVISED)

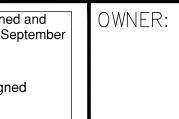
DRE GAMANIAN ICENS No. 93370 STATE OF LORIDA CHEMINA

ANDRE GAMANIAN, P.E.

FL LICENCE NO.93370

EXP. 02/28/2025

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Digitally signed by Andre Andre Gamanian Date: 2023.09.25 17:53:16-07'00'





INDIAN RIVER COUNTY FLORIDA FLORIDA

ENGINEER:

SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

2321 E. 28TH STREET, SUITE 400

LINE LIST (SHEET 2 OF 3)

ISSUED FOR CONSTRUCTION

DRAWING NO.

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

| M-445Q |

FLORIDA	1
1325 74th AVE SW,	70000
VERO BEACH, FLORIDA	32968

Bioga	Engine	ering	IFC			IRC					LANDFILL G	SAS BLOW	ER SKID AN	ND FLARE	REPLAC	CEMENT	•										-
	no								AMETER		OPERA COND		DES	SIGN CON	NDITION	S		PIPE SYSTE	M DETAILS	6			PRES	S. TEST	НЕАТ		
REV NO	Sequence	LINE NO	FROM	то	FLUID	COMMODITY DESCRIPTION	P&ID NO	PHASE	OMINAL DI	PIPING CLASS	APP. WOR.	WOR. TEMP.	PRE	SS.	TEN	MP.	MATERIAL	RATING	TRACING		JLATION	PWHT	ТҮРЕ	MIN PRESSURE	TRACE LENGTH, FT	NOTES	REMARKS
-									Ž				MIN	MAX	MIN	MAX				TYPE	THICK						
									IN		psig	°F	psig	psig	°F	°F				1116	inch			psig			
1.0	0501	8"-LFG-0501-SS1-P	8"-LFG-0510-SS1-P	FS-001	LFG	PROCESS GAS	P-445L	V	8"	SS1	7	265	-	14	24	300	STAINLESS STEEL	150	NA	P	1	NA	Н	21			STICK BUILT (CONTRACTOR SCOPE)
1.0	0502	1"-IA-0502-SS1-N	2"-IA-0104-SS1-N	1/2"-IA-0513-SS1-N	IA	INSTRUMENT AIR	P-445L	V	1"	SS1	90	40	-	100	24	100	STAINLESS STEEL	150	NA	N	NA	NA	Н	150			STICK BUILT (CONTRACTOR SCOPE)
2.0	0503	1"-IA-0503-SS1-N	1"-IA-0502-SS1-N	1/2"-IA-0504-SS7-N	IA.	INSTRUMENT AIR	P-445L	V	1/2"	SS1	90	40	-	100	24	100	STAINLESS STEEL	150	NA	N	NA	NA	H	150			SKID MODULE (BGE SCOPE)
1.0	0504	1/2"-IA-0504-SS7-N	1"-IA-0503-SS1-N	PV-0509	IA	INSTRUMENT AIR	P-445L	V	1/2"	SS7	90	40	-	100	24	100	SS TUBING	150	NA	N	NA	NA	Н	150			SKID MODULE (BGE SCOPE)
1.0	0505	1/2"-IA-0505-SS1-N	1"-IA-0503-SS1-N	1/2"-IA-0506-SS7-N	IA	INSTRUMENT AIR	P-445L	V	1/2"	SS1	90	40	-	100	24	100	STAINLESS STEEL	150	NA	N	NA	NA	NA	NA			SKID MODULE (BGE SCOPE)
1.0	0506	1/2"-IA-0506-SS7-N	1/2"-IA-0505-SS1-N	FV-0415	IA	INSTRUMENT AIR	P-445L	V	1/2"	SS7	90	40	-	100	24	100	SS TUBING	150	NA	N	NA	NA	Н	150			SKID MODULE (BGE SCOPE)
1.0	0507	1"-IA-0507-SS1-N	2"-IA-0104-SS1-N	1/2"-IA-0508-SS7-N	IA	INSTRUMENT AIR	P-445L	V	1/2"	SS1	90	40	-	100	24	100	STAINLESS STEEL	150	NA	N	NA	NA	н	150			STICK BUILT (CONTRACTOR SCOPE)
<sub>∞</sub> 1.0	0508	1/2"-IA-0508-SS7-N	1/2"-IA-0507-SS1-N	XV-0106	IA	INSTRUMENT AIR	P-445L	V	1/2"	SS7	90	40	-	100	24	100	SS TUBING	150	NA	N	NA	NA	Н	150			STICK BUILT (CONTRACTOR SCOPE)
₹ 1.0	0509	1/2"-IA-0509-SS1-N	2"-IA-0104-SS1-N	1/2"-IA-0521-SS7-N	IA	INSTRUMENT AIR	P-445L	V	1/2"	SS1	90	40	-	100	24	100	STAINLESS STEEL	150	NA	N	NA	NA	Н	150			STICK BUILT (CONTRACTOR SCOPE)
± 1.0	0510	8"-LFG-0510-SS1-P	10"-LFG-0202-SS1-N	8"-LFG-0501-SS1-P	LFG	PROCESS GAS	P-445L	V	8"	SS1	7	265	-	14	24	300	STAINLESS STEEL	150	NA	Р	1	NA	Н	21			SKID MODULE (BGE SCOPE)
≥ 1.0	0511	1/4"-LFG-0511-SS7-N	8"-LFG-0510-SS1-P	FT-0503	LFG	PROCESS GAS	P-445L	V	1/4"	SS7	7	265	-	14	24	300	SS TUBING	150	NA	N	NA	NA	Н	21			SKID MODULE (BGE SCOPE)
? <b>1.0</b>	0512	1/4"-LFG-0512-SS7-N	8"-LFG-0510-SS1-P	FT-0503	LFG	PROCESS GAS	P-445L	V	1/4"	SS7	7	265	-	14	24	300	SS TUBING	150	NA	N	NA	NA	Н	21			SKID MODULE (BGE SCOPE)
1.0	0513	1/2"-IA-0513-SS1-N	1"-IA-0502-SS1-N	1/2"-IA-0514-SS7-N	IA	INSTRUMENT AIR	P-445L	V	1/2"	SS1	90	40	-	100	24	100	STAINLESS STEEL	150	NA	N	NA	NA	Н	150			STICK BUILT (CONTRACTOR SCOPE)
5 1.0	0514	1/2"-IA-0514-SS7-N	1/2"-IA-0513-SS1-N	FV-0239	IA	INSTRUMENT AIR	P-445L	V	1/2"	SS7	90	40	-	100	24	100	SS TUBING	150	NA	N	NA	NA	Н	150			STICK BUILT (CONTRACTOR SCOPE)
1.0		1/2"-IA-0515-SS1-N	1"-IA-0502-SS1-N	1/2"-IA-0516-SS7-N	IA	INSTRUMENT AIR		V	1/2"		90	40	_	100	24	100	STAINLESS STEEL	+	NA	N	NA	NA	Н	150			STICK BUILT (CONTRACTOR SCOPE)
5 1.0	1	1/2"-IA-0516-SS7-N	1/2"-IA-0515-SS1-N	FV-0140		INSTRUMENT AIR	+	V	1/2"	SS7	90	40	_	100	24	100	SS TUBING	150	NA	N	NA NA	NA	Н	150			STICK BUILT (CONTRACTOR SCOPE)
§ 1.0		1/2"-IA-0517-SS1-N	2"-IA-0104-SS1-N	P-202 (CONDENSATE PUMP)	IA		P-445L	V	1/2"	SS1	90	40	-	100	24	100	STAINLESS STEEL		NA	N	NA	NA	Н	150			SKID MODULE (BGE SCOPE)
2.0		1"-IA-0518-SS1-N	2"-IA-0104-SS1-N	1/2"-IA-0519-SS7-N	IA		P-445L	¥	1"	SS1	90	40	_	100	24	100	STAINLESS STEEL		NA	N	NA	NA	H	150			NA
<del>1</del> <del>2.0</del>	0519	1/2"-IA-0519-SS7-N	1"-IA-0518-SS1-N	FV-0415		INSTRUMENT AIR	P-445L	¥	1/2"	\$ <del>\$7</del>	90	40	_	100	<del>2</del> 4	100	SS TUBING	150	NA	N N	NA	NA	Ħ	150			NA .
≥ 1.0		3/4"-FG-0520-SS1-N	PILOT GAS PANEL	FS-001		PILOT GAS	P-445L	T v	3/4"		15	40	_	25	24	80	STAINLESS STEEL		NA	N	NA	NA NA	Н	37.5			STICK BUILT (CONTRACTOR SCOPE)
○ 1.0		1/2"-IA-0521-SS7-N	1/2"-IA-0509-SS1-N	XV-0103	-	INSTRUMENT AIR	+	V	1/2"	SS7	90	40	_	100	24	100	SS TUBING	150	NA	N	NA NA	NA NA	H	150			STICK BUILT (CONTRACTOR SCOPE)
5 <b></b>				1 4.44	1 ",	1	1		-/-	1 30,	1 30			1 -00	·		1 00.05.110	1 100	1 1471	1 1	1 1111	1 . 17 1		1 -50			

IN THE REMARK COLUMN,

IF IT IS MENTIONED "SKID MODULE", IT IS BGE SCOPE OF SUPPLY.
AND IF IT IS MENTIONED "STICK BUILT", IT IS CONTRACTOR SCOPE OF SUPPLY.





INDIAN RIVER COUNTY FLORIDA

25 74th AVE SW, RO BEACH, FLORIDA 32968

ENGINEER:

ENGINEERING

2321 E. 28TH STREET, SUITE 400

SIGNAL HILL, CA 90755, Ph: (562) 726-3565

EMAIL: INFO@BIOGASENG.COM

ISSUED FOR CONSTRUCTION

LINE LIST (SHEET 3 OF 3)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. M-445R

	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER	RE GAMANAMINE CENS	This item has been digitally signed and sealed by Andre Gamanian on September	OWNER
7	08/24/2022	ISSUED FOR BID	AK	TP	AG		No. 93370	25, 2023.	,
7	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG		* *	Digitally signed by Andre Andre Campaign Gamanian	
7	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.	SOM CORIDINATE	Andre Gamanian Date: 2023.09.25	1325 VERO
7	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025	SSIONAL ENGINEER	17:53:16-07'00'	VLIVO

Biogas Engineering	Manual Valve List			
Skid Module_Supply				
	SERVICE FLUID DATA & INSTRUMENT REQUIREMENT		TO BE FILLED BY SUPPLIER	NOT TO BE FILLED BY SUPPLIER
	by Design Design			

						SERVI	ice fluid i	DATA &	INSTRUMEN	NT REQUI	REMENT						ŀ	TO BE FILLED	BY SUPPLIER			NOT TO BE FILLED	ノBY SUPPLIF	ER
							0	SL S		Design	Design													
	PID	P&ID		_			Size	atir	Design	Temp	Temp			1	End						_			
No.	sheet	Tag #	Scope Item	Category	Location	Line	E	SS r	Pressure	F.	F.	Fluid Service	Fluid Composition	Material	Connectio	Description n	Manufacturer	Model Number	Supplier	Remark	Comments	Scope of Supply	Status	Isometric Nu
					,	,	.  ≝ .	Cla	psig	Min.	Max -	<i>.</i>   ,	.	-	-		.   .				- '		-	
																Compressed Air Filter Regulator								
			Air Filter													with gauge, outdoor rated,								
1	P-455L	AFR-0519	9   Skid Module	Piping Item	PV-509	1"-IA-0503-SS1-N	1/2"	150	150	24	150	Instrument Air	DRY ATM GAS COMPOSITION	1	NPT (F)		NUMATICS	8653APBM4FA00GN				BGE		1"-IA-0503-SS1-N
			Regulator													metal bowl w/site glass &								
																Gauge			Coyle Supply					
														-		Compressed Air Filter Regulator								
2	P-455L	AED OF 21	1 Skid Module Air Filter	Dining Itom	FV-0415	1/2"-IA-0505-SS1-N	1/2"	150	150	24	150	Instrument Air	DRY ATM GAS COMPOSITION	İ	NPT (F)	with gauge, outdoor rated,	NUMATICS	8653APBM4FA00GN				BGE		1/2"-IA-0505-SS
2	P-455L	AFK-0521	Regulator	Piping Item	FV-0415	1/2 -IA-U3U3-331-IN	1/2	150	130	24	150	Instrument All	DRY ATIVI GAS COMPOSITION		INPT (F)	metal bowl w/site glass &	NOWATICS	8033APBIVI4FAUUGIN				BGE		1/2 -IA-0505-55
																Gauge			Coyle Supply					
					SUCTION SCRUBBER								CH4 50%, CO2 21.75% N212%			CHECK VALVE, LIFT TYPE, CLASS	-		Process-					
3	P-455I	CK-0233	Skid Module   Check valve	Piping Valve	<del>DRAIN LINE</del>	1 1/2"-C-0204-SS1-HT	T 1/2"	<del>150</del>	<del>25</del>	<del>2</del> 4	<del>150</del>	CONDENSATE	<del>O2 2.5%, H2S .10%</del>	SS Body ASTM A351	Flanged	150. RF	GM Valves		<del>Valves(India)</del>			<del>BGE</del>		NA
				•									02 2.370, 1120 12070			Compressed Air Filter Regulator			varves(maia)	1				
4	P-455I	AFR-0252	2   Skid Module   Air Filter Regulat	Piping Item	P-202 INSTRUMENT LINE	1/2"-IA-0517-SS1-N	1/2"	150	15	24	150	Instrument Air	DRY ATM GAS COMPOSITION			with gauge, outdoor rated,	NUMATICS	8653APBM4FA00GN	Coyle Supply			BGE		1/2"-IA-0517-SS
																metal bowl w/site glass &								
															NPT (F)	Gauge								
					SUCTION SCRUBBER									SS Body ASTM A351 Gr. CF8		BALL VALVE, UNI-BODY								
5	P-455I	HV-0231	Skid Module   Ball Valve	Piping Valve	DRAIN LINE	1 1/2"-C-0204-SS1-HT	T 1 1/2"	150	25	24	150	CONDENSATE	H20 100% with traces of H2S	Ball-SS 316, Seat - RTFE,	Flanged	DESIGN, REGULAR BORE, CLASS	GM Valves		Process			BGE		1 1/2"-C-0204-S
					DRAIN LINE									Ball-33 316, Seat - RTFE,		150, RF		Regular Bore GM406-CF8	Valves(India)					
														_		BALL VALVE, UNI-BODY								
6	P-455I	HV-0223	S   Skid Module   Ball Valve	Piping Valve	SUCTION SCRUBBER	1 1/2"-C-0204-SS1-HT	T 1 1/2"	150	25	24	150	CONDENSATE	H20 100% with traces of H2S	SS Body ASTM A351 Gr. CF8	Flanged	DESIGN, REGULAR BORE, CLASS	GM Valves		Process			BGE		1 1/2"-C-0204-S
Ū	1 4331	117 0223	Skid Modale   Ball Valve	i iping valve	DRAIN LINE	11/2 0 0204 331 111	'   ' - ' - '	150	23	∠¬	150	CONDENSATE	1120 10070 WILL CLACES OF 1125	Ball-SS 316, Seat - RTFE,	liangea	150. RF	1	Regular Bore GM406-CF8	Valves(India)			502		1 1/2 0 020+ 3
														+				Regular Bore divi400-Cro	valves(iliula)				+	
																BALL VALVE, UNI-BODY								
7	P-455I	HV-0241	Skid Module   Ball Valve	Piping Valve	SUCTION SCRUBBER	1 1/2"-C-0204-SS1-HT	T 1/2"	150	<b>2</b> 5	24	150	CONDENSATE	H20 100% with traces of H2S	SS Body ASTM A351 Gr. CF8	NPT (F)	DESIGN, REGULAR BORE, NPT	GM Valves					BGE		1 1/2"-C-0204-S
•	. ,65.	111 02 12	Jan Tante	i iping vaire	DRAIN LINE	1 1/2 0 020 1 001 111	-, -	150		_ ,			1120 100/0 William trades 51 1125	Ball-SS 316, Seat - RTFE,	( ,	(F), MANUAL LEVER LOCKABLE			Process			302		2,2 0 020 1 0
																OPERATOR		Full Bore GM406-CF8	Valves(India)					
														SS D		BALL VALVE, UNI-BODY								
8	P-455I	HV-0222	Skid Module   Ball Valve	Piping Valve	SUCTION SCRUBBER V-200	0 Vessel Trim V-200	1 1/2"	150	25	24	150	CONDENSATE	H20 100% with traces of H2S	SS Body ASTM A351 Gr. CF8	Flanged	DESIGN, REGULAR BORE, CLASS	GM Valves		Process			BGE		
				' 3										Ball-SS 316, Seat - RTFE,		150. RF		Regular Bore GM406-CF8	Valves(India)					1 1/2"-T-0207-S
														+		BALL VALVE, UNI-BODY		Tregular Bore Givinoo ero	varves(maia)					1 1/2 1 0207 3
0	D 4551	104 0220	Chial Mandada   Dall Maha	District - Males	CHCTION CODURDED V 200	0 / /   T-: // 200	1"	150	4.5	2.4	150	LANDELL CAC	CH4 50%, CO2 21.75% N212%	SS Body ASTM A351 Gr. CF8		· ·	C0.437-1		D			D.C.F.		
9	P-455I	HV-0228	Skid Module   Ball Valve	Piping Valve	SUCTION SCRUBBER V-200	Vessel Trim V-200	1"	150	15	24	150	LANDFILL GAS	O2 2.5%, H2S .10%	Ball-SS 316, Seat - RTFE,	Flanged	DESIGN, REGULAR BORE, CLASS	1		Process			BGE		
													<u> </u>	<u>, , , , , , , , , , , , , , , , , , , </u>		150, RF		Regular Bore GM406-CF8	Valves(India)					1"-T-0207-SS1-N
																BALL VALVE, UNI-BODY								
10	D 4551	111/ 0220		Distinct Value	BLOWER DISCHARGE	10" LEC 0202 CC1 D	1 /2"	150	15	2.4	150	LANDELL CAS	CH4 50%, CO2 21.75% N212%	SS Body ASTM A351 Gr. CF8	NIDT (E)	DESIGN, REGULAR BORE, NPT	GM Valves	F. III D - 11- CN4450 CF0				D.C.F.		1011 1 50 0202 6
10	P-455I	NV-0229	Skid Module   Ball Valve	Piping Valve	PIPING	10"-LFG-0202-SS1-P	1/2"	150	15	24	150	LANDFILL GAS	O2 2.5%, H2S .10%	Ball-SS 316, Seat - RTFE,	INPT (F)	(F), MANUAL LEVER LOCKABLE	Givi valves	Full Bore GM450-CF8	Process			BGE		10"-LFG-0202-S
																OPERATOR			Valves(India)					
																BALL VALVE, UNI-BODY			, ,					
					SUCTION SCRUBBER LEVE									SS Body ASTM A351 Gr. CF8										
11	P-455I	HV-0238	B   Skid Module   Ball Valve	Piping Valve	SUCTION SCRUBBER LEVE TRANSMITTER	1"-C-0206-SS1-H	1/2"	150	25	24	150	CONDENSATE	H20 100% with traces of H2S	Ball-SS 316, Seat - RTFE,	NPT (F)	(F), MANUAL LEVER LOCKABLE	GM Valves	Full Bore GM450-CF8	Process			BGE		1"-C-0206-SS1-
					IRANSIVIITEK									Ball-33 316, Seat - KTFE,		• •								
														1		OPERATOR			Valves(India)					
														ł		BALL VALVE, UNI-BODY								
12	P-455I	H// 0330	Skid Module   Ball Valve	Piping Valve	SUCTION SCRUBBER LEVE	L 1" C 0206 SS1 H	1/2"	150	25	24	150	CONDENSATE	H20 100% with traces of H2S	SS Body ASTM A351 Gr. CF8	NDT (E)	DESIGN, REGULAR BORE, NPT	GM Valves					BGE		1"-C-0206-SS1-I
14	r-4331	110-0239	, Janu Wiodule   Ball Valve	i iping valve	TRANSMITTER	  ± -0-0200-331-∏	1/2	130	۷.)	24	130	CONDLINGATE	1120 100/0 WILLI LIBLES UI HZ3	Ball-SS 316, Seat - RTFE,	[NET (E)	(F), MANUAL LEVER LOCKABLE	Jivi valves		Process			DQE		1 -C-0200-331-1
																OPERATOR		Full Bore GM450-CF8	Valves(India)					
																BALL VALVE, UNI-BODY			, ,					
														SS Body ASTM A351 Gr. CF8		DESIGN, REGULAR BORE, NPT								
13	P-455J	HV-0347	7   Skid Module   Ball Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0301-SS1-H	1/2"	150	25	24	150	CONDENSATE	H20 100% with traces of H2S	Ball-SS 316, Seat - RTFE,	NPT (F)	(F), MANUAL LEVER LOCKABLE	GM Valves		Process			BGE		8"-LFG-0301-SS
														Daii-33 310, 3641 - KIFE,		OPERATOR		Full Dans CNAAFO CEO	Process					
																0.2.0		Full Bore GM450-CF8	Valves(India)					
					DISCHARGE SCRUBBER V-								CH4 50%, CO2 21.75% N212%	SS Body ASTM A351 Gr. CF8		BALL VALVE, UNI-BODY				1				
14	P-455K	HV-0413	B   Skid Module   Ball Valve	Piping Valve	401	V-401 TRIM	1"	150	15	24	150	LANDFILL GAS	O2 2.5%, H2S .10%	Ball-SS 316, Seat - RTFE,	Flanged	DESIGN, REGULAR BORE, CLASS			Process			BGE		
					401								02 2.370, 1123 .1070	Dali-33 310, Seat - KTT L,		150, RF		Regular Bore GM406-CF8	Valves(India)					1"-T-0406-SS1-
					DICCUADOS CONTRA									CC D - 1 ACTA 4 CCT 5		BALL VALVE, UNI-BODY								
15	P-455K	HV-0418	Skid Module   Ball Valve	Piping Valve	DISCHARGE SCRUBBER V-	V-401 TRIM	1"	150	25	24	150	CONDENSATE	H20 100% with traces of H2S	SS Body ASTM A351 Gr. CF8	Flanged	DESIGN, REGULAR BORE, CLASS	GM Valves		Process			BGE		
-					401		_							Ball-SS 316, Seat - RTFE,		150, RF		Regular Bore GM406-CF8	Valves(India)			<b>-</b>	1	1"-T-0406-SS1-
																BALL VALVE, UNI-BODY			- Tarres(maia)					1 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
1.0	D 45514	187.0435		Dia:	DISCHARGE SCRUBBER	1 1 / 2    6 0 4 0 4 6 6 4 1 1 1	T 4.4./20	150	35	24	150	CONDENCATE	1130 1000/	SS Body ASTM A351 Gr. CF8	[FI= = - 1	DESIGN, REGULAR BORE, CLASS	CNAV-L		Due e			BCE		1 1 /21 0 0401
Τр	P-455K	HV-0425	Skid Module   Ball Valve	Piping Valve	DRAIN LINE	1 1/2"-C-0404-SS1-HT	1   1 1/2"	150	25	24	150	CONDENSATE	H20 100% with traces of H2S	Ball-SS 316, Seat - RTFE,	Flanged	, , , , , , , , , , , , , , , , , , , ,		n   n	Process			BGE		1 1/2"-C-0404-
	-													, ,		150, RF		Regular Bore GM406-CF8	Valves(India)					
					DISCHARGE SCRUBBER									SS Body ASTM A351 Gr. CF8		BALL VALVE, UNI-BODY								
17	P-455K	HV-0427	7 Skid Module Ball Valve	Piping Valve		1 1/2"-C-0404-SS1-HT	T   1 1/2"	150	25	24	150	CONDENSATE	H20 100% with traces of H2S	I	Flanged	DESIGN, REGULAR BORE, CLASS	GM Valves		Process			BGE		1 1/2"-C-0404-
					DRAIN LINE									Ball-SS 316, Seat - RTFE,		150, RF		Regular Bore GM406-CF8	Valves(India)				1	
																BALL VALVE, UNI-BODY		<u> </u>	1					
					DISCHARGE CONTROLS									CC DOWN ACTIVE ADDITIONS OF OFFI	ł	DESIGN DECLIAR BODE NOT							1	
18	P-455K	HV-0419	Skid Module Ball Valve	Piping Valve	DISCHARGE SCRUBBER	1"-C-0405-SS1-C	1/2"	150	25	24	150	CONDENSATE	H20 100% with traces of H2S	SS Body ASTM A351 Gr. CF8	NPT (F)	DESIGN, REGULAR BORE, NPT	GM Valves		_			BGE		1"-C-0405-SS1-
					LEVEL TRANSMITTER									Ball-SS 316, Seat - RTFE,		(F), MANUAL LEVER LOCKABLE			Process				1	
																OPERATOR		Full Bore GM450-CF8	Valves(India)					

- 1. IF LIST IS "SKID MODULE\_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
  2. IF LIST IS "STICK BUILT\_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

	۷. ۱۱	LIST IS SHOW BOILT_SOLLET, IT BOLS WELD TO BE TWOCOVED	AND INSTAL		MINACION.	
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025

DRE GAMANIA No. 93370 TO RIDA CHANGE





INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORÍDA 32968

ISSUED FOR CONSTRUCTION ENGINEER:

SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

2321 E. 28TH STREET, SUITE 400

VALVE LIST (SKID MODULE) (SHEET 1 OF 13)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445S

Bio	oga	s En	gine	ering							Mar	nual V	alve Lis	st											
Skid N	Modu	le_Su	ıpply																						
								SERVIC	CE FLUID	DATA &	INSTRUM	NT REQU	IREMENT							TO BE FILLED	BY SUPPLIER			NOT TO BE FILLED	3Y SUPPLIER
No.	PII		P&ID Tag#	Scope	ltem	Category	Location	Line	Item Size	Class rating	Design Pressure psig	Design Temp F, Min.	Design Temp F, Max	uid Service	Fluid Composition	Material	End Connection	Description	Manufacturer	Model Number	Supplier	Remark	Comments	Scope of Supply	Status Isometric Numbe
19	P-45	55K H	HV-0420	Skid Module	Ball Valve	Piping Valve	DISCHARGE SCRUBBER LEVEL TRANSMITTER	1"-C-0405-SS1-C	1/2"	150	25	24		IDENSATE	H20 100% with traces of H2S	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	GM Valves	Bore GM450-CF8	Process Valves(India)			BGE	1"-C-0405-SS1-C-1
20	P-45	55K F	HV-0414	Skid Module	Ball Valve	Piping Valve	DISCHARGE SCRUBBER RECYCLE LINE	4"-LFG-0403-SS1-N	4"	150	15	24	150 LAN	1)FILL (5Δ5	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF	S GM Valves	ular Bore GM406-CF8	Process Valves(India)			BGE	4"-LFG-0403-SS1-N-2
21	P-45	55K F	HV-0416	Skid Module	Ball Valve	Piping Valve	DISCHARGE SCRUBBER RECYCLE LINE	4"-LFG-0403-SS1-N	4"	150	15	24	150 LAN	DELLI GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF	l l	ular Bore GM406-CF8	Process Valves(India)			BGE	4"-LFG-0403-SS1-N-3

CH4 50%, CO2 21.75% N212% | SS Body ASTM A351 Gr. CF8, | NPT (F)

CH4 50%, CO2 21.75% N212% | SS Body ASTM A351 Gr. CF8, | NPT (F)

CH4 50%, CO2 21.75% N212% SS Body ASTM A351 Gr. CF8, NPT (F)

CH4 50%, CO2 21.75% N212% SS Body ASTM A351 Gr. CF8, NPT (F)

CH4 50%, CO2 21.75% N212% | SS Body ASTM A351 Gr. CF8, | NPT (F)

CH4 50%, CO2 21.75% N212% SS Body ASTM A351 Gr. CF8,

CH4 50%, CO2 21.75% N212% | SS Body ASTM A351 Gr. CF8, | NPT (F)

CH4 50%, CO2 21.75% N212% | SS Body ASTM A351 Gr. CF8, | NPT (F)

CH4 50%, CO2 21.75% N212% | SS Body ASTM A351 Gr. CF8, | NPT (F)

CH4 50%, CO2 21.75% N212% | SS Body ASTM A351 Gr. CF8, | NPT (F)

Ball-SS 316, Seat - RTFE,

SS Body ASTM A351 Gr. CF8, NPT (F)

SS Body ASTM A351 Gr. CF8, NPT (F)

SS Body ASTM A351 Gr. CF8, NPT (F)

|SS Body ASTM A351 Gr. CF8, | NPT (F)

SS Body ASTM A351 Gr. CF8, NPT (F)

NOTES:

32

P-455I

P-455I

22 P-455L HV-0504 Skid Module Ball Valve

P-455L | HV-0512 | Skid Module | Ball Valve

P-455L | HV-0514 | Skid Module | Ball Valve

P-455L | HV-0520 | Skid Module | Ball Valve

P-455L | HV-0534 | Skid Module | Ball Valve

P-455I | HV-0233 | Skid Module | Ball Valve

P-455I | HV-0246 | Skid Module | Ball Valve

HV-0248 | Skid Module | Ball Valve

HV-0250 | Skid Module | Ball Valve

P-455K HV-0452 Skid Module Ball Valve

35 P-455K HV-0450 Skid Module Ball Valve

P-455L | HV-0532 | Skid Module | Ball Valve

27 | P-455L | HV-0526 | Skid Module |

28 | P-455L | HV-0527 | Skid Module |

HV-0518 | Skid Module | Ball Valve

Ball Valve

Ball Valve

IF LIST IS "SKID MODULE\_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.

Piping Valve | FLARE INLET LINE

Piping Valve | PV-509

Piping Valve | FV-0415

Piping Valve | FE-0503

Piping Valve | FE-0503

Piping Valve

Piping Valve

Piping Valve

Piping Valve

Piping Valve

Piping Valve | FLARE INLET LINE

SUCTION SCRUBBER INLET

2. IF LIST IS "STICK BUILT\_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

DATE DESCRIPTION APRV BY PROFESSIONAL ENGINEER ISSUED FOR BID 02/03/202 ISSUED FOR CONSTRUCTION SS ISSUED FOR CONSTRUCTION (REVISED) ISSUED FOR CONSTRUCTION (REVISED)

SSIONAL EN

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8"-LFG-0510-SS1-P

8"-LFG-0510-SS1-P

8"-LFG-0510-SS1-P

1"-IA-0503-SS1-N

1/2"-IA-0505-SS1-N

8"-LFG-0510-SS1-P-2

8"-LFG-0510-SS1-P-3

8"-LFG-0501-SS1-P

4"-LFG-0403-SS1-N

10"-LFG-0202-SS1-P

10"-LFG-0202-SS1-P

4"-LFG-0403-SS1-N

4"-LFG-0403-SS1-N

1/2"-IA-0517-SS1-N

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ANDRE GAMANIAN, P.E.

FL LICENCE NO.93370

EXP. 02/28/2025

24

24

24

24

12"-LFG-0201-SS1-N 1/2" 150 15 24 150 LANDFILL GAS 02 2.5%, H2S .10%

150 | LANDFILL GAS

150 LANDFILL GAS

150 | LANDFILL GAS

150 LANDFILL GAS

150 LANDFILL GAS

150 | LANDFILL GAS

150 LANDFILL GAS

150 LANDFILL GAS

150 LANDFILL GAS

150 LANDFILL GAS

150 LANDFILL GAS

O2 2.5%, H2S .10%

150 Instrument Air DRY ATM GAS COMPOSITION

CH4 50%, CO2 21.75% N212%

150 Instrument Air DRY ATM GAS COMPOSITION

150 Instrument Air DRY ATM GAS COMPOSITION

CH4 50%, CO2 21.75% N212%



FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968



ISSUED FOR CONSTRUCTION

**VALVE LIST (SKID MODULE)** 

(SHEET 2 OF 13)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

BGE

8"-LFG-0510-SS1-P-4

8"-LFG-0510-SS1-P-4

8"-LFG-0510-SS1-P-3

1"-IA-0503-SS1-N-1

1/2"-IA-0505-SS1-N-1

8"-LFG-0510-SS1-P-2

8"-LFG-0510-SS1-P-3

8"-LFG-0510-SS1-P-5

4"-LFG-0403-SS1-N-1

12"-LFG-0201-SS1-N-2

10"-LFG-0202-SS1-P-5

10"-LFG-0202-SS1-P-2

4"-LFG-0403-SS1-N-2

4"-LFG-0403-SS1-N-4

1/2"-IA-0517-SS1-N-1

M-445T

DRAWING NO.

GAMANA				y signed and n on September	OV
TATE OF CONAL ENGINEER	Andre Ga	aman	by An ian Gama Date: 2023.	nian	1. V

NDIAN RIVER COUNTY

BALL VALVE, UNI-BODY

OPERATOR

DESIGN, REGULAR BORE, NPT

(F), MANUAL LEVER LOCKABLE

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

Process

Valves(India)

Full Bore GM450-CF8

GM Valves

**GM Valves** 

**GM Valves** 

GM Valves

**GM Valves** 

GM Valves

**GM Valves** 

**GM** Valves

**GM Valves** 

**GM Valves** 

**GM Valves** 

<b>Biogas Engine</b>	ering							Man	ual V	alve Lis	st											
kid Module_Supply																						
					SERVIC	CE FLUID D	DATA & I	NSTRUME	NT REQUI	REMENT							TO BE FILLI	D BY SUPPLIER			NOT TO BE FILLED	BY SUPPLIER
No. PID P&ID sheet Tag #	Scope	ltem	Category	Location	Line	Item Size	Class rating	Design Pressure psig	Design Temp F, Min.	Design Temp F, Max	luid Service	Fluid Composition	Material	End Connection	Description	Manufacturer	Model Number	Supplier	Remark	Comments	Scope of Supply	Status Isometric Nun
37 P-455I HV-0207	Skid Module	Butterfly Valve	Piping Valve	BLOWER DISCHARGE PIPING	10"-LFG-0202-SS1-P	6"	150	15	24	150 LAN	NDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8 SPINDLE & DISC-SS 316, SEA SS 316	LUG TYPE	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF	GM Valves	Pending	Process Valves(India)			BGE	10"-LFG-0202-SS1
38 P-455I HV-0214	Skid Module	Butterfly Valve	Piping Valve	BLOWER DISCHARGE PIPING	10"-LFG-0202-SS1-P	6"	150	15	24	150 LAN	NDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8 SPINDLE & DISC-SS 316, SEA SS 316	: LUG TYPE	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF	GM Valves	Pending	Process Valves(India)			BGE	10"-LFG-0202-SS1
39 P-455L HV-0506	Skid Module	Needle Valve	Piping Valve	FLARE INLET LINE	8"-LFG-0510-SS1-P	1/2"	<del>150</del>	<del>15</del>	<del>24</del>	150 LAN	NDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS-BODY	NPT (F)	WULTIPORT BLOCK & BLEED VALVE, CLASS 6000, SOFT SEAT PTFE PACKING, BLEED PORT	,					BGE	AM
40 P-455I HV-0203	Skid Module	Butterfly Valve	Piping Valve	BLOWER SUCTION PIP	PING 12"-LFG-0201-SS1-N	8"	150	15	24	150 LAN	IDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8 SPINDLE & DISC-SS 316, SEA SS 316	: LUG TYPE	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF	GM Valves	ending	Process Valves(India)			BGE	12"-LFG-0201-SS
41 P-455I HV-0210	Skid Module	Butterfly Valve	Piping Valve	BLOWER SUCTION PIP	PING 12"-LFG-0201-SS1-N	8"	150	15	24	150 LAN	NDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8 SPINDLE & DISC-SS 316, SEA SS 316	: LUG TYPE	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF	GM Valves	ending	Process Valves(India)			BGE	12"-LFG-0201-SS1
42 P-455L HV-0501	Skid Module	Butterfly Valve	Piping Valve	FLARE INLET LINE	8"-LFG-0510-SS1-P	8"	150	15	24	150 LAN	NDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8 SPINDLE & DISC-SS 316, SEA SS 316	: LUG TYPE	BUTTERFLY VALVE, GEAR OPERATED HAND WHEEL, CLASS 150, RF WITH 14 FT CHAIN	GM Valves	ending	Process Valves(India)			BGE	8"-LFG-0510-SS1-
43 P-455L HV-0508	Skid Module	Butterfly Valve	Piping Valve	FLARE INLET LINE	8"-LFG-0510-SS1-P	8"	150	15	24	150 LAN	NDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8 SPINDLE & DISC-SS 316, SEA SS 316		BUTTERFLY VALVE, CLASS 150,	GIVI Valves	ending	Process Valves(India)			BGE	8"-LFG-0510-SS1-
44 P-455L HV-0510	Skid Module	Butterfly Valve	Piping Valve	FLARE INLET LINE	8"-LFG-0510-SS1-P	8"	150	15	24	150 LAN	NDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8 SPINDLE & DISC-SS 316, SEA SS 316	: LUG TYPE	BUTTERFLY VALVE, CLASS 150,	GIVI valves	ending	Process Valves(India)			BGE	8"-LFG-0510-SS1-I

SS Body ASTM A351

SS Body ASTM A351

SS Body ASTM A351

TBD (VENDOR TO SPECIFY)

TBD (VENDOR TO SPECIFY) | Flanged

# NOTES:

53

52 P-455J

P-455L

55 P-455L

P-455K

SI-0502

HV-0417

HV-0511

Skid Module

Skid Module | Globe valve

| Skid Module | Globe valve

P-455I

P-455I

1. IF LIST IS "SKID MODULE\_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.

Speciality Item RNG LFG FLOW METER

Piping Valve | FLARE INLET LINE

RECYCLE LINE

DISCHARGE SCRUBBER

2 IF LIST IS "STICK BUILT SUPPLY" IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR

Piping Valve

		۷. ۱۱	LIST IS SHOW BOILT_SOLLET, IT DOES NEED TO BE TROCORED	AND INSTAL	LLD DI CO	IN IIVACTON.	
F	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
_	1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
	2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
_	3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
<u> </u>	4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025

P-455I SI-0212 Skid Module FLEXIBLE HOSE Speciality Item BLOWER DISCHARGE PIPING

CK-0206 | Skid Module | Check valve

CK-0213 | Skid Module | Check valve

P-455I | SI-0205 | Skid Module | FLEXIBLE HOSE | Speciality Item

47 P-455K CK-0428 Skid Module Check valve

10"-LFG-0202-SS1-P

10"-LFG-0202-SS1-P

10"-LFG-0202-SS1-P

10"-LFG-0202-SS1-P

10"-LFG-0202-SS1-P

8'-LFG-0510-SS1-P

4"-LFG-0403-SS1-N

8"-LFG-0510-SS1-P

BLOWER DISCHARGE

BLOWER DISCHARGE

DISCHARGE SCRUBBER

P-455I | SI-0204 | Skid Module | FLEXIBLE HOSE | Speciality Item | BLOWER SUCTION PIPING | 12"-LFG-0201-SS1-N | 8" | 150 | 15 | 24 | 150 | LANDFILL GAS

DRAIN LINE

Piping Valve

Piping Valve

Piping Valve

P-455I SI-0211 Skid Module | FLEXIBLE HOSE | Speciality Item | BLOWER SUCTION PIPING | 12"-LFG-0201-SS1-N

SI-0302 | Skid Module | FLEXIBLE HOSE | Speciality Item | AFTER COOLER INLET

conditioner

150

150

150

6" 150

15

15

25

15

15

15

15

15

15

15

6"

6"

6"

8"

8"

6"

150

150

150

150

150

1 1/2"-C-0404-SS1-HT | 1 1/2" | 150 |

24

24

24

24

24

24

24

150 LANDFILL GAS

150 | LANDFILL GAS

150 CONDENSATE

150 LANDFILL GAS

150 | LANDFILL GAS

150 LANDFILL GAS

150 | LANDFILL GAS

150 LANDFILL GAS

150 LANDFILL GAS

150 LANDFILL GAS

O2 2.5%, H2S .10%

CH4 50%, CO2 21.75% N212%

|CH4 50%, CO2 21.75% N212% | Body- ASTM A351 Gr. CF8.

Disc- SS 316,S

BODY-ASTM A351 CF3, CF8,

SPINDLE & DISC-SS 316, SEAT: Flanged

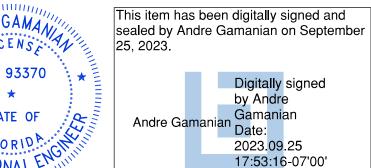
O2 2.5%, H2S .10%

O2 2.5%, H2S .10%

O2 2.5%, H2S .10%

O2 2.5%, H2S .10%

THE GAMAN! P. CENS No. 93370 LORIDA





NDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

Flanged



Process

Process

Process

Pending

Pending

Pending

Regular Bore GM406-CF8

PF31-321

PF31-321

PF31-321

PF31-321

PF31-321

50E

GM Valves

GM Valves

METALFLEX

METALFLEX

METALFLEX

METALFLEX

METALFLEX

CANADA

PIPELINE

GM Valves

**GM Valves** 

Pending

Pending

DUAL DISC SPING LOADED

DUAL DISC SPING LOADED

CLASS 150, RF

CHECK VALVE, WAFER TYPE,

3'-10" LONG FLEXIBLE HOSE

3'-10" LONG FLEXIBLE HOSE

4' LONG FLEXIBLE HOSE WITH

4' LONG FLEXIBLE HOSE WITH

4'-8" LONG FLEXIBLE HOSE

WITH 150# FLANGED END

8" SCH 40 316 S/S FLOW

GLOBE VALVE, CLASS 150, RF

GLOBE VALVE, CLASS 150, RF

CONDITIONER

150# FLANGED END

150# FLANGED END

WITH 150# FLANGED END

WITH 150# FLANGED END

CHECK VALVE, LIFT TYPE, CLASS

CHECK VALVE, WAFER TYPE,

Valves(India)

Valves(India)

Valves(India)

Coyle Supply

Coyle Supply

Coyle Supply

Coyle Supply

Coyle Supply

Coyle Supply

Valves(India)

Valves(India)

Process

EMAIL: INFO@BIOGASENG.COM

FIXED WELDNECK FLANGE ONE END,

SPINNING FLANGE

W/ SCH 10 STUBEND OTHER

**VALVE LIST (SKID MODULE)** (SHEET 3 OF 13)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565

ISSUED FOR CONSTRUCTION

DRAWING NO. M-445U

10"-LFG-0202-SS1-P-4

10"-LFG-0202-SS1-P-3

1 1/2"-C-0404-SS1-HT-4

10"-LFG-0202-SS1-P-4

10"-LFG-0202-SS1-P-3

12"-LFG-0201-SS1-N-2

12"-LFG-0201-SS1-N-2

10"-LFG-0202-SS1-P-1

8'-LFG-0510-SS1-P-1

4"-LFG-0403-SS1-N-2

8"-LFG-0510-SS1-P-6

BGE

BGE

BGE

BGE

BGE

BGE

BGE

BGE

BGE

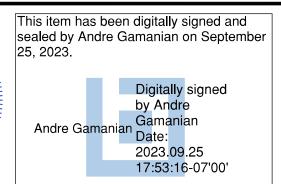
Biogas Engineering				Man	ual Va	alve List												
Skid Module_Supply																		
		SERV	ICE FLUID DATA &	& INSTRUMEN	NT REQUIR	EMENT						TO BE FILLED	BY SUPPLIER			NOT TO BE FILLED	BY SUPPLIER	
No. PID P&ID Scope Item Car	gory Location	Line	Item Size	Design Pressure psig	Design Temp F, Min.	Design Temp F, Max	vice Fluid Composition	Material	End Connection	Description	Manufacturer	Model Number	Supplier	Remark	Comments	Scope of Supply	Status	Isometric Number
	BLOWER DISCHARGE						CH4 50%, CO2 21,75% N212%			MULTIPORT BLOCK & BLEED								

						SERVIC	CE FLUID D	AIAGIN	43 I KOIVIL	III ILQU								10 DE TILLE	D BY SUPPLIER			NOT TO BE FILLEL	DI JOPPLIL	
No.	PID sheet	P&ID Tag #	Scope Item	Category	Location	Line	Item Size	ן סיַ ן	Design Pressure psig	Design Temp F, Min.	Design Temp F, Max	Fluid Service	Fluid Composition	Material	End Connection	Description	Manufacturer	Model Number	Supplier	Remark	Comments	Scope of Supply	Status	Isometric Number
- 56	P-455I	HV-0208	Skid Module Needle Valve	Piping Valve	BLOWER DISCHARGE PIPING	10"-LFG-0202-SS1-P	1/2"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	316 S/S	NPT (M)	MULTIPORT BLOCK & BLEED VALVE, CLASS 6000, SOFT SEAT, PTFE PACKING, BLEED PORT			Coyle Supply			BGE		10"-LFG-0202-SS1-P-2
57	P-455J	SI-0348	Skid Module SS PLUG	Speciality Item	AFTER COOLER OUTLET	8"-LFG-0301-SS1-H	1/2"	150	25	24	150	CONDENSATE	H20 100% with traces of H2S	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG			Fabritek			BGE		8"-LFG-0301-SS1-H-1
58	P-455L	SI-0513	Skid Module SS PLUG	Speciality Item	LARE INLET LINE	8"-LFG-0510-SS1-P	1/2"	150	<b>2</b> 5	24	150	CONDENSATE	H20 100% with traces of H2S	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG			Fabritek			BGE		8"-LFG-0510-SS1-P-4
59	P-455L	SI-0515	Skid Module SS PLUG	Speciality Item   F	FLARE INLET LINE	8"-LFG-0510-SS1-P	1/2"	150	25	24	150	CONDENSATE	H20 100% with traces of H2S	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG			Fabritek			BGE		8"-LFG-0510-SS1-P-3
60	P-455L	SI-0535	Skid Module SS PLUG	Speciality Item   F	FLARE INLET LINE	8"-LFG-0510-SS1-P	1/2"	150	25	24	150	CONDENSATE	H20 100% with traces of H2S	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG			Fabritek			BGE		8"-LFG-0510-SS1-P-5
61	P-455I	SI-0245	Skid Module SS PLUG	Piping Item	SUCTION SCRUBBER INL	4"-LFG-0403-SS1-N	1/2"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG			Fabritek			BGE		4"-LFG-0403-SS1-N-1
62	P-455I	SI-0247	Skid Module SS PLUG			12"-LFG-0201-SS1-N		150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG			Fabritek			BGE		12"-LFG-0201-SS1-N-2
G3	P-455I	SI-0249	Skid Module SS PLUG	1		10"-LFG-0202-SS1-P		150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG			Fabritek			BGE		10"-LFG-0202-SS1-P-5
왕 무 나 나	P-455I	SI-0251	Skid Module SS PLUG	1		_ET 10"-LFG-0202-SS1-P	I	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG			Fabritek			BGE		10"-LFG-0202-SS1-P-2
s Aukes 65	P-455K	SI-0453	Skid Module SS PLUG			4"-LFG-0403-SS1-N		150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG			Fabritek			BGE		4"-LFG-0403-SS1-N-2
66	P-455K	SI-0451	Skid Module SS PLUG	1		4"-LFG-0403-SS1-N		150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG			Fabritek			BGE		4"-LFG-0403-SS1-N-4
67 67 67 67 67 67 67 67 67 67 67 67 67 6	P-455L	HV-0536	Skid Module Ball Valve		P-202 INSTRUMENT LIN		1/2"	150	<del>15</del>	24	150	Instrument Air	DRY ATM GAS COMPOSITION	SS Body ASTM A351 Gr. (	CF8, B NPT (F)	BALL VALVE, UNI-BODY- DESIGN, REGULAR BORE, NPT- (F), MANUAL LEVER LOCKABLE- OPERATOR	GM Valves	Full Bore GM450-CF8	Process Valves(Indi	<del>a)</del>		BGE		NA
1-445AE.dw	P-455I	AFR-0537	7 Skid Module Air Filter Regula	it Piping Item	P-202 INSTRUMENT LIA	NE 1'-IA-0518-SS1-N	<del>1/2"</del>	<del>150</del>	<del>15</del>	<del>24</del>	<del>150</del>	Instrument Air	DRY ATM GAS COMPOSITION		NPT (F)	Compressed Air Filter Regulator with gauge, outdoor rated, metal bowl w/site glass & Gauge	NUMATICS	8653APBM4FA00GN	Coyle Supply			BGE		NA
445S to W	P-455L	HV-0537	7 Skid Module Needle Valve	Piping Valve	NSTRUMENT AIR TO P- 202	1/2"-IA-0517-SS1-N	1/2"	150	15	24	150	Instrument Air	DRY ATM GAS COMPOSITION		NPT (M)	MULTIPORT BLOCK & BLEED VALVE, CLASS 6000, SOFT SEAT, PTFE PACKING, BLEED PORT			Coyle Supply			BGE		1/2"-IA-0517-SS1-N-1

- 1. IF LIST IS "SKID MODULE\_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
  2. IF LIST IS "STICK BUILT\_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

2								
a lny	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER	
5	1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG		
いととい	2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG		
ין א ושי	3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.	
ر ان ان	4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025	

No. 93370



MINDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

ENGINEER:

ISSUED FOR CONSTRUCTION

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

VALVE LIST (SKID MODULE) (SHEET 4 OF 13)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445V

			eering					Ma	<u>ınual '</u>	Valve	List														
Stick	Built_Su	pply																							
	T	T	Τ				SERVICE FLUID DATA	A & INSTRUME	ENT REQUI				1		<u> </u>	T			TO BE FIL	LED BY SUPPLIE	ER		NOT TO BE FILL	ED BY SUPF	PLIER
No.	PID sheet	P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Design Pressure psig	F,	Гетр	Fluid Service	Fluid Composition	Material	End Connection	Descrip	otion	Manufacture	Model Number	Supplier	Remark	Comments	Scope of Supply	Status	Isometric Number
1	P-455G	HV-0101	STICK BUILT	Ball Valve	Piping Valve	SUCTION SCRUBBER INLET	14"-LFG-0101-SS1-N	1/2" 150	15	24	150 LANDFI	FILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,		BALL VALVE, UNI-BODY BORE, NPT (F), MANUA OPERATOR	· · · · · · · · · · · · · · · · · · ·	1					IRC	1	.4"-LFG-0101-SS1-N-2
2	P-455G	HV-0105	STICK BUILT	Ball Valve	Piping Valve	SUCTION SCRUBBER INLET	14"-LFG-0101-SS1-N	2" 150	15	24	150 LANDFI	EILL GAS I	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	IFIDNODA	BALL VALVE, UNI-BODY BORE, CLASS 150, RF	Y DESIGN, REGULA	AR					IRC	1	4"-LFG-0101-SS1-N-3
3	P-455G	HV-0138	STICK BUILT	Butterfly Valve	Piping Valve	SUCTION SCRUBBER INLET	14"-LFG-0101-SS1-N	14" 150	15	24	150 LANDFI	FILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8 SPINDLE & DISC-SS 316, SEA SS 316	T LUG TYPE	BUTTERFLY VALVE, GEA CLASS 150, RF	AR OPERATED,						IRC	1	.4"-LFG-0101-SS1-N-3
4	P-455G	HV-0119	STICK BUILT	Butterfly Valve	Piping Valve	TO RNG PIPELINE @ B/L	8"-LFG-0102-SS1-HT	8" <del>150</del>	<del>15</del>	24	150 LANDFI	FILL GAS	<u> </u>	BODY-ASTM A351 CF3, CF8 SPINDLE & DISC-SS 316, SEA SS 316	<b>'</b>	BUTTERFLY VALVE, CL/	\ <del>SS 150, RF</del>					Deleted	IRC	4	<del>V/A</del>
5	P-455G	HV-0103	STICK BUILT	Ball Valve	Piping Valve	TO RNG PIPELINE @ B/L	8"-LFG-0102-SS1-HT	1/2" 150	15	24	150 LANDFI	FILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	· ·	BALL VALVE, UNI-BODY BORE, NPT (F), MANUA OPERATOR	•	1					IRC	8	3"-LFG-0102-SS1-HT-4
6	P-455G	HV-0120	STICK BUILT	Ball Valve	Piping Valve	TO RNG PIPELINE @ B/L	12"-LFG-0115-SS1-N	<del>12"</del> <del>150</del>	<del>15</del>	24	150 LANDFI	EILLGAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	' l <u>Elanged</u>	BALL VALVE, FULL PORT	,				Full Port & With Gear operator	. Deleted	IRC	4	<del>1/A</del>
7	P-455G	HV-0121	STICK BUILT	Ball Valve	Piping Valve	TO EVAP PIPELINE U/G	8"-LFG-0127-HD1-N	8" 150	15	24	150 LANDFI	EILL GAS I	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	FULL PORT HDPE VALVE	BUTT FUSION	BALL VALVE GEAR OPE HANDLE, BUTT FUSION COMMENT COLUMN)						THIS VALVE TO BE PROCURED ALONG WITH HDPE PIPELINE MTO	IRC	1	NA
8	P-455G	HV-0108	STICK BUILT	Ball Valve	Piping Valve	TO EVAP PIPELINE @ B/L	6"-LFG-0103-SS1-HT	1/2" 150	15	24	150 LANDFI	HILL GAS I	N212% O2 2.5%, H2S .10%		NPT (F)	BALL VALVE, UNI-BODY BORE, NPT (F), MANUA OPERATOR		l l					IRC	$\epsilon$	5"-LFG-0103-SS1-HT-3
10	P-455G	HV-0123	STICK BUILT	Ball Valve	Piping Valve	INSTRUMENT AIR PIPING @ B/L	2"-IA-0104-SS1-N	2" 150	150	24	150 Instrum	ment Air	DRY ATM GAS COMPOSITION	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY BORE, CLASS 150, RF	Y DESIGN, REGULA	AR					IRC	2	2"- A-0104-SS1-N-1
11	P-455G	HV-0110	STICK BUILT	Ball Valve	Piping Valve	INSTRUMENT AIR PIPING @ B/L	2"-IA-0104-SS1-N	1/2" 150	150	24	150 Instrum	ment Air I	DRY ATM GAS COMPOSITION	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY BORE, NPT (F), MANUA OPERATOR	•						IRC	2	2"-IA-0104-SS1-N-2
12	P-455G	HV-0137	STICK BUILT	Ball Valve	Piping Valve	RNG FACILITY CONDENSATE LINE @ B/L	2"-C-0121-SS1-N	2" 150	25	24	150 CONDE	NENISATE I	H20 100% with traces of H2S	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	l Hanged	BALL VALVE, UNI-BODY BORE, CLASS 150, RF	Y DESIGN, REGULA	AR					IRC	2	2"-C-0121-SS1-N-1
<del>13</del>	P-455G	HV-0135	STICK BUILT	<del>Ball Valve</del>	Piping Valve	RNG CONDENSATE FLOW METER	<del>2" C 0121-SS1-N</del>	<del>1/2"</del> <del>150</del>	<del>25</del>	24	150 CONDE	DENSATE H	H2O 100% with traces of H2S	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY BORE, NPT (F), MANUA OPERATOR	,						IRC		
14	P-455G	HV-0136	STICK BUILT	Ball Valve	Piping Valve	RNG CONDENSATE FLOW METER	2"-C-0121-SS1-N	2" 150	25	24	150 CONDE	DENSATE H	H20 100% with traces of H2S	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY BORE, NPT (F), MANUA OPERATOR	•						IRC	2	2"-C-0121-SS1-N-1
15	P-455H	HV-0130	STICK BUILT	Ball Valve	Piping Valve	RNG LFG FLOW METER	8"-LFG-0102-SS1-HT	1/2" 150	15	24	150 LANDFI	FILL (¬Δ\	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	' NPT (F)	BALL VALVE, UNI-BODY BORE, NPT (F), MANUA OPERATOR	•	ı					IRC	8	3"-LFG-0102-SS1-HT-3
16	P-455H	HV-0131	STICK BUILT	Ball Valve	Piping Valve	RNG LFG FLOW METER	8"-LFG-0102-SS1-HT	1/2" 150	15	24	150 LANDFI	FILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY BORE, NPT (F), MANUA OPERATOR	•						IRC	8	3"-LFG-0102-SS1-HT-3
17	P-455H	HV-0132	STICK BUILT	Ball Valve	Piping Valve	EVAP LFG FLOW METER	6"-LFG-0103-SS1-HT	1/2" 150	15	24	150 LANDFI	FILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY BORE, NPT (F), MANUA OPERATOR	•						IRC	6	5"-LFG-0103-SS1-HT-3
18	P-455H	HV-0133	STICK BUILT	Ball Valve	Piping Valve	EVAP LFG FLOW METER	6"-LFG-0103-SS1-HT	1/2" 150	15	24	150 LANDFI	HILL GAS I	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	' NPT (F)	BALL VALVE, UNI-BODY BORE, NPT (F), MANUA OPERATOR							IRC	6	5"-LFG-0103-SS1-HT-2
19	P-455H	SI-0117	STICK BUILT	FLOW CONDITION	IER Speciality Item	RNG LFG FLOW METER	8"-LFG-0102-SS1-HT	8" 150	15	24	150 LANDFI	HII (¬Δ\	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	WAFER TYPE	8" SCH 40 316 S/S FLO	W CONDITIONER						IRC	8	3-LFG-0102-SS1-HT-2

CH4 50%, CO2 21.75%

N212% O2 2.5%, H2S .10% | SF 11VDLL .

# NOTES:

20 P-455H HV-0115

STICK BUILT Butterfly Valve

1. IF LIST IS "SKID MODULE\_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.

2. IF LIST IS "STICK BUILT SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

Piping Valve

)		۷. ۱۱	LIST IS STICK BOILT_SOLLET, IT DOES NEED TO BE TROCORED	AND INSTAL	LLD DI CO	TN III ACTOIN.	
	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	I
	1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
	2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
	3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	
٠	4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

PROFESSIONAL ENGINEER No. 93370 STATE OF

ANDRE GAMANIAN, P.E.

FL LICENCE NO.93370 EXP. 02/28/2025

8" | 150 | 15

24 150 LANDFILL GAS

8"-LFG-0102-SS1-HT

RNG LFG FLOW METER

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. 2023.09.25 17:53:16-07'00'



BODY-ASTM A351 CF3, CF8,

SPINDLE & DISC-SS 316, SEAT: LUG TYPE BUTTERFLY VALVE, CLASS 150, RF

INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968 ENGINEER:

ISSUED FOR CONSTRUCTION

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM VALVE LIST (STICK BUILT) (SHEET 5 OF 13)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445W

DRAWING NO.

8"-LFG-0102-SS1-HT-1

	Bioga	as En	gine	ering					N	lanu	al Val	ve Lis	t										
Stic	c Built_S																						
								SERVICE FLUID DATA &	k INSTRU	MENT RI			_			1		TO BE FIL	LED BY SUPPLIE	R		NOT TO BE FILLE	D BY SUPPLIER
. Ne	PID	1	&ID og#	Scope	Item	Category	Location	Line	Item Size	Class rating b	sign Tem	F,	Fluid Service	Fluid Composition	Material	End Connection	Description	Manufacturer Model Number	Supplier	Remark	Comments	Scope of Supply	Status Isometric Number
2	P-455	SH SI-C	)112	STICK BUILT	FLOW CONDITIONS	ER Speciality Item	EVAP LFG FLOW METER	6"-LFG-0103-SS1-HT	6" 1	.50 2	L5 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%		WAFER TYPE	6" SCH 40 316 S/S FLOW CONDITIONER					IRC	6-LFG-0103-SS1-HT-1
2	P-455	5H HV-0	0116	STICK BUILT	Butterfly Valve	Piping Valve	EVAP LFG	6"-LFG-0103-SS1-HT	6" 1	.50 .	15 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8 SPINDLE & DISC-SS 316, SEA SS 316		BUTTERFLY VALVE, CLASS 150, RF					IRC	6"-LFG-0103-SS1-HT-1
2	P-45	51 HV-(	0201	STICK BUILT	Needle Valve	Piping Valve	SUCTION SCRUBBER INLET	14"-LFG-0101-SS1-N	1/2"   1	.50	15 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	316 S/S	NPT (F)	MULTIPORT BLOCK & BLEED VALVE, CLASS 6000, SOFT SEAT, PTFE PACKING, BLEED PORT					IRC	14"-LFG-0101-SS1-N-1
2	P-45	5I HV-0	0220	STICK BUILT	Ball Valve	Piping Valve	SUCTION SCRUBBER INLET	14"-LFG-0101-SS1-N	1/2" 1	.50 :	L5 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8 Ball-SS 316, Seat - RTFE,	' NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR					IRC	14"-LFG-0101-SS1-N-1
2	P-45	5I SI-C	0216	STICK BUILT	SS PLUG	Piping Item	SUCTION SCRUBBER INLET	14"-LFG-0101-SS1-N	1/2" 1	.50 2	15 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG					IRC	14"-LFG-0101-SS1-N-1
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	P-45!	5J HV-(	0347	STICK BUILT	Ball Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0301-SS1-H	1/2"   1	. <del>50</del> =	L <del>S</del> 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8 Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	-				IRC	N/A
ikesh]	P 45	SI C	)348	STICK BUILT	SS PLUG	Piping Item	AFTER COOLER OUTLET	8" LFG 0301 SS1 H	1/2" 1	. <del>50</del>	15 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H25 .10%	<del>SS 316</del>	NPT (M)	1/2" SS NPT VALVE PLUG					IRC	N/A
NW 2023	P-45	5J HV-(	0349	STICK BUILT	Ball Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0301-SS1-H	1/2"   1	. <del>50</del> -	<u>15</u> 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8 Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	-				IRC	N/A
<del>2</del> -90	P-45	SI-C	)350	STICK BUILT	SS PLUG	Piping Item	AFTER COOLER OUTLET	8"-LFG-0301-SS1-H	1/2" 1	<del>.50</del> -	15 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H25 .10%	<del>SS 316</del>	NPT (M)	1/2" SS NPT VALVE PLUG					IRC	N/A
wg 21	P-45!	21 HA-0	0309	STICK BUILT	Ball Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0318-SS1-H	1/2" 1	.50	15 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8 Ball-SS 316, Seat - RTFE,	' NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR					IRC	8"-LFG-0318-SS1-H-3
3 AE. 0	P-45!	5J SI-C	310	STICK BUILT	SS PLUG	Piping Item	AFTER COOLER OUTLET	8"-LFG-0318-SS1-H	1/2" 1	.50 2	15 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG					IRC	8"-LFG-0318-SS1-H-3
o M - 44	P-45	21 HV-0	0305	STICK BUILT	Needle Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0318-SS1-H	1/2" 1	.50	15 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	316 S/S	NPT (F)	MULTIPORT BLOCK & BLEED VALVE, CLASS 6000, SOFT SEAT, PTFE PACKING, BLEED PORT					IRC	8"-LFG-0318-SS1-H-2
3	P-45	21 HA-0	0307	STICK BUILT	Ball Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0318-SS1-H	1/2"   1	.50	15 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8 Ball-SS 316, Seat - RTFE,	' NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR					IRC	8"-LFG-0318-SS1-H-2
	P-45	21 HV-0	0311	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0318-SS1-H	8" 1	.50 (	15 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8 SPINDLE & DISC-SS 316, SEA SS 316	·	BUTTERFLY VALVE, CLASS 150, RF					IRC	8"-LFG-0318-SS1-H-3
Mechar 1	P-45	21 HA-0	0312	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0318-SS1-H	8" 1	.50 .	15 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8 SPINDLE & DISC-SS 316, SEA SS 316	·	BUTTERFLY VALVE, CLASS 150, RF					IRC	8"-LFG-0318-SS1-H-3
W∕sbui, 3	P-45	21 HV-0	0313	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0306-SS1-H	8" 1	.50 .	L5 24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8 SPINDLE & DISC-SS 316, SEA SS 316	· i	BUTTERFLY VALVE, CLASS 150, RF					IRC	8"-LFG-0306-SS1-H-1

- 1. IF LIST IS "SKID MODULE\_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
  2. IF LIST IS "STICK BUILT\_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

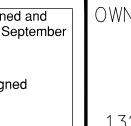
	۷٠ ۱۱	LIST IS STICK BOILT_SOLLET, IT BOLS NEED TO BE TROCORED	AND INSTAL	LLD DI CO	MINACION.	
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	F
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	

PROFESSIONAL ENGINEER No. 93370 STATE OF

ANDRE GAMANIAN, P.E.

FL LICENCE NO.93370 EXP. 02/28/2025

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Digitally signed by Andre Andre Gamanian Date: 2023.09.25 17:53:16-07'00'





INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968



ISSUED FOR CONSTRUCTION

VALVE LIST (STICK BUILT) (SHEET 6 OF 13)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445X

DRAWING NO.

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

E	iogas	Engin	eering					N	lanu	al Val	lve	List											
ick E	uilt_Su	oply																					
							SERVICE FLUID DATA	A & INSTRU	MENT F		ENT sign D	)esign					TO BE F	ILLED BY SUPPLII	ER		NOT TO BE FILLI	ED BY SUP	PLIER
No.	PID sheet	P&ID Tag#	Scope	Item	Category	Location	Line	Item Size	er Sc.	essure essure nsig	mp T	Fluid Service F, Max	Fluid Composition	Material	End Connection	Description	Manufacturer Model Number	Supplier	Remark	Comments	Scope of Supply	Status	Isometric Numbe
37	P-455J	HV-0314	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0306-SS1-H	8" 1	150	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8, SPINDLE & DISC-SS 316, SEAT SS 316		BUTTERFLY VALVE, CLASS 150, RF					IRC		8"-LFG-0306-SS1-H-1
8	P-455J	HV-0319	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0306-SS1-H	8" 1	150	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8, SPINDLE & DISC-SS 316, SEAT SS 316		BUTTERFLY VALVE, GEAR OPERATED HAND WHEEL, CLASS 150, RF WITH 18 FT CHAIN			18FT CHAIN TO BE INCLUDED WITH GEAR OPERATED HAND WHEEL 18FT CHAIN TO BE		IRC		8"-LFG-0306-SS1-H-1
9	P-455J	HV-0320	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0306-SS1-H	8" 1	150	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8, SPINDLE & DISC-SS 316, SEAT SS 316	·	BUTTERFLY VALVE, GEAR OPERATED HAND WHEEL, CLASS 150, RF WITH 18 FT CHAIN			INCLUDED WITH GEAR OPERATED HAND WHEEL		IRC		8"-LFG-0306-SS1-H-1
10	P-455J	HV-0321	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0304-SS1-H	8" 1	150	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8, SPINDLE & DISC-SS 316, SEAT SS 316		BUTTERFLY VALVE, GEAR OPERATED HAND WHEEL, CLASS 150, RF WITH 18 FT CHAIN			INCLUDED WITH GEAR OPERATED HAND WHEEL		IRC		8"-LFG-0304-SS1-H-1
1	P-455J	HV-0322	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0305-SS1-H	8" 1	150	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8, SPINDLE & DISC-SS 316, SEAT SS 316	, Γ: LUG TYPE	BUTTERFLY VALVE, GEAR OPERATED HAND WHEEL, CLASS 150, RF WITH 18 FT CHAIN			18FT CHAIN TO BE INCLUDED WITH GEAR OPERATED HAND WHEEL		IRC		8"-LFG-0305-SS1-H-1
12	P-455J	HV-0326	STICK BUILT	Butterfly Valve	Piping Valve	F-302 INLET	8"-LFG-0311-SS1-H	8" 1	150	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	T: LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF					IRC		8"-LFG-0311-SS1-H-1
12	P-455J	HV-0328	STICK BUILT	Butterfly Valve	Piping Valve	F-302 INLET	8"-LFG-0311-SS1-H	8" 1	150	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	T: LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF					IRC		8"-LFG-0311-SS1-H-2
3	P-455J	HV-0327	STICK BUILT	Butterfly Valve	Piping Valve	F-302 INLET	8"-LFG-0312-ST1-H	8" 1	150	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	T: LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF					IRC		8"-LFG-0312-ST1-H-1
4	P-455J	HV-0328	Skid Module	Globe valve	Piping Valve	FLARE INLET LINE	8"-LFG-0312-SS1-H	6" 1	<del>150</del>	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	<del>33 310</del>	T: Flanged	GLOBE VALVE, CLASS 150, RF					IRC		N/A
5	P-455J	HV-0339	STICK BUILT	Ball Valve	Piping Valve	DPG-0340	8"-LFG-0317-SS1-H	1/2" 1	150	15 2	4	150 LANDFILL GAS	N212% U2 2.5%, H25 .10%			OPERATOR	E				IRC		8"-LFG-0317-SS1-H-2
16	P-455J	HV-0341	STICK BUILT	Ball Valve	Piping Valve	DPG-0340	8"-LFG-0304-SS1-H	1/2" 1	150	15 2	4	150 LANDFILL GAS	N212% O2 2.5%, H25 .10%			BALL VALVE, UNI-BODY DESIGN, REGULA BORE, NPT (F), MANUAL LEVER LOCKABL OPERATOR	E				IRC		8"-LFG-0304-SS1-H-1
17	P-455J	HV-0342	STICK BUILT	Ball Valve	Piping Valve	DPG-343	8"-LFG-0303-SS1-H	1/2" 1	150	15 2	4	150 LANDFILL GAS	N212% O2 2.5%, H2S .10%	·		BALL VALVE, UNI-BODY DESIGN, REGULA BORE, NPT (F), MANUAL LEVER LOCKABL OPERATOR	E				IRC		8"-LFG-0303-SS1-H-1
18	P-455J	HV-0344	STICK BUILT	Ball Valve	Piping Valve	DPG-343	8"-LFG-0305-SS1-H	1/2" 1	150	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULA BORE, NPT (F), MANUAL LEVER LOCKABL OPERATOR	i i		SS, Heavy Wall		IRC		8"-LFG-0305-SS1-H-1
49	P-455J	EJ-0315	STICK BUILT	Expansion Bellows	Speciality Item	H2S VESSEL	8"-LFG-0304-SS1-H	8" 1	150	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%		Flanged	Refer Datasheet			Bellows. 150# Flat Face (3) SS Tie Rods. Special Non Cancel, Non- Rerurnable		IRC		8"-LFG-0304-SS1-H-1
0	P-455J	EJ-0316	STICK BUILT	Expansion Bellows	Speciality Item	H2S VESSEL	8"-LFG-0305-SS1-H	8" 1	150	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%		Flanged	Refer Datasheet			SS, Heavy Wall Bellows. 150# Flat Face (3) SS Tie Rods. Special Non Cancel, Non- Rerurnable		IRC		8"-LFG-0305-SS1-H-1
L	P-455J	EJ-0317	STICK BUILT	Expansion Bellows	Speciality Item	H2S VESSEL	8"-LFG-0317-SS1-H	8" 1	L50	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%		Flanged	Refer Datasheet			SS, Heavy Wall Bellows. 150# Flat Face (3) SS Tie Rods. Special Non Cancel, Non- Rerurnable		IRC		8"-LFG-0317-SS1-H-1
2	P-455J	EJ-0318	STICK BUILT	Expansion Bellows	Speciality Item	H2S VESSEL	8"-LFG-0303-SS1-H	8" 1	150	15 2	4	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%			Refer Datasheet			SS, Heavy Wall Bellows. 150# Flat Face (3) SS Tie Rods. Special Non Cancel, Non- Rerurnable		IRC		8"-LFG-0303-SS1-H-2
53	P-455J	HV-0329	STICK BUILT	Ball Valve	Piping Valve	H2S VESSEL	V-301A TRIM	4" 1	150	15 2	4	150 LANDFILL GAS	NZ12% UZ 2.5%, HZ3 .10%	<u> </u>		BURE, CLASS 150, RF			Recurrence		IRC		4"-T-0315-SS1-H-1
	I	1	l	l		1		l					ICH4 50%, CO2 21.75%	SS Body ASTM A351 Gr. CF8,	1	BALL VALVE, UNI-BODY DESIGN, REGULA	K					1	

STICK BUILT Ball Valve

54 P-455J HV-0338

1. IF LIST IS "SKID MODULE\_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
2. IF LIST IS "STICK BUILT\_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

Piping Valve

H2S VESSEL

V-301B TRIM

•	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
	1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
	2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
,	3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
,	4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025

No. 93370

24 150 LANDFILL GAS

4" 150 15

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Digitally signed by Andre Gamanian Date: 2023.09.25 17:53:16-07'00'



CH4 50%, CO2 21.75% SS Body ASTM A351 Gr. CF8, N212% O2 2.5%, H2S .10% Ball-SS 316, Seat - RTFE,

INDIAN RIVER COUNTY FLORIDA

BALL VALVE, UNI-BODY DESIGN, REGULAR

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

ISSUED FOR CONSTRUCTION ENGINEER:



2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

VALVE LIST (STICK BUILT) (SHEET 7 OF 13)

IRC

4"-T-0315-SS1-H-2

DRAWING NO. LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445Y

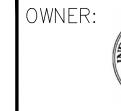
	Bioga	s Engir	neering					(	Manual	Valve	List											
St	ck Built_S	upply																				
							SERVICE FLUID DAT	A & INSTR	UMENT REQ				T				TO BE FIL	LED BY SUPPLI	ER		NOT TO BE FILLE	D BY SUPPLIER
	o. PID sheet	P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Class Desig Pressu psig	re   Iemp	Temp F, Fluid S	vice Fluid Composition	Material	End Connectio	Description n	Manufacturer N	Лodel Number	Supplier	Remark	Comments	Scope of Supply	Status Isometric Number
	i5 P-455.	HV-0345	STICK BUILT	Ball Valve	Piping Valve	H2S VESSEL	V-301A TRIM	2"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF						IRC	2"-T-0315-SS1-H-1
	66 P-455.	HV-0346	STICK BUILT	Ball Valve	Piping Valve	H2S VESSEL	V-301B TRIM	2"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF						IRC	2"-T-0315-SS1 H-2
	57 P-455.	HV-0350	STICK BUILT	Ball Valve	Piping Valve	H2S VESSEL LEAD LAG PIPING	8"-LFG-0306-SS1-H	1/2"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC	8"-LFG-0306-SS1-H-1
	8 P-455.	SI-0351	STICK BUILT	SS PLUG	Piping Item	H2S VESSEL LEAD LAG PIPING	8"-LFG-0306-SS1-H	1/2"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG						IRC	8-LFG-0306-SS1-H-1
hakur	9 P-455.	HV-0323	STICK BUILT	Ball Valve	Piping Valve	H2S VESSEL LEAD LAG PIPING	8"-LFG-0311-SS1-H	1/2"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC	8"-LFG-0311-SS1-H-2
MukeshT	60 P-455.	HV-0324	STICK BUILT	SS PLUG	Piping Item	H2S VESSEL LEAD LAG PIPING	8"-LFG-0311-SS1-H	1/2"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG						IRC	8"-LFG-0311-SS1-H-2
2023	61 P-455.	HV-0330	STICK BUILT	Ball Valve	Piping Valve	H2S VESSEL LEAD LAG PIPING	8"-LFG-0311-SS1-H	1/2"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC	8"-LFG-0311-SS1-H-1
g 21–06	52 P-455.	SI-0331	STICK BUILT	SS PLUG	Piping Item	H2S VESSEL LEAD LAG PIPING	8"-LFG-0311-SS1-H	1/2"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG						IRC	8"-LFG-0311-SS1-H-1
45AE.dw	63 P-455.	HV-0332	STICK BUILT	Ball Valve	Piping Valve	H2S VESSEL LEAD LAG PIPING	8"-LFG-0312-ST1-H	1/2"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC	8"-LFG-0312-ST1-H-1
to M-4	64 P-455.	SI-0333	STICK BUILT	SS PLUG	Piping Item	H2S VESSEL LEAD LAG PIPING	8"-LFG-0312-ST1-H	1/2"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG						IRC	8"-LFG-0312-ST1-H-1
1-445S	65 P-455.	HV-0334	STICK BUILT	Needle Valve	Piping Valve	FILTER -302 - DPG-335	1/4"-LFG-0313-SS7-N	1/4"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	316 S/S	NPT (F)	SS BODY SOFT SEAT, PTFE PACKING,						IRC	NA
nanical \N	66 P-455.	HV-0336	STICK BUILT	Needle Valve	Piping Valve	FILTER -302 - DPG-335	1/4"-LFG-0314-SS7-N	1/4"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	316 S/S	NPT (F)	SS BODY SOFT SEAT, PTFE PACKING,						IRC	NA
/M-Meck	57 P-455.	HV-0337	STICK BUILT	Ball Valve	Piping Valve	H2S VESSEL LEAD LAG PIPING	F-302 TRIM	1"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC	NA
rawings	58 P-455.	SI-0347	STICK BUILT	SS PLUG	Piping Item	H2S VESSEL LEAD LAG PIPING	F-302 TRIM	1"	150 15	24	150 LANDFILL G	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG						IRC	8"-LFG-0301-SS1-H-1

- 1. IF LIST IS "SKID MODULE\_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
  2. IF LIST IS "STICK BUILT\_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

2	۷. ۱۱	LIST IS SHOW BOILT_SOLLET, IT BOLS NELD TO BE TWOCOVED	AND INSTAL	LLD DI CO	MINACION.	
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
$\frac{2}{2.0}$	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
$\frac{2}{3.0}$	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
$\frac{2}{3}$ $\boxed{4.0}$	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025

No. 93370

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Digitally signed by Andre Andre Gamanian Date: 2023.09.25 17:53:16-07'00'



INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORÍDA 32968 ENGINEER:

ISSUED FOR CONSTRUCTION

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

VALVE LIST (STICK BUILT) (SHEET 8 OF 13)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. M-445Z

	Bioga	as E	ngine	eering					Ma	ınual '	Valve	List															
Stick	Built_S	Suppl	<u>у</u>																								
-								SERVICE FLUID DATA	A & INSTRUMI	ENT REQU									ТО	BE FILLED	BY SUPPLIER			NOT TO BE FILLI	ED BY SUP	PLIER	
No.	PID shee		P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Design Pressure psig	F,	Design Temp F, Max	Fluid Service	Fluid Composition	Material	End Connection	Description on	Manufac	urer Model Nur	nber	Supplier	Remark	Comments	Scope of Supply	Status	lsometric N	ımber
69	P-455	5K H	V-0403	STICK BUILT	Needle Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0312-ST1-H	1/2" 150	15	24	150 LAN	NDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	316 S/S	NPT (F)	MULTIPORT BLOCK & BLEED VALVE, CLAS 6000, SOFT SEAT, PTFE PACKING, BLEED PORT	SS						IRC		8"-LFG-0312-ST1-H-2	
70	P-455	5K H	V-0405	STICK BUILT	Ball Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0312-ST1-H	1/2" 150	15	24	150 LAN	NDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAI BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	R E						IRC		8"-LFG-0312-ST1-H-2	
71	P-455	5K H	V-0409	STICK BUILT	Needle Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0401-ST1-C	1/2" 150	15	24	150 LAN	NDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	316 S/S	NPT (F)	MULTIPORT BLOCK & BLEED VALVE, CLAS 6000, SOFT SEAT, PTFE PACKING, BLEED PORT	SS						IRC		8"-LFG-0401-ST1-C-2	
72	P-455	5K H	V-0411	STICK BUILT	Ball Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0401-ST1-C	1/2" 150	15	24	150 LAN	NDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAI BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	1						IRC		3"-LFG-0401-ST1-C-2	
73	P-455	5K H	V-0434	STICK BUILT	Ball Valve	Piping Valve	CHILLER SUPPLY LINE	3"-CHWS-0409-CS1-C	1/2" 150	150	8	150 CHI	IILLER WATER	35% PEG/Water	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAI BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	R						IRC		3"-CHWS-0409-CS1-0	:-2
74	P-455	SK S	SI-0435	STICK BUILT	SS PLUG	Piping Item	CHILLER SUPPLY LINE	3"-CHWS-0409-CS1-C	1/2" 150	150	8	150 CHI	IILLER WATER	35% PEG/Water	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG							IRC		3"-CHWS-0409-CS1-0	2
75	P-455	5K H	V-0430	STICK BUILT	Ball Valve	Piping Valve	CHILLER SUPPLY LINE	3"-CHWS-0409-CS1-C	1/2" 150	150	8	150 CHI	IILLER WATER	35% PEG/Water	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAI BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR							IRC		3"-CHWS-0409-CS1-0	:-2
76	P-455	5K H	V-0436	STICK BUILT	Ball Valve	Piping Valve	CHILLER SUPPLY LINE	3"-CHWS-0409-CS1-C	1/2" 150	150	8	150 CHI	IILLER WATER	35% PEG/Water	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAI BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	R						IRC		3"-CHWS-0409-CS1-0	3
77	P-455	5K S	51-0437	STICK BUILT	SS PLUG	Piping Item	CHILLER SUPPLY LINE	3"-CHWS-0409-CS1-C	1/2" 150	150	8	150 CHI	IILLER WATER	35% PEG/Water	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG							IRC		3"-CHWS-0409-CS1-0	,-3
78	P-455	5K H	V-0429	STICK BUILT	Ball Valve	Piping Valve	CHILLER RETURN LINE	3"-CHWS-0409-CS1-C	3" 150	150	8	150 CHI	IILLER WATER	35% PEG/Water	CS Body Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAI BORE, CLASS 150, RF	R						IRC		3"-CHWS-0409-CS1-0	1
79	P-455	5K H	V-0440	STICK BUILT	Ball Valve	Piping Valve	CHILLER RETURN LINE	3"-CHWR-0410-CS1-C	3" 150	150	8	150 CHI	IILLER WATER	35% PEG/Water	CS Body Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAI BORE, CLASS 150, RF	R						IRC		3"-CHWR-0410-CS1-	)-3
80	P-455	5K H	V-0442	STICK BUILT	Ball Valve	Piping Valve	CHILLER RETURN LINE	3"-CHWR-0410-CS1-C	3" 150	150	8	150 CHI	IILLER WATER	35% PEG/Water	CS Body Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAI BORE, CLASS 150, RF	R						IRC		3"-CHWR-0410-CS1-	J-3
81	P-455	5K H	V-0443	STICK BUILT	Ball Valve	Piping Valve	CHILLER RETURN LINE	3"-CHWR-0410-CS1-C	3" 150	150	8	150 CHI	IILLER WATER	35% PEG/Water	CS Body Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAI BORE, CLASS 150, RF	R						IRC		3"-CHWR-0410-CS1-	C-4
82	P-455	5K H	V-0438	STICK BUILT	Ball Valve	Piping Valve	CHILLER RETURN LINE	3"-CHWR-0410-CS1-C	1/2" 150	150	8	150 CHI	IILLER WATER	35% PEG/Water	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)								IRC		3"-CHWR-0410-CS1-6	:-4
83	P-455	5K S	51-0439	STICK BUILT	SS PLUG	Piping Item	CHILLER RETURN LINE	3"-CHWR-0410-CS1-C	1/2" 150	150	8	150 CHI	IILLER WATER	35% PEG/Water	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG							IRC		3"-CHWR-0410-CS1-	 J-4

1. IF LIST IS "SKID MODULE\_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
2. IF LIST IS "STICK BUILT\_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

DATE DESCRIPTION DRN BY CHK BY APRV BY PROFESSIONAL ENGINEER ISSUED FOR BID ISSUED FOR CONSTRUCTION ISSUED FOR CONSTRUCTION (REVISED) SS ISSUED FOR CONSTRUCTION (REVISED)

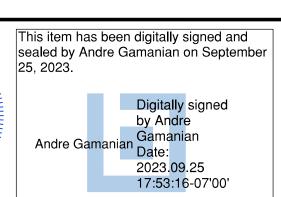
DRE GAMANA ICENS No. 93370 STATE OF

ANDRE GAMANIAN, P.E.

FL LICENCE NO.93370

EXP. 02/28/2025

SSIONAL ENGINEERING





INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968 ENGINEER:

SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

VALVE LIST (STICK BUILT) (SHEET 9 OF 13)

ISSUED FOR CONSTRUCTION

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445AA

2321 E. 28TH STREET, SUITE 400

	Bioga	as E	ngine	ering					Ma	nual \	/alve Lis	st											
Stick	SERVICE FLUID DATA & INSTRUMENT REQUIREMENT  SERVICE FLUID DATA & INSTRUMENT REQUIREMENT  SERVICE FLUID DATA & INSTRUMENT REQUIREMENT  NOT TO BE FILLED BY SUPPLIER  NOT TO BE FILLED BY S																						
	ı						1	SERVICE FLUID DATA	& INSTRUME	NT REQUI							TO BE FILLED	BY SUPPLIER			NOT TO BE FILLE	ED BY SUPPL	.IER
No.				Scope	Item	Category	Location	Line	Item Size		l I		Fluid Composition	Material	Description	Manufacturer Mo	odel Number	Supplier	Remark	Comments		Status	Isometric Number
84	P-455	5K H	V-0444	STICK BUILT	Ball Valve	Piping Valve	CHILLER RETURN LINE	3"-CHWR-0410-CS1-C	1/2" 150	150	8 150	CHILLER WATER	35% PEG/Water	CS Body ASTM A105 Gr. CF8, Ball-SS 316, Seat - RTFE,	BALL VALVE, UNI-BODY DESIGN, REGU IPT (F) BORE, NPT (F), MANUAL LEVER LOCKA OPERATOR						IRC	3"-	'-CHWR-0410-CS1-C-1
85	P-455	5K S	I-0445	STICK BUILT	SS PLUG	Piping Item	CHILLER RETURN LINE	3"-CHWR-0410-CS1-C	1/2" 150	150	8 150	CHILLER WATER	35% PEG/Water	SS 316	IPT (M) 1/2" SS NPT VALVE PLUG						IRC	3"-	'-CHWR-0410-CS1-C-1
86	P-455	5K S	I-0441	STICK BUILT	STRAINER	Speciality Item	CHILLER RETURN LINE	3"-CHWR-0410-CS1-C	3" 150	150	8 150	CHILLER WATER	35% PEG/Water	CARBON STEEL BODY	langed Flange 150# Y-strainer with 20 mesh o higher with purge valve connection	r					IRC	3"-	'-CHWR-0410-CS1-C-3
87	P-455	5K H	V-0447	STICK BUILT	Butterfly Valve	Piping Valve	RNG LFG	8"-LFG-0402-SS1-HT	8" 150	15	24 150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8, SPINDLE & DISC-SS 316, SEAT: I SS 316	UG TYPE BUTTERFLY VALVE, CLASS 150, RF						IRC	8"-	'-LFG-0402-SS1-HT-2
88	P-455	5L H	V-0522	STICK BUILT	Ball Valve	Piping Valve	XV-106	1"-IA-0507-SS1-N	1/2" 150	150	24 150	Instrument Air	DRY ATM GAS COMPOSITION	Ball-SS 316, Seat - RTFE,	BALL VALVE, UNI-BODY DESIGN, REGULARY (F)  BORE, NPT (F), MANUAL LEVER LOCKA  OPERATOR	BLE					IRC	1"-	'-IA-0507-SS1-N-1
89	P-455	5L H	V-0524	STICK BUILT	Ball Valve	Piping Valve	XV-013	1/2"-IA-0509-SS1-N	1/2" 150	150	24 150	Instrument Air	DRY ATM GAS COMPOSITION	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	OPERATOR						IRC	1/2	/2"-IA-0509-SS1-N-1
90	P-455	5L AF	-R-0523	STICK BUILT	Air Filter Regulator	Piping Item	XV-106	1"-IA-0507-SS1-N	1/2" 150	150	24 150	Instrument Air	DRY ATM GAS COMPOSITION		Compressed Air Filter Regulator with gauge, outdoor rated, metal bowl w/si glass & Gauge	te					IRC	1"-	'-IA-0507-SS1-N-1
91	P-455	5L AF	FR-0525	STICK BUILT	Air Filter Regulator	Piping Item	XV-102	1/2"-IA-0509-SS1-N	1/2" 150	150	24 150	Instrument Air	DRY ATM GAS COMPOSITION		Compressed Air Filter Regulator with gauge, outdoor rated, metal bowl w/si glass & Gauge						IRC	1/2	/2"-IA-0509-SS1-N-1
92	P-455	5L H	V-0526	STICK BUILT	Ball Valve	Piping Valve	IRC FLARE FLOW METER	8"-LFG-0501-SS1-P	1/2" 150	15	24 150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball SS 316, Seat RTFE,	BALL VALVE, UNI-BODY DESIGN, REGULARY BORE, NPT (F), MANUAL LEVER LOCKA OPERATOR	BLE					IRC	N/	<del>/</del> A
93 PE. d wd	P-455	5L H	V-0527	STICK BUILT	Ball Valve	Piping Valve	IRC FLARE FLOW METER	8"-LFG-0501-SS1-P	1/2" 150	<del>15</del>	<del>24</del> <del>150</del>	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	BALL VALVE, UNI-BODY DESIGN, REGULIPT (F)  BORE, NPT (F), MANUAL LEVER LOCKA  OPERATOR						IRC	N/	<del>/A</del>
94	P-455	5L H	V-0516	STICK BUILT	Ball Valve	Piping Valve	FLARE INLET LINE	8"-LFG-0510-SS1-P	1/2" 150	15	24 150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	OPERATOR	BLE					IRC	8"-	'-LFG-0510-SS1-P-2
95	P-455	5L S	I-0526	STICK BUILT	FLEXIBLE HOSE	Speciality Item	PROPANE SUPPLY	PROPANE TANK TO FLARE	1/2" 150	15	-40 140	PROPANE GAS	PROPANE	TBD (VENDOR TO SPECIFY)	IPT (M) LP gas hose, ¼" MNPT x ¼" MNPT x 5ft McMaster-Carr 45835K11 or equal	-,					IRC	N.A	A
96	P-455	5L S	I <del>-0502</del>	STICK BUILT	FLOW CONDITIONER	Speciality Item	RNG LFG FLOW METER	8"-LFG-0501-SS1-P	8" <del>150</del>	<del>15</del>	24 <u>150</u>	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	ISS 316	VAFER- YPE 8" SCH 40 316 S/S FLOW CONDITION	<del>ER</del>				THIS IS SHIFTED TO SKID	BGE	N/	<del>/A</del>
97	P-455	5H S	I-0128	STICK BUILT	Vent Screen	Speciality Item	Analyzer Vent	1/2"-LFG-0114-SS7-N	1/2" 150	15	24 150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316							IRC	N/	Α
98	P-455	5J S	I-0301	STICK BUILT	FLEXIBLE HOSE	Speciality Item	AFTER COOLER OUTLET	8"-LFG-0318-SS1-H	8" 150	15	24 150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	TRD (VENDOR TO SPECIEV)	langed 4'-5" LONG FLEXIBLE HOSE WITH 150	#					IRC	8"-	'-LFG-0318-SS1-H-1
⊕     ≥   ∞	P-455	5L AF	-R-0531	STICK BUILT	Air Filter Regulator	Piping Item	FV-0139	1/2"-IA-0513-SS1-N	1/2" 150	150	24 150	Instrument Air	DRY ATM GAS COMPOSITION		Compressed Air Filter Regulator with gauge, outdoor rated, metal bowl w/si glass & Gauge	te					IRC	1/2	′2"-IA-0513-SS1-N -1
100	P-455	5L H	V-0530	STICK BUILT	Ball Valve	Piping Valve	FV-0139	1/2"-IA-0513-SS1-N	1/2" 150	150	24 150	Instrument Air	DRY ATM GAS COMPOSITION	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	BALL VALVE, UNI-BODY DESIGN, REGU IPT (F) BORE, NPT (F), MANUAL LEVER LOCKA OPERATOR						IRC	1/2	/2"-IA-0513-SS1-N -1

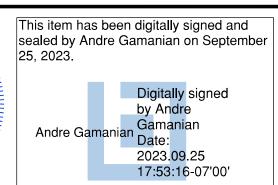
- 1. IF LIST IS "SKID MODULE\_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
  2. IF LIST IS "STICK BUILT\_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

9	۷. ۱۱	LIST IS STICK BUILT_SUPPLY, IT DUES NEED TO BE PROCURED	AND INSTAL	LLD BI CO	IN III ACTOIN.
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG
2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG

PROFESSIONAL ENGINEER No. 93370

ANDRE GAMANIAN, P.E.

FL LICENCE NO.93370 EXP. 02/28/2025





INDIAN RIVER COUNTY FLORIDA

1325 74 VERO BE

ENGINEER:

ISSUED FOR CONSTRUCTION

VALVE LIST (STICK BUILT) (SHEET 10 OF 13)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445AB

TORIO	
74th AVE SW,	2321 E. 28TH STREET, SUITE 400
BEACH, FLORIDA 32968	SIGNAL HILL, CA 90755, Ph: (562) 726-3565
	EMAIL: INFO@BIOGASENG.COM

- 1	Biogas	Engin	eering					Ma	nual '	Valve	e List												
Stick	Built_Su	pply																					
	_	_			_		SERVICE FLUID DATA	& INSTRUME	NT REQU	IREMENT	Г			_			TO BE I	ILLED BY SUPP	LIER		NOT TO BE FILLE	D BY SUPP	LIER
No.	PID sheet	P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Design Pressure psig	Temp	F, Fluid Service	Fluid Composition	Material	End Connection	Description	Manufacture	er Model Numbe	Supplier	Remark	Comments	Scope of Supply	Status	Isometric Number
101	P-455L	AFR-0529	STICK BUILT	Air Filter Regulator	Piping Item	FV-0140	1/2"-IA-0515-SS1-N	1/2" 150	150	24	150 Instrument Air	DRY ATM GAS COMPOSITION		NPT (F)	Compressed Air Filter Regulator with gauge, outdoor rated, metal bowl w/site glass & Gauge						IRC	1	/2"-IA-0515-SS1-N-1
102	P-455L	HV-0528	STICK BUILT	Ball Valve	Piping Valve	FV-0140	1/2"-IA-0515-SS1-N	1/2" 150	150	24	150 Instrument Air	DRY ATM GAS COMPOSITION	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	<del> </del>	1					IRC	1	/2"-IA-0515-SS1-N-1
103	P-455G	HV-0141	STICK BUILT	Ball Valve	Piping Valve	EVAP FACILITY RECEIVER VALVE	8"-LFG-0127-HD1-N	8" 150	15	24	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	FULL PORT HDPE VALVE	BUTT FUSION	BALL VALVE GEAR OPERATED EXTENDED HANDLE, BUTT FUSION (REFER COMMENT COLUMN)					THIS VALVE TO BE PROCURED ALONG WITH HDPE PIPELINE MTO	IRC	N	<b>I</b> A
103	P-455G	HV-0142	STICK BUILT	Ball Valve	Piping Valve	EVAP FACILITY RECEIVER VALVE	8"-LFG-0127-HD1-N	8" 150	15	24	150 LANDFILL GAS		FULL PORT HDPE VALVE	BUTT FUSION	BALL VALVE GEAR OPERATED EXTENDED HANDLE, BUTT FUSION (REFER COMMENT COLUMN)					THIS VALVE TO BE PROCURED ALONG WITH HDPE PIPELINE MTO	IRC	N	JA
104	P-455H	SI-0129	STICK BUILT	Vent Screen	Speciality Item	Analyzer Vent	1/2"-LFG-0124-SS7-N	1/2" 150	15	24	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316								IRC		<b>I</b> A
105	P-455K	HV-0448	STICK BUILT	Ball Valve	Piping Valve	CHILLER SUPPLY LINE	3"-CHWS-0409-CS1-C	3/4" 150	150	8	150 CHILLER WATER	35% PEG/Water	CS Body ASTM A105 Gr CER	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULA BORE, NPT (F), MANUAL LEVER LOCKABLI OPERATOR						IRC	3	"-CHWS-0409-CS1-C-1
106	P-455K	SI-0449	STICK BUILT	Expansion Tank	Speciality Item	CHILLER SUPPLY LINE	3"-CHWS-0409-CS1-C	3/4" 150	150	8	150 CHILLER WATER	35% PEG/Water			SUPPLIED BY THERMAL CARE (AMTROL Model: AX-10-DD)						IRC	3	"-CHWS-0409-CS1-C-1
107	P-455L	HV-0533	STICK BUILT	Ball Valve	Piping Valve	CONTROL PANEL	1"-IA-0507-SS1-N	1/2" 150	150	24	150 Instrument Air	DRY ATM GAS COMPOSITION	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULA BORE, NPT (F), MANUAL LEVER LOCKABLI OPERATOR						IRC	1	."-IA-0507-SS1-N-1
108	P-455G	HV-0136	STICK BUILT	Ball Valve	Piping Valve	RNG CONDENSATE FLOW METER	2"-C-0121-SS1-N	<del>1/2"</del> <del>150</del>	25	24	150 CONDENSATE	H20 100% with traces of	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULA BORE, NPT (F), MANUAL LEVER LOCKABL OPERATOR						IRC		
109	P-455G	SI-0135	STICK BUILT	STRAINER	Speciality Item	RNG CONDENSATE FLOW METER	2"-C-0121-SS1-N	2" 150	25	24	150 CONDENSATE	H20 100% with traces of H2S	STAINLESS STEEL BODY	Flanged	Flange 150# Y-strainer with 20 mesh or higher with purge valve connection						IRC		2-C-0121-SS1-N-1
110	P-455L	SI-0307	STICK BUILT	STRAINER	Speciality Item	PROPANE SUPPLY	PROPANE TANK TO FLARE	1/2" 150	15	-40	140 PROPANE GAS	PROPANE	CARBON STEEL BODY	NPT (F)	Y-STRAINER, NPT(F), PROPANE SUPPLY(VENDOR TO SPECIFY SUITABLE STRAINER FOR SERVICE)						IRC		3/4"- FG-0520-SS1-N-1
111	P-455G	HV-0122	STICK BUILT	Ball Valve	Piping Valve	TO EVAP PIPELINE U/G	8"-LFG-0127-HD1-N	8" 150	15	24	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	FULL PORT HDPE VALVE	BUTT FUSION	BALL VALVE GEAR OPERATED EXTENDED HANDLE, BUTT FUSION (REFER COMMENT COLUMN)					THIS VALVE TO BE PROCURED ALONG WITH HDPE PIPELINE MTO	IRC	N	NA
112	P-455J	HV-0352	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0318-SS1-H	8" 150	15	24	150 LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	BODY-ASTM A351 CF3, CF8, SPINDLE & DISC-SS 316, SEAT SS 316	· 1	BUTTERFLY VALVE, CLASS 150, RF						IRC	8	"-LFG-0318-SS1-H-3

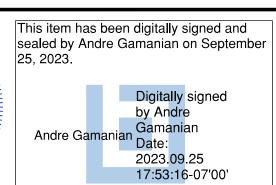
1. IF LIST IS "SKID MODULE\_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
2. IF LIST IS "STICK BUILT\_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

DATE DESCRIPTION DRN BY CHK BY APRV BY PROFESSIONAL ENGINEER ISSUED FOR BID ISSUED FOR CONSTRUCTION ANDRE GAMANIAN, P.E. ISSUED FOR CONSTRUCTION (REVISED) SS FL LICENCE NO.93370 ISSUED FOR CONSTRUCTION (REVISED)

NORE GAMANANIA No. 93370

EXP. 02/28/2025

ALORIDA CHANGE





INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORÍDA 32968 ENGINEER:

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

VALVE LIST (STICK BUILT) (SHEET 11 OF 13)

ISSUED FOR CONSTRUCTION

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. M-445AC

Bioga	s Engin	neering								Instrum	ent List														
kid Module	_Supply	,																							
								1 1			Design INSTRUMENT	REQUIREMENT	1			I			TO BE FILLED BY	Y SUPPLIER		NO	OT TO BE FILLED	BY SUPPLIER	
lo. PID sheet	P&ID Tag#	Scope	ltem .	Instrument Loacation	Category	Line	Item Size	Class rating	Design Pressure psi	-	Temp Fluid Service F, Max	Fluid Composition	Range	End Connection	Description	POWER SUPPLY	Feedback SIGNAL	Manufacturer	Model Number	Supplier	Remark	Comments	Scope of Supply	Status	Isometric Number
1 P-445I	I G-0221	1 SKID MODULE	Level Gauge	@ V-200	GAUGFS	1"-C-0206-SS1-H	1"	150	-3 TO +5 PSIG	74	150 LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	3'-3"	RF FI ANGFD	Sight Glass with 1" ANSI 150 Flanged Stainless Steel Gauge Valves	N/A	N/A	JOHN C ERNST	81910F-39.00-ATH-150-150-5N	COYLE			BGE		1"-C-0206-SS1-H-1
2 P-4451	LT-0215	5 SKID MODULE	Level Transmitter	@ V-200	TRANSMITTER	1/2"-LFG-0208-SS7-Н/ 1/2"-LFG-0209-SS7-Н	1/2"	150	-3 TO +5 PSIG	24	150 LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	0-50" wc	MNPT	Differential Pressure Transmitter	24DC	4-20 mA	ABB	266DSH	COYLE	Provide RTD with Thermowell		BGE		1"-C-0206-SS1-H-1 & 1"-C-020 SS1-H-2
3 P-4451	PG-0242	SKID MODULE	Pressure Gauge	Suction Scrubber Drain	GAUGES	1 1/2"-C-0204-SS1-HT	1/2"	150	-3 TO +5 PSIG	24	150 CONDENSATE	WATER	-100 TO +100"WC	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	REOTEMP	CSI-PC40S1A2P72-LD-D-T	COYLE		We need CSI-PC40S1A2P75-D-T, what does LD stand for, P75 IS FOR -100 TO 100 INWC	BGE		1 1/2"-C-0204-SS1-HT-1
4 P-4451	PG-0230	SKID MODULE	Pressure Gauge	Blower Discharge	GAUGES	10"-LFG-0202-SS1-P	1/2"	150	15	24	150 LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0-30PSIG	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	REOTEMP	CSI-PR40S1A2P16-LD-D-T	COYLE			BGE		10"-LFG-0202-SS1-P-2
5 P-4451	PT-0209	9 SKID MODULE	Pressure Transmitter	DOWNSTREAM OF BLOWER INLET SCRUBBER	TRANSMITTER	10"-LFG-0202-SS1-P	1/2"	150	15	24	150 LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	0-30 psig	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	ABB	266HSH	COYLE			BGE		10"-LFG-0202-SS1-P-2
6 P-445K	LG-0423	3 SKID MODULE	Level Gauge	@ V-401	GAUGES	1"-C-0405-SS1-C	1"	150	15	24	150 LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	2'-8"	RF FLANGED	Sight Glass with 1" ANSI 150 Flanged Stainless Steel Gauge Valves	N/A	N/A	JOHN C ERNST		COYLE			BGE		1"-C-0405-SS1-C-1
7 P-445K	LT-0424	4 SKID MODULE	Level Transmitter	@ V-401	TRANSMITTER	1/2"-LFG-0407-SS7-C/ 1/2"-LFG-0408-SS7-C	1/2"	150	15	24	150 LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	0-50" wc	MNPT	Differential Pressure Transmitter	24DC	4-20 mA	АВВ	266DSH	COYLE	Provide RTD with Thermowell		BGE	1	1"-C-0405-SS1-C-1 & 1"-C-0405 C-2
8 P-445L	PG-0505	5KID MODULE	Pressure Gauge	Blower Discharge	GAUGES	8"-LFG-0510-SS1-P	1/2"	150	15	24	150 LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	0-10PSIG	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	REOTEMP	CSI-PR40S1A2P15-LD-D-T	COYLE			BGE		8"-LFG-0510-SS1-P-4
9 P-445L	<del>PT-0507</del>	7 SKID- MODULE	Pressure Transmitter	UPSTREAM OF BLOWER INLET- SCRUBBER	TRANSMITTER	8"-LFG-0510-SS1-P	1/2"	150	<del>15</del>	24	150 LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	0-10PSIG	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	<del>N/A</del>	<del>N/A</del>						BGE		NA
LO P-445L	FT-0503	3 SKID MODULE		LFG OUTLET TO EVAP FACILITY @ B/L	TRANSMITTER	8"-LFG-0510-SS1-P	1/2"	150	15	24	150 LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	0-3000 SCFM	MNPT	Orifice plate and Flow Transmitter that connects to orifice flange,	24DC	4-20 mA	ABB		TRI-PACIFIC			BGE		8"-LFG-0510-SS1-P-3
.1 P-445I	TT/TW-02	254 SKID MODULE	RTD	UPTREAM OF LFG AFTER COOLER	TRANSMITTER	10"-LFG-0202-SS1-P	3/4"	150	15	24	150 LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0 to 300°F	MNPT	100 ohm RTD Sensor / 4" Spring Loaded Stem/Aluminum Screw Connection head	24DC	4-20 mA	#N/A					BGE		10"-LFG-0202-SS1-P-2
.2 P-4451	TG/TW-02	255 SKID MODULE	Temperature Gauge	UPTREAM OF LFG AFTER COOLER	GAUGES	10"-LFG-0202-SS1-P	3/4"	150	15	24	150 LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0 to 300°F	MNPT	5" Dial Adjustable Thermometer. 2 1/2" Insertion, T304 SS Thermowell	N/A	N/A	#N/A					BGE		10"-LFG-0202-SS1-P-2
13 P-445L	PT-0538	8 SKID MODULE	Pressure Transmitter	Instrument Air to P-202	TRANSMITTER	1/2"-IA-0517-SS1-N	1/2"	150	150	24	150 INSTRUMENT AIR	AIR	0-150 psig	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	АВВ	266HSH	COYLE			BGE		1/2"-IA-0517-SS1-N-1

1. All transmitter shall generate 4-20 mA signal.

2. All the items shall be desinged for class I Div 2 electrical area classification.

3. All items except SS tags are quantity of one each. 4 All items shall be tagged with SS tags

**Actuated Valve List Biogas Engineering** 

$\underset{-}{\overset{\oplus}{\geq}}$  Sk	id Module_	Supply																							
± F										SERV	ICE FLUID DATA & INSTRUMENT REQUIREMENT										TO BE FI	LLED BY SUPPLIER		NOT TO BE FILLE	ED BY SUPPLIER
wings	PID sheet	P&ID Tag #	Scope	Item	XV Location	Line No	Item Size CI	Design Pressur psig	Temp F,	Temp F, Max	Fluid Composition	Actuation	Seal Cl		nstrument Air Requirement	Power Supply	Feedback SIGNAL	End Connection	Description	Manufacturer	Model Number	Supplier Cost	Remark	Comments Scope of Supply	Status Isometric Number
1 Dro	P-445I	SV-0232	SKID MODULE	On/Off Valve	Suction Scrubber Drain	1 1/2"-C-0204-SS1- HT	1 1/2" 1	50 40 PSIC	24	150 CONDENSATE	WATER	Electrical	Class	ss 2 Fail Closed Ball Valve	NA	24DC	Form C Contacts (Open Close)	ГМРТ	Stainless Steel Solenoid Valve, Threaded, Norm Closed, 24Vdc Explosion Proof.	TRIAC	22-TX-150/3RFS-FB	Coyle \$957.25	Full Port SS THREADED Ball Valve, Non-Firesafe	BGE	1 1/2"-C-0204-SS1- HT-2
	P-445K	SV-0426	SKID MODULE	On/Off Valve	Discharge Scrubber Drain	1 1/2"-C-0404-SS1- HT	1 1/2" 1	50 15	24	150 CONDENSATE	WATER	Electrical	Class	ss 2 Fail Closed Ball Valve	NA	24DC	Form C Contacts (Open Close)	FNPT	Stainless Steel Solenold Valve, Threaded, Norm Closed, 24Vdc Explosion Proof.	MAGNATROL	PLF35K45SC-HDTH-24VDC VISUAL INDICATOR	Coyle \$2,286.90	Solenoid Valve. Non-Firesafe	BGE	1 1/2"-C-0404-SS1- HT-3
un ty	P-445K	FV-0415	SKID MODULE	Flow Control Valve	Discharge Scrubber Recycle	4"-LFG-0403-SS1-N	N 4" 1	50 15	24	150     ANDEILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	Instrument Air	r CLASS	SS 3 Fail Closed Ball Valve	80 psi	24DC	Form C Contacts (Open Close)	RF FLANGED	V-Port Segmented Ball Control Valve, SS, 150 Flanged, Pneumatic Fail CLOSE Act. 4/20 Modulating, Class I Div II	TRIAC	VS-F1-0400-SXX-3R500SR FAIL CLOSED	Coyle \$6,815.88	Segmented V-Port SS 150 Flanged Ball Valve. Non- Firesafe	BGE	4"-LFG-0403-SS1-N- 4
er Co	P-445L	PV-0509	SKID MODULE	Pressure Control Valve	LFG Line to Flare	8"-LFG-0510-SS1-F	8" 1	50 15	24		CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	Instrument Air	r CLASS	SS 3 Fail Closed Butterfly valve	80 psi	24DC	Form C Contacts (Open Close)	LUG TYPE	Lug type Butterfly Valve control valve modulating based on Pressure input signal, pneumatic spring return, held open, fail closed. Assembled with solenoid, exhaust speed control mufflers, position indication/limit switches.	TRIAC	P1F-L1-0800-F6C-XAG - 3R850SI	R Coyle \$7,924.50	SS, ANSI 150 LUG, FIRESAFE DESIGN, G2TFE/ 316L METAL SEAT	BGE	8"-LFG-0510-SS1-P- 5
≥ ≥ 1	P-445I	SV-0253	SKID MODULE	On/Off Valve	Instrument Air Line to P-202	1/2"-IA-0517-SS1-N	N 1/2" 1	50 150	24	150 INSTRUMENT AIR	AIR	Electrical	Class	ss 2 Fail Closed Ball Valve	NA	24DC	Form C Contacts (Open Close)	FNPT	Stainless Steel Solenoid Valve, Threaded, Norm Closed, 24Vdc Explosion Proof.	MAGNATROL	PLF41K36SC-HDTG-24VDC PLF41K36G	Coyle \$2,770.20	Solenoid Valve. Non-Firesafe	BGE	1/2"-IA-0517-SS1-N- 1

- All the items shall be desinged for class I Div 2 electrical area classification.
- Instrument air supply: Maximum 100 psig, Normal: 80 psig Minimum: 65 psig Position indication is not required for valves with Electro-pneumatic positioner
- All items except SS tags are quantity of one each. All items shall be tagged with SS tags

Pro je	Stick Built_	_Supply																												
76	<i></i>												SERV	CE FLUID DATA & INSTRUN	IENT REQUIREMENT									TO BE FILLED BY SUPPLIER				NOT TO BE FILL	D BY SUPPLIER	-
ngineering	No. PID sheet	P&ID Tag #	Scope	Item	XV Location	Line No	o Ite	m Size Class	s Design Pressure psig	Temp 1	esign Femp F, Max	ce Flui	d Composition	Actuation	Seal Class	Failure Positio	Inline Element	Instrument Air Requirement	Power Supply	y Feedback SIGNAL	End Connection	Description	Manufactur	er Model Number	Supplier	Remark	Comments	Scope of Supply	Status	Isometric Number
nts∕E	1 P-445G	XV-0106	Stick Built	On/Off Valve	LFG INLET @ B/I	L 14"-LFG-0101	L-SS1-N	<b>14"</b> 150	-3 TO +5 PSIG	G 24	150 LANDFILL G		,CO2 21.75-26.75 %, N2 6, H2O 13.64%, H2S 0.10		CLASS 3	Norm Closed	Butterfly valve	80 psi	24DC	Form C Contacts (Open, Close)	LUG TYPE	Lug type Butterfly Valve, pneumatic spring return, held open, fail closed. Assembled with solenoid, exhaust speed control mufflers, topworx position indication/limit switches.						IRC		14"-LFG-0101-SS1-N-2
ocume	2 P-445H	FV-0139	Stick Built	Flow Control Valve	LFG INLET @ B/I	L 8"-LFG-0102	-SS1-N	<b>8"</b> 150	15	24	150 LANDFILL G		,CO2 21.75-26.75 %, N2 5, H2O 13.64%, H2S 0.10		CLASS 3	Norm Closed	V-PORT VALVE	80 psi	24DC	Form C Contacts (Open, Close)	FLANGED	V-Port Segmented Ball Control Valve, SS, 150 Flanged, Pneumatic Fail CLOSE Act. 4/20 Modulating, Class I Div II	TRIAC	VS-F1-0800-SXX-3R1200SR FAIL CLOSED	Coyle			BGE		8"-LFG-0102-SS1-HT-1
- D0	3 P-445H	FV-0140	Stick Built	Flow Control Valve	LFG INLET @ B/I	6"-LFG-0103	-SS1-N	3" 150	15	24	150 LANDFILL G		,CO2 21.75-26.75 %, N2 5, H2O 13.64%, H2S 0.10		CLASS 3	Norm Closed	V-PORT VALVE	80 psi	24DC	Form C Contacts (Open, Close)	LUG TYPE	V-Port Segmented Ball Control Valve, SS, 150 Flanged, Pneumatic Fail CLOSE Act. 4/20 Modulating, Class I Div II	TRIAC	VS-F1-0600-SXX-3R1000SR FAIL CLOSED	Coyle			BGE		6"-LFG-0103-SS1-HT-1

All the items shall be desinged for class I Div 2 electrical area classification.

Instrument air supply: Maximum 100 psig, Normal: 80 psig Minimum: 65 psig Position indication is not required for valves with Electro-pneumatic positioner All items except SS tags are quantity of one each.

All items shall be tagged with SS tags

## NOTES:

1. IF LIST IS "SKID MODULE\_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.

2. IF LIST IS "STICK BUILT\_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR, EXCEPT FV-0139 AND FV-0140 SHALL BE SUPPLIED BY BGE AND INSTALLED BY CONTRACTOR.

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025

No. 93370 STATE OF

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. 2023.09.25 17:53:16-07'00'



VERO BEACH, FLORIDA 32968

INDIAN RIVER COUNTY FLORIDA

ENGINEER:

# 2321 E. 28TH STREET, SUITE 400

SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

ISSUED FOR CONSTRUCTION

INSTRUMENT LIST (SKID MODULE) & ACTUATED VALVE LIST (SKID MODULE/STICK BUILT) (SHEET 12 OF 13)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. |M-445AD|

Biogas Engine								instrument Li														
Stick Built_Supply							9	SERVICE FLUID DAT	A & INSTRUMENT RI	EQUIREMENT							TO BE FILLED BY	SUPPLIER		NOT	TO BE FILLED BY SUPPLI	ER
No. PID P&ID	Scope	ltem	Instrument Loacation	Category	Line	Item Size	Class Pressure	Design Design Temp Temp	Fluid Service	Fluid Composition	Range	End Connection	Description	POWER SUPPLY	Feedback SIGNAL	Manufacturer	Model Number	Supplier	Remark	Comments	Scope of Supply Status	Isometric Number
sheet Tag #			LFG INLET @ B/L	GAUGES	,	, ,	psi psi 150 -3 TO +5 PSIG	F, F, Max	LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O	-100 TO +100"WC	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	REOTEMP		, applic.			IRC	14"-LFG-0101-SS1-N-2
2 P-445G TT/TW-010			LFG INLET @ B/L	RTD/Thermowell	14"-LFG-0101-SS1-N		150 -3 TO +5 PSIG		LANDFILL GAS	13.64%, H2S 0.10%  CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O	0 to 300°F	MNPT	100 ohm RTD Sensor / 4" Spring Loaded Stem/Aluminum Screw Connection head	24DC	4-20 mA	TRERICE		Provi	de RTD with Thermowell		IRC	14"-LFG-0101-SS1-N-1
2 1 4430 11/11/10/10	or Stick Built	·	LIGHTELI & OFE	M by memowen	14 El 0 0101 351 N	3/4	310 313131	24 130	EANOTILE GAS	13.64%, H2S 0.10%	0 10 300 1	Wild	200 omi Kib Sensor / 4 Spring Louded Sterny Administrative Connection nead	2400	T-20 IIIA	MEMCE		1100	de KID With Memowell		inc	14 -210-0101-331-14-1
3 P-445G PG-0104	Stick Built	Pressure Gauge	LFG OUTLET TO RNG FACILITY @ B/L	GAUGES	8"-LFG-0102-SS1-HT	1/2"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0-15PSIG	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	REOTEMP					IRC	8"-LFG-0102-SS1-HT-4
4 P-445G PG-0109	Stick Built	Pressure Gauge	LFG OUTLET TO EVAP FACILITY @ B/L	GAUGES	6"-LFG-0103-SS1-HT	1/2"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0-15PSIG	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	REOTEMP					IRC	6"-LFG-0103-SS1-HT-3
5 P-445G PG-0111	Stick Built	Pressure Gauge	LFG OUTLET TO EVAP FACILITY @ B/L	GAUGES	2"-IA-0104-SS1-N	1/2"	150 150	24 150	INSTRUMENT AIR	AIR	0-150PSIG	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	REOTEMP				The design pressure of the Instrument Air supply from the client needs to be confirmed	IRC	2"-IA-0104-SS1-N-2
6 P-445G FT-0134	Stick Built	: Flow Meter	CONDENSATE FROM RNG @ B/L	TRANSMITTER	2"-C-0121-SS1-N	2"	150 15	24 150	CONDENSATE	WATER	0-170 GPM	MNPT	Nutating Disc Flow Meter	24DC	4-20 mA	Badger Meter	M170-200ENSX-HL-GAXX				IRC	2"-C-0121-SS1-N-1
7 P-445H UIT-0113	Stick Built	Mulitvariable Flow Meter Element & Transmitter	LFG OUTLET TO EVAP FACILITY @ B/L	TRANSMITTER	6"-LFG-0103-SS1-HT	6"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0-800 SCFM	MNPT	Orifice plate and Flow Transmitter that connects to orifice flange,	24DC	4-20 mA	ABB		TRI-PACIFIC			BGE	6"-LFG-0103-SS1-HT-2
8 P-445H UIT-0118	Stick Built	Mulitvariable Flow Meter Element & Transmitter	LFG OUTLET TO RNG FACILITY @ B/L	TRANSMITTER	8"-LFG-0102-SS1-HT	8"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0-1300 SCFM	MNPT	Orifice plate and Flow Transmitter that connects to orifice flange, (TO BE SUPPLIED WITH ANALYZER PACKAGE AE-0127)	24DC	4-20 mA	АВВ		TRI-PACIFIC			BGE	8"-LFG-0102-SS1-HT-3
9 P-445H TT/TW-012	24 Stick Built	: RTD	LFG OUTLET TO RNG FACILITY @ B/L	RTD/Thermowell	8"-LFG-0102-SS1-HT	3/4"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2- 2.88%, H2O 0.62%,	<del>0 to 300°F</del>	МИРТ	100 ohm RTD Sensor / 4" Spring Loaded Stem/Aluminum Screw Connection head	24DC	4 <del>-20 m</del> A	TRERICE		Confire	m the measurement range		IRC	NA
N	Stick Built	TotalFlow Landfillgas BTU Gas Chromatograph	LFG OUTLET TO RNG FACILITY @ B/L	ANALYZER	8"-LFG-0102-SS1-HT	3/4"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	REFER VENDOR DATASHEET	MNPT	REFER VENDOR DATASHEET	24DC	4-20 mA	АВВ		TRI-PACIFIC Includ	de cabinet with TotalFlow system		BGE	NA
11 P-445I PT-0202	Stick Built	: Pressure Transmitter	UPSTREAM OF BLOWER INLET SCRUBBER	TRANSMITTER	14"-LFG-0101-SS1-N/10"-LFG-0202- SS1-P	1/2"	150 -3 TO +5 PSIG	24 150	LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	-100 TO +100"WC	MNPT	Pressure Transmitter	24DC	4-20 mA	АВВ					IRC	14"-LFG-0101-SS1-N-1
D	O3 Stick Built	: RTD	DOWNSTREAM OF LFG AFTER COOLER	TRANSMITTER	8"-LFG-0318-SS1-H	3/4"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0 to 300°F	MNPT	100 ohm RTD Sensor / 4" Spring Loaded Stem/Aluminum Screw Connection head	24DC	4-20 mA	TRERICE					IRC	8"-LFG-0318-SS1-H-2
13 P-445J TG/TW-030	O4 Stick Built	Temperature Gauge	DOWNSTREAM OF LFG AFTER COOLER	GAUGES	8"-LFG-0318-SS1-H	3/4"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0 to 300°F	MNPT	5" Dial Adjustable Thermometer. 2 1/2" Insertion, T304 SS Thermowell	N/A	N/A	REOTEMP					IRC	8"-LFG-0318-SS1-H-2
O 14 P-445J PT-0306	Stick Built	: Pressure Transmitter	UPSTREAM OF BLOWER INLET SCRUBBER	TRANSMITTER	8"-LFG-0318-SS1-H	1/2"	150 15	24 150	LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	0-30 psig	MNPT	Pressure Transmitter	24DC	4-20 mA	ABB					IRC	8"-LFG-0318-SS1-H-2
FG-0308	Stick Built	: Pressure Gauge	UPSTREAM OF BLOWER INLET SCRUBBER	GAUGES	8"-LFG-0318-SS1-H	1/2"	150 15	24 150	LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	0-30 psig	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	REOTEMP					IRC	8"-LFG-0318-SS1-H-2
D   16   P-445J   DPG-0340	Stick Built	: Pressure Differential Gauge	@ V-301A	GAUGES	1/2"-LFG-0307-SS7-H/ 1/2"-LFG-0308-SS7-H	1/2"	150 15	24 150	LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	0-100" WC	MNPT	Differential Pressure Gauge	N/A	N/A	#N/A					IRC	8"-LFG-0304-SS1-H-1
∑	3 Stick Built	: Pressure Differential Gauge	@ V-301B	GAUGES	1/2"-LFG-0309-SS7-H/ 1/2"-LFG-0310-SS7-H	1/2"	150 15	24 150	LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	0-100" WC	MNPT	Differential Pressure Gauge	N/A	N/A	#N/A					IRC	8"-LFG-0303-SS1-H-1
D 18 P-445J DPG-0335	5 Stick Built	: Pressure Differential Gauge	@ F-302	GAUGES	1/2"-LFG-0313-SS7-H/ 1/2"-LFG-0314-SS7-H	1/2"	150 15	24 150	LANDFILL GAS	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O 13.64%, H2S 0.10%	0-100" WC	MNPT	Differential Pressure Gauge	N/A	N/A	#N/A					IRC	NA
Σ 19 P-445J Π/TW-032	25 Stick Built	: RTD	DOWNSTREAM OF H2S VESSEL	TRANSMITTER	8"-LFG-0311-SS1-H	3/4"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0 to 300°F	MNPT	100 ohm RTD Sensor / 4" Spring Loaded Stem/Aluminum Screw Connection head	24DC	4-20 mA	TRERICE					IRC	8"-LFG-0311-SS1-H-2
20 P-445K TI/TT/TW-04	101 Stick Built	: RTD	UPSTREAM OF LOW PRESSURE COOLER	TRANSMITTER	8"-LFG-0312-ST1-H	3/4"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0 to 300°F	MNPT	100 ohm RTD Sensor / 4" Spring Loaded Stem/Aluminum Screw Connection head AND with local TI indication	24DC	4-20 mA	TRERICE					IRC	8"-LFG-0312-ST1-H-2
21 P-445K TG/TW-040	O2 Stick Built	: Temperature Gauge	UPSTREAM OF LOW PRESSURE COOLER	GAUGES	8"-LFG-0312-ST1-H	3/4"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0 to 300°F	MNPT	5" Dial Adjustable Thermometer. 2 1/2" Insertion, T304 SS Thermowell	N/A	N/A	REOTEMP					IRC	8"-LFG-0312-ST1-H-2
D 22 P-445K PT-0404	Stick Built	: Pressure Transmitter	UPSTREAM OF LOW PRESSURE COOLER	TRANSMITTER	8"-LFG-0312-ST1-H	1/2"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0-30 psig	MNPT	Pressure Transmitter	24DC	4-20 mA	АВВ					IRC	8"-LFG-0312-ST1-H-2
23 P-445K PG-0406	Stick Built	: Pressure Transmitter	UPSTREAM OF LOW PRESSURE COOLER	GAUGES	8"-LFG-0312-ST1-H	1/2"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0-30 psig	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	REOTEMP					IRC	8"-LFG-0312-ST1-H-2
24 P-445K TI/TT/TW-04	108 Stick Built	: RTD	UPSTREAM OF LOW PRESSURE COOLER	TRANSMITTER	8"-LFG-0401-ST1-C	3/4"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0 to 300°F	MNPT	100 ohm RTD Sensor / 4" Spring Loaded Stem/Aluminum Screw Connection head AND with local TI indication	24DC	4-20 mA	TRERICE					IRC	8"-LFG-0401-ST1-C-1
0 N . 25 P-445K TG/TW-040	O7 Stick Built	: Temperature Gauge	UPSTREAM OF LOW PRESSURE COOLER	GAUGES	8"-LFG-0401-ST1-C	3/4"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0 to 300°F	MNPT	5" Dial Adjustable Thermometer. 2 1/2" Insertion, T304 SS Thermowell	N/A	N/A	REOTEMP					IRC	8"-LFG-0401-ST1-C-1
26 P-445K PT-0410	Stick Built	: Pressure Transmitter	UPSTREAM OF LOW PRESSURE COOLER	TRANSMITTER	8"-LFG-0401-ST1-C	1/2"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0-30 psig	MNPT	Pressure Transmitter	24DC	4-20 mA	АВВ					IRC	8"-LFG-0401-ST1-C-2
27 P-445K PG-0412	Stick Built	: Pressure Transmitter	UPSTREAM OF LOW PRESSURE COOLER	GAUGES	8"-LFG-0401-ST1-C	1/2"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0-30 psig	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	REOTEMP					IRC	8"-LFG-0401-ST1-C-2
Σ Σ 28 P-445K Π/TW-043	32 Stick Built	: RTD	CHILLER WATER SUPPLY	TRANSMITTER	3"-CHWS-0409-CS1-C	3/4"	150 200	24 200	CHILLED WATER	PROPYLENE GLYCOL AND WATER	0 to 300°F	MNPT	100 ohm RTD Sensor / 4" Spring Loaded Stem/Aluminum Screw Connection head	24DC	4-20 mA	TRERICE					IRC	3"-CHWS-0409-CS1-C-2
29 P-445K PG-0431	Stick Built	: Pressure Gauge	CHILLER WATER SUPPLY	GAUGES	3"-CHWS-0409-CS1-C	1/2"	150 200	24 200	CHILLED WATER	PROPYLENE GLYCOL AND WATER	0-100 psig	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	REOTEMP					IRC	3"-CHWS-0409-CS1-C-2
30 P-445K FS-0433	Stick Built	: Flow Switch	CHILLER WATER SUPPLY	TRANSMITTER	3"-CHWS-0409-CS1-C	TBD	150 200	24 200	CHILLED WATER	PROPYLENE GLYCOL AND WATER	TBD	TBD	Flow switch	24DC	4-20 mA	FLOTECT					IRC	3"-CHWS-0409-CS1-C-2
31 P-445L FT-0503	Stick Built	Mulitvariable Flow Meter- Element & Transmitter	LFG OUTLET TO EVAP FACILITY @ B/L	TRANSMITTER	8"-LFG-0501-SS1-P	1/2"	<del>150</del> <del>15</del>	24 1 <del>50</del>	<del>LANDFILL GAS</del>	CH4 45-50%,CO2 21.75-26.75 %, N2 12%, O2 2.5%, H2O- 13.64%, H2S 0.10%	0-3000 SCFM	MNPT	Orifice plate and Flow Transmitter that connects to orifice flange,	<del>24DC</del>	4- <del>20 mA</del>	#N/A			the measurement range & y Rosemont make to be considered			NA
32 P-445L PG-0517	Stick Built	: Pressure Gauge	INLET LINE TO THE FLARE	GAUGES	8"-LFG-0501-SS1-P	1/2"	150 15	24 150	LANDFILL GAS	CH4 51.84-57.6%,CO2 25.06-26.75 %, N2 13.83%, O2 2.88%, H2O 0.62%,	0-50" wc	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	REOTEMP					IRC	8"-LFG-0501-SS1-P-2
Notes:  1. All transmitte 2. All the items s	_	4-20 mA signal. I for class I Div 2 electrical area class	sification.			-																

3. All items except SS tags are quantity of one each.4 All items shall be tagged with SS tags

**Biogas Engineering** 

# NOTES:

- 1. IF LIST IS "SKID MODULE\_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
  2. IF LIST IS "STICK BUILT\_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER	
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG		
2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG		
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.	
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025	

Instrument List

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Digitally signed by Andre Gamanian Date: 2023.09.25 17:53:16-07'00'



INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968 ISSUED FOR CONSTRUCTION

ENGINEER:

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

INSTRUMENT LIST (STICK BUILT) (SHEET 13 OF 13)

> LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

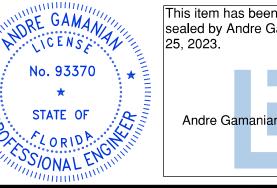
M-445AE

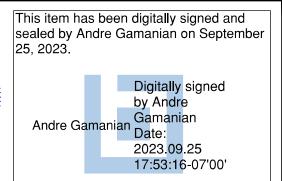
### PIPING SUPPORT STANDARD - SUPPORT INDEX S.NO. DESCRIPTION DRAWING NO. REVISION DATE TYPE U-BOLT FOR BARE PIPE SIZE 1/2" THRU 16" M-445AG05/30/2023 M-445AG PIPE SHOE FOR INSULATED PIPE SIZE 1/2" TO 6" 05/30/2023 M-445AG 05/30/2023 PIPE SHOE FOR INSULATED PIPE SIZE 8" TO 16" 05/30/2023 PIPE SHOE FOR INSULATED PIPE SIZE 18" TO 24" M-445AH PIPE SADDLE FOR SLOPE LINE FOR PIPE SIZE 10" THRU 24" M-445AH 05/30/2023 05/30/2023 GUIDE SUPPORT FOR BARE PIPE-SIZE 1/2" TO 12" M-445AI GUIDE SUPPORT FOR BARE PIPE-SIZE 14" TO 24" 05/30/2023 M-445AI M-445AJPICK UP SUPPORTS 05/30/2023 05/30/2023 LINE STOP FOR UNINSULATED PIPE ON STEEL / CONCRETE STRUCTURE M-445AJ M-445AJ05/30/2023 LINE STOP FOR UNINSULATED PIPE ON STEEL / CONCRETE STRUCTURE 10 ADJUSTABLE LOW SUPPORT WITH 4 BOLTS FOR PIPE SIZE 2" THRU 16" M-445AK 05/30/2023 05/30/2023 LOW SUPPORT SLIDING FOR BARE AND INSULATED PIPE - SIZE 2" THRU 16" M-445AK 12 LS3 DUMMY PIPE SUPPORT FOR INSULATED PIPE SIZE 2" THRU 16" 05/30/2023 M-445AK 05/30/2023 PIPE HANGER SUPPORT FOR BARE/INSULATED PIPE SIZE 1/2' THRU 12" M-445AL

ISSUED FOR CONSTRUCTION

2							
Z Inv	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEE
5	1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
いといい	2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
ין אין	3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
., 0	4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025

PROFESSIONAL ENGINEER No. 93370 ANDRE GAMANIAN, P.E.







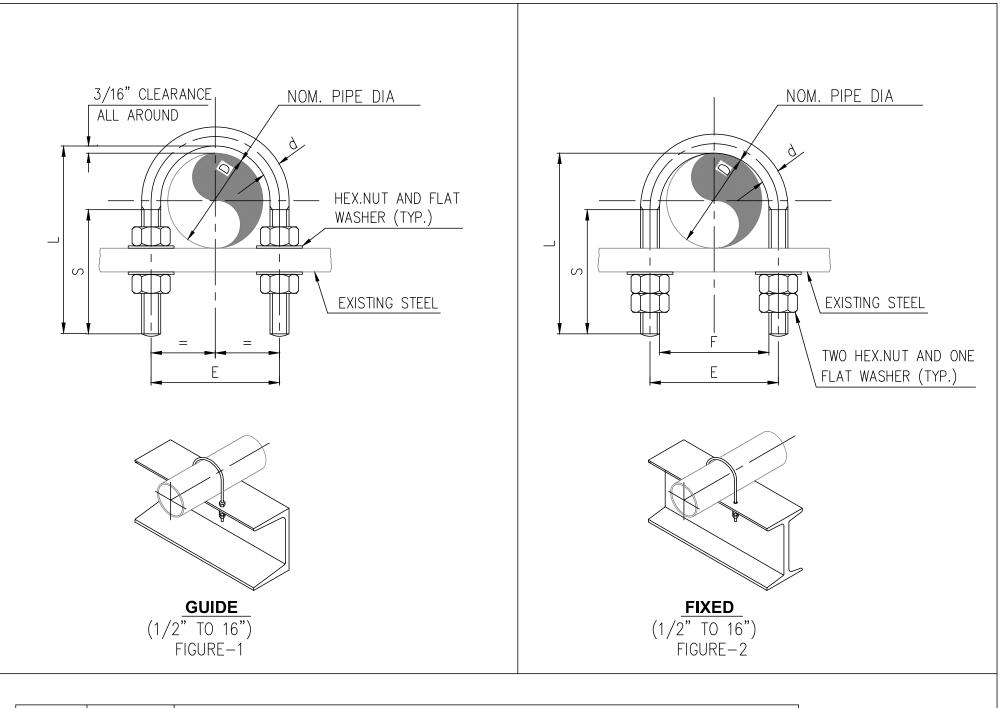
1325 74th AVE SW, VERO BEACH, FLORIDA 32968

	BIOGAS
•	<b>ENGINEERING</b>
2321 E. 281	TH STREET, SUITE 400
	, CA 90755, Ph: (562) 726-3565 @BIOGASENG.COM

PIPING SUPPORT STANDARD **SUPPORT INDEX** (SHEET 1 OF 7)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445AF



	0.0		'U' CLAMP										
D	O.D.	L	E	S	d	F	THREAD						
1/2"	13/16	2 9/16	1 3/16	2	1/4	15/16	1/4"-20 UNC						
3/4"	1 1/16	2 3/4	1 7/16	2	1/4	1 3/16	1/4"-20 UNC						
1"	1 5/16	2 15/16	1 3/4	2 3/16	5/16	1 7/16	1/4"-20 UNC						
1 1/2"	1 7/8	3 9/16	2 3/8	2 3/16	5/16	2 1/16	3/8"-16 UNC						
2"	2 3/8	4 1/8	2 13/16	2 3/8	5/16	2 1/2	3/8"-16 UNC						
3"	3 1/2	5 11/16	4 3/16	3 1/8	1/2	3 11/16	1/2"-13 UNC						
4"	4 1/2	6 11/16	5 1/8	3 1/8	1/2	4 11/16	1/2"-13 UNC						
6"	6 5/8	9 7/16	7 1/2	3 15/16	5/8	6 13/16	1/2"-13 UNC						
8"	8 5/8	11 7/16	9 1/2	3 15/16	5/8	8 7/8	5/8"-11 UNC						
10"	10 3/4	13 9/16	11 5/8	3 15/16	5/8	11	3/4"-10 UNC						
12"	12 3/4	16 9/16	13 13/16	5 1/8	13/16	13	7/8"-9 UNC						
14"	14	17 3/4	15 1/16	5 1/8	13/16	14 1/4	7/8"-9 UNC						
16"	16	19 11/16	17 1/8	5 1/8	13/16	16 5/16	7/8"-9 UNC						

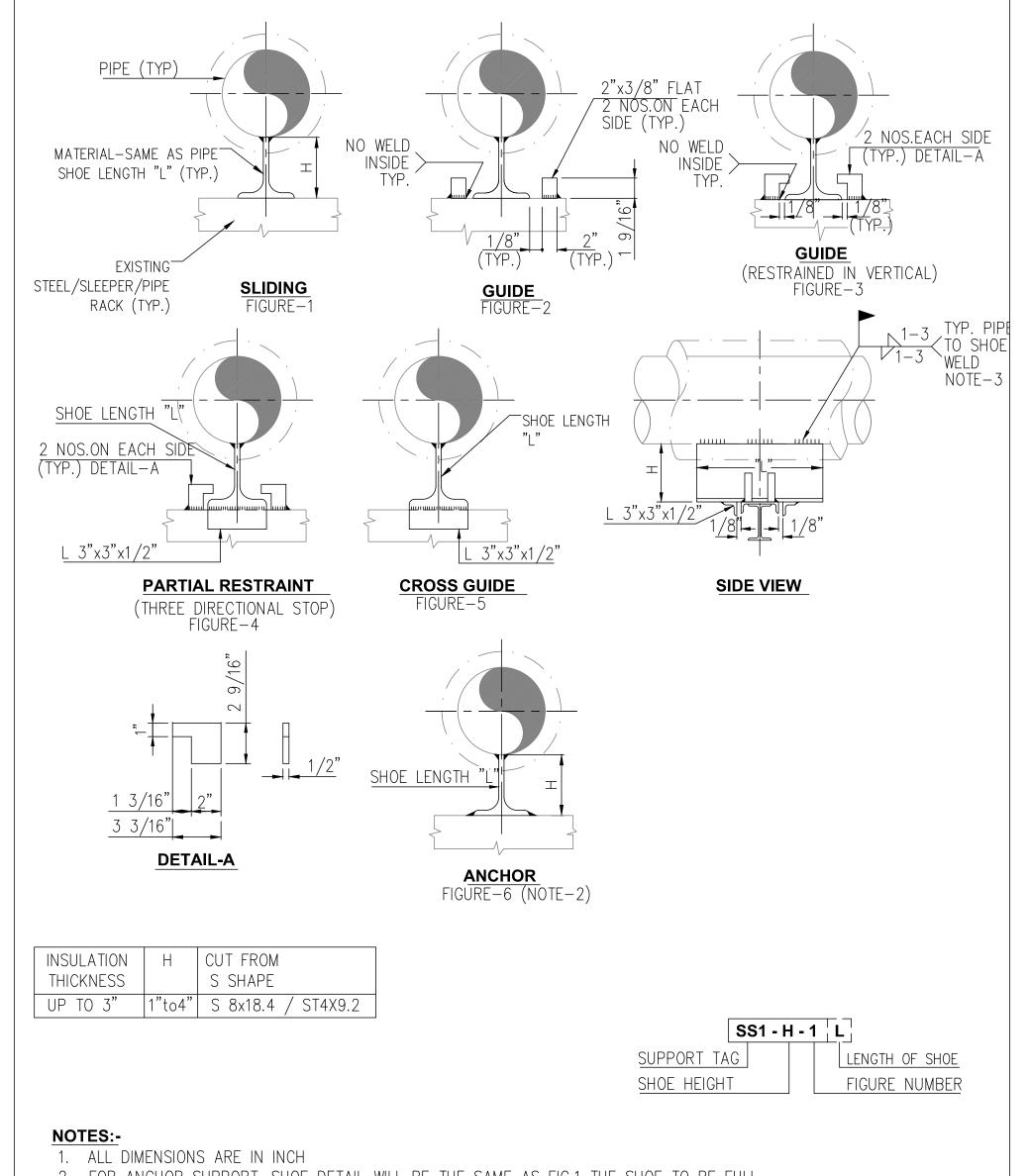
US1 - 1 - D SUPPORT TAG PIPE NB (INCH) FIGURE NUMBER

# NOTES:-

. ALL DIMENSIONS ARE IN INCH.

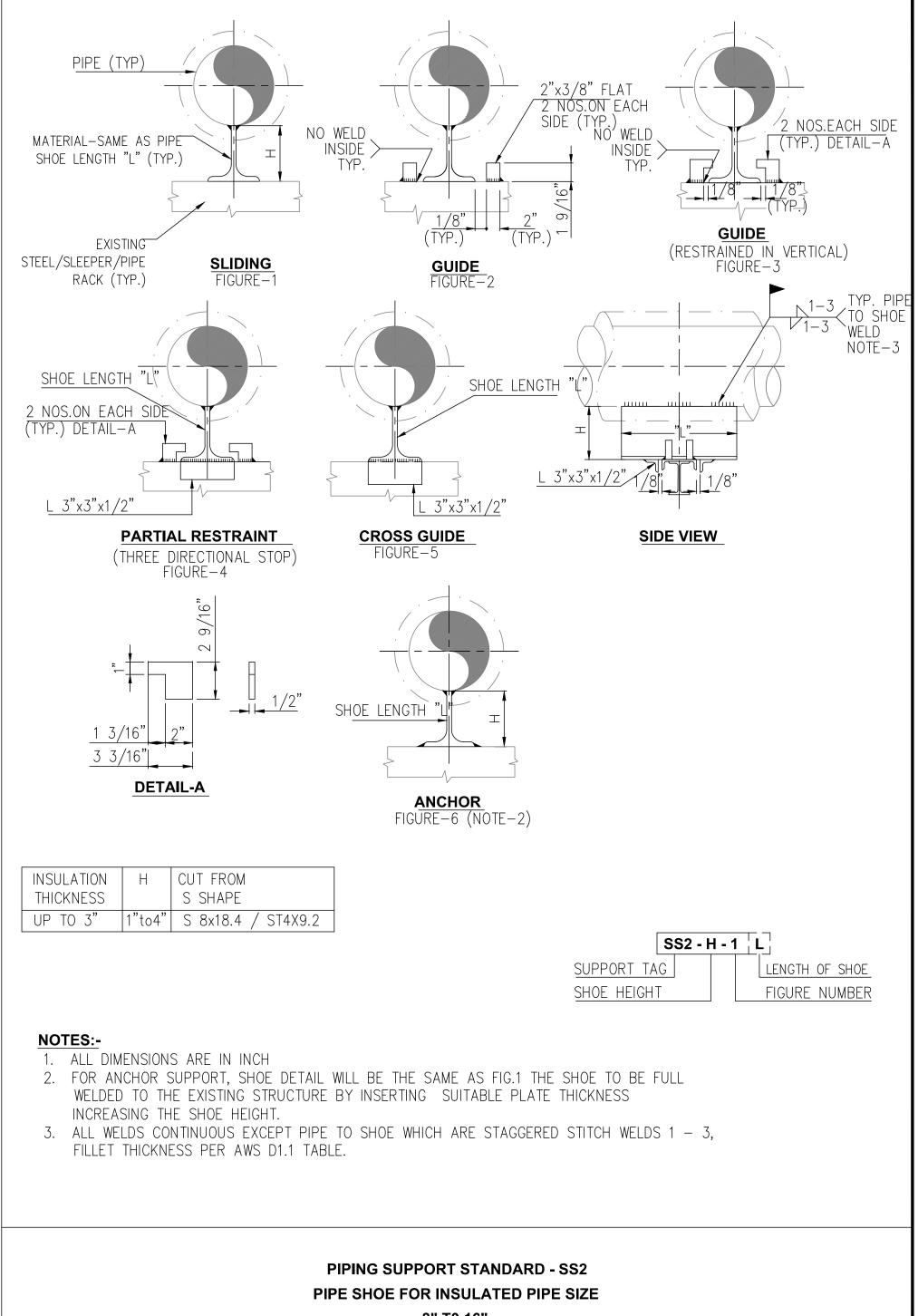
2. U-CLAMPS SHALL BE HOT DIP GALVANIZED, UNLESS NOTED OTHERWISE.

**PIPING SUPPORT - US1** U-BOLT FOR BARE PIPE **SIZE 1/2" THRU 16"** 



- 2. FOR ANCHOR SUPPORT, SHOE DETAIL WILL BE THE SAME AS FIG.1 THE SHOE TO BE FULL WELDED TO THE EXISTING STRUCTURE BY INSERTING SUITABLE PLATE THICKNESS INCREASING THE SHOE HEIGHT.
- 3. ALL WELDS CONTINUOUS EXCEPT PIPE TO SHOE WHICH ARE STAGGERED STITCH WELDS 1 3, FILLET THICKNESS PER AWS D1.1 TABLE.

**PIPING SUPPORT STANDARD - SS1** PIPE SHOE FOR INSULATED PIPE SIZE 1/2" T0 6"

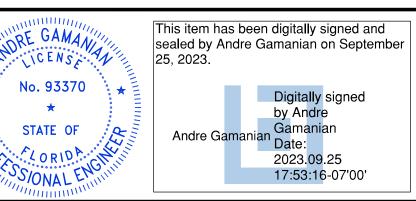


8" T0 16"

ISSUED FOR CONSTRUCTION

. <u>~</u>							
kur\B	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEE
ih Thal	1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
Mukes	2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
sers/	3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
) ) ) (	4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	МТ	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025

ENGINEER THE GAMAN! No. 93370 STATE OF CORIDA





INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968



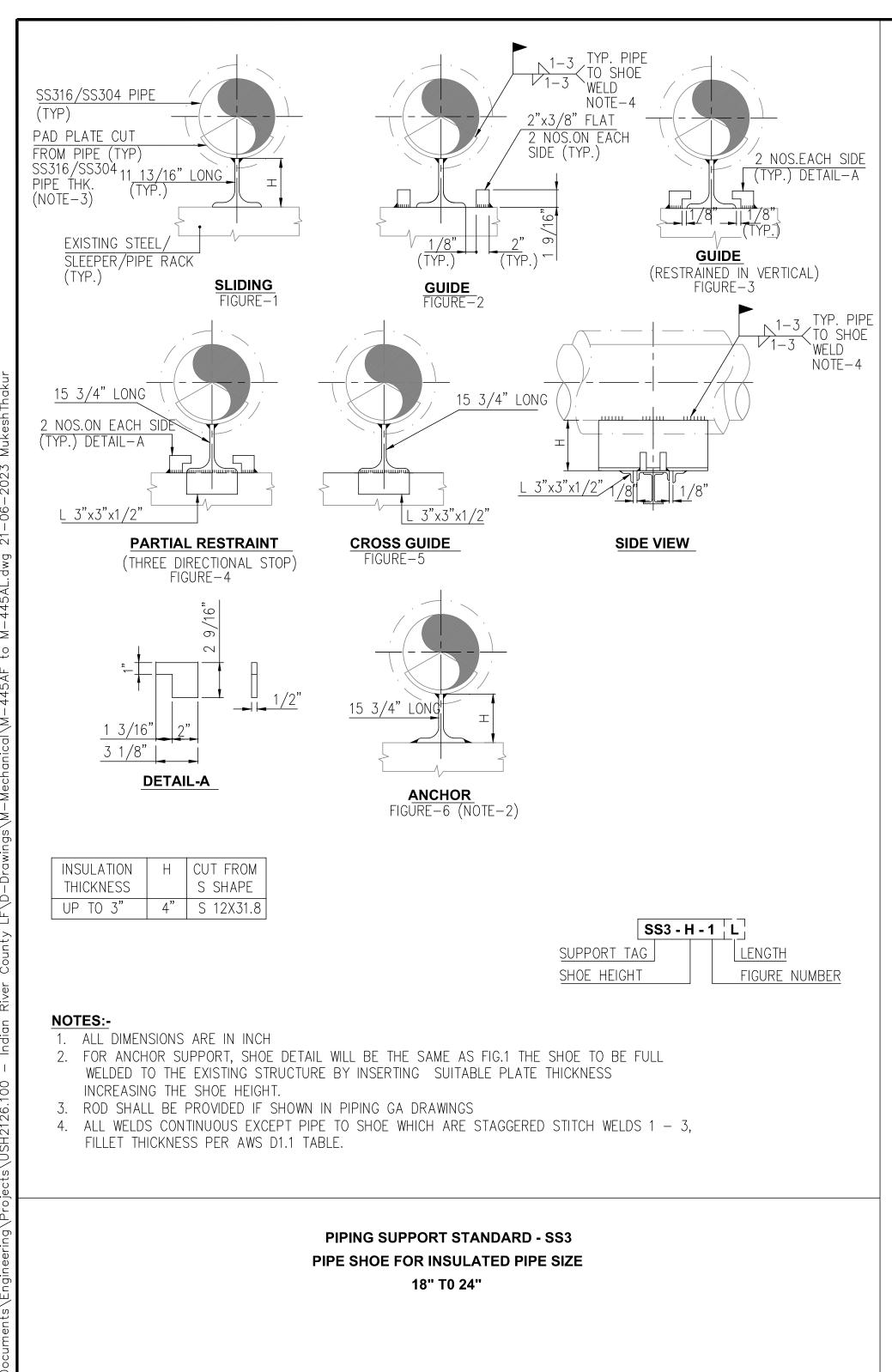
2321 E. 28TH STREET, SUITE 400

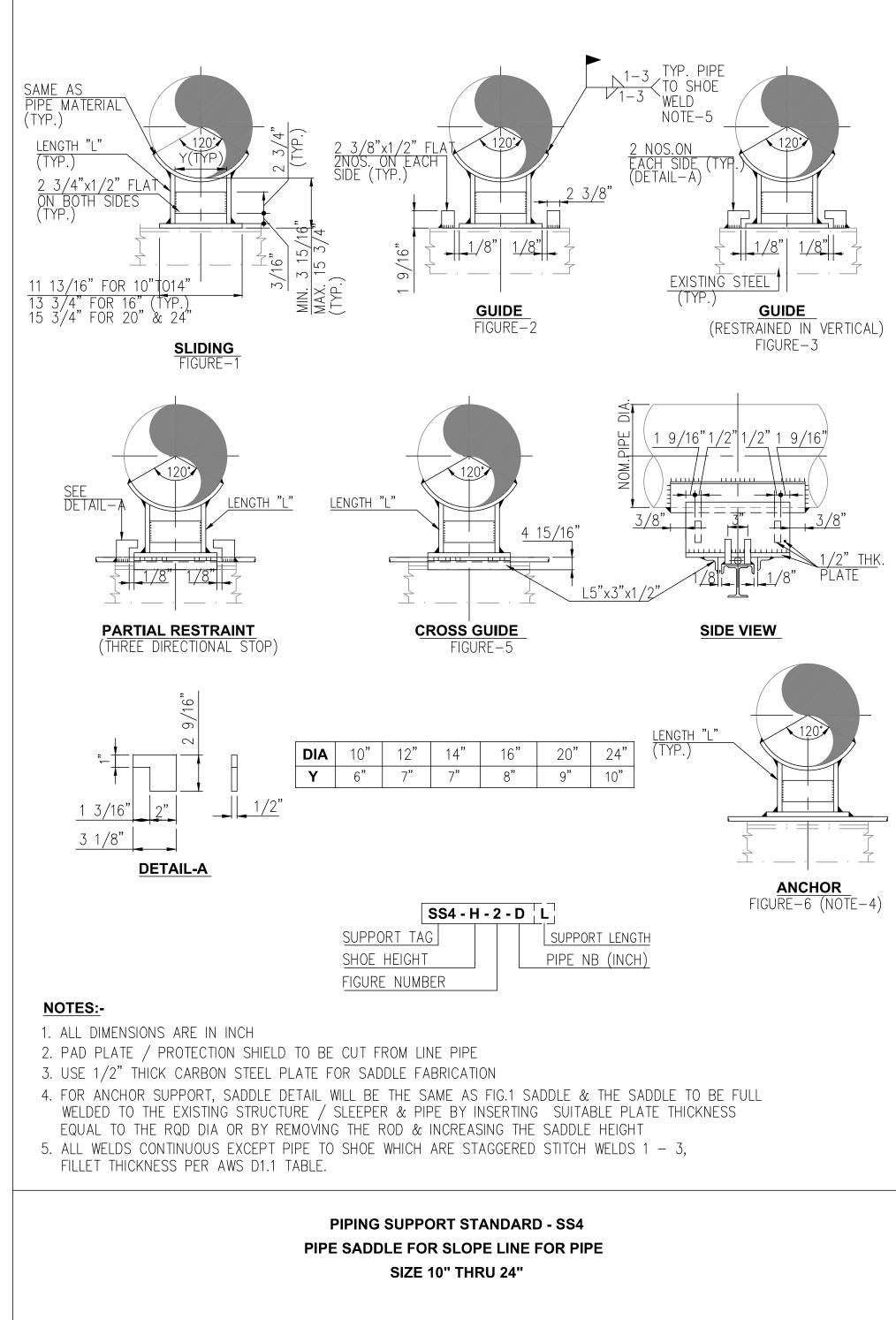
EMAIL: INFO@BIOGASENG.COM

PIPING SUPPORT STANDARD (SHEET 2 OF 7)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT SIGNAL HILL, CA 90755, Ph: (562) 726-3565

DRAWING NO. M-445AG

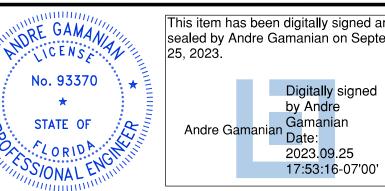




ISSUED FOR CONSTRUCTION

$\stackrel{\sim}{\sim}$ 1							
√ur \Ε	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
in Inal	1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	
Mukes	2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
sers /[	3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	ANDRE GAMANIAN, P.E.
: \Us	4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	FL LICENCE NO.93370 EXP. 02/28/2025

ESSIONAL ENGINEER NORE GAMANA No. 93370 SSIONAL ENGIN









1325 74th AVE SW, VERO BEACH, FLORIDA 32968



2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

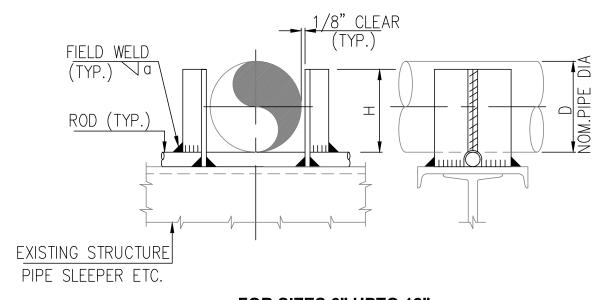
PIPING SUPPORT STANDARD (SHEET 3 OF 7)

& FLARE REPLACEMENT

DRAWING NO. LANDFILL GAS BLOWER SKID

M-445AH

## FOR SIZES UPTO 4" FIGURE-1



## FOR SIZES 6" UPTO 12" FIGURE-2

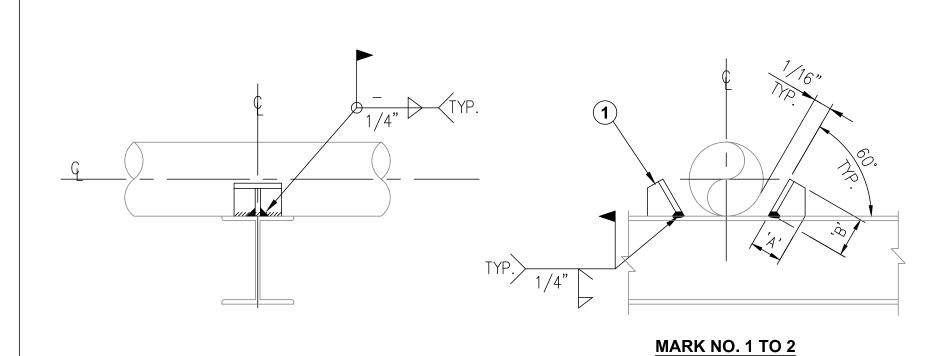
D	Н	а	GUIDE SIZE
2" & SMALLER	1 9/16	1/4	FLAT 3 1/8 x 5/16 (NOTE 3)
3" TO 4"	2 3/4	1/4	FLAT 3 x 5/8 (NOTE 3)
6" TO 8"	5 1/8	1/4	2 NOS. L 2 x 2 x 1/4
10" TO 12"	9 1/16	3/8	2 NOS. L 3 x 3 x 1/2

GS1 - 1 - D SUPPORT TAG PIPE NB (INCH) FIGURE NUMBER

## NOTES:-

- 1. ALL DIMENSIONS ARE IN INCH.
- 2. GUIDE ANGLES SHOULD BE SUITABLY TRIMMED WHEREVER IT OBSTRUCTS WITH ADJOINING GUIDE ANGLES.
- 3. ALTERNATIVELY CARBON STEEL PLATE OF EQUIVALENT THICKNESS CAN BE USED.
- 4. ROD SHALL BE PROVIDED IF SHOWN IN PIPING GA DRAWINGS.

**PIPING SUPPORT STANDARD - GS1** GUIDE SUPPORT FOR BARE PIPE 1/2" TO 12"



PIPE SIZE NB	`A'	`B'	,C,	MAX. GUIDE SPACING
14"	3 1/8	6	4	1 1/8
16"	3 1/8	6	4	1 3/16
18"	3 1/8	6	4	1 3/16
20"	4	8	5	1 3/16
24"	4	8	5	1 3/16

MATERIAL TAKE OFF						
ITEM	QTY					
1	1					

## NOTES:-

1. ALL DIMENSIONS ARE IN INCH.

PIPING SUPPORT STANDARD - GS2 **GUIDE SUPPORT FOR BARE PIPE** 14" TO 24"

ISSUED FOR CONSTRUCTION

DRN BY CHK BY APRV BY PROFESSIONAL ENGINEER DESCRIPTION DATE ISSUED FOR BID ISSUED FOR CONSTRUCTION ANDRE GAMANIAN, P.E. ISSUED FOR CONSTRUCTION (REVISED) SS FL LICENCE NO.93370 ISSUED FOR CONSTRUCTION (REVISED) EXP. 02/28/2025

DRE GAMANIA No. 93370 FLORIDA CHANGE

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. 2023.09.25 17:53:16-07'00'



INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968



SIGNAL HILL, CA 90755, Ph: (562) 726-3565

EMAIL: INFO@BIOGASENG.COM

2321 E. 28TH STREET, SUITE 400

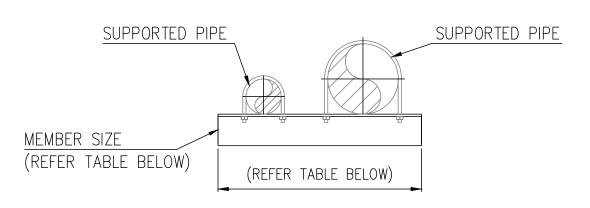
PIPING SUPPORT STANDARD (SHEET 4 OF 7)

DRAWING NO. LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

M-445AI

## **ELEVATION**

## **CONFIGURATION TO BE FOLLOWED FOR INSULATED SUPPORTING PIPE**



## **ELEVATION**

## CONFIGURATION TO BE FOLLOWED FOR NON-INSULATED SUPPORTING PIPE

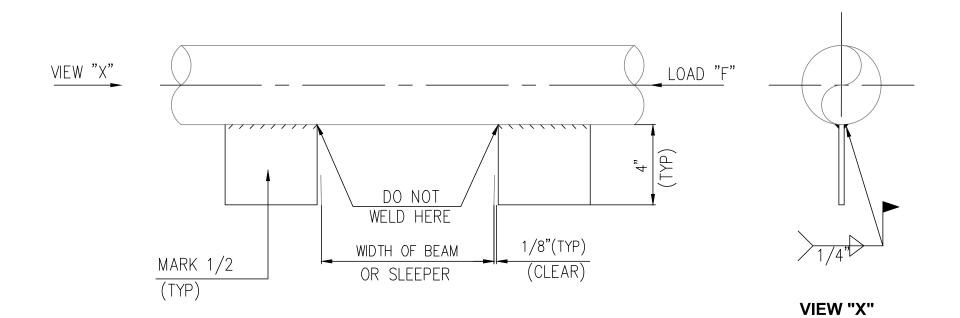
MEMBER SIZE	SUPPORTED PIPE SIZE	SUPPORTING PIPE SIZE	MAX. LENGTH
L2x2x1/4	1/2" - 1"	2" - 4"	24"
L3x3x1/4	1/2" - 3"	6" - 10"	36"
L4x4x1/4	1/2" - 6"	12" - 16"	48"

PS6

## **NOTES:-**

- 1. ALL DIMENSIONS ARE IN INCH.
- 2. THIS SUPPORT SHALL ONLY BE USED FOR SUPPORTING 1" AND SMALLER PIPES

PIPING SUPPORT STANDARD - PS6 PICK UP SUPPORTS

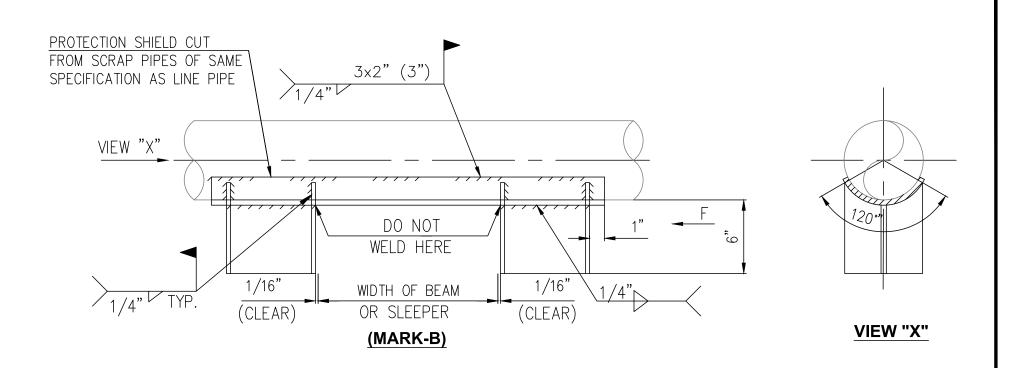


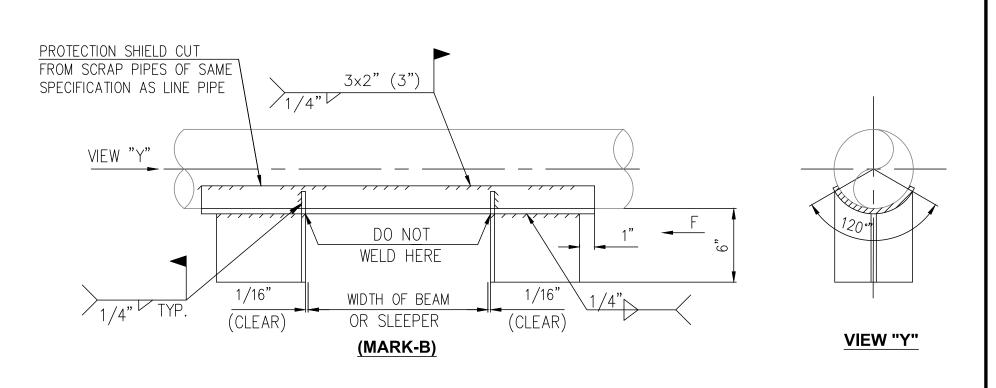
	MAR	<b>&lt;</b> - 1	MARI		
LINE SIZE	MAX LOAD PLATE 'F' (LBS) SIZE		MAX LOAD `F' (LBS)	PLATE SIZE	QTY.
1"	55116	6x4x3/8 THK.	27558	3×4×3/8 THK.	2
1 1/2"	55116	6x4x3/8 THK.	27558	3x4x3/8 THK.	2
2"	55116	6x4x3/8 THK.	27558	3x4x3/8 THK.	2
3"	74957	6x4x3/8 THK.	37478	3x4x3/8 THK.	2

AS1 - A - D SUPPORT TAG PIPE SIZE MARK NO.

- 1. ALL DIMENSIONS ARE IN INCH.
- 2. PLATE MATERIAL TO BE COMPATIBLE WITH PIPE.

**PIPING SUPPORT STANDARD - AS1** LINE STOP FOR UNINSULATED PIPE ON STEEL/CONCRETE STRUCTURES





MARK NO.	DESCRIPTION	MAX LOAD `F' (LBS)
А	1/2 W8 X 13	9700
В	W8 X 13	19400

AS2 - A - D PIPE SIZE SUPPORT TAG

MARK NO.

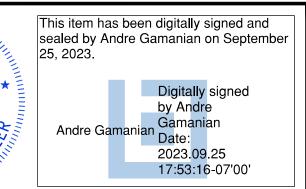
NOTES: 1. ALL DIMENSIONS ARE IN INCH.

> PIPING SUPPORT STANDARD - AS2 LINE STOP FOR UNINSULATED PIPE ON STEEL/CONCRETE STRUCTURES

ISSUED FOR CONSTRUCTION

DATE DESCRIPTION CHK BY APRV BY PROFESSIONAL ENGINEER ISSUED FOR BID 02/03/202 ISSUED FOR CONSTRUCTION SS ANDRE GAMANIAN, P.E. ISSUED FOR CONSTRUCTION (REVISED) SS FL LICENCE NO.93370 ISSUED FOR CONSTRUCTION (REVISED) EXP. 02/28/2025

NE GAMANIAN ICENS No. 93370 TORIDA CHIMINA







1325 74th AVE SW, VERO BEACH, FLORIDA 32968



2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING SUPPORT STANDARD (SHEET 5 OF 7)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. M-445AJ

## **INSTALLATION PROCEDURE:-**

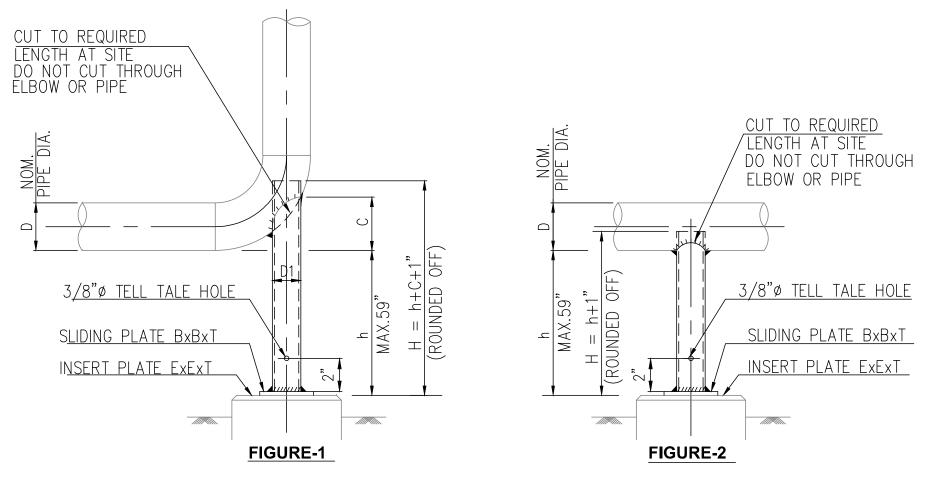
PLACE SUPPORT UNDER PIPE BEFORE CONNECTING PIPE TO EQUIPMENT. TURN ADJUSTABLE NUT UP UNTIL PIPE FLANGE IS ALIGNED WITH EQUIPMENT OR VALVE FLANGE.

SIZE NO.	D	D1 (NOTE-3)	В	Т	С	HEX. BOLT FULLY THREADED WITH TWO NUTS	H (MIN.)	Р	Ø
1.	2"	2"SCH.40	10"	3/8	2 3/4	ø1/2" x 4" LONG	7 7/8 8 7/16	4	9/16 9/16
2.	4"	3"SCH.40	12"	3/8	5 3/8	ø3/4" x 6" LONG	9 13/16	6	7/8
۷٠	6" 8"	J 3UN.4U	12	3/0	6 7/8	43/4 X 0 LONG	11 13/16	6	7/8 7/8
3.	10"	4"SCH.40	14"	1/2	10 5/16	Ø7/8" x 6 7/8" LONG	13 3/16	7	1
	12" 14"				11 5/16 15 1/16		14 3/16 15 3/16	7 9	1 1 1/1
4.	16"	6"SCH.40	16"	1/2	16 7/16	ø1" x 6 7/8" LONG	16 1/8	9	1 1/16

# **NOTES:-**

- 2. MATERIAL AND PAINTING OF TRUNNION PIPE AND BASE PLATE/GUSSETS SHALL BE SAME AS MAIN PIPE SPEC. ALL INSERT PLATES, BOLTS & NUTS SHALL BE OF STAINLESS STEEL
- 3. INCASE, SIZE AND\OR SCH. OF TRUNNION PIPE, (D1) LISTED IN THE TABLE IS NOT AVAILABLE, USE NEXT HIGHER SIZE AND VOR NEAREST EQUIVALENT THICKNÉSS AVAILABLE.
- 4. IN CASE H IS MORE THAN 40", RAISE HEIGHT OF CONCRETE PEDESTAL ACCORDINGLY.
- 5. USE THIS DETAIL AS SOLID SUPPORT FOR LINE, WHEN VERTICAL THERMAL EXP. IS NOT PRESENT. THE MOST COMMON USE WOULD BE FOR END SUCTION PUMP. TURN ADJUSTING NUT UNTIL ELBOW/FLANGE IS ALIGNED

PIPING SUPPORT STANDARD - LS2 **ADJUSTABLE LOW SUPPORT WITH 4 BOLTS** FOR PIPE SIZE 2" THRU 16"



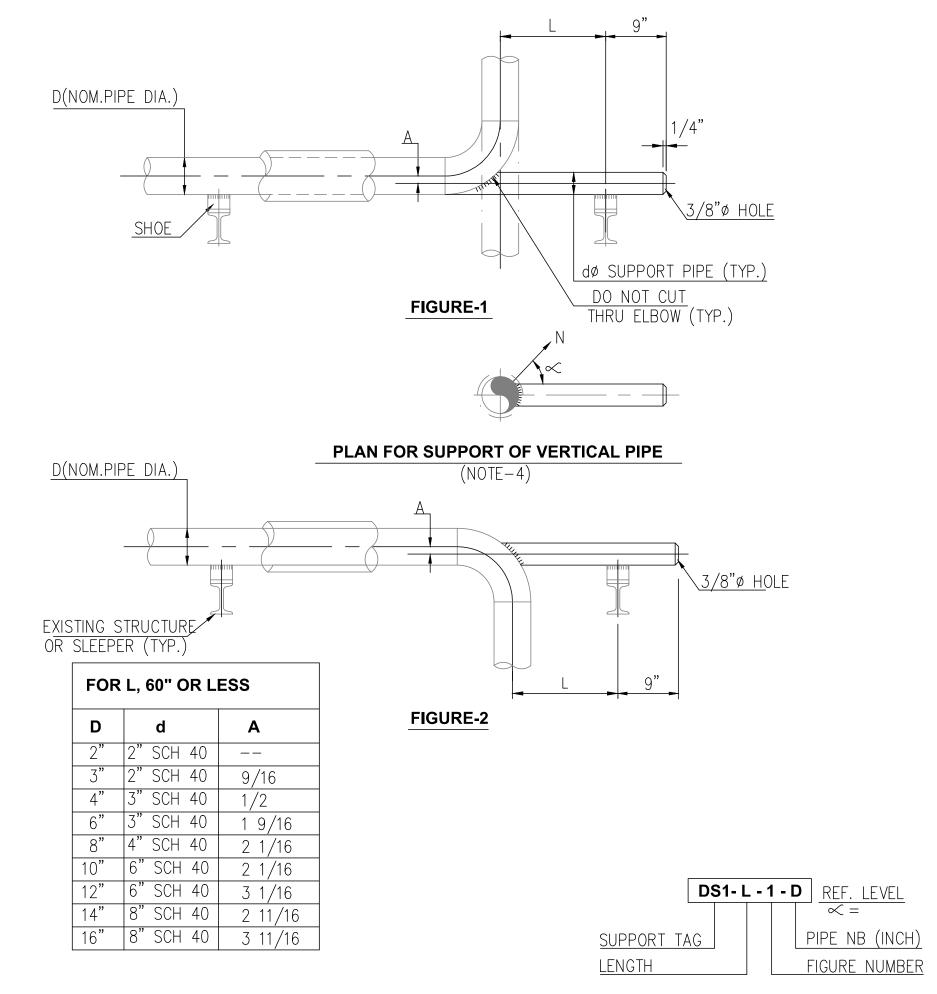
SIZE NO:	D	D1 NOTE-2	В	Т	С	E
1.	2" 3"	2" SCH.40	6"	3/8	2 3/4 4 1/2	10"
2.	4" 6"	3" SCH.40	8"	3/8	5 3/8 6 7/8	12"
3.	8" 10"	4" SCH.40	8"	1/2	8 10 5/16	12"
4.	12" 14" 16"	6" SCH.40	10"	1/2	11 5/16 15 1/4 16 7/16	14"

LS3 - H - 1 - 1 SIZE NUMBER SUPPORT TAG FIGURE NUMBER

## NOTES:-

- 1. ALL DIMENSIONS ARE IN INCH.
- 2. IN CASE SIZE AND/OR SCHEDULE OF SUPPORT PIPE (D1) LISTED IN THE TABLE IN NOT AVAILABLE, USE NEXT HIGHER SIZE AND/OR NEAREST EQUIVALENT THICKNESS AVAILABLE.
- 3. MATERIAL OF SUPPORT PIPE SHALL BE THE SAME AS THE MAIN PIPE SPEC. PLATES SHALL BE OF CARBON STEEL.

**PIPING SUPPORT STANDARD - LS3** LOW SUPPORT SLIDING FOR BARE AND **INSULATED PIPE - SIZE 2" THRU 16"** 



## NOTES:-

- 1. ALL DIMENSIONS ARE IN INCH.
- 2. MATERIAL OF SUPPORT PIPE SHALL BE THE SAME AS THE MAIN PIPE SPECIFICIATION FOR C.S PIPES. FOR SS PIPES, SS PAD PLATES SHALL BE WELDED ON TO THE PIPES AND THE DUMMY PIPE SHALL BE OF CS.
- 3. IN CASE, SIZE AND/OR SCHEDULE OF SUPPORT PIPE (d) LISTED IN THE TABLE IS NOT
- AVAILABLE, USE NEXT HIGHER SIZE AND/OR NEAREST EQUIVALENT THICKNESS AVAILABLE.

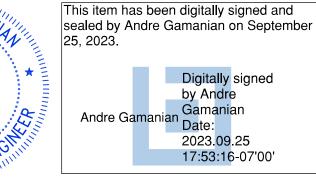
4. REFERNCE LEVEL AND ∝ ARE TO BE GIVEN IN CASE SUPPORT IS WELDED TO A VERTICAL PIPE.

**PIPING SUPPORT STANDARD - DS1 DUMMY PIPE SUPPORT FOR INSULATED PIPE SIZE 2" THRU 16"** 

ISSUED FOR CONSTRUCTION

DATE CHK BY APRV BY PROFESSIONAL ENGINEER DESCRIPTION ISSUED FOR BID )2/03/202 ISSUED FOR CONSTRUCTION ANDRE GAMANIAN, P.E. SS ISSUED FOR CONSTRUCTION (REVISED) FL LICENCE NO.93370 ISSUED FOR CONSTRUCTION (REVISED) EXP. 02/28/2025

THE GAMAN CENSERA No. 93370 STATE OF OK LORIDA SSIONAL EN







1325 74th AVE SW, VERO BEACH, FLORIDA 32968



EMAIL: INFO@BIOGASENG.COM

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565

PIPING SUPPORT STANDARD (SHEET 6 OF 7)

> LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. M-445AK

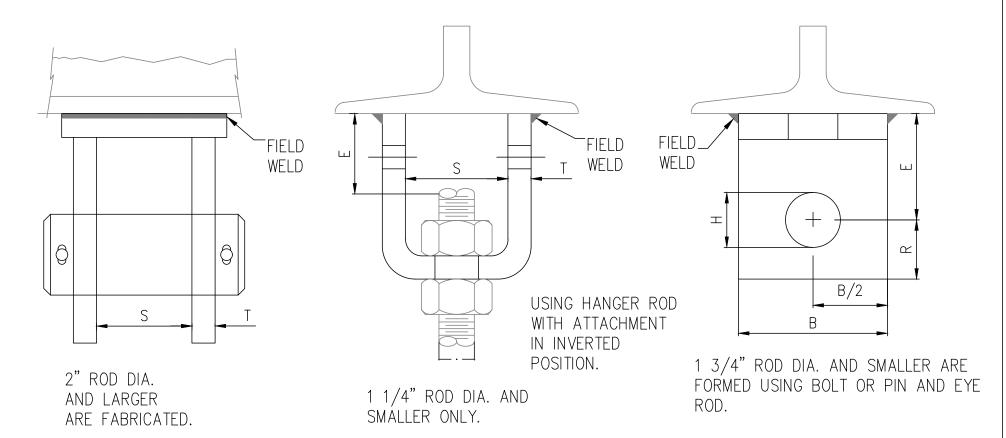
Pipe Size	Max Load		Weight	Rod Size	В		Rod Take	Adjust. F	G	H Width	
ripe Size	450° F	650° F	vveigni	Α	В	B C '		Aujust. F	G	Lower	
1/2			0.34		2 3/16	2 11/16	1 ½				
3/4			0.34		2	2 11/10	1 <del>5</del> 16	5			
1	520	470	0.35	3	2 5/16	3	1 5	<u>5</u> 8	1		
1 1/4	520		0.40	<u>3</u> 8	2 3/8	3 1/4	1 11/16		<u>1</u> 4	1	
1 1/2			0.45		2 13/16	3 13/16	2 1/8	7 8			
2			0.50	3 5/16	4 1/2	2 5/8	1 1/8				
2 1/2	060	965	0.65	0.65	1	4 1/16	5 1/2	3 3/16	1 <del>5</del>	3	
3	960	865	0.85	$\frac{1}{2}$	4 3/4	6 1/2	4 1/16	1 5/8	<u>3</u> 8		
4	1015	1005	1.51	5	5 9/16	7 13/16	4 1/2	1 <u>11</u>	3		
5	1215	1095	1.70	<u>5</u> 8	6 9/16	8 15/16	5 1/2	1 15 16	<u>3</u> 8	1 3/16	
6	1650	1485	3.10	3	6 15/16	10 1/4	5 3/4	1 <del>11</del> 16	1	1 7	
8	1700	1530	4.75	<u>3</u> 4	8 3/8	12 11/16	7 3/16	2	<u>1</u> 2	1 7/16	
10	1750	1575	8.60	7	9 7/8	15 1/4	8 7/16	2 1/8	5	1 3/4	
12	1850	1665	11.20	<u>7</u> 8	11 9/16	17 15/16	10 1/8	2 13	<u>5</u>	2	

HS1- A- L - D NOM.PIPE DIA. SUPPORT TAG LENGTH OF ROD

NOTES:-

1. ALL DIMENSIONS ARE IN INCH.

PIPING SUPPORT STANDARD - HS1 PIPE HANGER SUPPORT FOR BARE/INSULATED PIPE SIZE 1/2' THRU 12" SHEET 1 OF 3



		Max	Load	Wei	ght	Rod Ta	ıke Out					
Rod Size A	Bolt Size	650° F	750°F	Without Bolt and Nut		E	E'	В	н	R	S	Т
3/8	1/2 X 2 1/2 5/8 X 2	730	572		1.2	1 7/8			9/16			
1/2	1/2	1350	1057	0.96 1.3	2	2	2	11/16	7/8	1 1/4	1/4	
5/8	3/4 X 2 3/4	2160	1692		1.6	1 3/4	1 3/4			13/16		
3/4	7/8 X 4	3230	2530	1.9	2.8			0.1/0	15/16	1 1/8	1 7/8	7 /0
7/8	1X4	4480	3508	2.5	3.9	2 5/8		2 1/2	1 1/8	1 1/4	2	3/8
1	1 1/8 X5		4620	4.3	6.3	2 3/4	_	3	1 1/4	1 1/2		1/2
1 1/4	1 3/8 X 5 3/8	9500	7440	8.1	10.2	2 7/8	3	4	1 1/2	2	2 1/2	5/8
1 1/2	1 5/8 X6	13800	10807	_	19.0	_	4		1 3/4	2 1/2	3	
1 3/4	1 7/8 X 6 7/8	18600	14566	_	24.2	_	_	5	2	2 3/4	3 3/4	3/4
2	2 1/4 X 6 7/8	24600	19265	_	30.6	_	5		2 3/8	3 1/4	7 1 /0	1/2
2 1/4	2 1/2 X 7 3/8	32300	25295	_	36.8	_		6	2 5/8	3 1/2	3 1/2	
2 1/2	2 3/4 X 7 5/8	39800	31169	_	39.7	_	5 3/4		2 7/8	3 3/4	,	5/8
2 3/4	3 X 7	49400	38687	_	40.8	_			3 1/8		3 3/4	
3	3 1/4 X 7	60100	47066	_	46.7	_	6 1/4	_	3 3/8	4		
3 1/4	3 1/2 X 7 3/4	71900	56307	_	62.1	_	7	7	3 5/8	1 1 /0	1 1 /1	7 /1
3 1/2	3 3/4 X 7 3/4	84700	66331	_	72.4	-	7 1/2	8	3 7/8	4 1/2	4 1/4	3/4

NOTES:-

1. ALL DIMENSIONS ARE IN INCH.

**PIPING SUPPORT STANDARD - HS1** PIPE HANGER SUPPORT FOR BARE/INSULATED PIPE SIZE 1/2' THRU 12" SHEET 2 OF 3

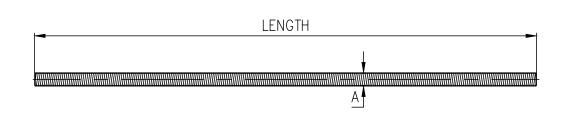


FIG. 146: LOADS (LBS) ● WEIGHT (LBS) ● DIMENSIONS (IN)

	,	, ,	. ,
ROD SIZE A	THREAD PER INCH	MAX. LOAD 650° F	WEIGHT PER Ft.
1/4"	20	240	0.12
3/8"	16	730	0.30
1/2"	13	1,350	0.53
5/8"	11	2,160	0.84
3/4"	10	3,230	1.20
7/8"	9	4,480	1.70
1"	8	5,900	2.30
1 1/4"	7	9,500	3.60
1 1/2"	6	13,800	5.10

**NOTE:** OTHER ROD SIZES AVAILABLE UPON REQUEST. CLASS 2 FIT IS AVAILABLE UPON REQUEST.

SIZE RANGE: 14" THROUGH 1 1/2" STOCKED IN SIX, TEN & TWELVE FOOT LENGTH. OTHER EVEN FOOT LENGTH CAN BE FURNISHED TO ORDER.

MATERIAL: CARBON STEEL OR STAINLESS STEEL GR. 304

THREADS : NATIONAL COARSE (USS), ROD THREAD COMPLETE LENGTH. FINISH : PLAIN OR ZINC PLATED (HOT DIP GALVANIZED OPTIONAL).

MAXIMUM TEMPERATURE: 650° F

ORDERING: SPECIFY ROD DIAMETER AND LENGTH, FIGURE NUMBER, NAME AND FINISH NOTE: THE ACCEPTABILITY OF GALVANIZED COATING AT TEMPERATURES ABOVE 450° F

IS AT THE DISCRETION OF THE END USER.

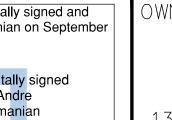
PIPING SUPPORT STANDARD - HS1 PIPE HANGER SUPPORT FOR BARE/INSULATED PIPE SIZE 1/2' THRU 12" SHEET 3 OF 3

ISSUED FOR CONSTRUCTION

DATE CHK BY APRV BY PROFESSIONAL ENGINEER DESCRIPTION ISSUED FOR BID )2/03/202 ISSUED FOR CONSTRUCTION ANDRE GAMANIAN, P.E. ISSUED FOR CONSTRUCTION (REVISED) SS FL LICENCE NO.93370 ISSUED FOR CONSTRUCTION (REVISED) EXP. 02/28/2025

DRE GAMANANA No. 93370 STATE OF LORIDA

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Andre Gamanian Date: 2023.<mark>09</mark>.25 17:53:16-07'00'





INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968



2321 E. 28TH STREET, SUITE 400

SIGNAL HILL, CA 90755, Ph: (562) 726-3565

EMAIL: INFO@BIOGASENG.COM

PIPING SUPPORT STANDARD (SHEET 7 OF 7)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

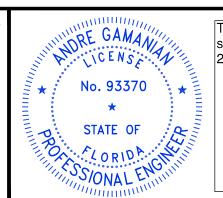
M-445AL

Sr No	Drawing No.	Description	Date	Rev
1	1/2"-IA-0509-SS1-N-1	PIPING ISOMETRIC	06/21/2023	1
2	1/2"-IA-0513-SS1-N-1	PIPING ISOMETRIC	06/21/2023	1
3	1/2"-IA-0515-SS1-N-1	PIPING ISOMETRIC	06/21/2023	1
4	3/4"-FG-0520-SS1-N-1	PIPING ISOMETRIC	06/21/2023	1
5	1-C-0411-SS1-HT-1	PIPING ISOMETRIC	06/21/2023	1
6	1-IA-0502-SS1-N-1	PIPING ISOMETRIC	06/21/2023	1
7	1-IA-0507-SS1-N-1	PIPING ISOMETRIC	06/21/2023	1
8	1-T-0316-SS1-H-1	PIPING ISOMETRIC	06/21/2023	1
9	2-C-0119-HD1-N-1	PIPING ISOMETRIC	06/21/2023	1
10	2-C-0120-HD1-N-1	PIPING ISOMETRIC	06/21/2023	1
11	2-C-0121-SS1-N-1	PIPING ISOMETRIC	06/21/2023	1
12	2-C-0125-HD1-N-1	PIPING ISOMETRIC	06/21/2023	1
13	2-IA-0104-SS1-N-1	PIPING ISOMETRIC	06/21/2023	1
14	2-IA-0104-SS1-N-2	PIPING ISOMETRIC	06/21/2023	1
15	2-IA-0104-SS1-N-3	PIPING ISOMETRIC	06/21/2023	1
16	2-IA-0104-SS1-N-4	PIPING ISOMETRIC	06/21/2023	1
17	2-IA-0104-SS1-N-5	PIPING ISOMETRIC	06/21/2023	1
18	2-IA-0104-SS1-N-6	PIPING ISOMETRIC	06/21/2023	1
19	2-T-0315-SS1-H-1	PIPING ISOMETRIC	06/21/2023	1
20	2-T-0315-SS1-H-2	PIPING ISOMETRIC	06/21/2023	1
21	3-CHWR-0410-CS1-C-1	PIPING ISOMETRIC	06/21/2023	1
22	3-CHWR-0410-CS1-C-2	PIPING ISOMETRIC	06/21/2023	1
23	3-CHWR-0410-CS1-C-3	PIPING ISOMETRIC	06/21/2023	1
24	3-CHWR-0410-CS1-C-4	PIPING ISOMETRIC	06/21/2023	1
25	3-CHWR-0410-CS1-C-5	PIPING ISOMETRIC	06/21/2023	1
26	3-CHWS-0409-CS1-C-1	PIPING ISOMETRIC	06/21/2023	1
27	3-CHWS-0409-CS1-C-2	PIPING ISOMETRIC	06/21/2023	1
28	3-CHWS-0409-CS1-C-3	PIPING ISOMETRIC	06/21/2023	1
29	4-T-0315-SS1-H-1	PIPING ISOMETRIC	06/21/2023	1
30	4-T-0315-SS1-H-2	PIPING ISOMETRIC	06/21/2023	1
31	6-LFG-0103-SS1-HT-1	PIPING ISOMETRIC	06/21/2023	1
32	6-LFG-0103-SS1-HT-2	PIPING ISOMETRIC	06/21/2023	1

Sr No	Drawing No.	Description	Date	Rev
33	6-LFG-0103-SS1-HT-3	PIPING ISOMETRIC	06/21/2023	1
34	6-LFG-0103-SS1-HT-4	PIPING ISOMETRIC	06/21/2023	1
35	8-LFG-0102-SS1-HT-1	PIPING ISOMETRIC	06/21/2023	1
36	8-LFG-0102-SS1-HT-2	PIPING ISOMETRIC	06/21/2023	1
37	8-LFG-0102-SS1-HT-3	PIPING ISOMETRIC	06/21/2023	1
38	8-LFG-0102-SS1-HT-4	PIPING ISOMETRIC	06/21/2023	1
39	8-LFG-0303-SS1-H-1	PIPING ISOMETRIC	06/21/2023	1
40	8-LFG-0303-SS1-H-2	PIPING ISOMETRIC	06/21/2023	1
41	8-LFG-0304-SS1-H-1	PIPING ISOMETRIC	06/21/2023	1
42	8-LFG-0305-SS1-H-1	PIPING ISOMETRIC	06/21/2023	1
43	8-LFG-0306-SS1-H-1	PIPING ISOMETRIC	06/21/2023	1
44	8-LFG-0311-SS1-H-1	PIPING ISOMETRIC	06/21/2023	1
45	8-LFG-0311-SS1-H-2	PIPING ISOMETRIC	06/21/2023	1
46	8-LFG-0311-SS1-H-3	PIPING ISOMETRIC	06/21/2023	1
47	8-LFG-0312-ST1-H-1	PIPING ISOMETRIC	06/21/2023	1
48	8-LFG-0312-ST1-H-2	PIPING ISOMETRIC	06/21/2023	1
49	8-LFG-0312-ST1-H-3	PIPING ISOMETRIC	06/21/2023	1
50	8-LFG-0317-SS1-H-1	PIPING ISOMETRIC	06/21/2023	1
51	8-LFG-0317-SS1-H-2	PIPING ISOMETRIC	06/21/2023	1
52	8-LFG-0318-SS1-H-1	PIPING ISOMETRIC	06/21/2023	1
53	8-LFG-0318-SS1-H-2	PIPING ISOMETRIC	06/21/2023	1
54	8-LFG-0318-SS1-H-3	PIPING ISOMETRIC	06/21/2023	1
55	8-LFG-0401-ST1-C-1	PIPING ISOMETRIC	06/21/2023	1
56	8-LFG-0401-ST1-C-2	PIPING ISOMETRIC	06/21/2023	1
57	8-LFG-0402-SS1-HT-1	PIPING ISOMETRIC	06/21/2023	1
58	8-LFG-0402-SS1-HT-2	PIPING ISOMETRIC	06/21/2023	1
59	8-LFG-0501-SS1-P-1	PIPING ISOMETRIC	06/21/2023	1
60	8-LFG-0501-SS1-P-2	PIPING ISOMETRIC	06/21/2023	1
61	8-LFG-0501-SS1-P-3	PIPING ISOMETRIC	06/21/2023	1
62	14-LFG-0101-SS1-N-1	PIPING ISOMETRIC	06/21/2023	1
63	14-LFG-0101-SS1-N-2	PIPING ISOMETRIC	06/21/2023	1
64	14-LFG-0101-SS1-N-3	PIPING ISOMETRIC	06/21/2023	1

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER	
1.0	06/21/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG		1111
							инни
						ANDRE GAMANIAN, P.E.	11111
						FL LICENCE NO.93370 EXP. 02/28/2025	



This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.

Digitally signed by Andre Gamanian Date: 2023.09.25 17:53:16-07'00'



INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

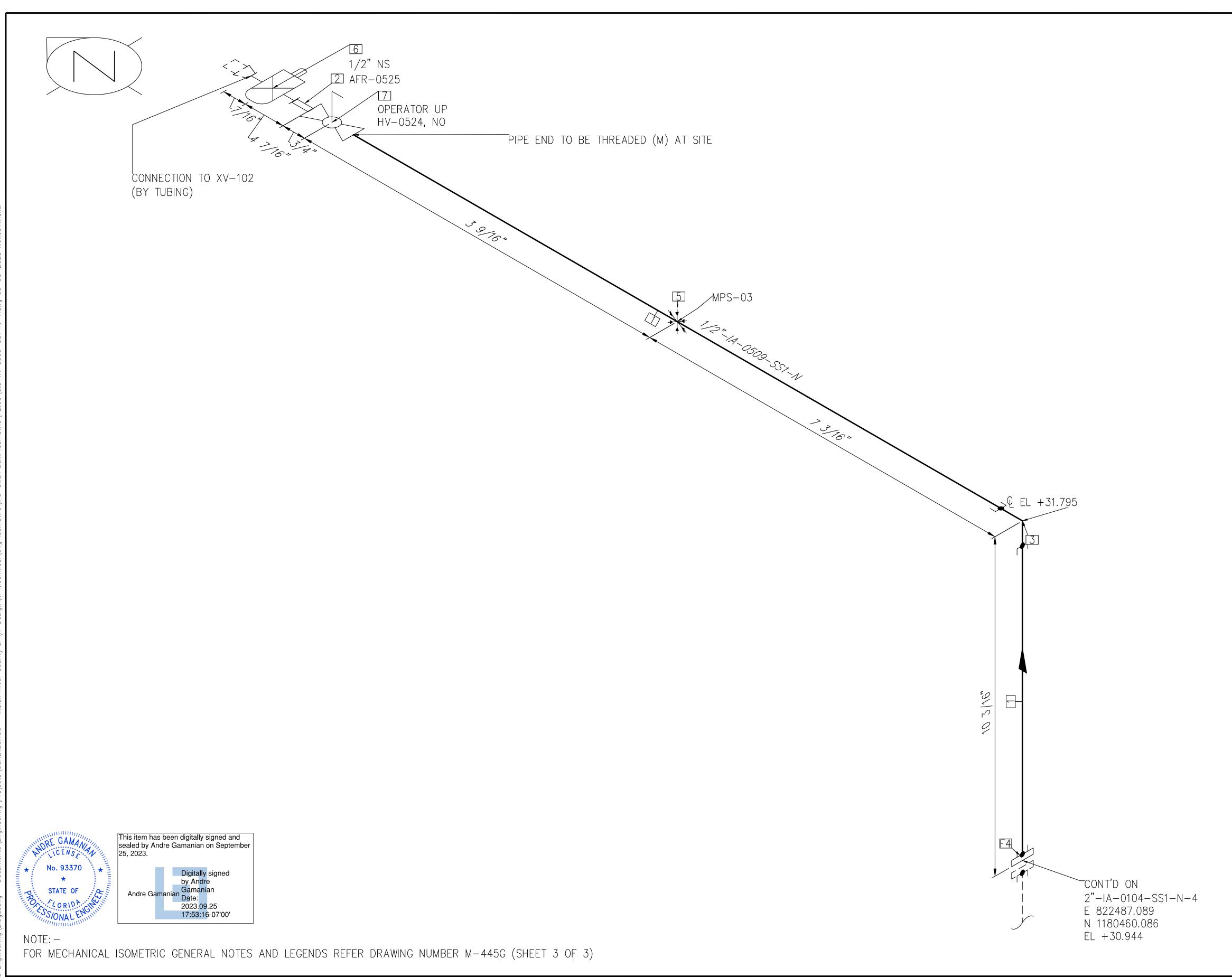


2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

MECHANICAL ISOMETRIC INDEX SHEET

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

BLOWER SKID M-445AM



PIPE							
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
1	1'-7"	1/2"	80S	PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304			
	FITTINGS						
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
2	1	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, NPT (M), ASME A733, ASTM A312 GR TP 304			
3	1	1/2"	3000	ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304			
FLANGES							
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
4	1	1/2"	150	FLANGE SW, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304			
			PIPE SUP	PORTS			
ID	QTY	ND	ITEM CODE	DESCRIPTION			
5	1	1/2"	US1-1-1/2"	U-BOLT FOR BARE PIPE SIZE 1/2" THRU 16"			
			VALV	ES			
ID	QTY	ND	ITEM CODE	DESCRIPTION			
6	1	1/2"	AFR-0525	COMPRESSED AIR FILTER REGULATOR WITH GAUGE, OUTDOOR RATED, METAL BOWL W/SITE GLASS			
7	1	1/2"	HV-0524	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR			

BILL OF MATERIALS

ISSUED FOR CONSTRUCTION

REV DATE DESCRIPTION DRN BY CHK BY APRV BY 01/06/2023 ISSUED FOR CONSTRUCTION MT SS AG

SERVICE IA

PIPE SPEC SS1

P&ID DWG P2.05

INSULATION SPEC N

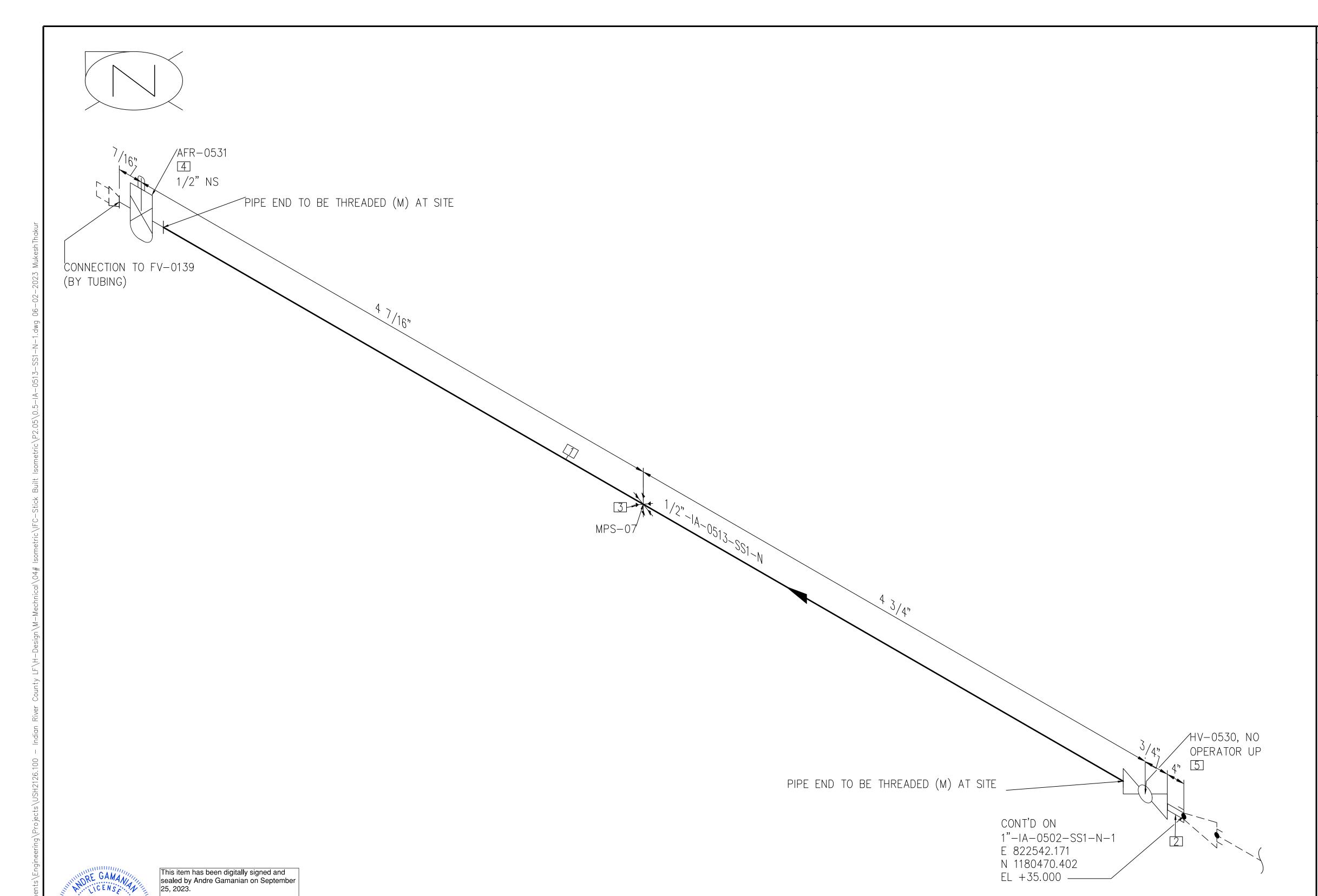
INSULATION THK —

INDIAN RIVER COUNTY
FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

/	ENGINEER: BIOGAS
	ENGINEERING  2321 E. 28TH STREET, SUITE 400  SIGNAL HILL, CA 90755, Ph: (562) 726-356  EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC 1/2"-IA-0509-SS1-N	SHEET 1
RING	LANDFILL GAS BLOWER SKID	SCALE N.T.S
726-3565	& FLARE REPLACEMENT	11.1.0



BILL OF MATERIALS PIPE QTY SCH/CLASS DESCRIPTION ID PIPE, ERW, SCH 80S, PE, ASME 8" B36.19, ASTM A312 GR TP 304 FITTINGS QTY SCH/CLASS ID DESCRIPTION ND PIPE NIPPLE, SMLS, 4" LG, SCH 1/2" 80S, PE X NPT (M), ASME A733, ASTM A312 GR TP 304 PIPE SUPPORTS QTY DESCRIPTION ITEM CODE ND US1-1-1/2" U-BOLT FOR BARE PIPE SIZE 1/2" THRU 16" VALVES QTY ITEM CODE DESCRIPTION ND COMPRESSED AIR FILTER REGULATOR WITH GAUGE, OUTDOOR 1/2" AFR-0531 RATED, METAL BOWL W/SITE GLASS BALL VALVE, UNI-BODY DESIGN, 1/2" HV-0530 REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR

ISSUED FOR CONSTRUCTION

DRN BY CHK BY APRV BY DESCRIPTION DATE ISSUED FOR CONSTRUCTION AG SS

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

2023.09.25 17:53:16-07'00'

No. 93370

STATE OF

SONAL ENGINE

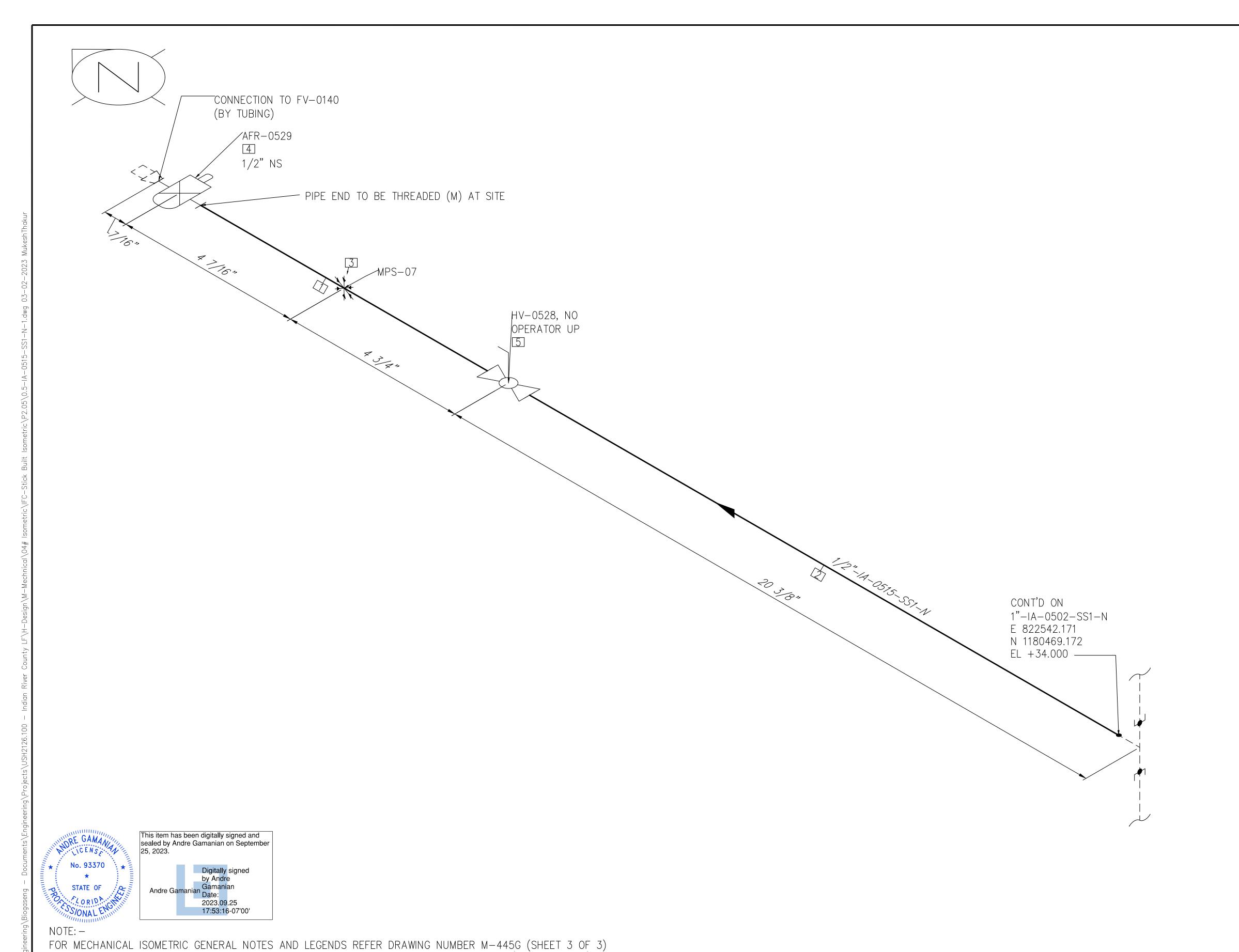
SERVICE SS1 PIPE SPEC P2.05 P&ID DWG INSULATION SPEC INSULATION THK

INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

ENGINEER:	BIOGAS ENGINEERING	f
2321 E. 28T	H STREET, SUITE 400	

/ ENGIN	NEEK:	BIOGAS	PIPING ISOMETRIC  1/2"-IA-0513-SS1-N	SHEET 1
SIGN	E. 28TH STRE	755, Ph: (562) 726-3565	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



			BILL OF MA	ATERIALS
			PIPI	
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	8"	1/2"	80\$	PIPE, SMLS, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304
2	1'-7"	1/2"	80S	PIPE, SMLS, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304
PIPE SUPPORTS			PORTS	
ID	QTY	ND	ITEM CODE	DESCRIPTION
3	1	1/2"	US1-1-1/2"	U-BOLT FOR BARE PIPE SIZE 1/2" THRU 16"
			VALV	ES
ID	QTY	ND	ITEM CODE	DESCRIPTION
4	1	1/2"	*AFR-0529	COMPRESSED AIR FILTER REGULATOR WITH GAUGE, OUTDOOR RATED, METAL BOWL W/SITE GLASS
5	1	1/2"	*HV-0528	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR

Bioga	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	
hakur∖		01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG	
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ers∖Mu							
\Use							

SERVICE	IA
PIPE SPEC	SS1
P&ID DWG	P2.05
INSULATION SPEC	Ν
INSULATION THK	_

INDIAN RIVER COUNTY
FLORIDA

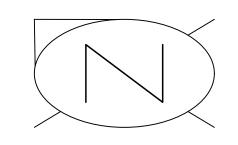
1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

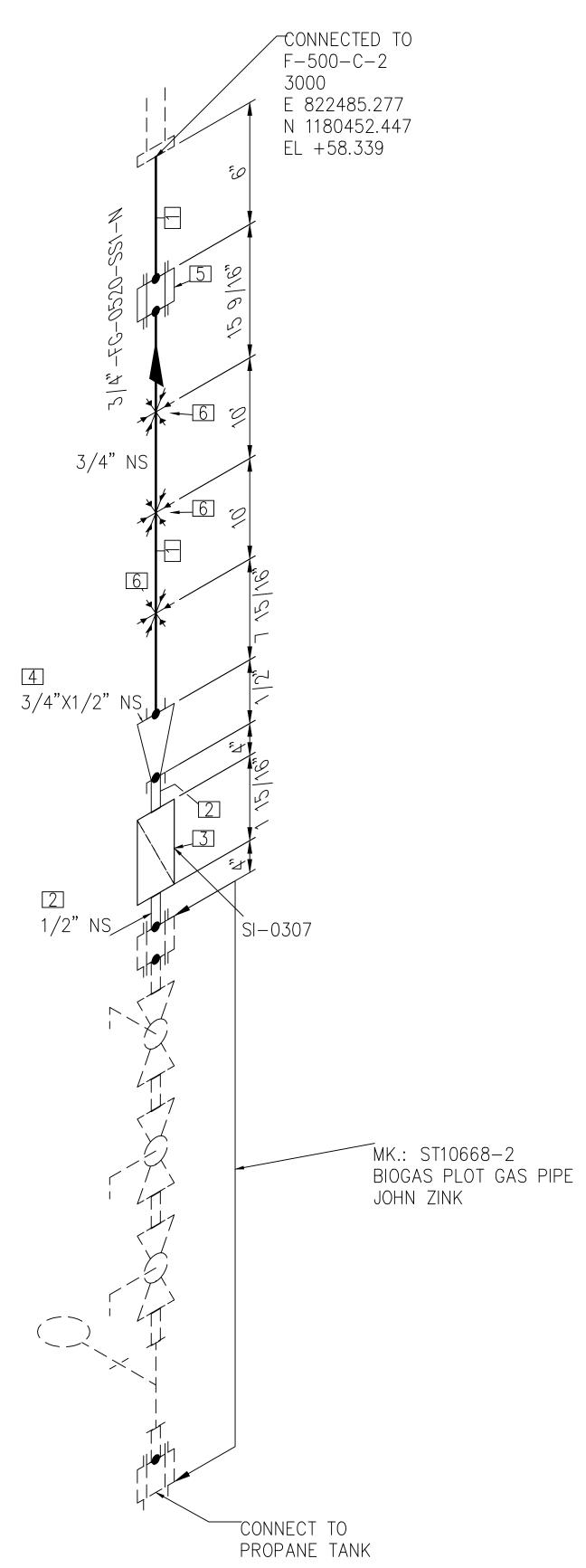
FLORIDA

2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM

,	ENGINEER:	BIOG ENGI	AS NEERING
	2321 E. 28TH	STREET, SUITE	400

	PIPING ISOMETRIC 1/2"-IA-0515-SS1-N	SHEET 1
5	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S





PIPE QTY SCH/CLASS DESCRIPTION ID ND PIPE, SMLS, SCH 80S, PE, ASME 3/4" 1 22'-5" 80S B36.19, ASTM A312 GR TP 304 FITTINGS SCH/CLASS QTY DESCRIPTION ND ID PIPE NIPPLE, SMLS, 4" LG, SCH 1/2" 80S, PE X NPT (M), ASME A733, ASTM A312 GR TP 304 Y-STRAINER, NPT(F), PROPANE 1/2" SI - 0307SUPPLY(VENDOR TO SPECIFY SUITABLE STRAINER FOR SERVICE RED COUPLING, CLASS 3000, SW, 3/4"X1/2 ASTM B16.11, ASTM A182 GR F304 UNION, SW, CLASS 3000, ASME 3/4" B16.11, ASTM A182 GR F304 PIPE SUPPORTS QTY ITEM CODE DESCRIPTION ID ND US1-1-3/4" U-BOLT FOR BARE PIPE SIZE 1/2" 3/4" THRU 16"

BILL OF MATERIALS

CENS No. 93370 STATE OF TO RIDA CHANT

DATE

01/06/2023

This item has been digitally signed and sealed by Andre Gamanian on September 2023.09.25 17:53:16-07'00'

ISSUED FOR CONSTRUCTION

DESCRIPTION

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

DRN BY CHK BY APRV BY

SS

AG

SERVICE SS1 PIPE SPEC P2.05 P&ID DWG INSULATION SPEC VERO BEACH, FLORIDA 32968

INSULATION THK

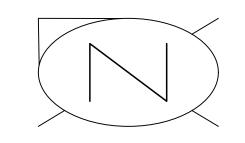
INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

ENGINEER: 2321 E. 28TH STREET, SUITE 400

EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC SHEET 3/4"-FG-0520-SS1-N SCALE LANDFILL GAS BLOWER SKID N.T.S & FLARE REPLACEMENT SIGNAL HILL, CA 90755, Ph: (562) 726-3565

ISSUED FOR CONSTRUCTION



CONT'D ON

NOTE: -

N 1180452.445 EL +34.777 —

1 1/2"-C-0404-SS1-HT E 822542.759 CONNECTED FROM E-400
E 822548.691
N 1180454.077
EL +34.812

1" NS

MPS-15

MPS-15

MPS-15

QTY SCH/CLASS DESCRIPTION ID PIPE, ERW, SCH 80S, BE, ASME B36.19, ASTM A312 GR TP 304 FITTINGS QTY SCH/CLASS DESCRIPTION ND ID PIPE NIPPLE, SMLS, 4" LG, SCH 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304 ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304 UNION, SW, CLASS 3000, ASME B16.11, ASTM A182 GR F304 FLANGES SCH/CLASS QTY ID DESCRIPTION ND FLANGE SW, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304 FASTENERS QTY SCH/CLASS DESCRIPTION ID STUD BOLT ASTM A193 GR B8, 1/2"X2 ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20 PIPE SUPPORTS QTY ITEM CODE DESCRIPTION ID ND PIPE SADDLE FOR INSULATED | SS1-4"-2-6" | PIPE SIZE 1/2" TO 6"

BILL OF MATERIALS

PIPE

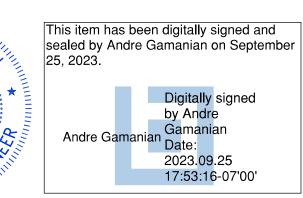
No. 93370

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No. 93370

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STATE OF

CORIDA CHARLES

NO. 93370



ENGINEER:

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

SERVICE	С
PIPE SPEC	SS1
P&ID DWG	P2.04
INSULATION SPEC	НТ
INSULATION THK	1"

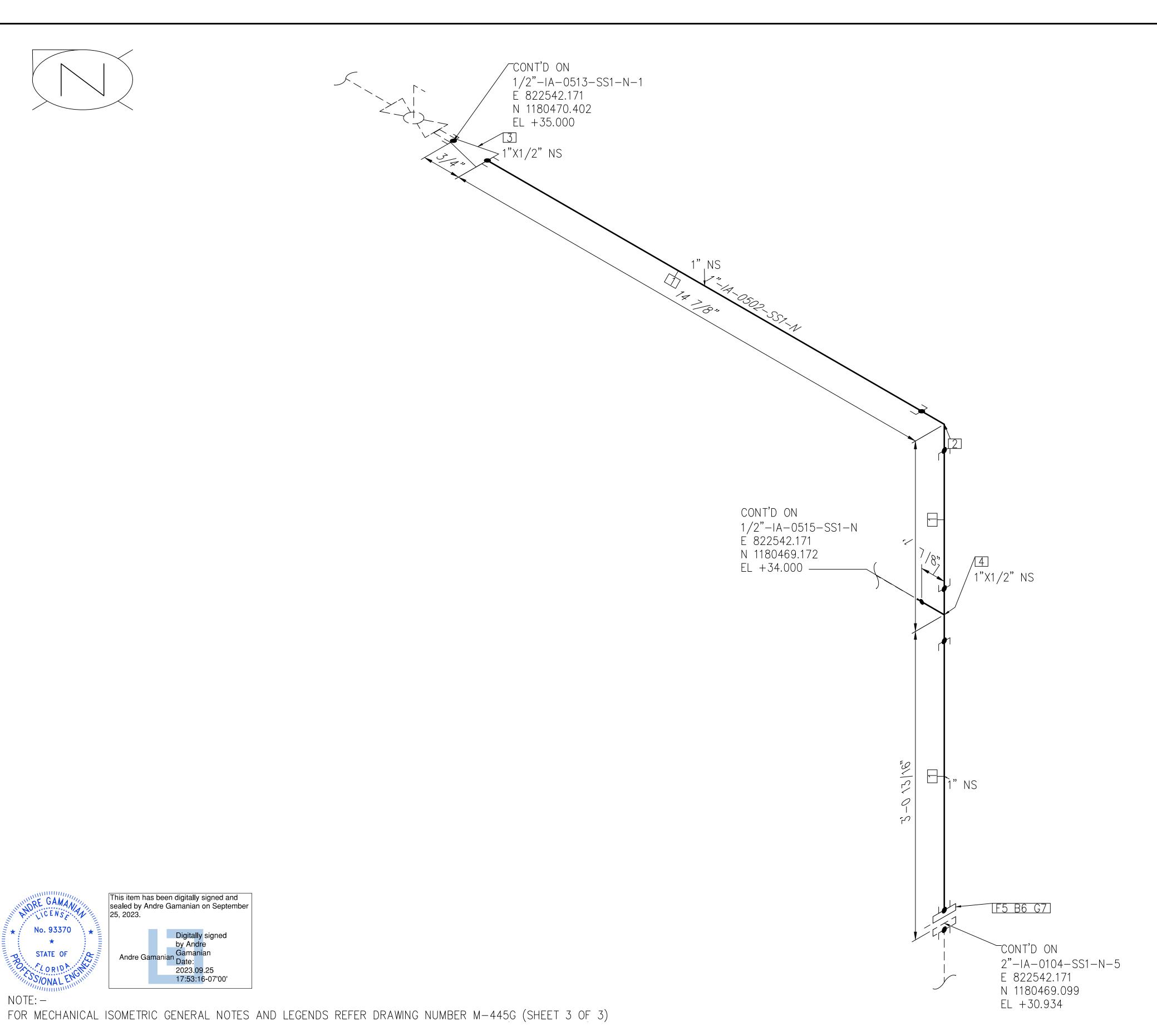
INDIAN RIVER COUNTY
FLORIDA

1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

S	PIPING ISOMETRIC  1"-C-0411-SS1-HT	SHEET 1
<b>EERING</b> 00 62) 726–3565	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



PIPE QTY SCH/CLASS DESCRIPTION ID PIPE, SMLS, SCH 80S, PE, ASME 5' B36.19, ASTM A312 GR TP 304 FITTINGS QTY SCH/CLASS DESCRIPTION ID ND ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304 RED COUPLING, CLASS 3000, SW, 1"X1/2" ASTM B16.11, ASTM A182 GR F304 TEE REDUCING, CLASS 3000, SW, 1"X1/2" ASME B16.11, ASTM A182 GR F304 FLANGES QTY SCH/CLASS DESCRIPTION ID FLANGE SW, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304 FASTENERS QTY SCH/CLASS ID DESCRIPTION ND STUD BOLT ASTM A193 GR B8, 1/2"X2 ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME

B 16.20

BILL OF MATERIALS

ISSUED FOR CONSTRUCTION

DRN BY CHK BY APRV BY DATE DESCRIPTION ISSUED FOR CONSTRUCTION 01/06/2023 AG

This item has been digitally signed and sealed by Andre Gamanian on September

2023.09.25 17:53:16-07'00'

No. 93370

STATE OF

S/ONAL EN

SERVICE SS1 PIPE SPEC P2.05 P&ID DWG INSULATION SPEC INSULATION THK

1325 74th AVE SW,

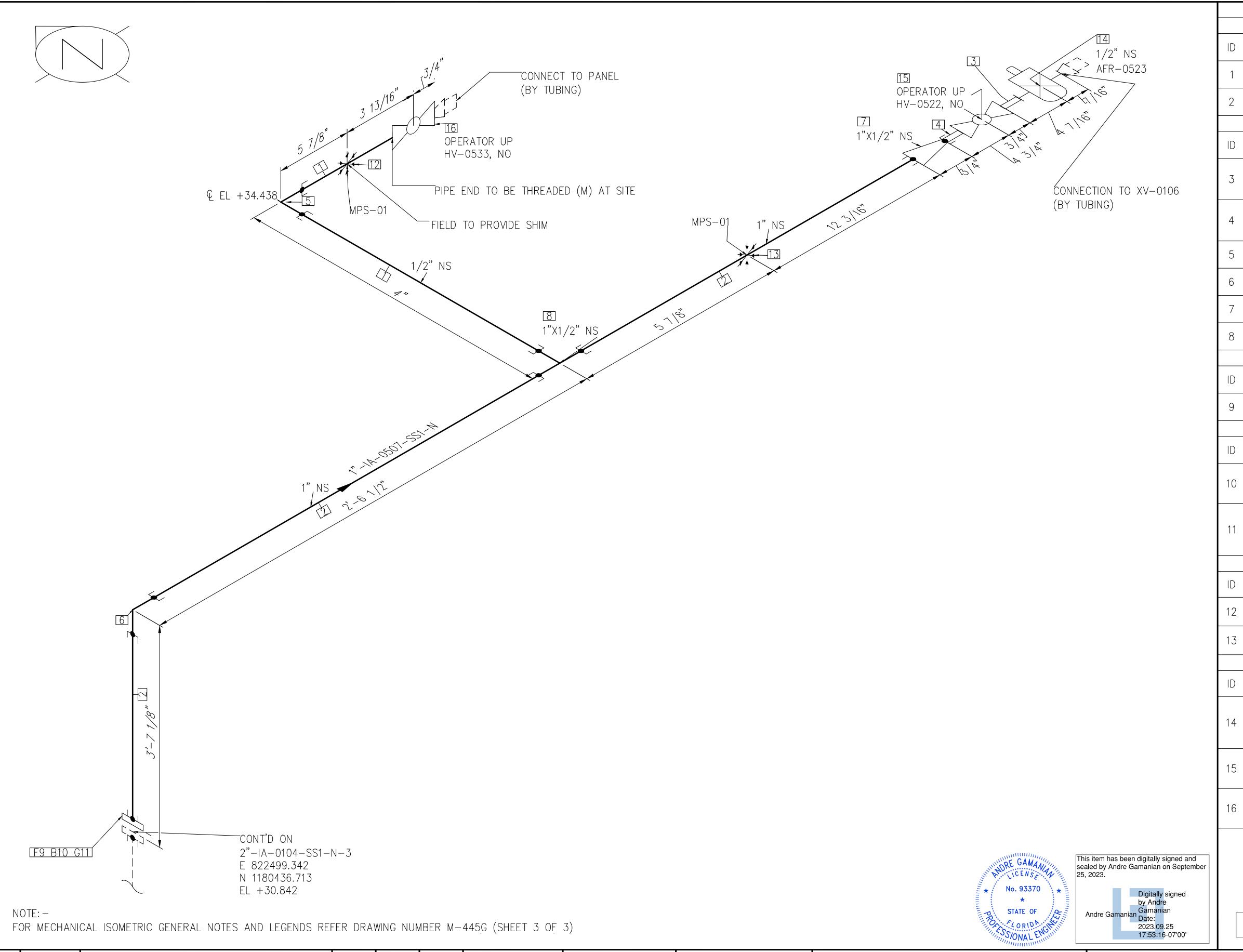
VERO BEACH, FLORIDA 32968

ENGINEER: DIOCAC INDIAN RIVER COUNTY FLORIDA 2321 E.

	BINGINEERING RINGAS	
	STREET, SUITE 400	
SIGNAL HILL,	CA 90755, Ph: (562) 726-3565	5

EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC 1"-IA-0502-SS1-N	SHEET 1	
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S	



ENGINEER:

ISSUED FOR CONSTRUCTION

DRN BY CHK BY APRV BY SERVICE DESCRIPTION DATE 01/06/2023 ISSUED FOR CONSTRUCTION SS AG PIPE SPEC SS1 P&ID DWG INSULATION SPEC INSULATION THK

P2.05

INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

2321 E. 28TH STF SIGNAL HILL, CA EMAIL: INFO@BIOGASENG.COM

<b>DI BIOGAS</b>	PIPING ISOMETRIC	SHEET
SI DIOOMO	1"-IA-0507-SS1-N	
<b>2</b> ENGINEERING		SCALE
TREET, SUITE 400	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	N.T.S
90755, Ph: (562) 726-3565	& FLARE REPLACEMENT	

BILL OF MATERIALS

PIPE

FITTINGS

DESCRIPTION

DESCRIPTION

PIPE NIPPLE, SMLS, 4" LG, SCH

80S, NPT (M), ASME A733, ASTM

PIPE NIPPLE, SMLS, 4" LG, SCH

80S, BE X NPT (M), ASME A733,

ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304

ELBOW 90 LR, CLASS 3000, SW,

ASME B16.11, ASTM A182 GR F304

RED COUPLING, CLASS 3000, SW,

ASTM B16.11, ASTM A182 GR F304

TEE REDUCING, CLASS 3000, SW,

ASME B16.11, ASTM A182 GR F304

DESCRIPTION

FLANGE SW, CLASS 150, RF, ASME

DESCRIPTION

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

US1-1-1/2" U-BOLT FOR BARE PIPE SIZE 1/2"

COMPRESSED AIR FILTER

HV-0522 REGULAR BORE, NPT (F), MANUAL

HV-0533 REGULAR BORE, NPT (F), MANUAL

RATED, METAL BOWL W/SITE

LEVER LOCKABLE OPERÁTOR

LEVER LOCKABLE OPERATOR

BALL VALVE, UNI-BODY DESIGN,

BALL VALVE, UNI-BODY DESIGN,

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

U-BOLT FOR BARE PIPE SIZE 1/2"

DESCRIPTION

REGULATOR WITH GAUGE, OUTDOOR

B16.5, ASTM A182 GR F304

A312 GR TP 304

ASTM A312 GR TP 304

PIPE, ERW, SCH 80S, PE, ASME

B36.19, ASTM A312 GR TP 304

PIPE, ERW, SCH 80S, PE, ASME

B36.19, ASTM A312 GR TP 304

SCH/CLASS

80S

SCH/CLASS

3000

3000

3000

SCH/CLASS

SCH/CLASS

ITEM CODE

US1-1-1"

ITEM CODE

AFR-0523

FLANGES

FASTENERS

PIPE SUPPORTS

VALVES

B 16.20

QTY

11"

QTY

QTY

QTY

QTY

QTY

ND

ND

1/2"

1"X1/2"

1"X1/2"

ND

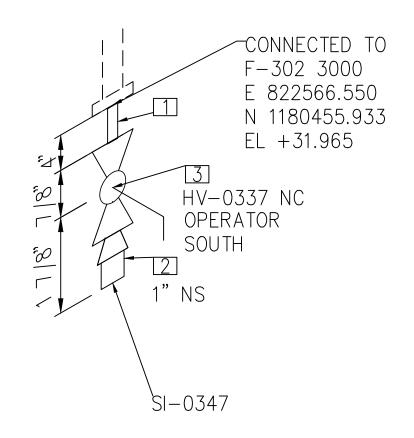
ND

1/2"X2

1/2"

1/2"

1/2"



BILL OF MATERIALS FITTINGS QTY SCH/CLASS DESCRIPTION PIPE NIPPLE, SMLS, 4" LG, SCH 80S, NPT (M), ASME A733, ASTM A312 GR TP 304 PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A182 3000 GR F304 VALVES ITEM CODE QTY DESCRIPTION ND ID BALL VALVE, UNI-BODY DESIGN, HV-0337 REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR

No. 93370 STATE OF ZORIDA GIR

This item has been digitally signed and sealed by Andre Gamanian on September Digitally signed by Andre Gamanian Date: 2023.09.25 17:53:16-07'00'

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

SERVICE	
PIPE SPEC	SS1
P&ID DWG	P2.03
INSULATION SPEC	Н
INSULATION THK	1"
	PIPE SPEC P&ID DWG INSULATION SPEC

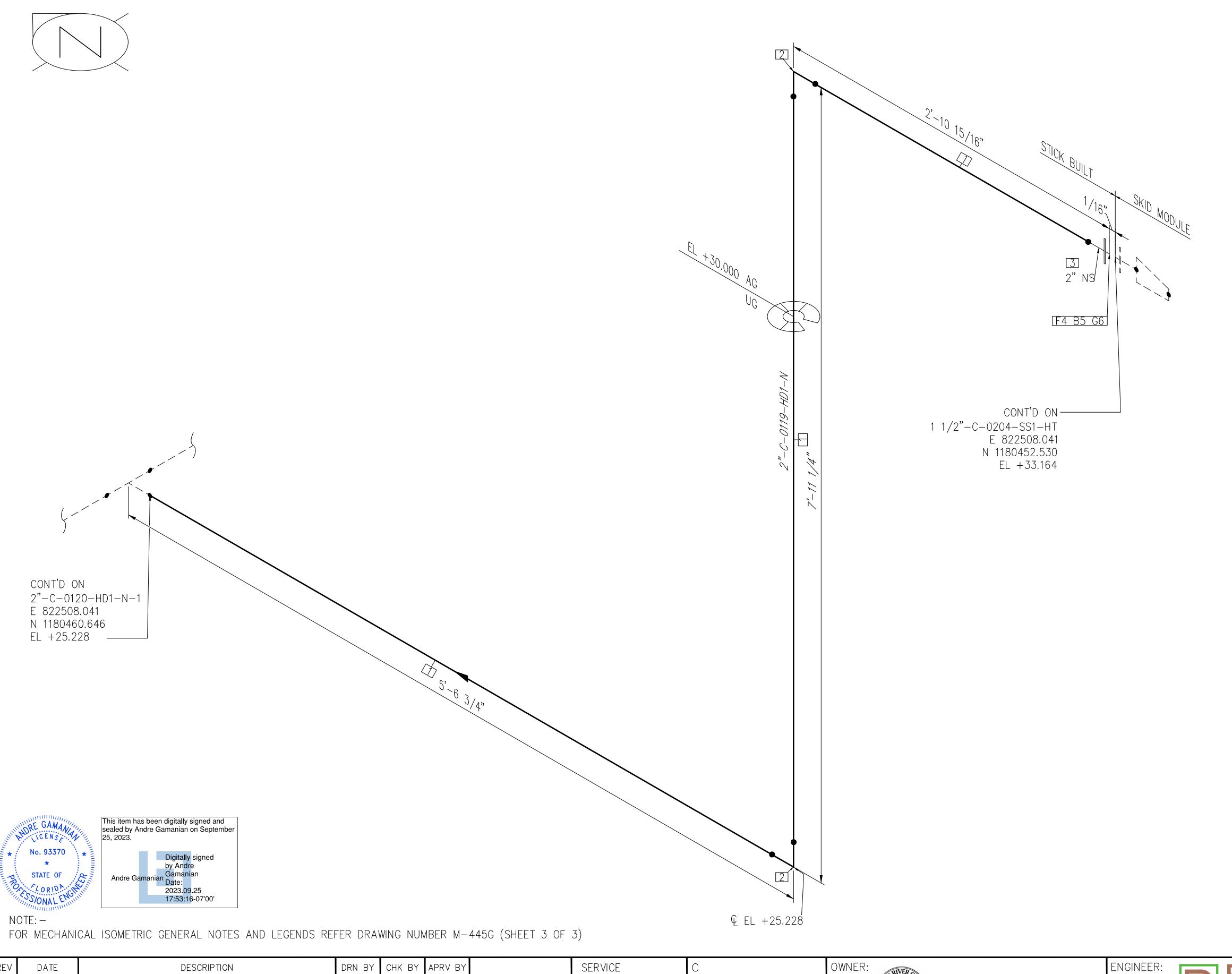
INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

,	ENGINEER: BIOGAS
	<b>ENGINEERING</b>
	2321 E. 28TH STREET, SUITE 400
	SIGNAL HILL, CA 90755, Ph: (562) 726-356 EMAIL: INFO@BIOGASENG.COM

ISSUED FOR CONSTRUCTION

	PIPING ISOMETRIC	SHEET
	1"-T-0316-SS1-H	1
IG		SCALE
	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	N.T.S
3565	W I LANCE INCLUDENT	



	BILL OF MATERIALS						
	PIPE						
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
1	14'-2"	2"	SDR17	PIPE, HDPE, ASTM D3035, IRON PIPE SIZE (IPS) PE 3408, SDR 17			
			FITTIN	IGS			
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
2	2	2"	SDR17	MOLDED ELBOW 90, BUTT FUSION ASTM D1248 P34 (PE3408), SDR 17			
3	1	2"	SDR17	STUB-END FOR LAP FLANGE, SHORT PATTERN, 2" ND, ASME B16.9			
			FLANC	GES			
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
4	1	2"	150	BACK UP FLANGE, ASME B16.5, CLASS 150, A105, FLAT FACE			
			FASTEN	IERS			
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
5 4 5/8"X3 1/4"		150	PTFE COATED, STUD BOLT ASTM A193 GR B7, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 2H, ASME 18.2.2				
6	1	2"	150	GASKET NEOPRENE, ASME 16.5, CLASS 150, FLAT FACED			

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
$\triangle$ 1	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

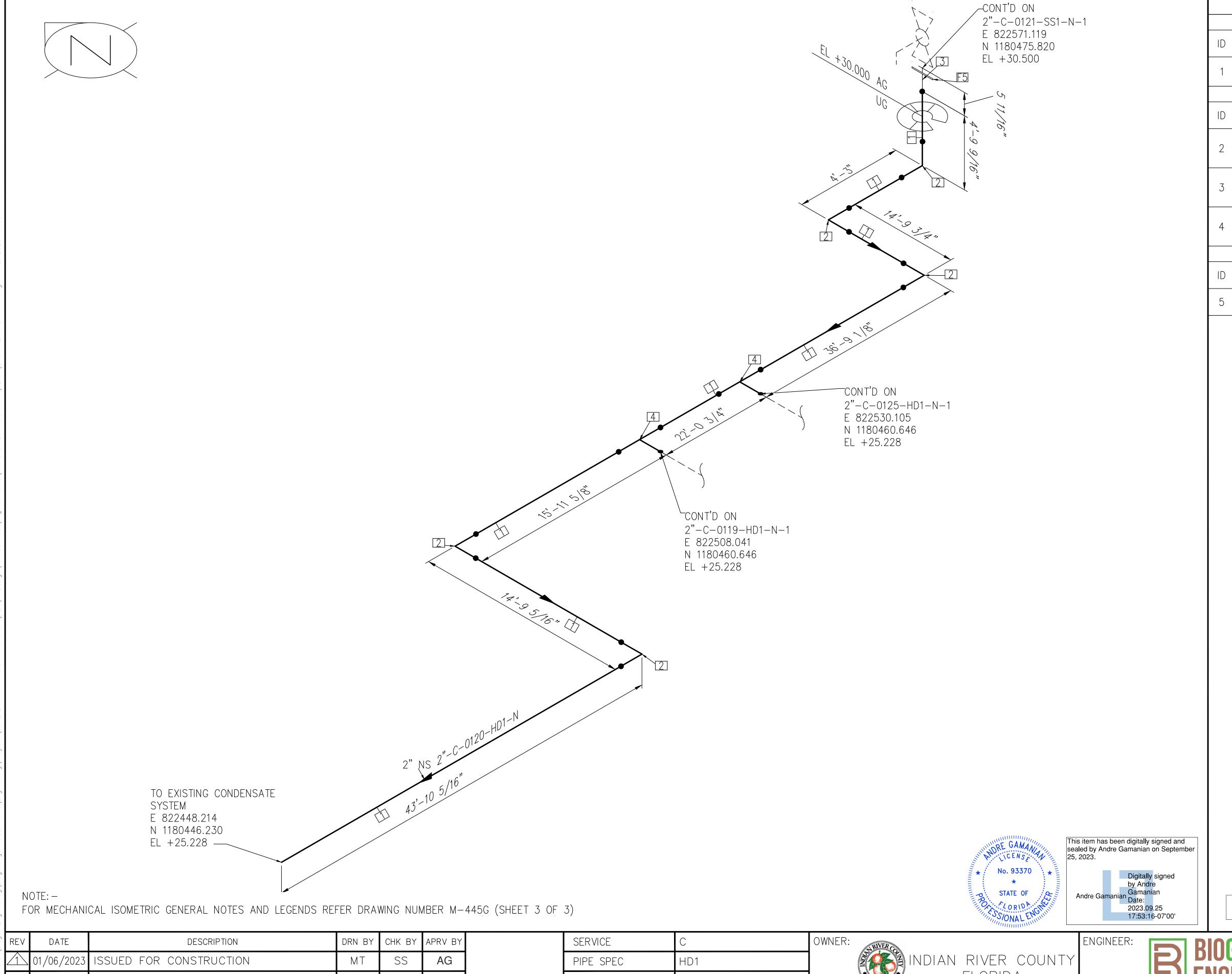
SERVICE	
PIPE SPEC	HD1
P&ID DWG	P2.02
INSULATION SPEC	Ν
INSULATION THK	_

INDIAN RIVER COUNTY
FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968	FIORIO	ILUNIDA
		32968

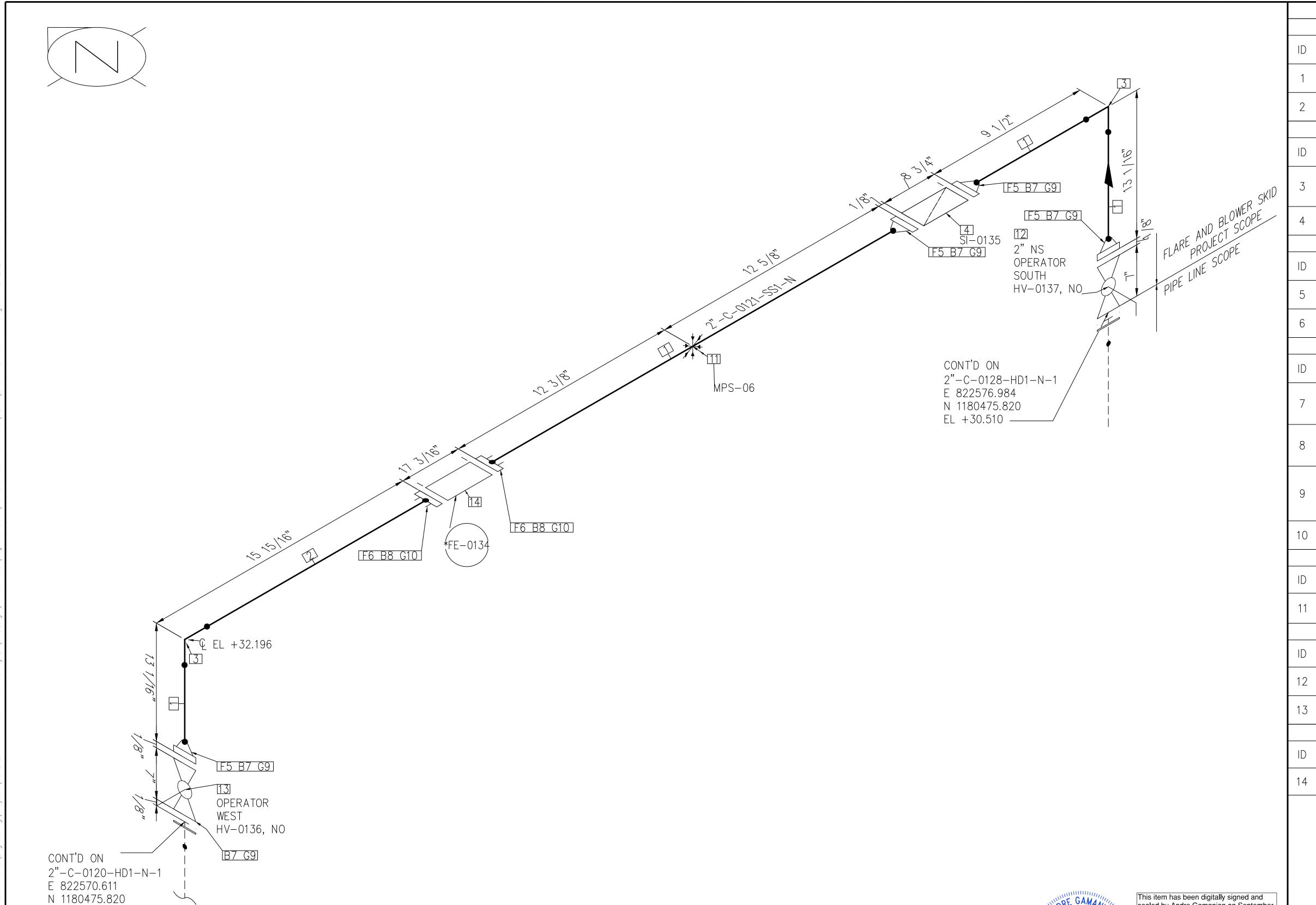
`	ENGINEER: BIOGAS
	ENGINEERING  2321 F 29TH STREET SHITE 400
	2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC	SHEET
	2"-C-0119-HD1-N	1
		SCALE
65	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	N.T.S



			BILL OF MA	ATERIALS				
	PIPE							
ID	QTY	ND	SCH/CLASS	DESCRIPTION				
1	152'-3"	2"	SDR17	PIPE, HDPE, ASTM D3035, IRON PIPE SIZE (IPS) PE 3408, SDR 17				
			FITTIN	IGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION				
2	5	2"	SDR17	MOLDED ELBOW 90, BUTT FUSION ASTM D1248 P34 (PE3408), SDR 17				
3	1	2"	SDR17	STUB-END FOR LAP FLANGE, SHORT PATTERN, 2" ND, ASME B16.9				
4	2	2"	SDR17	MOLDED EQUALTEE, BUTT FUSION ASTM D1248 P34 (PE3408), SDR 17				
FLANGES								
ID QTY ND SCH/CLASS DESCRIPTION								
5	1	2"	150	BACK UP FLANGE, ASME B16.5, CLASS 150, A105, FLAT FACE				

REV	DATE	DESCRIPTION	DRN BY CHK BY	APRV BY	SERVICE	С	OWNER:	ENGINEER: RIOCAC	PIPING ISOMETRIC	SHEET
akur 1	01/06/2023	ISSUED FOR CONSTRUCTION	MT SS	AG	PIPE SPEC	HD1	INDIAN RIVER COUNTY	EX DIOUAS	2"-C-0120-HD1-N	1
keshTk					P&ID DWG	P2.01	FLORIDA	<b>ENGINEERING</b>		SCALE
ers/Mu					INSULATION SPEC	N	_ · · · — · · · · · · · · · · — · · · ·	2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	N.T.S
C: \Use					INSULATION THK	_		EMAIL: INFO@BIOGASENG.COM		



No. 93370 STATE OF

This item has been digitally signed and sealed by Andre Gamanian on September Andre Gamanian Gamanian Date: 2023.09.25 17:53:16-07'00'

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

EL + 30.500

NOTE: -

SERVICE	С
PIPE SPEC	SS1
P&ID DWG	P2.01
INSULATION SPEC	N
INSULATION THK	_
	-

INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

ı	
I	2321 E. 28TH STREET, SUITE 400
	SIGNAL HILL, CA 90755, Ph: (562) 726-3565
	EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC 2"-C-0121-SS1-N	SHEET 1
65	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

BILL OF MATERIALS

PIPE

FITTINGS

FLANGES

FASTENERS

DESCRIPTION

DESCRIPTION

PIPE, ERW, SCH 80S, BE, ASME

B36.19, ASTM A312 GR TP 304

PIPE, ERW, SCH 80S, BE, ASME B36.19, ASTM A312 GR TP 304

ELBOW 90 LR, SMLS, SCH 80S,

ASME B16.10

FLANGE, SW

B 16.20

THRU 16"

PIPE SUPPORTS

VALVES

INSTRUMENT

ITEM CODE

US1-1-2"

ITEM CODE

HV-0137

HV-0136

ITEM CODE

FE-0134

BW, ASME B16.9, ASTM A403 GR

Y-TYPE STRAINER, CLASS 150, RF,

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

NEOPRENE RUBBER GASKET, FF

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

U-BOLT FOR BARE PIPE SIZE 1/2"

DESCRIPTION

DESCRIPTION

ROTARY FLOW METER, AWWA TWO

BOLT ELLIPTICAL FLANGE

BALL VALVE, UNI-BODY DESIGN,

REGULAR BORE, CLASS 150, RF

BALL VALVE, UNI-BODY DESIGN,

REGULAR BORE, CLASS 150, RF

B16.5, ASTM A182 GR F304

AWWA TWO BOLT ELLIPTICAL

SCH/CLASS

80S

SCH/CLASS

SCH/CLASS

SCH/CLASS

QTY

3'-5"

QTY

QTY

QTY

20

QTY

QTY

QTY

ND

ND

ND

5/8"X3

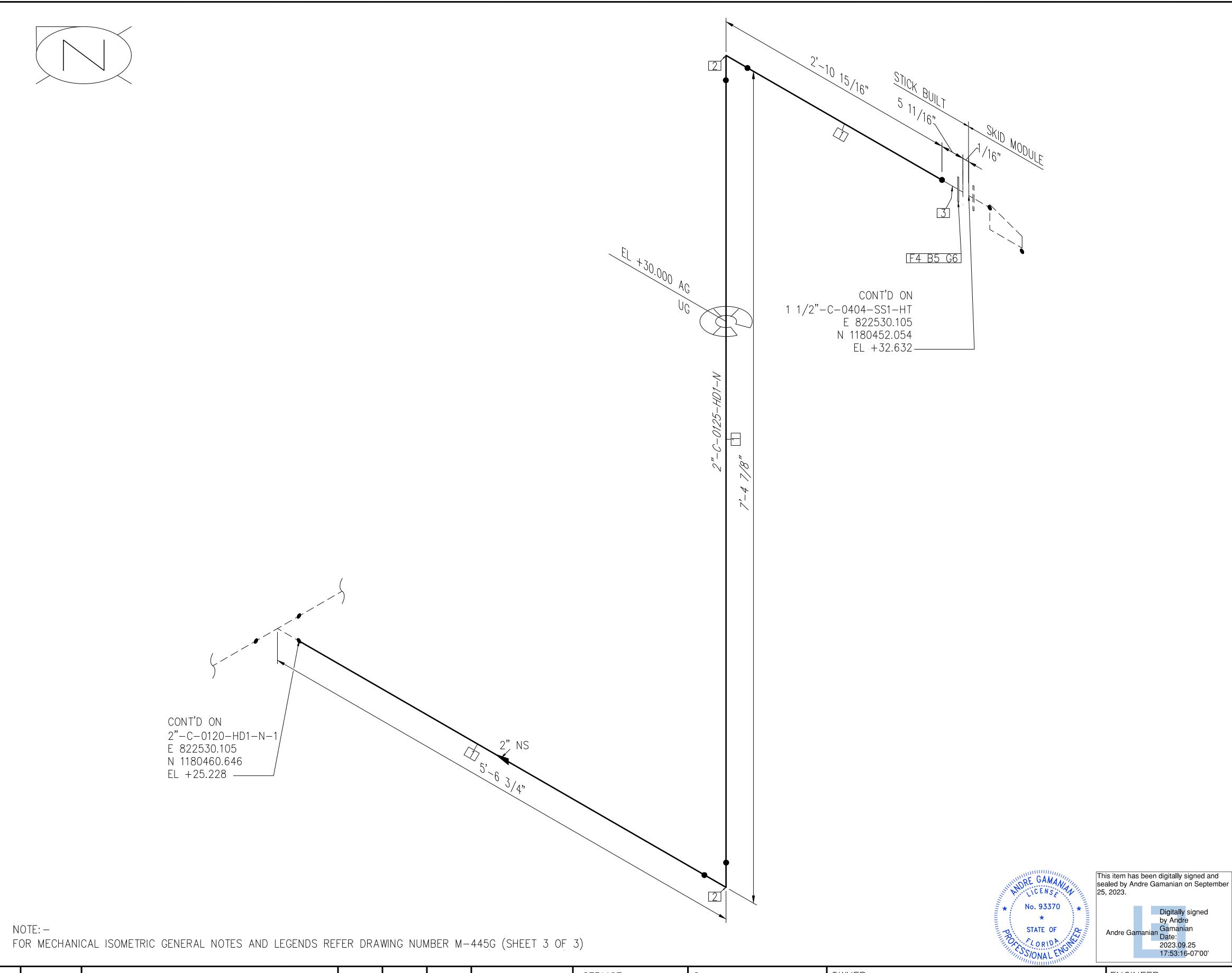
5/8"X3

ND

ND

ND

ENGINEER:



PIPE QTY SCH/CLASS DESCRIPTION PIPE, HDPE, ASTM D3035, IRON 1 | 14'-1" PIPE SIZE (IPS) PE 3408, SDR 17 FITTINGS QTY SCH/CLASS DESCRIPTION ID ND MOLDED ELBOW 90, BUTT FUSION SDR17 ASTM D1248 P34 (PE3408), SDR STUB-END FOR LAP FLANGE, SDR17 SHORT PATTERN, 2" ND, ASME B16.9 FLANGES SCH/CLASS QTY DESCRIPTION BACK UP FLANGE, ASME B16.5, CLASS 150, A105, FLAT FACE FASTENERS QTY SCH/CLASS DESCRIPTION ID ND PTFE COATED, STUD BOLT ASTM 5/8"X3 A193 GR B7, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 2H, ASME 18.2.2 GASKET NEOPRENE, ASME 16.5, CLASS 150, FLAT FACED

BILL OF MATERIALS

ISSUED FOR CONSTRUCTION 2023.09.25 17:53:16-07'00'

DRN BY CHK BY APRV BY DESCRIPTION DATE 01/06/2023 ISSUED FOR CONSTRUCTION AG

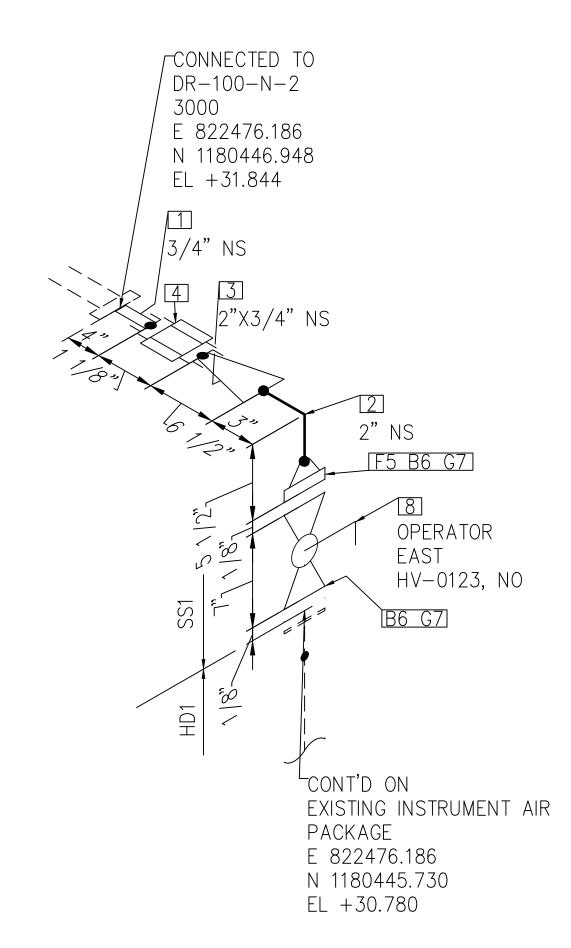
SERVICE HD1 PIPE SPEC P2.04 P&ID DWG INSULATION SPEC INSULATION THK

INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

NEER:	BIOGAS ENGINEERING
1 F 2	RTH STREET SUITE 400

BIOGAS	PIPING ISOMETRIC 2"-C-0125-HD1-N	SHEET 1
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



BILL OF MATERIALS FITTINGS QTY SCH/CLASS DESCRIPTION PIPE NIPPLE, SMLS, 4" LG, SCH 3/4" 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304 ELBOW 90 LR, SMLS, SCH 80S, BW, ASME B16.9, ASTM A403 GR WP 304 SWAGE (CONC), CLASS 3000, BW X 2"X3/4" 3000 SW, MSS-SP-95,ASTM A182 GR UNION, SW, CLASS 3000, ASME 3/4" B16.11, ASTM A182 GR F304 FLANGES QTY SCH/CLASS DESCRIPTION ID ND FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304 FASTENERS QTY SCH/CLASS DESCRIPTION ID ND STUD BOLT ASTM A193 GR B8, 5/8"X3 ASME 18.2.1, HEXAGONAL NUTS 8 ASTM A194 GR 8, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20 VALVES QTY ITEM CODE DESCRIPTION BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF

No. 93370

\*
STATE OF

CORIDA

CONTROL

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.

Digitally signed by Andre Gamanian Date:
2023.09.25
17:53:16-07'00'

ENGINEER:

ISSUED FOR CONSTRUCTION

NOTE: FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

REV DATE DESCRIPTION DRN BY CHK BY APRV B							
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY		
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG		

SERVICE	IA
PIPE SPEC	SS1
P&ID DWG	P2.01
INSULATION SPEC	Ν
INSULATION THK	_

INDIAN RIVER COUNTY
FLORIDA

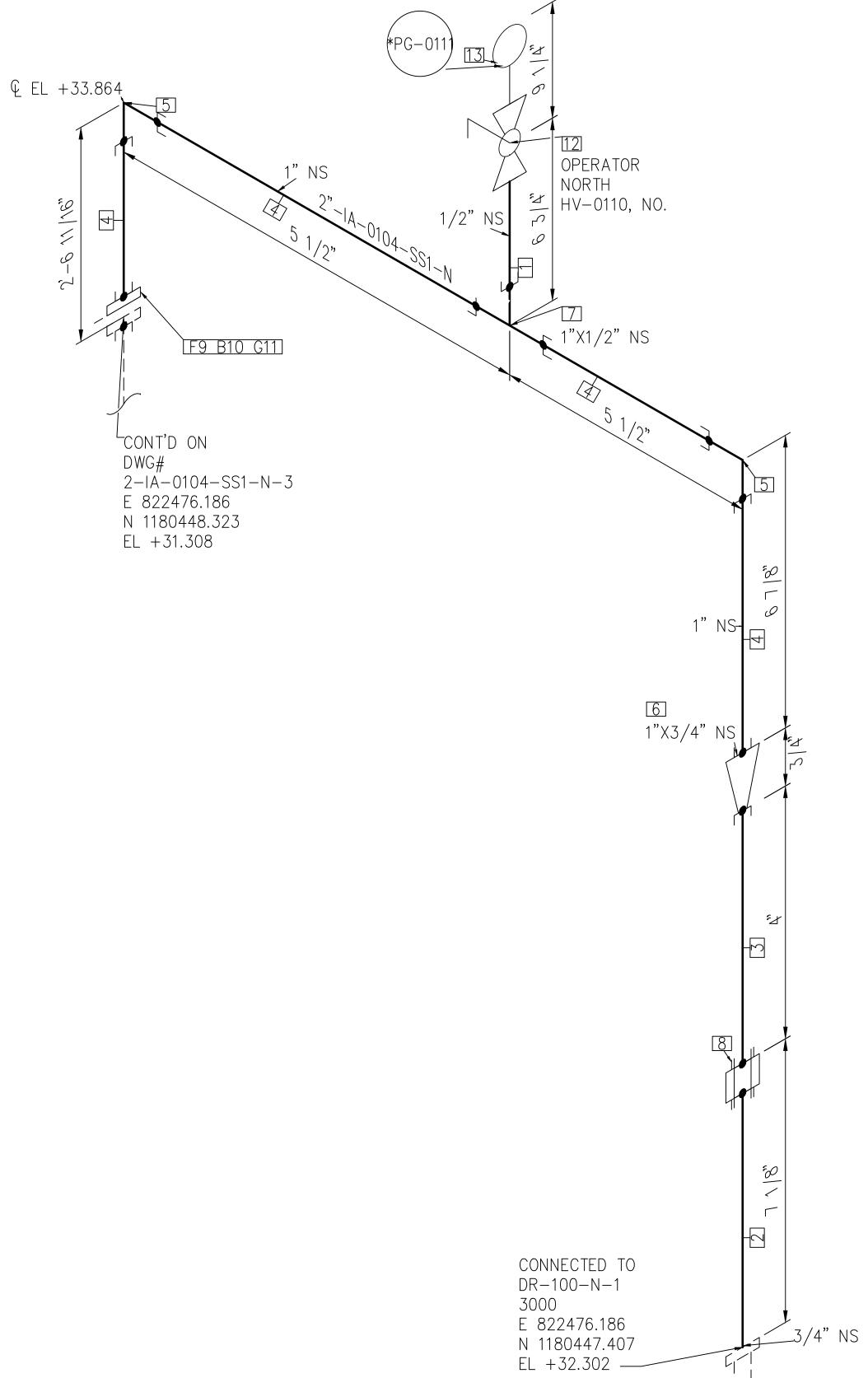
1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC 2"-IA-0104-SS1-N	SHEET 1
65	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

NOTE: -





This item has been digitally signed and sealed by Andre Gamanian on September Digitally signed by Andre Andre Gamanian Date: 2023.09.25 17:53:16-07'00'

ENGINEER:

ISSUED FOR CONSTRUCTION

BILL OF MATERIALS

PIPE

FITTINGS

FLANGES

FASTENERS

VALVES

INSTRUMENT

B 16.20

DESCRIPTION

PIPE, ERW, SCH 80S, PE, ASME

B36.19, ASTM A312 GR TP 304

PIPE, ERW, SCH 80S, PE, ASME

B36.19, ASTM A312 GR TP 304

PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304

PIPE, ERW, SCH 80S, PE, ASME

B36.19, ASTM A312 GR TP 304

DESCRIPTION

ASME B16.11, ASTM A182 GR F304

RED COUPLING, CLASS 3000, SW,

TEE REDUCING, CLASS 3000, SW,

UNION, SW, CLASS 3000, ASME

B16.11, ASTM A182 GR F304

B16.5, ASTM A182 GR F304

ASME B16.11, ASTM A182 GR F304

DESCRIPTION

FLANGE SW, CLASS 150, RF, ASME

DESCRIPTION

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

DESCRIPTION

BALL VALVE, UNI-BODY DESIGN,

HV-0110 REGULAR BORE, NPT (F), MANUAL

LEVER LOCKABLE OPERÁTOR

PRESSURE GAUGE, NPT (M)

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

ASTM B16.11, ASTM A182 GR F304

ELBOW 90 LR, CLASS 3000, SW,

SCH/CLASS

80S

SCH/CLASS

3000

3000

SCH/CLASS

SCH/CLASS

ITEM CODE

ITEM CODE

PG-0111

QTY

QTY

QTY

QTY

QTY

QTY

ID

ID

ND

ND

1"X3/4"

1"X1/2"

3/4"

ND

ND

1/2"X2

ND

1/2"

ND

ID

ID

SERVICE ISSUED FOR CONSTRUCTION МТ SS AG

SERVICE	IA	OWNER:
PIPE SPEC	SS1	
P&ID DWG	P2.01	
INSULATION SPEC	N	1325 7 VFRO F
INSULATION THK	_	I VERU E

NDIAN RIVER COUNTY FLORIDA 325 74th AVE SW,

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
2"-IA-0104-SS1-N	2
LANDFILL GAS BLOWER SKID	SCALE
& FLARE REPLACEMENT	N.T.S

F(	OR MECHANI	CAL ISOMETRIC	GENERAL NOTE	S AND I	LEGENDS	REFER	DRAWING	G NUMI	BER M	-445G (S	SHEET ,	3 OF	3)
EV	DATE		DESCRIPTION			DRI	N BY CH	K BY .	APRV B`	Y			S

		ZW. ZIC
PIPE SPEC	SS1	INDIAN RI
P&ID DWG	P2.01	- LI
INSULATION SPEC	Ν	1325 74th AVE SW, VERO BEACH, FLORIDA 32968
INICILI A TIONI TIUZ		VERU DEAUN, FLURIDA 32900

CONT'D FROM

E 822476.186 N 1180448.323

EL +31.308

2-IA-0104-SS1-N-2

DWG#

CONT'D ON 1"-IA-0507-SS1-N-1 E 822499.342 N 1180436.713 EL +30.842 —

16,

3

BILL OF MATERIALS PIPE QTY SCH/CLASS DESCRIPTION ID PIPE, ERW, SCH 80S, PE, ASME 1 42'-6" 80S B36.19, ASTM A312 GR TP 304 FITTINGS SCH/CLASS QTY DESCRIPTION ID ND ELBOW 90 LR, CLASS 3000, SW, 3000 ASME B16.11, ASTM A182 GR F304 ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304 ELBOW 45 LR, CLASS 3000, SW, 3000 ASME B16.11, ASTM A182 GR F304 EQUAL TEE, CLASS 3000, SW, 3000 ASME B16.11, ASTM A182 GR F304 FLANGES SCH/CLASS DESCRIPTION QTY ID ND FLANGE SW, CLASS 150, RF, ASME

B16.5, ASTM A182 GR F304

No. 93370

This item has been digitally signed and sealed by Andre Gamanian on September 2023.09.25 17:53:16-07'00'

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

SERVICE	IA
PIPE SPEC	SS1
P&ID DWG	P2.01
INSULATION SPEC	Ν
INSULATION THK	_

NDIAN RIVER COUNTY FLORIDA

10'-6 7/8"

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

CONT'D ON

E 822492.498 N 1180445.730

EL +24.888

2-IA-0104-SS1-N-4

DWG#

ENGINEER:	R			
		ENGII	NEE	RIN
2321 E. 281 SIGNAL HILL EMAIL: INFO	, CA 9075	55, Ph:		726-35

19	2"-IA-0104-SS1-N
<b>EERING</b> 00 662) 726–3565	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

PIPING ISOMETRIC

SHEET

SCALE

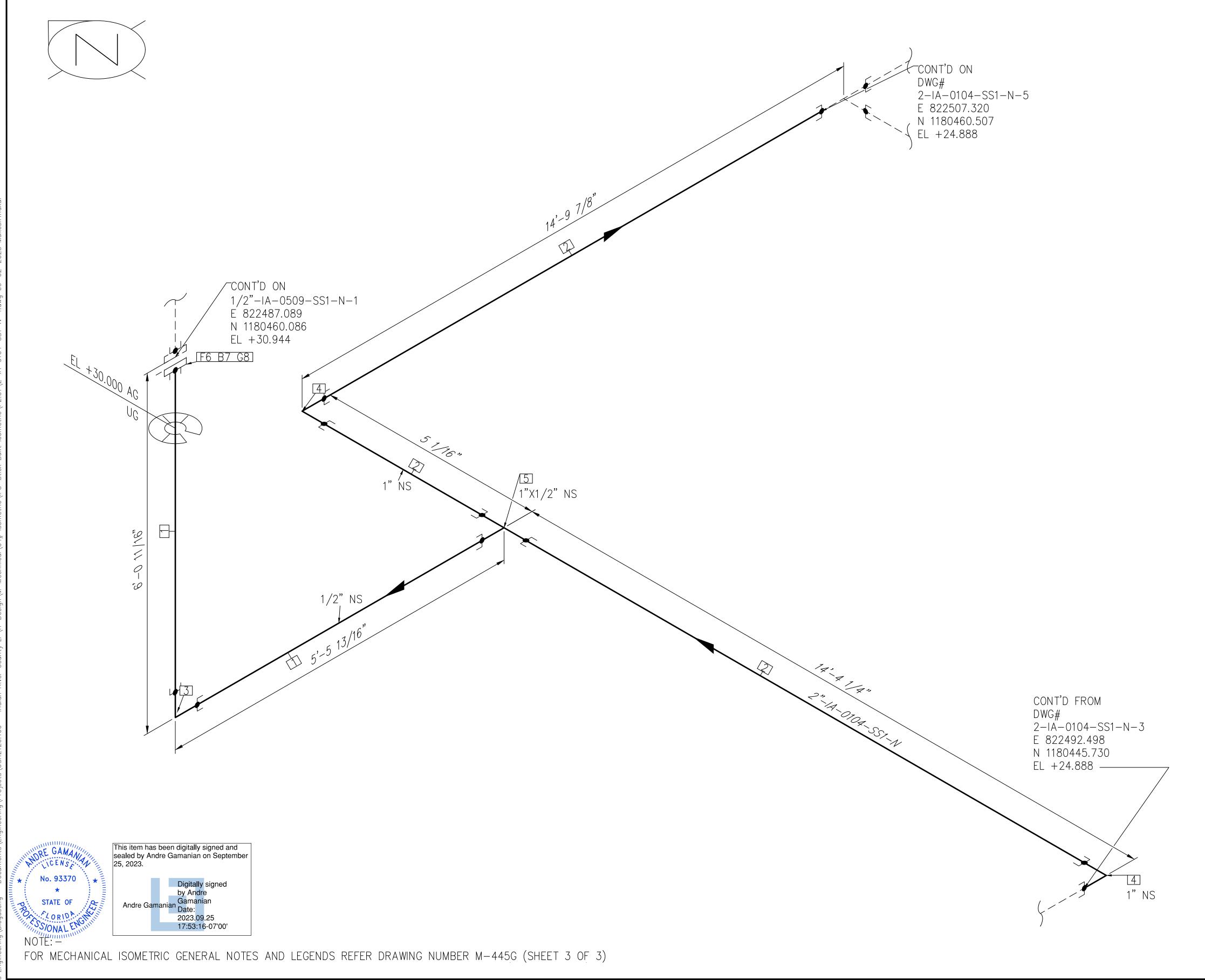
N.T.S

ISSUED FOR CONSTRUCTION

-51/16"

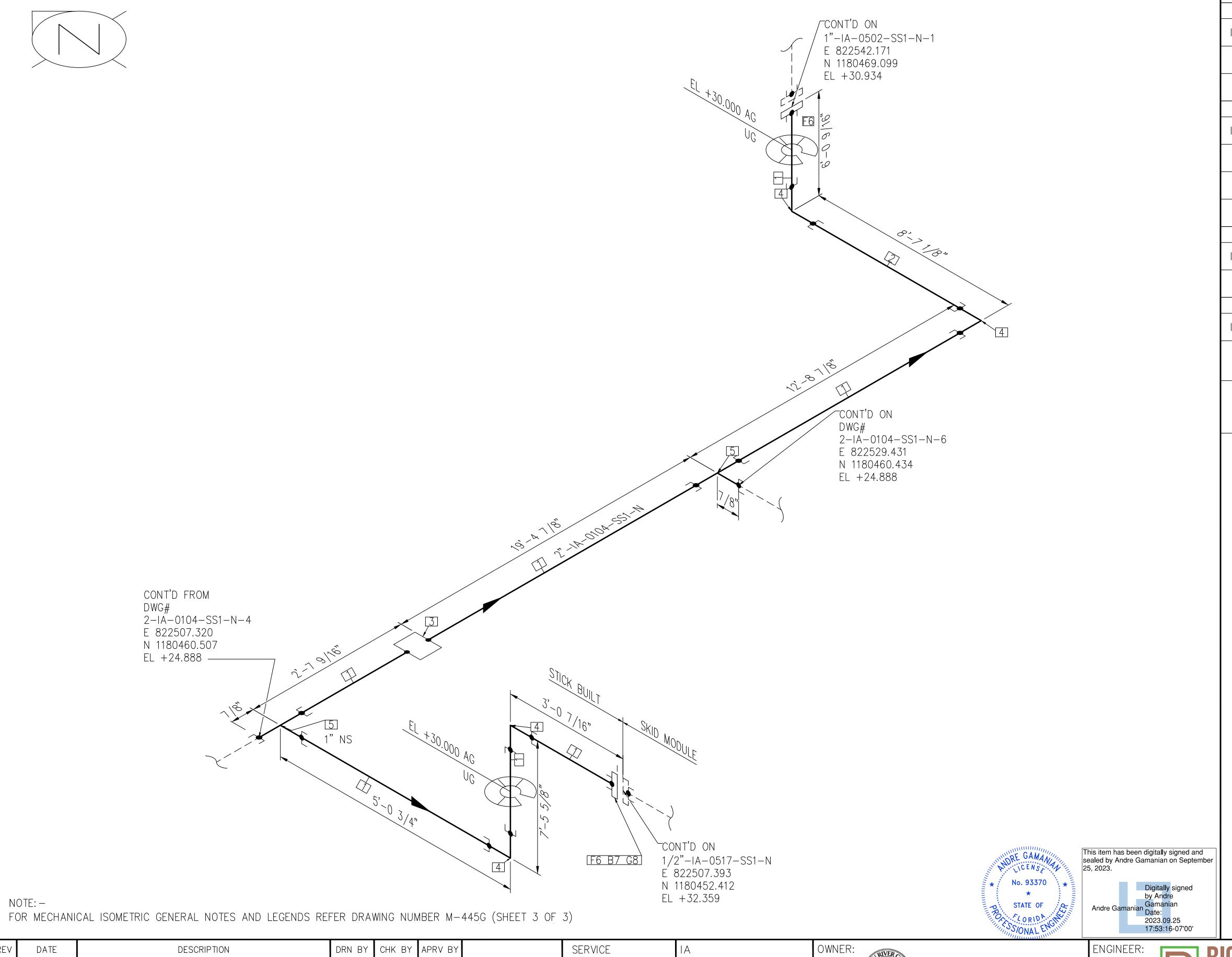
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NOTE: -



BILL OF MATERIALS								
PIPE								
ID	QTY	ND	SCH/CLASS	DESCRIPTION				
1	11'-4"	1/2"	80\$	PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304				
2	29'-2"	1"	80\$	PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304				
			FITTIN	IGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION				
3	1	1/2"	3000	ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304				
4	2	1"	3000	ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304				
5	1	1"X1/2"	3000	TEE REDUCING, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304				
			FLAN	GES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION				
6	1	1/2"	150	FLANGE SW, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304				
			FASTEN	IERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION				
7	4	1/2"X2 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2				
8	1	1/2"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20				

pboig)	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY		SERVICE	IA	OWNER:	ENGINEER: BIOGAS	PIPING ISOMETRIC	SHEET
Z	1 01,	/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG		PIPE SPEC	SS1	INDIAN RIVER COUNTY	EX DIOUAS	2"-IA-0104-SS1-N	4
keshTh		İ					1	P&ID DWG	P2.01	FLORIDA	<b>ENGINEERING</b>		SCALE
ers/Mu							]	INSULATION SPEC	Ν	1325 74th AVE SW, VERO BEACH, FLORIDA 32968	2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	N.T.S
C: \Use								INSULATION THK	_	VENO BLACH, FLONIDA 32900	EMAIL: INFO@BIOGASENG.COM		



BILL OF MATERIALS							
	1		PIPI				
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
1	55'-7"	1"	80\$	PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304			
2	8'-6"	1"	80S	PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304			
	_		FITTIN	IGS			
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
3	1	1"	3000	COUPLING, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304			
4	4	1"	3000	ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304			
5	2	1"	3000	EQUAL TEE, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304			
			FLANC	GES			
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
6	2	1"	150	FLANGE SW, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304			
	_		FASTEN	VERS			
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
$\begin{bmatrix} 7 & 4 & \frac{1/2}{2} & 150 & ASME 18.2.1, HEXAGONAL N$		STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2					
8	1	1"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20			

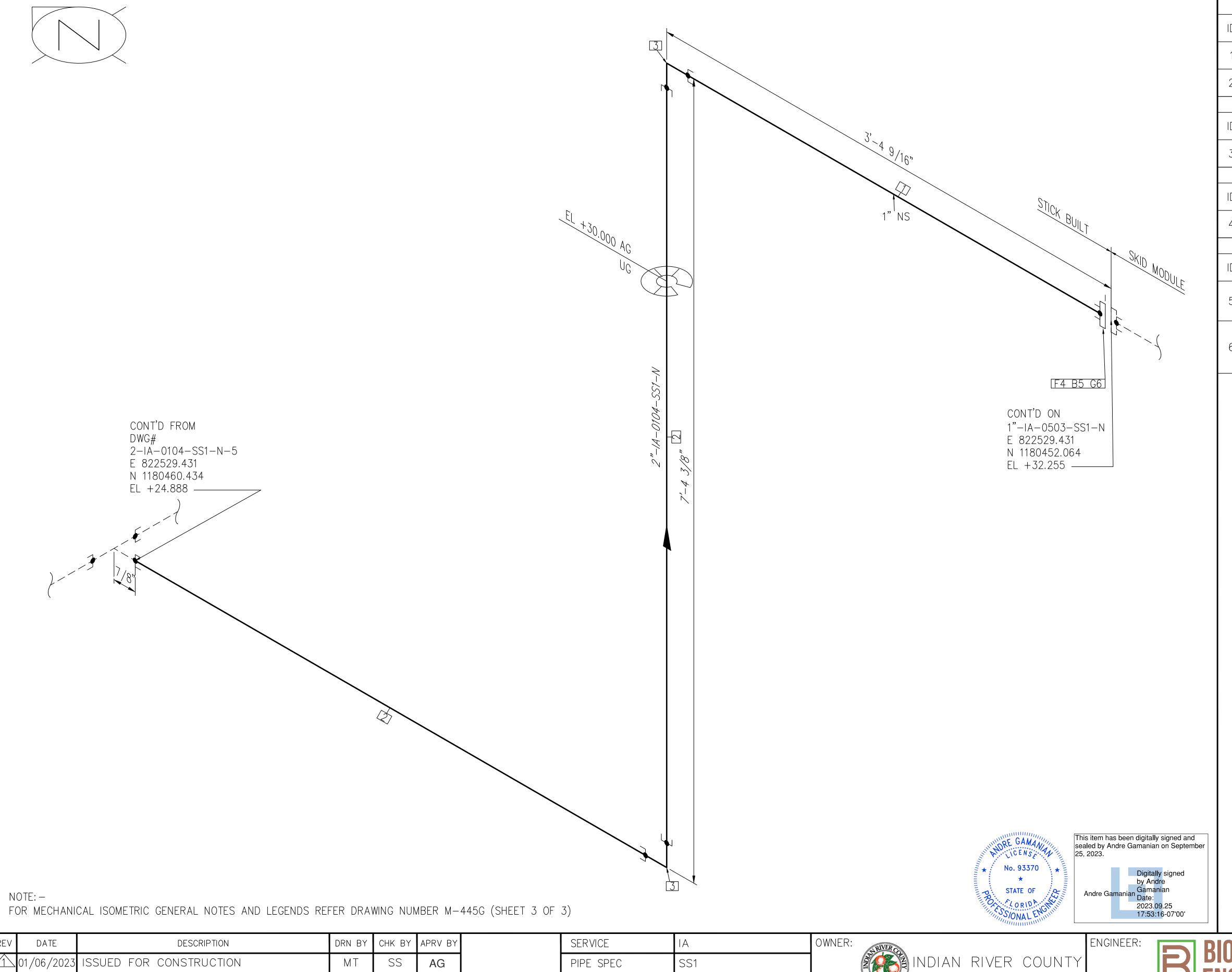
DATE ISSUED FOR CONSTRUCTION AG 01/06/2023 SS

SS1 PIPE SPEC P2.01 P&ID DWG INSULATION SPEC INSULATION THK

NDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

ENGINEER: BIOGAS	PIPING ISOMETRIC 2"-IA-0104-SS1-N	SHEET 5
ENGINEERING  2321 E. 28TH STREET, SUITE 400  SIGNAL HILL, CA 90755, Ph: (562) 726-3565  EMAIL: INFO@BIOGASENG.COM	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



	BILL OF MATERIALS							
			PIPI					
ID	QTY	ND	SCH/CLASS	DESCRIPTION				
1	3'-4"	1"	80S	PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304				
2	12'-2"	1"	80S	PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304				
			FITTIN	GS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION				
3	2	1"	3000	ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304				
			FLANC	GES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION				
4	1	1"	150	FLANGE SW, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304				
			FASTEN	IERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION				
5	4	1/2"X2 1/2"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2				
6	1	1"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20				

RE RE	V	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	<u>\</u> 01/0	06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG
Kesri						
)USE						

SERVICE	IA	(
PIPE SPEC	SS1	
P&ID DWG	P2.01	
INSULATION SPEC	Ν	
INSULATION THK	_	

INDIAN RIVER COUNTY
FLORIDA

1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

BIOGAS
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ENGINEER:
BIOGAS
ENGINEERING

2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC 2"-IA-0104-SS1-N	SHEET 6
5	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

SERVICE	Τ
PIPE SPEC	SS1
P&ID DWG	P2.03
INSULATION SPEC	Н
INSULATION THK	1"

INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

2321 E. 28TH STREET, SUITE 400

PIPING ISOMETRIC SHEET 2"-T-0315-SS1-H SCALE LANDFILL GAS BLOWER SKID N.T.S & FLARE REPLACEMENT

BILL OF MATERIALS

FITTINGS

FASTENERS

VALVES

B 16.20

DESCRIPTION

BLIND FLANGE, CLASS 150, RF,

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

BALL VALVE, UNI-BODY DESIGN,

REGULAR BORE, CLASS 150, RF

ASME B16.5, ASTM A182 GR F304

DESCRIPTION

SCH/CLASS

SCH/CLASS

ITEM CODE

HV-0345

QTY

QTY

8

QTY

ID

ID

ND

ND

5/8"X3

1/4"

ND

2"

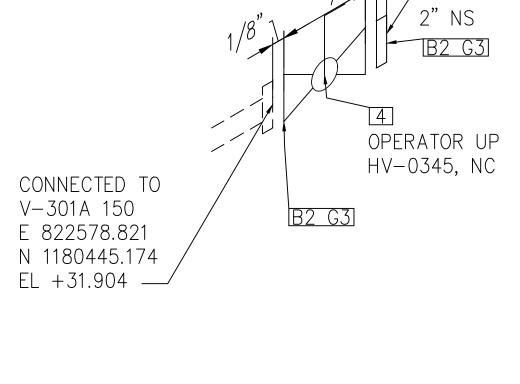
VERO BEACH, FLORIDA 32968

ENGINEER:

SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

ISSUED FOR CONSTRUCTION

NOTE: -FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)



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No. 93370 STATE OF

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Digitally signed by Andre Andre Gamanian Date: 2023.09.25 17:53:16-07'00'

DESCRIPTION DRN BY CHK BY APRV BY DATE 01/06/2023 ISSUED FOR CONSTRUCTION

SERVICE SS1 PIPE SPEC P2.03 P&ID DWG INSULATION SPEC INSULATION THK

CONNECTED TO V-301B 150 E 822582.821 N 1180445.174

EL +31.904

HV-0346, NC

OPERATOR UP

4

B2 G3 B2 G3

1 2" NS/

INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

ENGINEER: 2321 E. 28TH STREET, SUITE 400

PIPING ISOMETRIC SHEET 2"-T-0315-SS1-H SCALE LANDFILL GAS BLOWER SKID N.T.S & FLARE REPLACEMENT SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

BILL OF MATERIALS

FITTINGS

FASTENERS

VALVES

B 16.20

DESCRIPTION

DESCRIPTION

BLIND FLANGE, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF

SCH/CLASS

SCH/CLASS

ITEM CODE

HV-0346

QTY

QTY

QTY

5/8"X3

1/4"

ND

2"

ID

ID

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NOTE: —												
FOR MECHANICAL	ISOMETRIC	GENERAL	NOTES	AND	LEGENDS	REFER	DRAWING	NUMBER	M - 445G	(SHEET	3 OF	3)

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No. 93370 **
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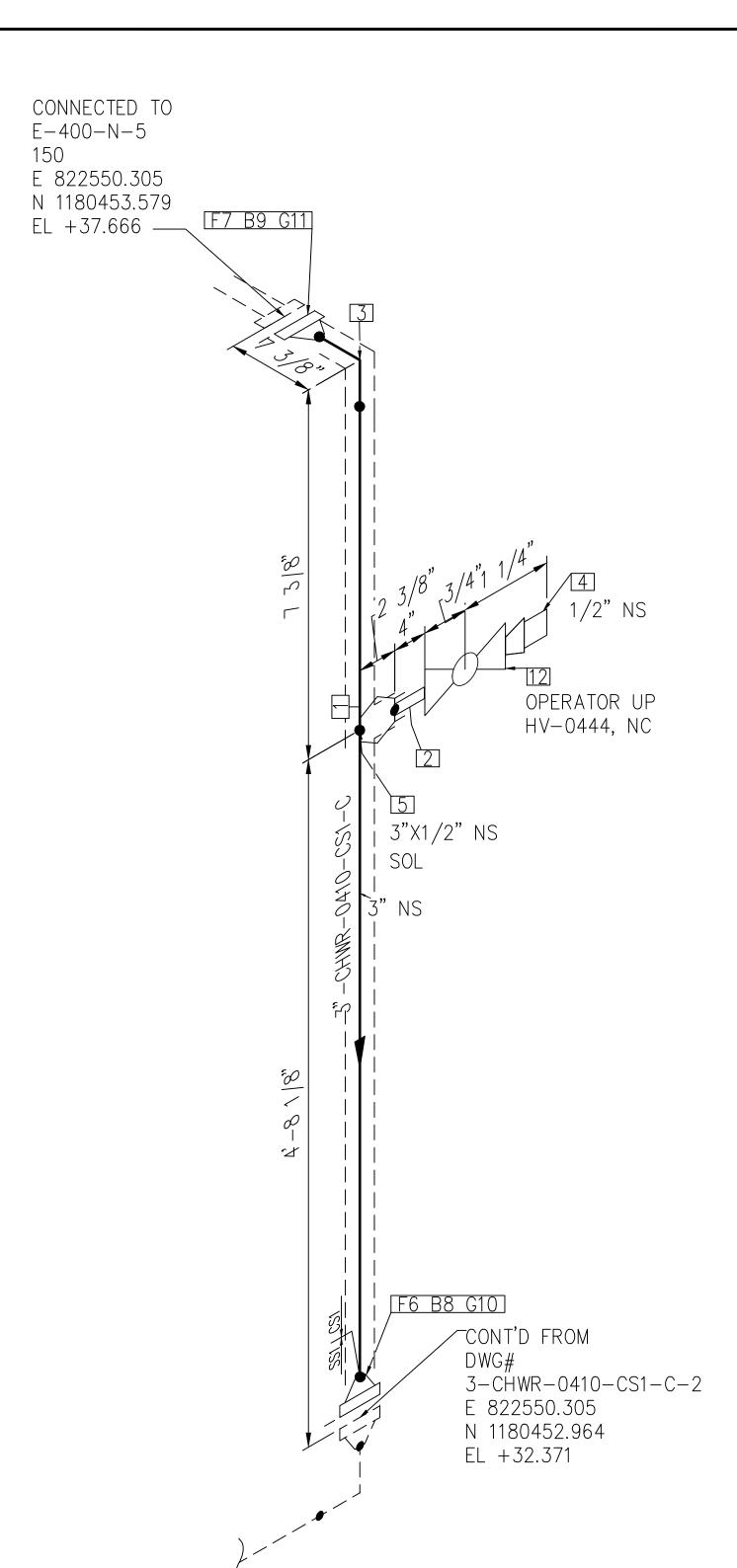
VERO BEACH, FLORIDA 32968

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No. 93370

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This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.

Digitally signed by Andre Gamanian Date: 2023.09.25 17:53:16-07'00'

ENGINEER:

ISSUED FOR CONSTRUCTION

BILL OF MATERIALS

PIPE

FITTINGS

OLETS

FLANGES

FASTENERS

DESCRIPTION

DESCRIPTION

PIPE NIPPLE, SMLS, 4" LG, SCH

80, PE X NPT (M), ASME A733,

PLUG, HEX HEAD, CLASS 3000,

ELBOW 90 LR, SMLS, SCH 40, BW, ASME B16.9, ASTM A234 GR WPB

NPT (M), ASME B16.11, ASTM A105

DESCRIPTION

SOCKOLET, CLASS 3000, BW X SW,

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2

PTFE COATED, STUD BOLT ASTM

HEXAGONAL NUTS ASTM A194 GR

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

BALL VALVE, UNI-BODY DESIGN,

LEVER LOCKABLE OPERATOR

HV-0444 REGULAR BORE, NPT (F), MANUAL

SS304 WINDING MATERIAL, SS

SS304 WINDING MATERIAL, CS

A193 GR B7, ASME 18.2.1,

2H, ASME 18.2.2

B 16.20

B 16.20

VALVES

ITEM CODE

B16.5, ASTM A182 GR F304

B16.5, ASTM A105

MSS-SP 97, ASTM A105

PIPE, ERW, SCH 40, BE, ASME

B36.10, ASTM A53 GR B

ASTM A53 GR B

SCH/CLASS

40

SCH/CLASS

3000

SCH/CLASS

3000

SCH/CLASS

SCH/CLASS

QTY

4'-9"

QTY

QTY

QTY

QTY

QTY

ND

1/2"

3"X1/2"

ND

ND

5/8"X3

5/8"X3

1/2"

ID

ID

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ID

ID

10

NOTE: —

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

SERVICE	CHWR	(
PIPE SPEC	CS1	
P&ID DWG	P2.04	
INSULATION SPEC	С	
INSULATION THK	1"	

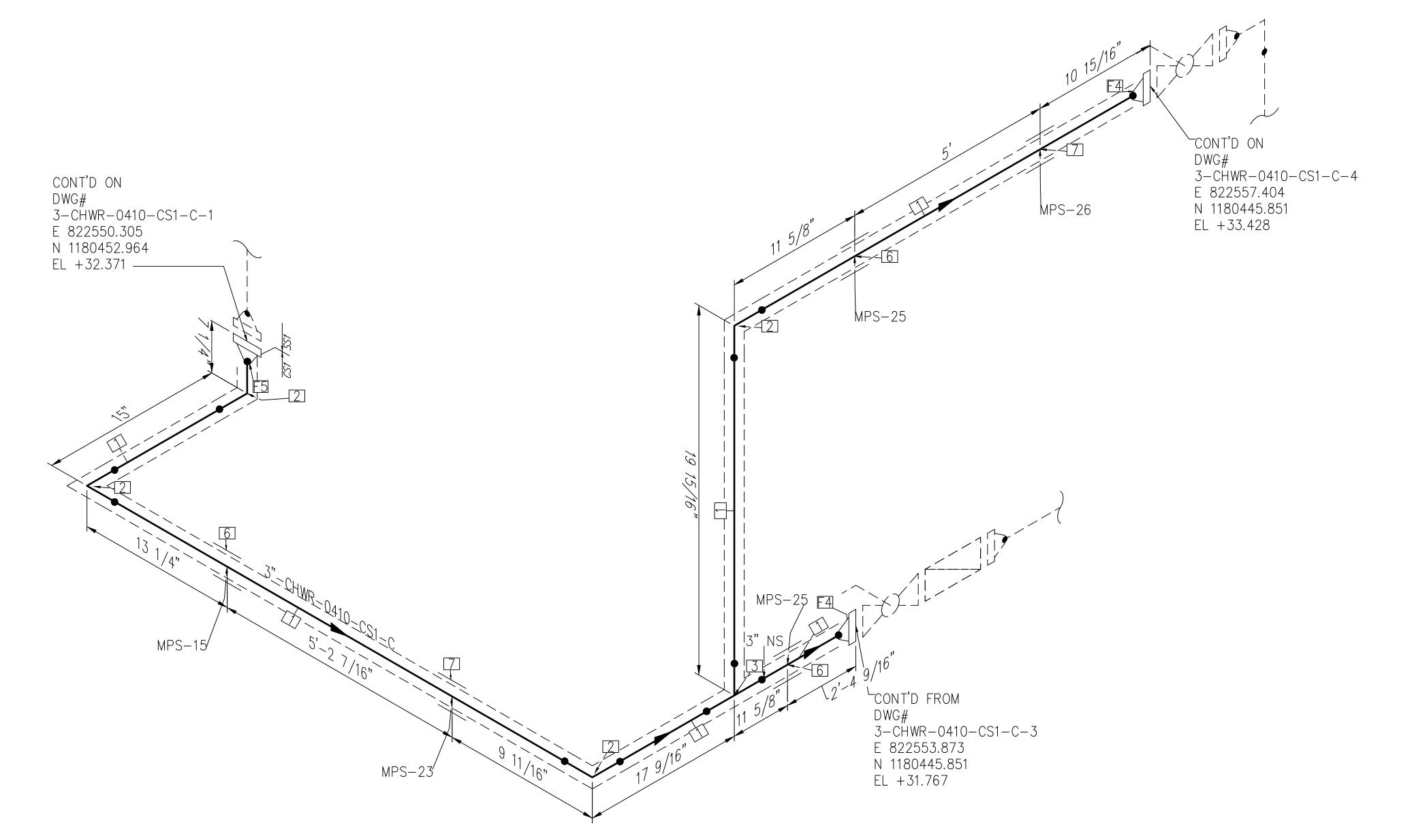
INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

<b>ENGINEERING</b>
2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC  3"-CHWR-0410-CS1-C	SHEET 1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.

Digitally signed by Andre Gamanian Date:
2023.09.25
17:53:16-07'00'

ISSUED FOR CONSTRUCTION

BILL OF MATERIALS

PIPE

FITTINGS

FLANGES

PIPE SUPPORTS

DESCRIPTION

DESCRIPTION

ELBOW 90 LR, SMLS, SCH 40, BW, ASME B16.9, ASTM A234 GR WPB

EQUAL TEE, SMLS, SCH 40, BW, ASME B16.9, ASTM A234 GR WPB

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

B16.5, ASTM A182 GR F304

B16.5, ASTM A105

SS1-4"-2-6 PIPE SADDLE FOR INSULATED PIPE

SS1-4"-1-6" PIPE SADDLE FOR INSULATED PIPE SIZE 1/2" TO 6"

SIZE 1/2" TO 6"

PIPE, ERW, SCH 40, BE, ASME

B36.10, ASTM A53 GR B

SCH/CLASS

SCH/CLASS

SCH/CLASS

ITEM CODE

QTY

QTY

QTY

QTY

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ID

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FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
$\triangle$ 1	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

SERVICE	CHWR
PIPE SPEC	CS1
P&ID DWG	P2.04
INSULATION SPEC	С
INSULATION THK	1"

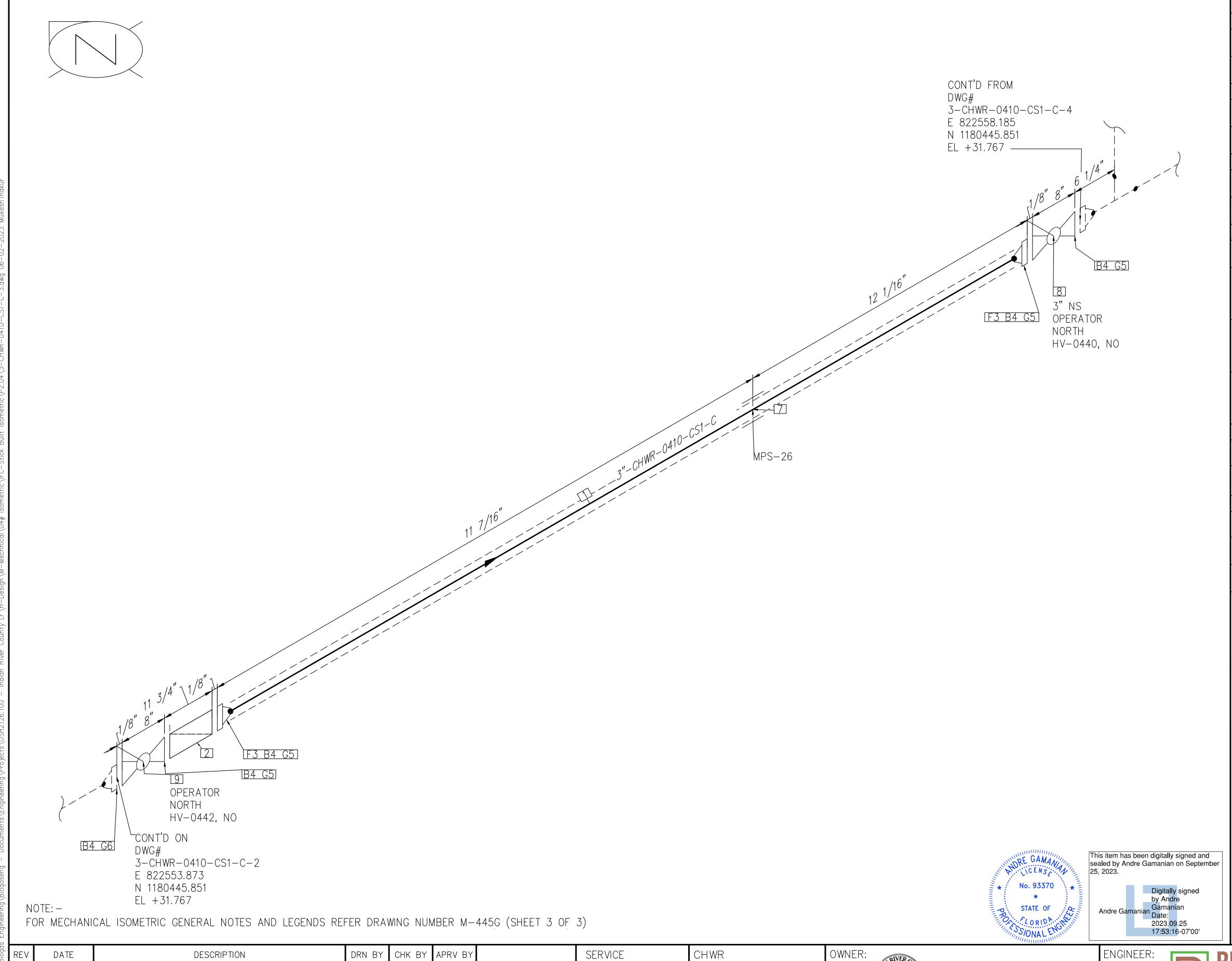
INDIAN RIVER COUNTY
FLORIDA

AVE SW

1325 74th AVE SW,	
VERO BEACH, FLORIDA	32968

Y	ENGINEER: BIOGAS
	<b>ENGINEERING</b>
	2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM
	SIGNAL HILL, CA 90755, Ph: (562) 726-3565
	EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC 3"-CHWR-0410-CS1-C	SHEET 2
5	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



			BILL OF MA	ATERIALS		
	PIPE					
ID	QTY	ND	SCH/CLASS	DESCRIPTION		
1	1'-6"	3"	40	PIPE, ERW, SCH 40, BE, ASME B36.10, ASTM A53 GR B		
			FITTIN	IGS		
ID	QTY	ND	SCH/CLASS	DESCRIPTION		
2	1	3"	150	Y-TYPE STRAINER, CLASS 150, RF, ASME B16.10		
			FLANC	GES .		
ID	QTY	ND	SCH/CLASS	DESCRIPTION		
3	2	3"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A105		
			FASTEN	IERS		
ID	QTY	ND	SCH/CLASS	DESCRIPTION		
4	20	5/8"X3 1/2"	150	PTFE COATED, STUD BOLT ASTM A193 GR B7, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 2H, ASME 18.2.2		
5	4	3"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, CS OUTER RING, CLASS 150, RF, ASME B 16.20		
6	1	3"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, CS OUTER RING, CLASS 150, RF, ASME B 16.20		
			PIPE SUP	PORTS		
ID	QTY	ND	ITEM CODE	DESCRIPTION		
7	1	3"	SS1-4"-1-6"	PIPE SADDLE FOR INSULATED PIPE SIZE 1/2" TO 6"		
			VALV	ES		
ID	QTY	ND	ITEM CODE	DESCRIPTION		
8	1	3"	HV-0440	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF		
9	1	3"	HV-0442	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF		
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REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

SERVICE	CHWR
PIPE SPEC	CS1
P&ID DWG	P2.04
INSULATION SPEC	С
INSULATION THK	1"

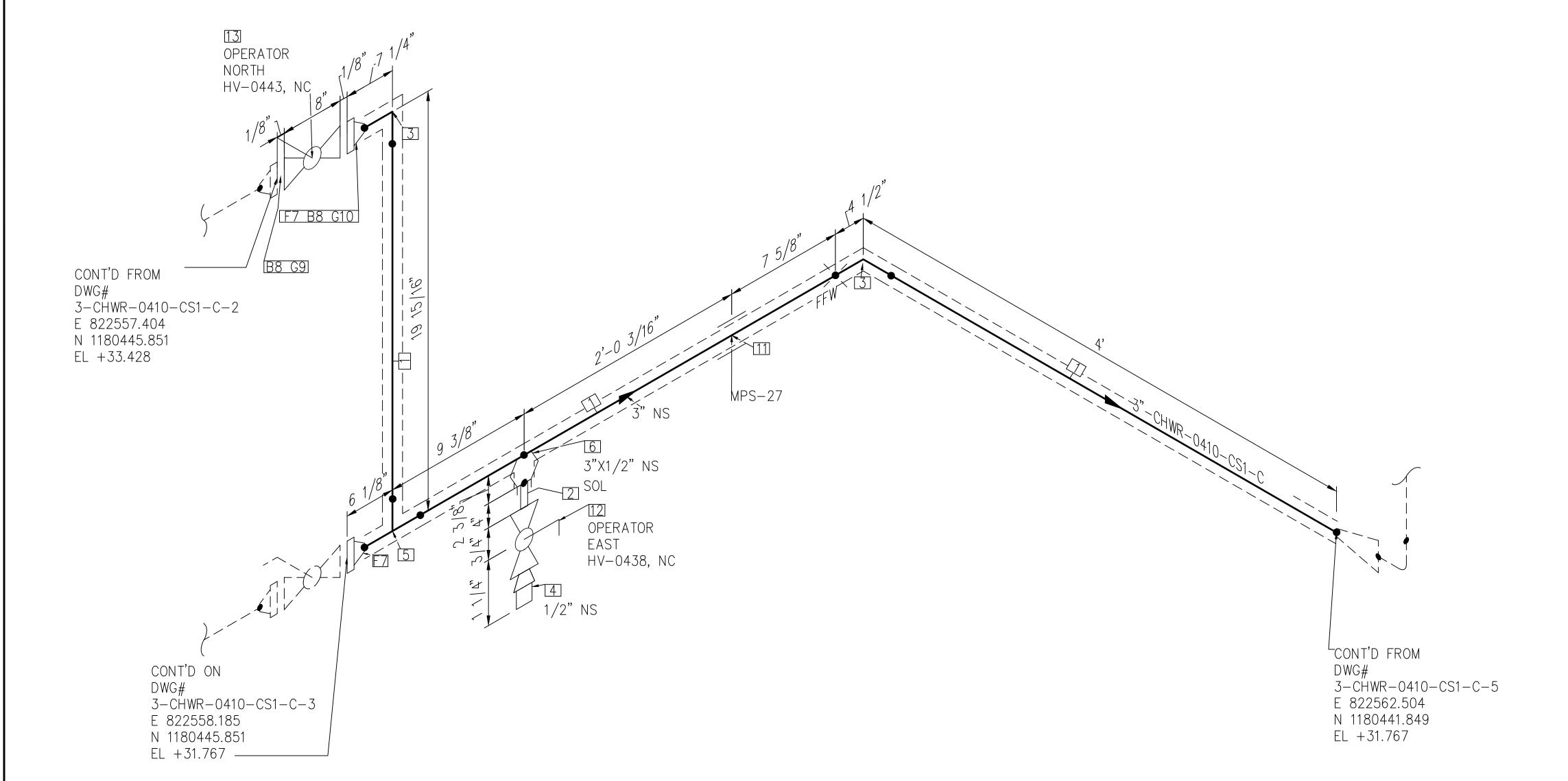
INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

	ENGINEER: DIOCAC
/	BIOGAS
	<b>ENGINEERING</b>
	2321 E. 28TH STREET, SUITE 400
	SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC  3"-CHWR-0410-CS1-C	SHEET 3
55	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

NOTE: -



QTY SCH/CLASS DESCRIPTION PIPE, ERW, SCH 40, BE, ASME 8'-1" B36.10, ASTM A53 GR B FITTINGS QTY SCH/CLASS DESCRIPTION ID PIPE NIPPLE, SMLS, 4" LG, SCH 1/2" 80, PE X NPT (M), ASME A733, ASTM A53 GR B ELBOW 90 LR, SMLS, SCH 40, BW, ASME B16.9, ASTM A234 GR WPB PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A105 EQUAL TEE, SMLS, SCH 40, BW, ASME B16.9, ASTM A234 GR WPB OLETS SCH/CLASS QTY DESCRIPTION ID ND SOCKOLET, CLASS 3000, BW X SW, 3"X1/2" MSS-SP 97, ASTM A105 FLANGES SCH/CLASS QTY DESCRIPTION ID ND FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A105 FASTENERS QTY SCH/CLASS DESCRIPTION ID PTFE COATED, STUD BOLT ASTM 5/8"X3 A193 GR B7, ASME 18.2.1, 8 HEXAGONAL NUTS ASTM A194 GR 2H, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, CS OUTER RING, CLASS 150, RF, ASME B 16.20 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, CS OUTER RING, CLASS 150, RF, ASME B 16.20 PIPE SUPPORTS QTY ITEM CODE DESCRIPTION ID SS1-4"-2-6 PIPE SADDLE FOR INSULATED PIPE SIZE 1/2" TO 6" VALVES QTY ITEM CODE DESCRIPTION ID ND BALL VALVE, UNI-BODY DESIGN, 1/2" HV-0438 REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR BALL VALVE, UNI-BODY DESIGN, HV-0443 REGULAR BORE, CLASS 150, RF

BILL OF MATERIALS

PIPE

No. 93370

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This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.

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Gamanian

ENGINEER:

Digitally signed
by Andre
Gamanian
Date:
2023.09.25
17:53:16-07'00'

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

SERVICE	CHWR	(
PIPE SPEC	CS1	
P&ID DWG	P2.04	
INSULATION SPEC	С	
INSULATION THK	1"	

INDIAN RIVER COUNTY
FLORIDA

1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

ENGINEERING

2321 E. 28TH STREET, SUITE 400

SIGNAL HILL, CA 90755, Ph: (562) 726-3565

EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
3"-CHWR-0410-CS1-C	4
LANDFILL GAS BLOWER SKID	SCALE
& FLARE REPLACEMENT	N.T.S

INSULATION THK

INDIAN RIVER COUNTY FLORIDA

ENGINEER: 2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC SHEET

ISSUED FOR CONSTRUCTION



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PROKING PROCES	No. 93370	
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No. 93370  * STATE OF  CORIDA  STATE  SS/ONAL ENGINEERS	Digitally signed by Andre Gamanian Date: 2023.09.25 17:53:16-07'00'

NOTE: -	

FOR MECHANICAL ISOMETRIC CENERAL NOTES AND LECENDS DEFED DRAWING NUMBER A 4450 (SUPERT 7 OF 7)

FOI	OR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)							
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY		SERVICE	CHWR
1	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG		PIPE SPEC	CS1
							P&ID DWG	P2.04
							INSULATION SPEC	С

CONNECTED TO

E 822561.738

N 1180441.015

EL +33.225

CHILLER PACKAGE (X-001)

CONT'D ON

E 822562.504

N 1180441.849 EL +31.767 —

3-CHWR-0410-CS1-C-4

F4 B5 G6

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

	3"-CHWR-0410-CS1-C	5
NG		SCAL
-3565	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	N.T.S

BILL OF MATERIALS

PIPE

FITTINGS

FLANGES

FASTENERS

DESCRIPTION

DESCRIPTION

ELBOW 90 LR, SMLS, SCH 40, BW,

ASME B16.9, ASTM A234 GR WPB

REDUCER (CONC), SMLS, SCH 40,

BW, ASME B16.9, ASTM A234 GR

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

PTFE COATED, STUD BOLT ASTM

HEXAGONAL NUTS ASTM A194 GR

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

SS304 WINDING MATERIAL, CS

GRUVLOK FIGURE 7012, FLANGE

A193 GR B7, ASME 18.2.1,

B16.5, ASTM A105

2H, ASME 18.2.2

ADAPTER INSERT

B 16.20

PIPE, ERW, SCH 40, BE, ASME

B36.10, ASTM A53 GR B

SCH/CLASS

40

SCH/CLASS

40

40

SCH/CLASS

SCH/CLASS

150

ID

QTY

QTY

QTY

QTY

ID

ID

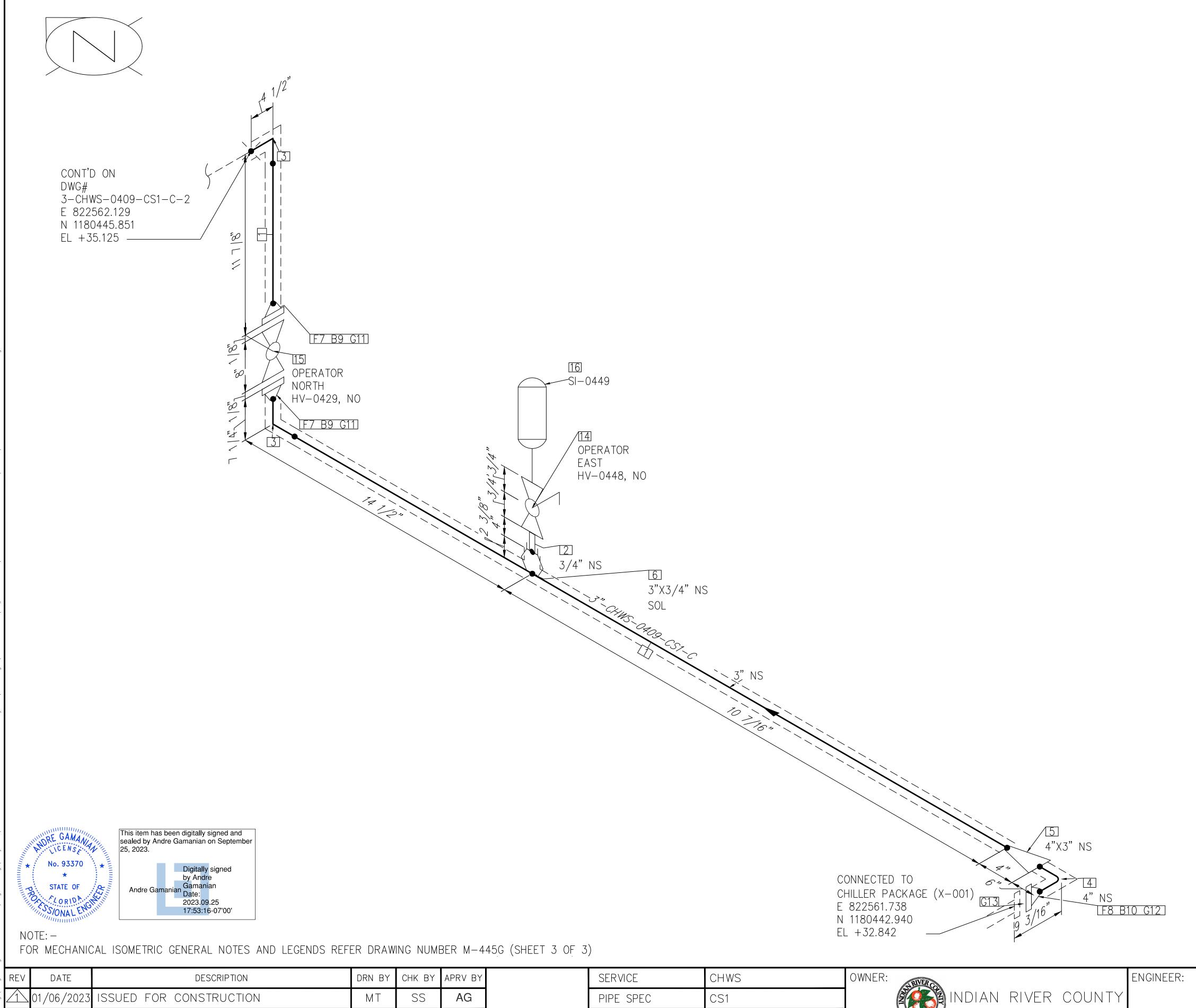
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5/8"X3

3/4"



			BILL OF MA	
			PIPI T	E 
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	2'-2"	3"	40	PIPE, ERW, SCH 40, BE, ASME B36.10, ASTM A53 GR B
			FITTIN	
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	3/4"	80	PIPE NIPPLE, SMLS, 4" LG, SCH 80, PE X NPT (M), ASME A733, ASTM A53 GR B
3	2	3"	40	ELBOW 90 LR, SMLS, SCH 40, BW, ASME B16.9, ASTM A234 GR WPB
4	1	4"	40	ELBOW 90 LR, SMLS, SCH 40, BW, ASME B16.9, ASTM A234 GR WPB
5	1	4"X3"	40	REDUCER (CONC), SMLS, SCH 40, BW, ASME B16.9, ASTM A234 GR WPB
			OLE <sup>-</sup>	
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	1	3"X3/4"	3000	SOCKOLET, CLASS 3000, BW X SW, MSS-SP 97, ASTM A105
			L FLAN(	·
ID	QTY	ND	SCH/CLASS	DESCRIPTION
7	2	3"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A105
8	1	4"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A105
			FASTEN	IERS
ID	QTY	ND	SCH/CLASS	DESCRIPTION
9	8	5/8"X3 1/2"	150	PTFE COATED, STUD BOLT ASTM A193 GR B7, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 2H, ASME 18.2.2
10	8	5/8"X3 3/4"	150	PTFE COATED, STUD BOLT ASTM A193 GR B7, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 2H, ASME 18.2.2
11	2	3"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, CS OUTER RING, CLASS 150, RF, ASME B 16.20
12	1	4"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, CS OUTER RING, CLASS 150, RF, ASME B 16.20
13	1	4"	150	GRUVLOK FIGURE 7012, FLANGE ADAPTER INSERT
			VALV	ES
ID	QTY	ND	ITEM CODE	DESCRIPTION
14	1	3/4"	HV-0448	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
15	1	3"	HV-0429	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF
16	1	3/4"	SI-0449	EXPANSION TANK SUPPLIED BY THERMAL CARE (AMTROL Model: AX-10-DD)

ì		

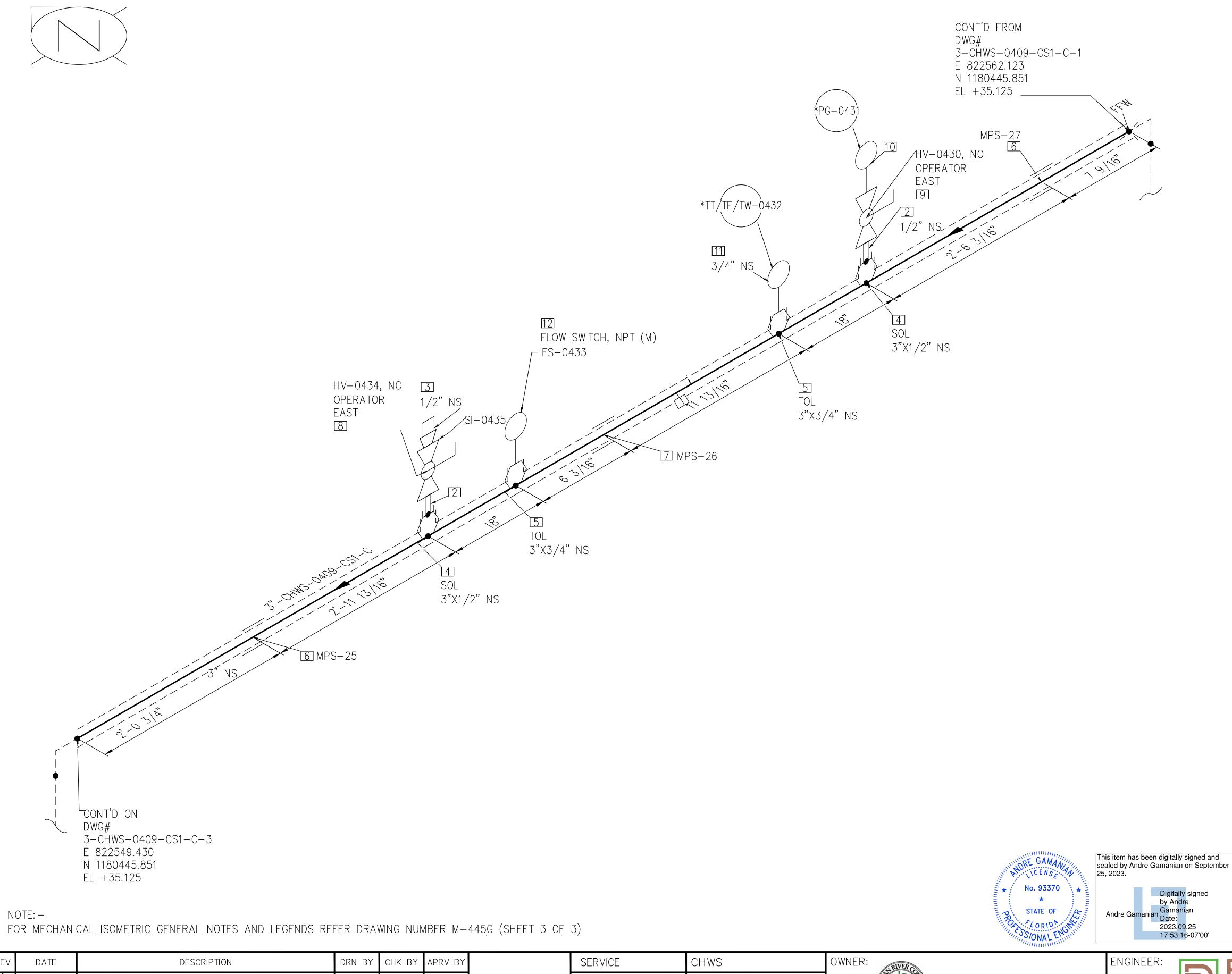
PIPE SPEC P&ID DWG P2.04 INSULATION SPEC INSULATION THK

INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

ENGINEER:	BIOGAS
	<b>ENGINEERING</b>
2321 E. 28 <sup>-</sup>	TH STREET, SUITE 400

ENGINEER: BIOGAS	PIPING ISOMETRIC  3"-CHWS-0409-CS1-C	SHEET 1
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



PIPE SPEC

P&ID DWG

INSULATION SPEC

INSULATION THK

P2.04

ISSUED FOR CONSTRUCTION

SS

AG

01/06/2023

PIPE QTY SCH/CLASS DESCRIPTION ID PIPE, ERW, SCH 40, BE, ASME 1 | 12'-9" B36.10, ASTM A53 GR B FITTINGS SCH/CLASS QTY DESCRIPTION ID ND PIPE NIPPLE, SMLS, 4" LG, SCH 1/2" 80, PE X NPT (M), ASME A733, ASTM A53 GR B PLUG, HEX HEAD, CLASS 3000, 3000 NPT (M), ASME B16.11, ASTM A105 OLETS SCH/CLASS DESCRIPTION QTY ID ND SOCKOLET, CLASS 3000, BW X SW, 3"X1/2" 3000 MSS-SP 97, ASTM A105 THREADOLET, CLASS 3000, BW X 3"X3/4" NPT (F), MSS-SP-97, ASTM A105 PIPE SUPPORTS QTY ITEM CODE DESCRIPTION ID ND SS1-4"-2-6 PIPE SADDLE FOR INSULATED PIPE SIZE 1/2" TO 6" , PIPE SADDLE FOR INSULATED PIPE SIZE 1/2" TO 6" VALVES DESCRIPTION ID QTY ITEM CODE ND BALL VALVE, UNI-BODY DESIGN, 1/2" HV-0434 REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR BALL VALVE, UNI-BODY DESIGN, HV-0430 | REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR INSTRUMENT QTY ITEM CODE DESCRIPTION ID ND PRESSURE GAUGE, NPT (M) PG-0431 TEMPERATURE TRANSMITTER & TT/TE/TW-0 TEMPERATURE ELEMENT WITH THERMOWELL, NPT (M) FLOW SWITCH TRANSMITTER, FS-0433 | NPT (M) 3/4"

BILL OF MATERIALS

ISSUED FOR CONSTRUCTION

INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW,

ENGINEER:

BIOGAS

ENGINEER:

2321 E. 28TH STREET, SUITE 400

VERO BEACH, FLORIDA 32968

ENGINEERING

2321 E. 28TH STREET, SUITE 400

SIGNAL HILL, CA 90755, Ph: (562) 726-3565

EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC

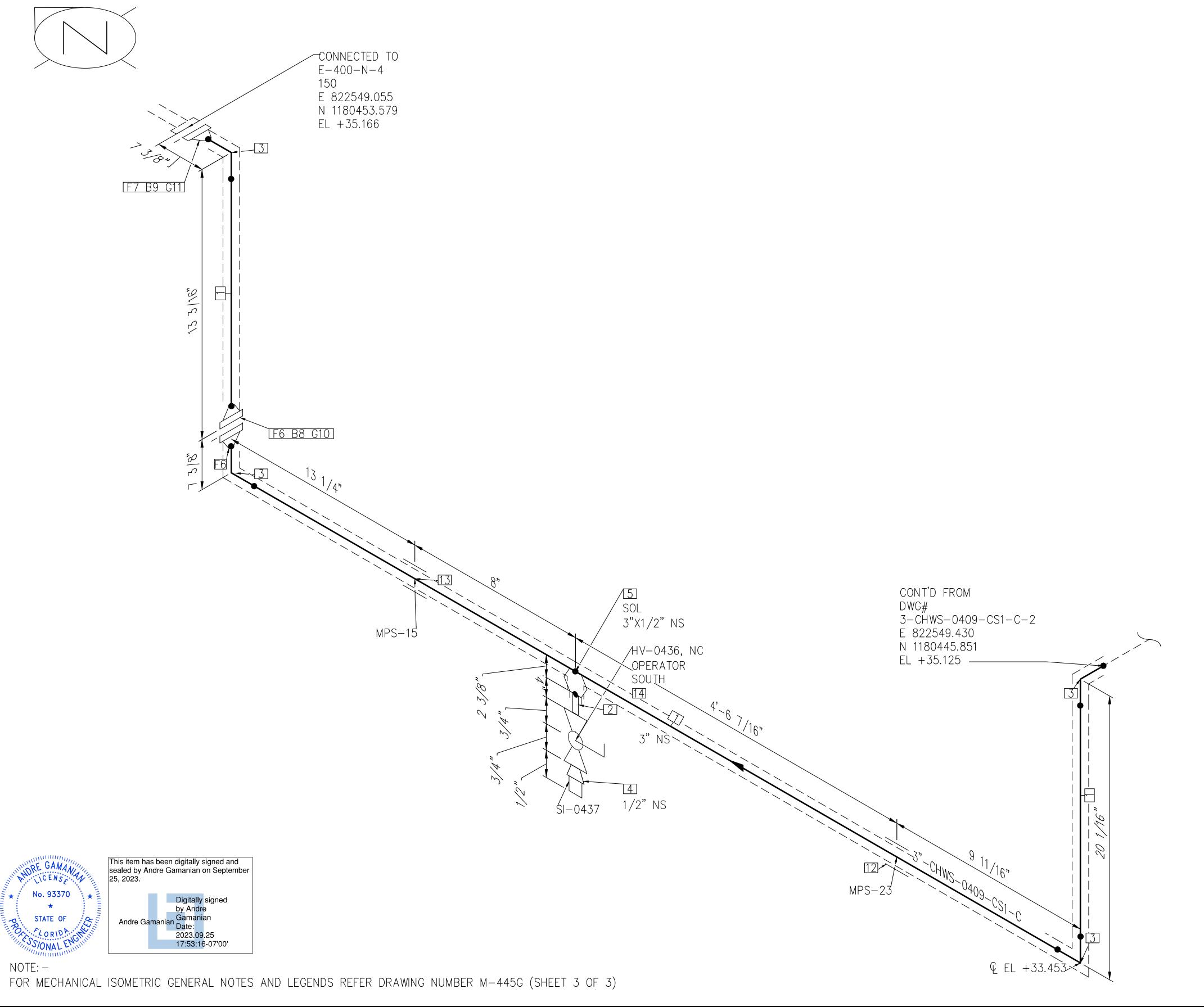
3"-CHWS-0409-CS1-C

SCALE

LANDFILL GAS BLOWER SKID

& FLARE REPLACEMENT

N.T.S



			BILL OF MA	ATLIMES
	,		PIP	E
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	7'-10"	3"	40	PIPE, ERW, SCH 40, BE, ASME B36.10, ASTM A53 GR B
			FITTIN	IGS
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	1/2"	80	PIPE NIPPLE, SMLS, 4" LG, SCH 80, PE X NPT (M), ASME A733, ASTM A53 GR B
3	4	3"	40	ELBOW 90 LR, SMLS, SCH 40, BW, ASME B16.9, ASTM A234 GR WPB
4	1	1/2"	3000	PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A105
	1		OLE <sup>-</sup>	TS
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	3"X1/2"	3000	SOCKOLET, CLASS 3000, BW X SW, MSS-SP 97, ASTM A105
			FLAN	GES
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	2	3"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
7	1	3"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A105
			FASTEN	VERS
ID	QTY	ND	SCH/CLASS	DESCRIPTION
8	4	5/8"X3 1/2"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
9	4	5/8"X3 1/2"	150	PTFE COATED, STUD BOLT ASTM A193 GR B7, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 2H, ASME 18.2.2
10	1	3"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
11	1	3"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, CS OUTER RING, CLASS 150, RF, ASME B 16.20
			PIPE SUF	PPORTS
ID	QTY	ND	ITEM CODE	DESCRIPTION
12	1	3"	SS1-4"-1-6	PIPE SADDLE FOR INSULATED PIPE SIZE 1/2" TO 6"
13	1	3"	SS1-4"-2-6	PIPE SADDLE FOR INSULATED PIPE SIZE 1/2" TO 6"
			VALV	/ES
ID	QTY	ND	ITEM CODE	DESCRIPTION
14	1	1/2"	HV-0436	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR

BILL OF MATERIALS

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

SERVICE	CHWS	OWNER:
PIPE SPEC	CS1	
P&ID DWG	P2.04	
INSULATION SPEC	С	1325 74 VFRO BI
INSULATION THK	1"	VERO DI

INDIAN RIVER COUNTY
FLORIDA

1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

BIOGAS
ENGINEER:
BIOGAS
ENGINEERING

2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-356
EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC 3"-CHWS-0409-CS1-C	SHEET 3
65	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

DESCRIPTION DRN BY CHK BY APRV BY DATE 01/06/2023 ISSUED FOR CONSTRUCTION SS AG

SERVICE SS1 PIPE SPEC P2.03 P&ID DWG INSULATION SPEC INSULATION THK

INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

ENGINEER: 2321 E. 28TH STREET, SUITE 400

EMAIL: INFO@BIOGASENG.COM

SIGNAL HILL, CA 90755, Ph: (562) 726-3565

ISSUED FOR CONSTRUCTION

PIPING ISOMETRIC SHEET 4"-T-0315-SS1-H SCALE LANDFILL GAS BLOWER SKID N.T.S & FLARE REPLACEMENT

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★ No. 93	370 ★
* STATE	OF Q
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No. 93370	This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.
No. 93370 *  STATE OF  STATE OF  CORIDA CITATION  SIONAL ENGINEERS	Digitally signed by Andre Andre Gamanian Date: 2023.09.25 17:53:16-07'00'

ОТ	<del>-</del> :-							
OR	MECHANICAL	ISOMETRIC	GENERAL	NOTES	AND	LEGENDS	REFER	DRAWING

FOF NUMBER M-445G (SHEET 3 OF 3)

B2 G3
CONNECTED TO V-301A 150 E 822574.443 N 1180443.052 EL +53.383

OPERATOR

HV-0329, NC

BILL OF MATERIALS FITTINGS QTY SCH/CLASS DESCRIPTION BLIND FLANGE, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304 FASTENERS SCH/CLASS QTY DESCRIPTION ID STUD BOLT ASTM A193 GR B8, 5/8"X3 ASME 18.2.1, HEXAGONAL NUTS 16 ASTM A194 GR 8, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20 VALVES ITEM CODE QTY DESCRIPTION ID BALL VALVE, UNI-BODY DESIGN, HV-0329 REGULAR BORE, CLASS 150, RF

REV	DATE	DESCRIPTION
	01/06/2023	ISSUED FOR CONSTRUCTION

INSULATION SPEC H INSULATION THK

INDIAN RIVER COUNTY FLORIDA

ENGINEER: 2321 E. 28TH STREET, SUITE 400

2023.09.25 17:53:16-07'00'

PIPING ISOMETRIC SHEET 4"-T-0315-SS1-H SCALE LANDFILL GAS BLOWER SKID N.T.S & FLARE REPLACEMENT SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

BILL OF MATERIALS

FITTINGS

FASTENERS

VALVES

B 16.20

DESCRIPTION

DESCRIPTION

SPIRAL WOUND GASKET, 1/8" THK, |

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF

BLIND FLANGE, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

SCH/CLASS

SCH/CLASS

ITEM CODE

QTY

QTY

16

QTY

5/8"X3

ID

ID

This item has been digitally signed and sealed by Andre Gamanian on September No. 93370 STATE OF

ISSUED FOR CONSTRUCTION

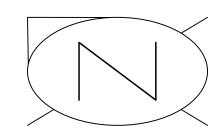
18, 18, 18, 18, 18, 18, 18, 18, 18, 18,	B2 G3  4" NS  4 OPERATOR EAST HV-0338. NC  B2 G3
*	CONNECTED TO V-301B 150 E 822587.200 N 1180443.052 EL +53.383

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NOTE: -FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	SERVICE	Т
01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG	PIPE SPEC	SS1
					P&ID DWG	P2.03
					INCLUATION OPEO	1.1

1325 74th AVE SW, VERO BEACH, FLORIDA 32968



CONT'D ON DWG# 6-LFG-0103-SS1-HT-2 E 822552.092 N 1180472.486 EL +32.789 OPERATOR UP HV-0116, NO F6 G11 F6 B8 G11] CONT'D ON OPERATOR UP F5 B7 G10 3" NS 8"-LFG-0402-SS1-HT-1 E 822545.265 FV-0140 N 1180472.486 EL +32.789 —

> No. 93370 STATE OF

This item has been digitally signed and sealed by Andre Gamanian on September Andre Gamanian Date: 2023.09.25 17:53:16-07'00'

ISSUED FOR CONSTRUCTION

BILL OF MATERIALS

PIPE

FITTINGS

FLANGES

FASTENERS

WP 304

DESCRIPTION

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

FLOW CONDITIONER, 6"CPA 50E,

REDUCER (CONC), SMLS, SCH 40S,

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

SS304 WINDING MATERIAL, SS

SS1-4"-2-8 PIPE SADDLE FOR INSULATED PIPE

RF (SUPPLIED BY BGE)

BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF

SIZE 1/2" TO 6"

B 16.20

PIPE SUPPORTS

VALVES

ITEM CODE

ITEM CODE

FV-0140

HV-0116

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

DESCRIPTION

BALL VALVE, V-PORT, CLASS 150,

B16.5, ASTM A182 GR F304

B16.5, ASTM A182 GR F304

BW, ASME B16.9, ASTM A403 GR

TYPE A, RF, SCH 40, SS 316

DESCRIPTION

SCH/CLASS

40S

SCH/CLASS

40S

SCH/CLASS

SCH/CLASS

QTY

1'-2"

3'-2"

QTY

QTY

QTY

8

QTY

QTY

ND

ND

6"X3"

ND

ND

5/8"X3

3/4"X6

3/4"X4

ND

ID

ID

ID

ID

10

ID

ID

DRN BY CHK BY APRV BY DATE DESCRIPTION ISSUED FOR CONSTRUCTION 01/06/2023 SS AG

SERVICE LFG SS1 PIPE SPEC P2.01A P&ID DWG INSULATION SPEC INSULATION THK

INDIAN RIVER COUNTY FLORIDA

VERO BEACH, FLORIDA 32968

ENGINEER:

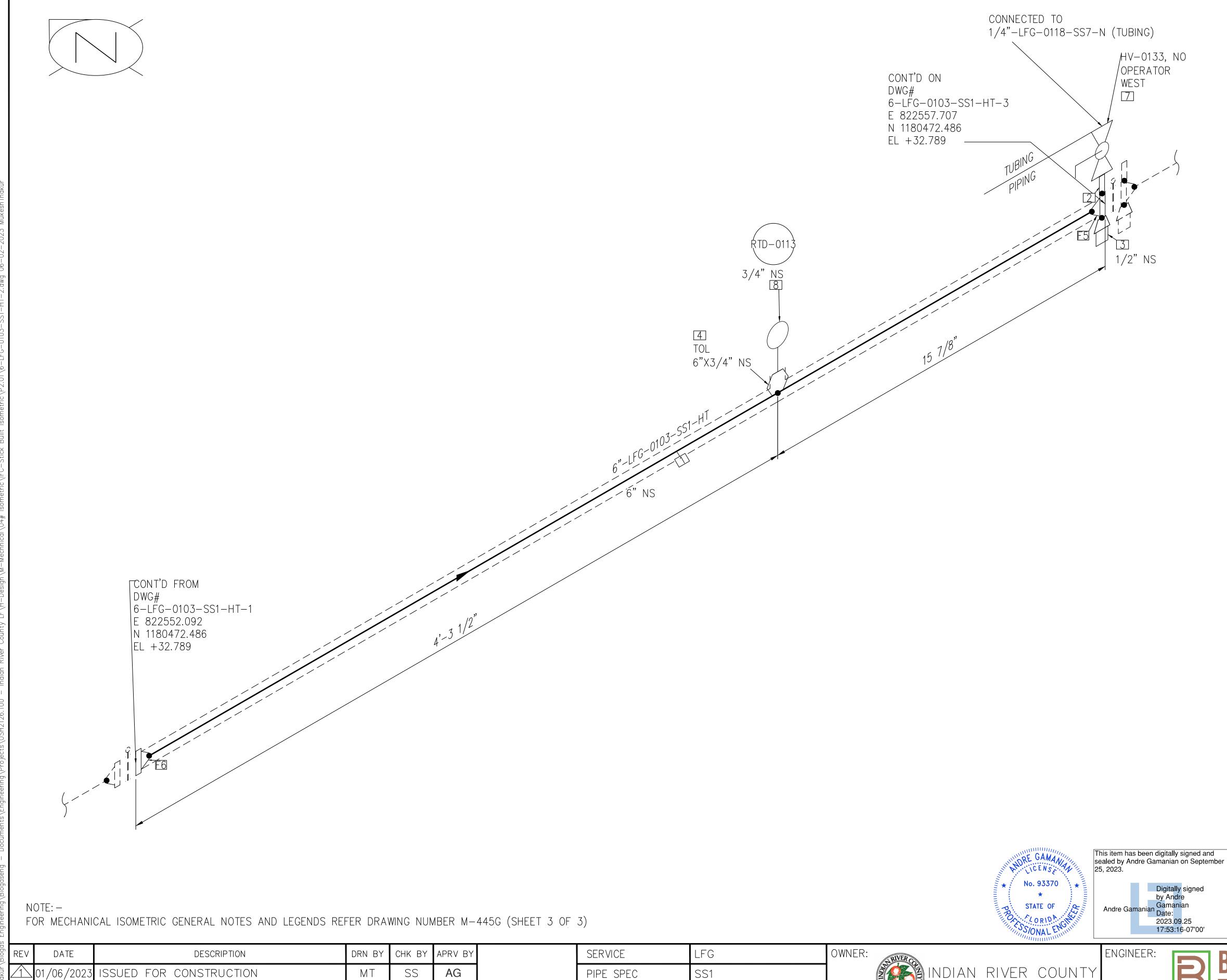
PIPING ISOMETRIC 6"-LFG-0103-SS1-HT	SHEET 1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

1325 74th AVE SW,

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

NOTE: -

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)



P2.01A

1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

P&ID DWG

INSULATION SPEC

INSULATION THK

PIPE QTY SCH/CLASS DESCRIPTION ID ND PIPE, ERW, SCH 40S, BE, ASME 5' B36.19, ASTM A312 GR TP 304 FITTINGS SCH/CLASS ID QTY DESCRIPTION ND PIPE NIPPLE, SMLS, 4" LG, SCH 1/2" 80S, NPT (M), ASME A733, ASTM A312 GR TP 304 PLUG, HEX HEAD, CLASS 3000, 1/2" NPT (M), ASME B16.11, ASTM A182 GR F304 OLETS SCH/CLASS QTY DESCRIPTION ID ND THREADOLET, CLASS 3000, BW X 6"X3/4" 3000 NPT (F), MSS-SP-97, ASTM A182 GR F304 FLANGES SCH/CLASS QTY DESCRIPTION ID ND ORFICE WN, CLASS 300, WNRF X 6"X1/2" 300 NPT (F), ASME B16.36, ASTM A182 GR F304 FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304 VALVES QTY ITEM CODE DESCRIPTION ID ND BALL VALVE, UNI-BODY DESIGN, 1/2" HV-0133 REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR INSTRUMENT QTY ITEM CODE DESCRIPTION ID ND RESISTANCE TEMPERATURE RTD-0113 DETECTOR, NPT (M) (SUPPLIED BY 3/4"

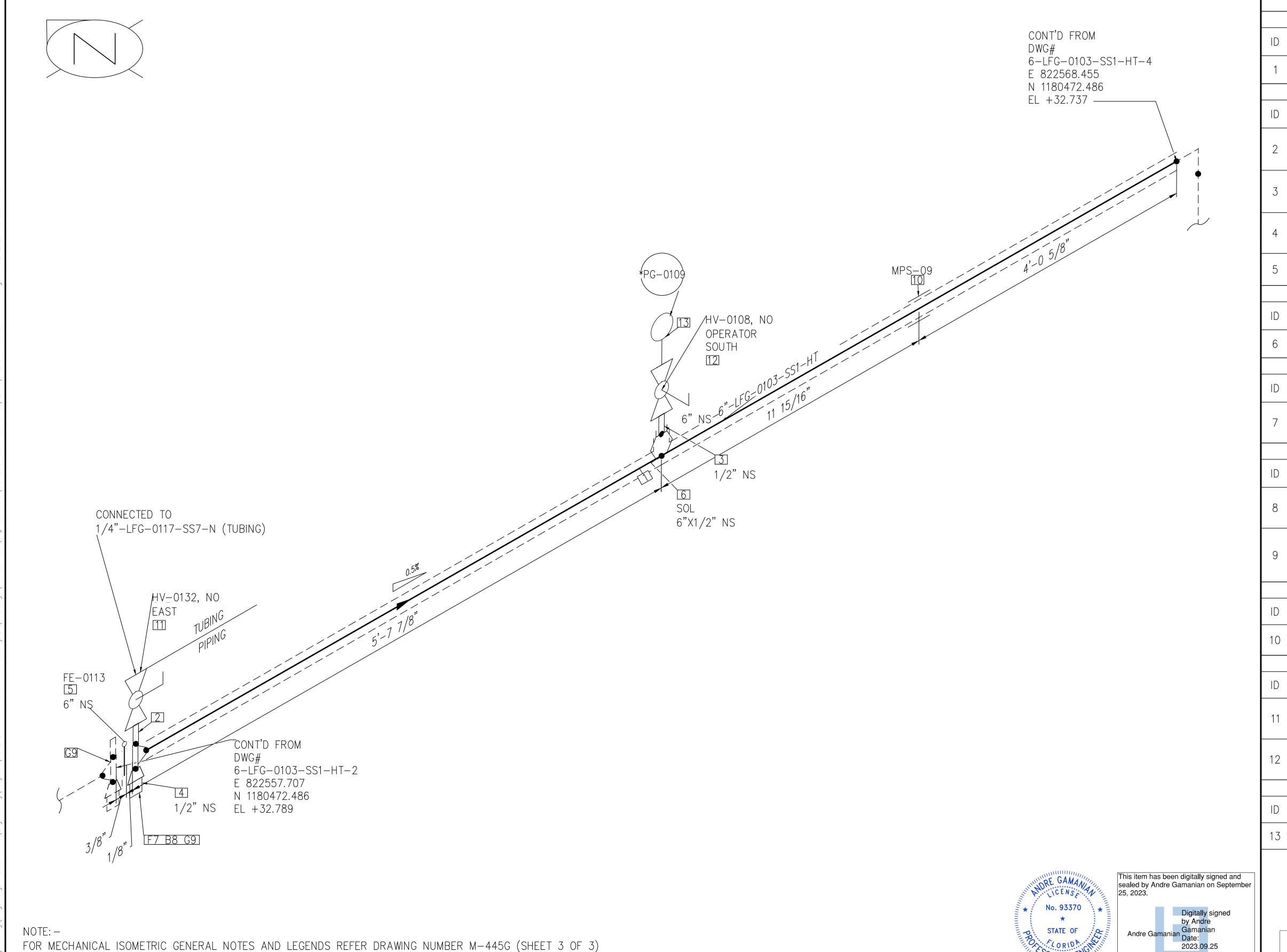
BILL OF MATERIALS

ISSUED FOR CONSTRUCTION

INDIAN RIVER COUNTY FLORIDA

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC 6"-LFG-0103-SS1-HT	SHEET 2
LANDFILL GAS BLOWER SKID	SCALE
& FLARE REPLACEMENT	N.T.S



SCH/CLASS QTY DESCRIPTION ID ND PIPE NIPPLE, SMLS, 4" LG, SCH 1/2" 80S, NPT (M), ASME A733, ASTM A312 GR TP 304 PIPE NIPPLE, SMLS, 4" LG, SCH 1/2" 80S, PE X NPT (M), ASME A733, ASTM A312 GR TP 304 PLUG, HEX HEAD, CLASS 3000, 1/2" NPT (M), ASME B16.11, ASTM A182 GR F304 FE-0113 FLOW ELEMENT (SUPPLIED 300 BY BGE) OLETS DESCRIPTION QTY SCH/CLASS ND SOCKOLET, CLASS 3000, BW X SW, 6"X1/2" MSS-SP-97, ASTM A182 GR F304 FLANGES SCH/CLASS QTY DESCRIPTION ID ND ORFICE WN, CLASS 300, WNRF X 6"X1/2" NPT (F), ASME B16.36, ASTM A182 300 GR F304 FASTENERS SCH/CLASS QTY DESCRIPTION ID ND STUD BOLT ASTM A193 GR B8, 3/4"X5 ASME 18.2.1, HEXAGONAL NUTS 12 1/4" ASTM A194 GR 8, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 300, RF, ASME B 16.20 PIPE SUPPORTS QTY ND ITEM CODE DESCRIPTION SS1-4"-1-8" PIPE SADDLE FOR INSULATED PIPE SIZE 1/2" TO 6" VALVES QTY ITEM CODE DESCRIPTION ID ND BALL VALVE, UNI-BODY DESIGN, 1/2" HV-0132 REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERÁTOR BALL VALVE, UNI-BODY DESIGN, 1/2" HV-0108 REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR INSTRUMENT QTY ITEM CODE DESCRIPTION ID ND PRESSURE GAUGE, NPT (M) PG-0109

BILL OF MATERIALS

PIPE

FITTINGS

DESCRIPTION

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

SCH/CLASS

40S

QTY

1 | 10'-5"

2023.09.25 17:53:16-07'00'

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG	

SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.01A
INSULATION SPEC	НТ
INSULATION THK	1"

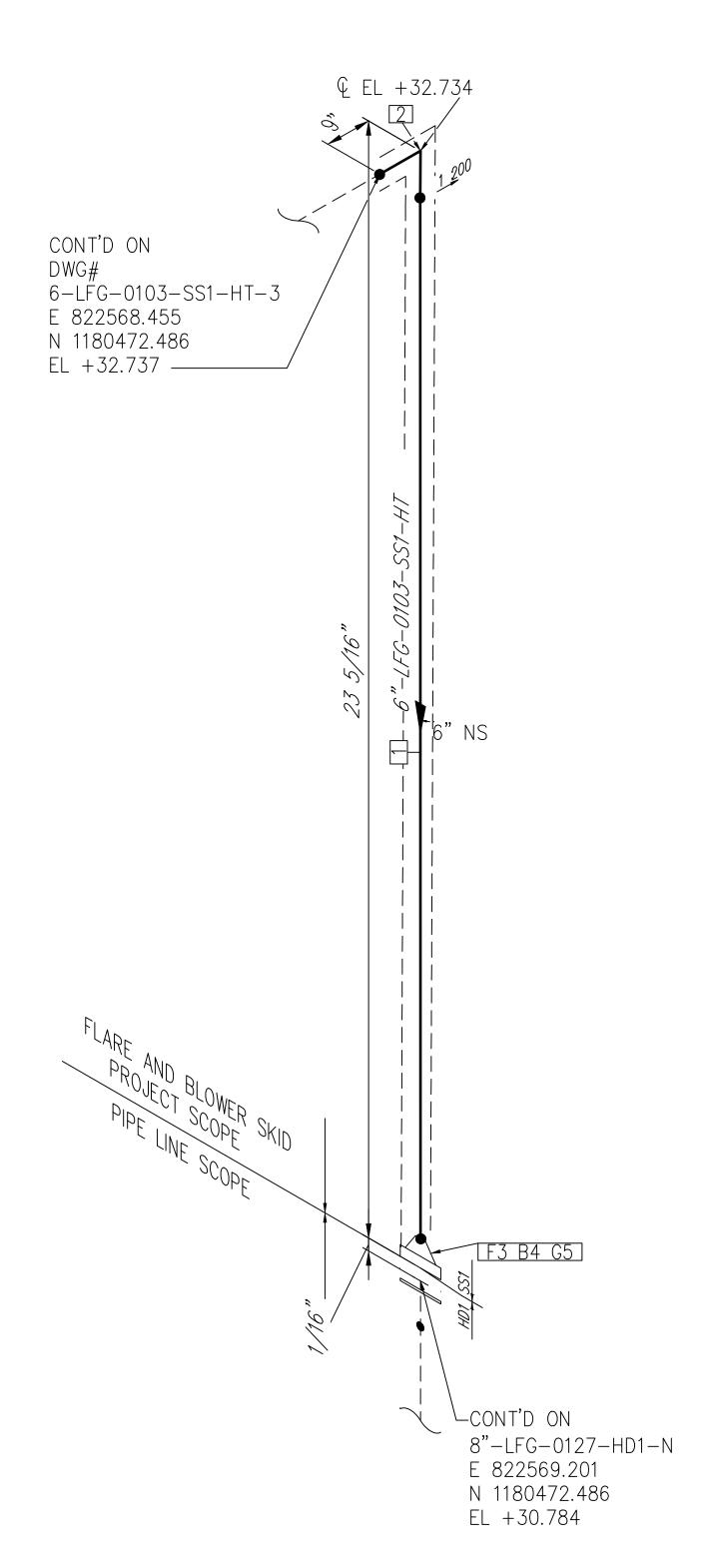
INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

Y	ENGINEEK:		BIOGAS ENGINEERING
			ET, SUITE 400
	ISIGNAL HILL,	CA 90	)755, Ph: (562) 726-356

EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
6"-LFG-0103-SS1-HT	3
LANDFILL GAS BLOWER SKID	SCALE
& FLARE REPLACEMENT	N.T.S



This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. No. 93370 2023.09.25 17:53:16-07'00'

B36.19, ASTM A312 GR TP 304 FITTINGS SCH/CLASS QTY DESCRIPTION ND ID ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304 FLANGES SCH/CLASS DESCRIPTION QTY ID ND FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304 FASTENERS SCH/CLASS QTY DESCRIPTION ID STUD BOLT ASTM A193 GR B8, 3/4"X4" ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20

BILL OF MATERIALS

PIPE

DESCRIPTION

PIPE, ERW, SCH 40S, BE, ASME

SCH/CLASS

QTY

11"

ID

ISSUED FOR CONSTRUCTION

Biogas	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
) akur	1	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG
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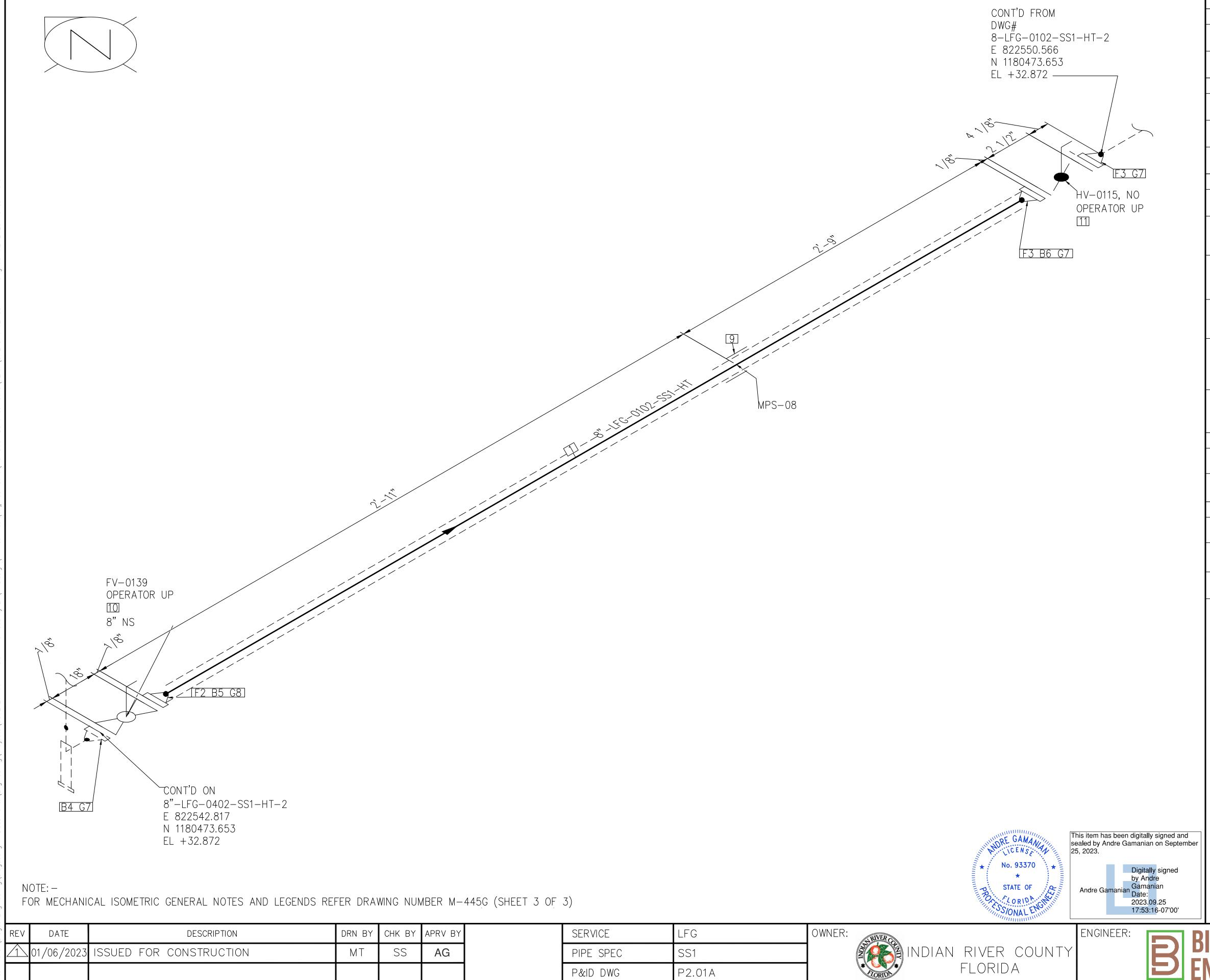
FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

LFG SERVICE SS1 PIPE SPEC P2.01A P&ID DWG INSULATION SPEC INSULATION THK

INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

ENGINEER: BIOGAS	PIPING ISOMETRIC 6"-LFG-0103-SS1-HT	SHE
ENGINEERING  2321 E. 28TH STREET, SUITE 400  SIGNAL HILL, CA 90755, Ph: (562) 726-3565  EMAIL: INFO@BIOGASENG.COM	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SC# N.T



P2.01A

1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

P&ID DWG

INSULATION SPEC

INSULATION THK

ID	QTY	ND	SCH/CLASS	DESCRIPTION		
1	5'	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304		
	FLANGES					
ID	QTY	ND	SCH/CLASS	DESCRIPTION		
2	1	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304		
3	2	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304		
			FASTEN	IERS		
ID	QTY	ND	SCH/CLASS	DESCRIPTION		
4	8	3/4"X4 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2		
5	8	3/4"X4 1/4"	150	STUD BOLT 3/4" X 4 1/4" LG, ASTM A193, GR B7 W/2 HEX. NUT 3/4", ASTM A194, GR 2H		
6	8	3/4"X7"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2		
7	3	8"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20		
8	1	8"	150	GASKET, SWG, 8" ND, 1/8" THK, 150 LB, RF, ASME B16.20, SS/PTFE		
			PIPE SUP	PORTS		
ID	QTY	ND	ITEM CODE	DESCRIPTION		
9	1	8"	SS2-4"-2-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"		
VALVES						
ID	QTY	ND	ITEM CODE	DESCRIPTION		
10	1	8"	FV-0139	BALL VALVE, V—PORT, CLASS 150, RF (SUPPLIED BY BGE)		
11	1	8"	HV-0115	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF		

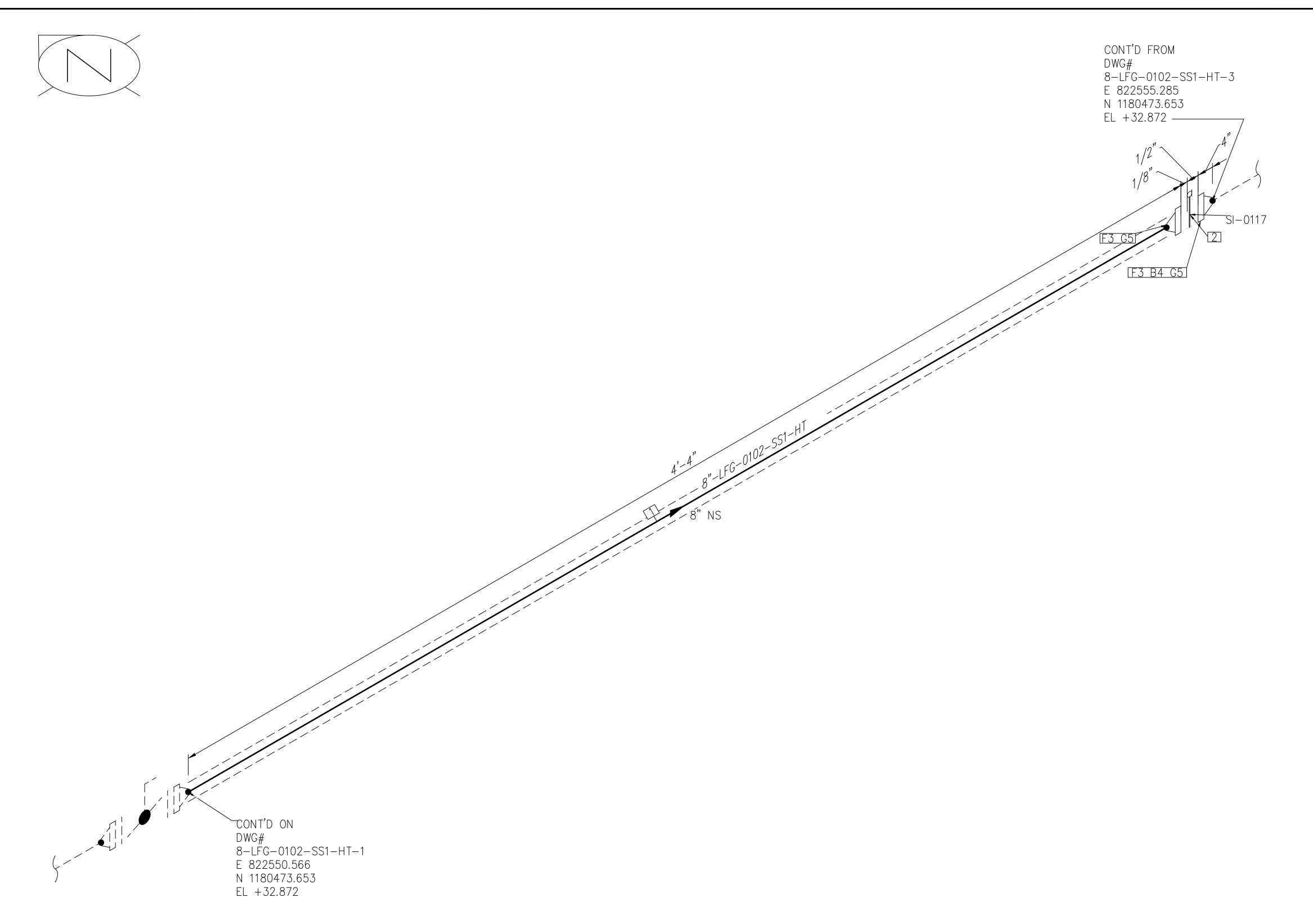
BILL OF MATERIALS

PIPE

ISSUED FOR CONSTRUCTION

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC 8"-LFG-0102-SS1-HT	SHEET 1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.

No. 93370

\*
STATE OF

Andre Gamanian

Date:
2023.09.25
17:53:16-07'00'

ENGINEER:

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

SERVICE	LF G	
PIPE SPEC	SS1	
P&ID DWG	P2.01A	
INSULATION SPEC	НТ	
INSULATION THK	1"	

INDIAN RIVER COUNTY
FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

,	ENGINEER: BIOGAS
	2321 E. 28TH STREET, SUITE 400
	SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC 8"-LFG-0102-SS1-HT	SHEET 2
<b>3</b> 65	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

BILL OF MATERIALS

PIPE

FITTINGS

FLANGES

FASTENERS

B 16.20

DESCRIPTION

DESCRIPTION

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

B16.5, ASTM A182 GR F304

PIPE, SMLS, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

FLOW CONDITIONER, 8"CPA 50E,

TYPE A, RF, SCH 40, SS 316

SCH/CLASS

40S

SCH/CLASS

150

SCH/CLASS

SCH/CLASS

QTY

QTY

QTY

QTY

8

ND

ND

ND

ID

ID

ID

CONNECTED TO CONNECTED TO 1/4"-LFG-0106-SS7-N (TUBING) 1/4"-LFG-0105-SS7-N (TUBING) HV-0130, NO HV-0131, NO. OPERATOR OPERATOR EAST WEST 9 -CONT'D ON DWG# 8-LFG-0102-SS1-HT-4 E 822562.701 N 1180473.653 EL +32.872 4 F6 B7 G8

No. 93370

This item has been digitally signed and sealed by Andre Gamanian on September

2023.09.25 17:53:16-07'00'

ISSUED FOR CONSTRUCTION

BILL OF MATERIALS

PIPE

FITTINGS

DESCRIPTION

DESCRIPTION

PIPE, SMLS, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

PIPE NIPPLE, SMLS, 4" LG, SCH

PLUG, HEX HEAD, CLASS 3000,

NPT (M), ASME B16.11, ASTM A182

FE-0118 FLOW ELEMENT (SUPPLIED

DESCRIPTION

THREADOLET, CLASS 3000, BW X

NPT (F), MSS-SP-97, ASTM A182

DESCRIPTION

ORFICE WN, CLASS 300, WNRF X

NPT (F), ASME B16.36, ASTM A182

DESCRIPTION

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS OUTER RING, CLASS 300, RF,

SPIRAL WOUND GASKET, 1/8" THK,

DESCRIPTION

BALL VALVE, UNI-BODY DESIGN,

BALL VALVE, UNI-BODY DESIGN,

DESCRIPTION

LEVER LOCKABLE OPERATOR

LEVER LOCKABLE OPERATOR

RESISTANCE TEMPERATURE

RTD-0118 DETECTOR, NPT (M) (SUPPLIED

BY BGE)

HV-0131 REGULAR BORE, NPT (F), MANUAL

HV-0130 REGULAR BORE, NPT (F), MANUAL

ASTM A312 GR TP 304

GR F304

BY BGE)

GR F304

GR F304

ASME B 16.20

OLETS

FLANGES

FASTENERS

VALVES

INSTRUMENT

80S, BE X NPT (M), ASME A733,

SCH/CLASS

SCH/CLASS

300

SCH/CLASS

3000

SCH/CLASS

300

SCH/CLASS

ITEM CODE

ITEM CODE

QTY

6'-8"

QTY

QTY

QTY

QTY

12

QTY

QTY

10

ID

ID

ID

ND

ND

1/2"

1/2"

ND

8"X3/4"

ND

8"X1/2"

ND

7/8"X5

3/4"

ND

1/2"

ND

3/4"

ID

ID

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.01A
INSULATION SPEC	НТ
INSULATION THK	1"

ENGINEER: INDIAN RIVER COUNTY FLORIDA

1/2" NS

1/2" NS

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
8"-LFG-0102-SS1-HT	3
LANDFILL GAS BLOWER SKID	SCALE
& FLARE REPLACEMENT	N.T.S

8"X3/4" NS

CONT'D ON

NOTE: -FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

8-LFG-0102-SS1-HT-2

E 822555.285 N 1180473.653

EL +32.872

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

		<

NOTE: -

DATE

HV-0103, NO 10 OPERATOR SOUTH F5 B6 G7 4 SOL 8"X1/2" NS CONT'D ON-UG PIPE LINE E 822569.201 N 1180473.653 EL +31.501 FIELD TO MPS-09 PROVIDE SHIM, CONT'D FROM 8-LFG-0102-SS1-HT-3 E 822562.701 N 1180473.653 EL +32.872 This item has been digitally signed and sealed by Andre Gamanian on September

ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR 40S WP 304 OLETS SCH/CLASS QTY DESCRIPTION ID ND SOCKOLET, CLASS 3000, BW X SW, 8"X1/2" 3000 MSS-SP-97, ASTM A182 GR F304 FLANGES SCH/CLASS QTY DESCRIPTION ID FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304 FASTENERS SCH/CLASS QTY ID ND DESCRIPTION STUD BOLT ASTM A193 GR B8, 3/4"X4 ASME 18.2.1, HEXAGONAL NUTS 8 ASTM A194 GR 8, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20 PIPE SUPPORTS QTY DESCRIPTION ID ITEM CODE ND SS2-4"-1-1 PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16" VALVES QTY ND ITEM CODE DESCRIPTION ID BALL VALVE, UNI-BODY DESIGN, 1/2" HV-0103 REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR INSTRUMENT QTY ITEM CODE DESCRIPTION ND 1/2" PRESSURE GAUGE, NPT (M) \*PG-0104

BILL OF MATERIALS

PIPE

FITTINGS

DESCRIPTION

DESCRIPTION

PIPE, SMLS, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

PIPE NIPPLE, SMLS, 4" LG, SCH

ASTM A312 GR TP 304

80S, BE X NPT (M), ASME A733,

SCH/CLASS

40S

SCH/CLASS

QTY

5'-7"

QTY

ND

1/2"

ID

ID

ISSUED FOR CONSTRUCTION

PIPING ISOMETRIC SHEET 8"-LFG-0102-SS1-HT LANDFILL GAS BLOWER SKID

INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW,

No. 93370

STATE OF

€ EL +32.840

SIGNAL HILL, CA 90755, Ph: (562) 726-3565

Digitally signed by Andre Gamanian Date: 2023.0°

ENGINEER:

2023.09.25 17:53:16-07'00'

ISSUED FOR CONSTRUCTION AG 01/06/2023 SS PIPE SPEC P&ID DWG INSULATION THK

DRN BY CHK BY APRV BY

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

DESCRIPTION

SS1 P2.01A INSULATION SPEC

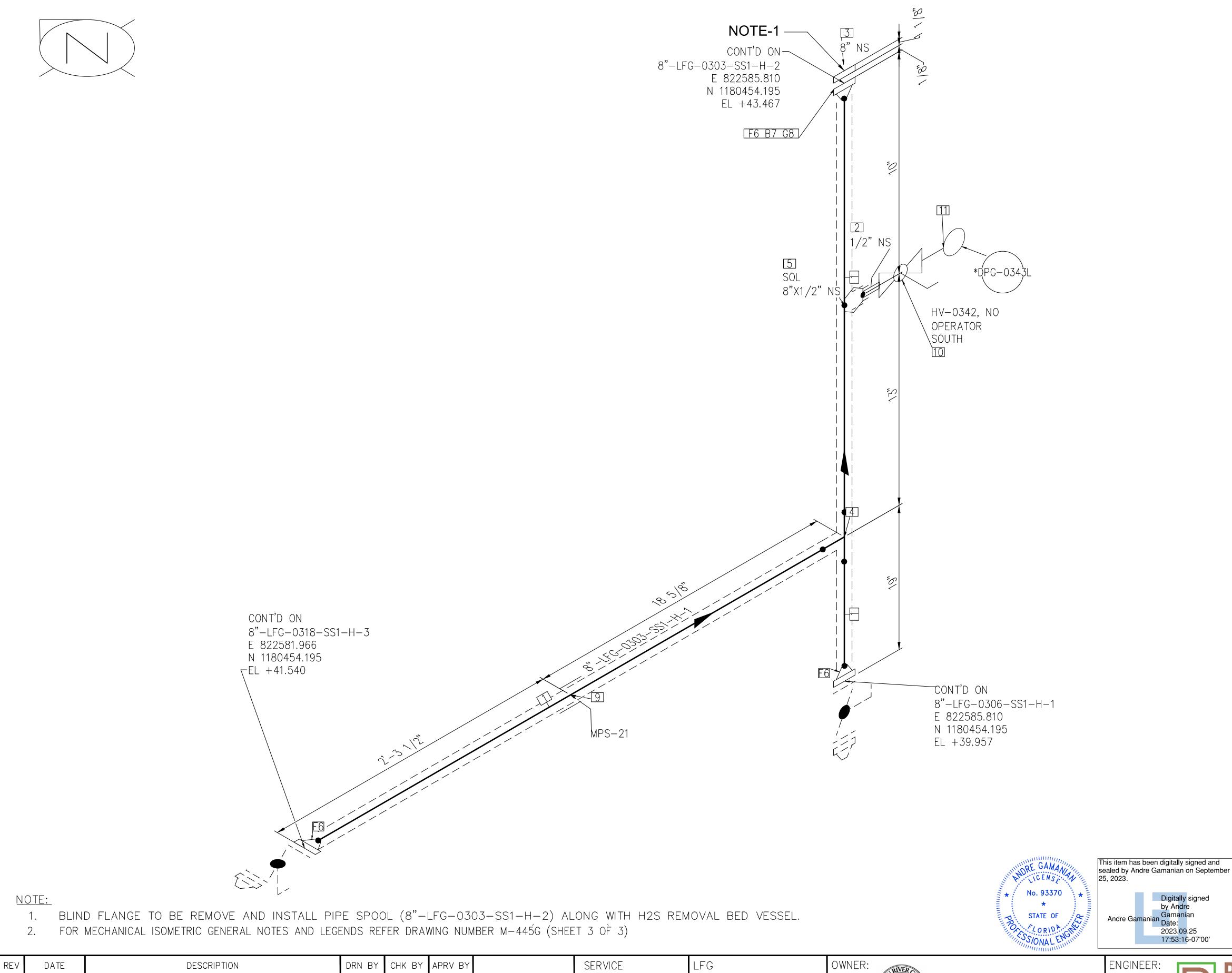
LFG

SERVICE

VERO BEACH, FLORIDA 32968

2321 E. 28TH STREET, SUITE 400 EMAIL: INFO@BIOGASENG.COM

SCALE N.T.S & FLARE REPLACEMENT



PIPE					
ID	QTY	ND	SCH/CLASS	DESCRIPTION	
1	4'-8"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304	
			FITTIN	GS	
ID	QTY	ND	SCH/CLASS	DESCRIPTION	
2	1	1/2"	80\$	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304	
3	1	8"	150	BLIND FLANGE, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304	
4	1	8"	40S	EQUAL TEE, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304	
			OLE	[S	
ID	QTY	ND	SCH/CLASS	DESCRIPTION	
5			SOCKOLET, CLASS 3000, BW X SW, MSS-SP-97, ASTM A182 GR F304		
			FLANC	GES	
ID	QTY	ND	SCH/CLASS	DESCRIPTION	
6	3	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304	
			FASTEN	IERS	
ID	QTY	ND	SCH/CLASS	DESCRIPTION	
7	8	3/4"X4 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2	
8	1	8"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20	
			PIPE SUP	PORTS	
ID	QTY	ND	ITEM CODE	DESCRIPTION	
9	1	8"	SS2-4"-2-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"	
			VALV	ES	
ID	QTY	ND	ITEM CODE	DESCRIPTION	
10	1	1/2"	HV-0342	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	
			INSTRUM	MENT	
ID	QTY	ND	ITEM CODE	DESCRIPTION	
11	1	1/2"	DPG-0343L	DIFFERENTIAL PRESSURE GAUGE, NPT (M)	

BILL OF MATERIALS

ISSUED FOR CONSTRUCTION

REV DATE DESCRIPTION DRN BY CHK BY APRV BY 01/06/2023 ISSUED FOR CONSTRUCTION MT SS AG

PIPE SPEC SS1

P&ID DWG P2.03

INSULATION SPEC H

INSULATION THK 1"

INDIAN RIVER COUNTY
FLORIDA

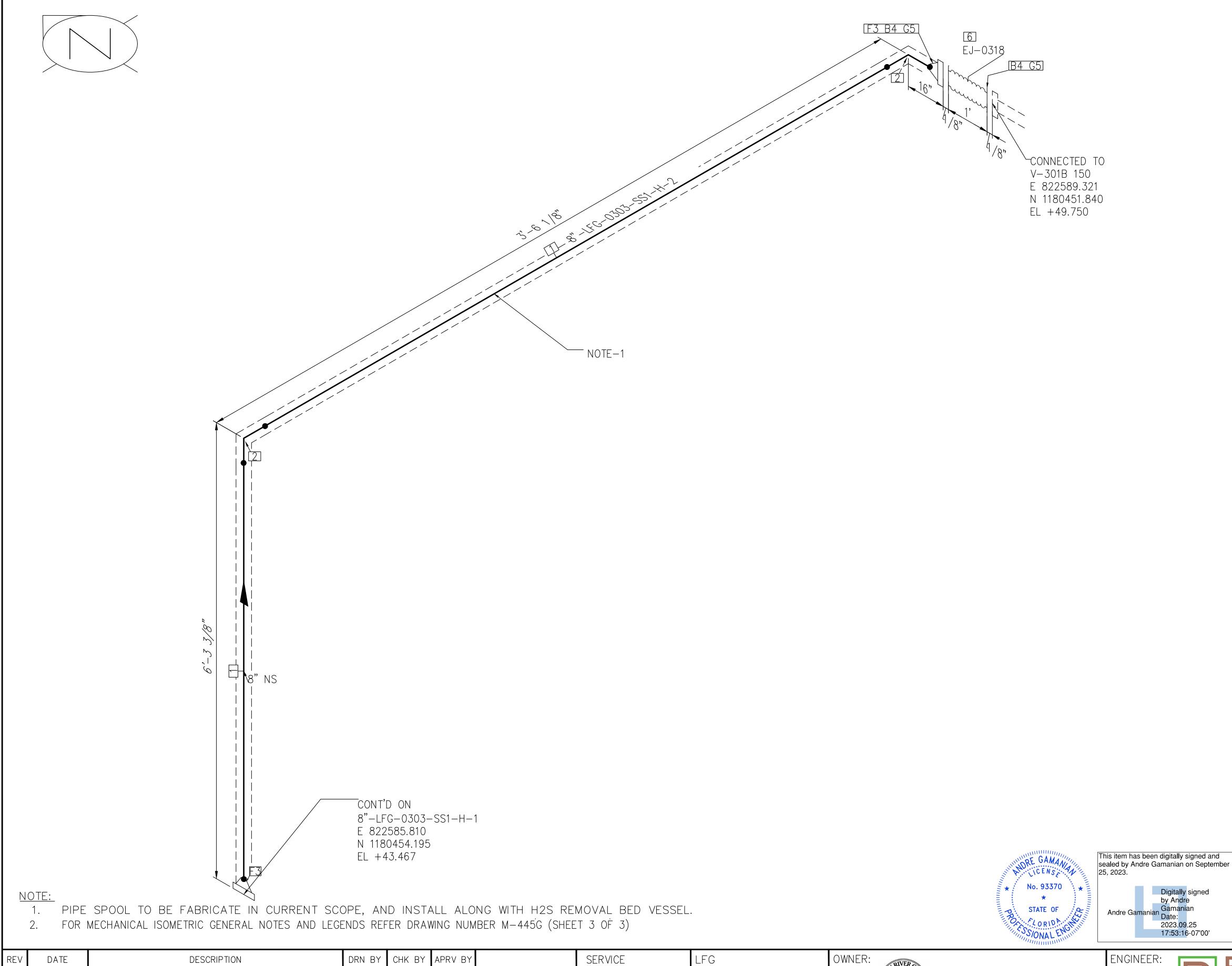
1325 74th AVE SW,

1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726–3565
EMAIL: INFO@BIOGASENG.COM

₹:		BIOGAS ENGINEERING
28T	H STRE	ET. SUITE 400

PIPING ISOMETRIC	SHEET
8"-LFG-0303-SS1-H	1
LANDFILL GAS BLOWER SKID	SCALE
& FLARE REPLACEMENT	N.T.S



			BILL OF MA	ATERIALS	
			PIPI	E	
ID	ID QTY ND SCH/CLASS DES			DESCRIPTION	
1	6'-6"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304	
			FITTIN	IGS	
ID	QTY	ND	SCH/CLASS	DESCRIPTION	
2	2	8"	40S	ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304	
FLANGES					
ID	QTY	ND	SCH/CLASS	DESCRIPTION	
3	2	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304	
			FASTEN	IERS	
ID	QTY	ND	SCH/CLASS	DESCRIPTION	
4	16	3/4"X4 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2	
5	2	8"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20	
			VALV	ES	
ID	QTY	ND	ITEM CODE	DESCRIPTION	
0)	1	8"	EJ-0318	STAINLESS STEEL, 12" LG BELLOW WITH TIE RODS, CLASS 150, RF, ASME B16.5	

LFG SS1

INDIAN RIVER COUNTY FLORIDA

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-356 EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC	SHEET
	8"-LFG-0303-SS1-H	2
		SCALE
	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	N.T.S
65	& ILANL NEFLACEMENT	

5010	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	1	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

PIPE SPEC P2.03 P&ID DWG INSULATION SPEC INSULATION THK

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

	OTE:- DR MECHANIO	CAL ISOMETRIC GENERAL NOTES AND LEGENDS REF	FER DRAV	wing num	1BER M-	44
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG	

[11] OPERATOR

HV-0341, NO~

2 1/2" NS\_

8" NS B7 G9 EJ-0315

CONNECTED TO V-301A 150

E 822572.321 N 1180451.840 EL +35.750

8"X1/2" NS

NORTH

[F6 B7 G9]

SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.03
INSULATION SPEC	Н
INSULATION THK	1"

INDIAN RIVER COUNTY FLORIDA

ENGINEER: DIOC

QTY

ND

SHEET SCALE LANDFILL GAS BLOWER SKID N.T.S & FLARE REPLACEMENT

BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF

DPG-0340H DIFFERENTIAL PRESSURE GAUGE, NPT (M)

DESCRIPTION

ally signed and nian on September by Andre

Andre Gamanian
Date:
2023.09.25
17:53:16-07'00'

NOTE: -												
FOR MECHANICAL	ISOMETRIC	GENERAL	NOTES	AND	LEGENDS	REFER	DRAWING	NUMBER	M-445G	(SHEET	3 OF	3)
										(		/

INO IL.		
FOR MECHANICAL ISOMETRIC GENERA	AL NOTES AND LEGENDS REFER DRAW!	NG NUMBER $M-445G$ (SHEET 3 OF 3)

CONT'D ON

E 822575.832 N 1180454.195 EL +36.667 —

8"-LFG-0306-SS1-H-1

SERVICE	LFG	OWN
PIPE SPEC	SS1	
P&ID DWG	P2.03	
INSULATION SPEC	H	13:
INICLU A TIONI TIUZ	1 "	٧L

325 74th AVE SW, ERO BEACH, FLORIDA 32968

CONT'D ON

EL +35.750 —

G9

OPERATOR

HV-0321, NC

DOWN

[F6 B8 G9]

8"-LFG-0311-SS1-H-3 E 822579.905 N 1180454.195

<b>Y</b>	BIUGAS
	2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

GAS			ISOMETRIC 0304—SS1—F	-		
	133010	1 011	001	131110011011		
	ISSLIED	FOR	$\bigcirc\bigcirc$	NSTRUCTION		

HV-0321

ITEM CODE

INSTRUMENT

**************************************	No. 93370	WANTING *	This item has ealed by 25, 2023.	nas been digitally Andre Gamaniar Digitall by And

	,		/	
1	4'-11"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304
			FITTIN	GS
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304
3	1	8"	40S	ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304
4	1	8"	40S	EQUAL TEE, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304
			OLE	S
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	8"X1/2"	3000	SOCKOLET, CLASS 3000, BW X SW MSS-SP-97, ASTM A182 GR F304
			FLANC T	;ES
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	3	8"	150	FLANGE WN, CLASS 150, RF, ASME  B16.5, ASTM A182 GR F304
	1	1	FASTEN	IERS
ID	QTY	ND	SCH/CLASS	DESCRIPTION
7	16	3/4"X4 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
8	8	3/4"X7"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
9	4	8"	150	SPIRAL WOUND GASKET, 1/8" THK SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASMI B 16.20
	I		PIPE SUP	PORTS
ID	QTY	ND	ITEM CODE	DESCRIPTION
10	1	8"	SS2-4"-2-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
	Ι	T	VALV	ES
ID	QTY	ND	ITEM CODE	DESCRIPTION
11	1	1/2"	HV-0341	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
12	1	8"	EJ-0315	STAINLESS STEEL, 12" LG BELLOW WITH TIE RODS, CLASS 150, RF, ASME B16.5
			1	I — — — — —

BILL OF MATERIALS

PIPE

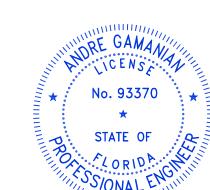
DESCRIPTION

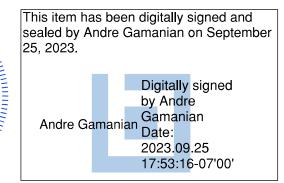
SCH/CLASS

ID

NOTE: -

OPERATOR NORTH CONT'D ON EJ-0316 B8 G9 8"-LFG-0306-SS1-H-1HV-0344, NO E 822585.810 N 1180454.195 EL +36.667 CONNECTED TO V-301B 150 E 822589.321 N 1180451.840 EL +35.750 8"X1/2" NS 12 8" NS OPERATOR DOWN HV-0322, NO CONT'D ON 8"-LFG-0311-SS1-H-3 E 822581.738
N 1180454.195
EL +35.750 — B7 G9 F6 G9





			PIPI BILL OF MA	
	OTV	ND		
ID	QTY	ND 	SCH/CLASS	DESCRIPTION PIPE, ERW, SCH 40S, BE, ASME
1	4'-11"	8"	40S	B36.19, ASTM A312 GR TP 304
	T		FITTIN	IGS
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304
3	1	8"	40S	ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304
4	1	8"	40S	EQUAL TEE, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304
			OLE	
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	8"X1/2"	3000	SOCKOLET, CLASS 3000, BW X SW MSS-SP-97, ASTM A182 GR F304
			FLANC	SES
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	3	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
			FASTEN	IERS
ID	QTY	ND	SCH/CLASS	DESCRIPTION
7	8	3/4"X7"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
8	16	3/4"X4 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
9	4	8"	150	SPIRAL WOUND GASKET, 1/8" THK SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASM B 16.20
			PIPE SUP	PORTS
ID	QTY	ND	ITEM CODE	DESCRIPTION
10	1	8"	2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
			VALV	E
ID	QTY	ND	ITEM CODE	DESCRIPTION  PALL VALVE LINE BODY DESIGN
11	1	1/2"	HV-0344	BALL VALVE, UNI—BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
12	1	8"	HV-0322	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF
13	1	8"	EJ-0316	STAINLESS STEEL, 12" LG BELLOW WITH TIE RODS, CLASS 150, RF, ASME B16.5
	I		INSTRU	MENT
ID	QTY	ND	ITEM CODE	DESCRIPTION
14	1	1/2"	DPG-0343H	DIFFERENTIAL PRESSURE GAUGE, NPT (M)

BILL OF MATERIALS

ISSUED FOR CONSTRUCTION

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

ഗ						
Biogas	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
hakur	$\triangle$	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG
ukeshT						
sers/Mu						
တိ						

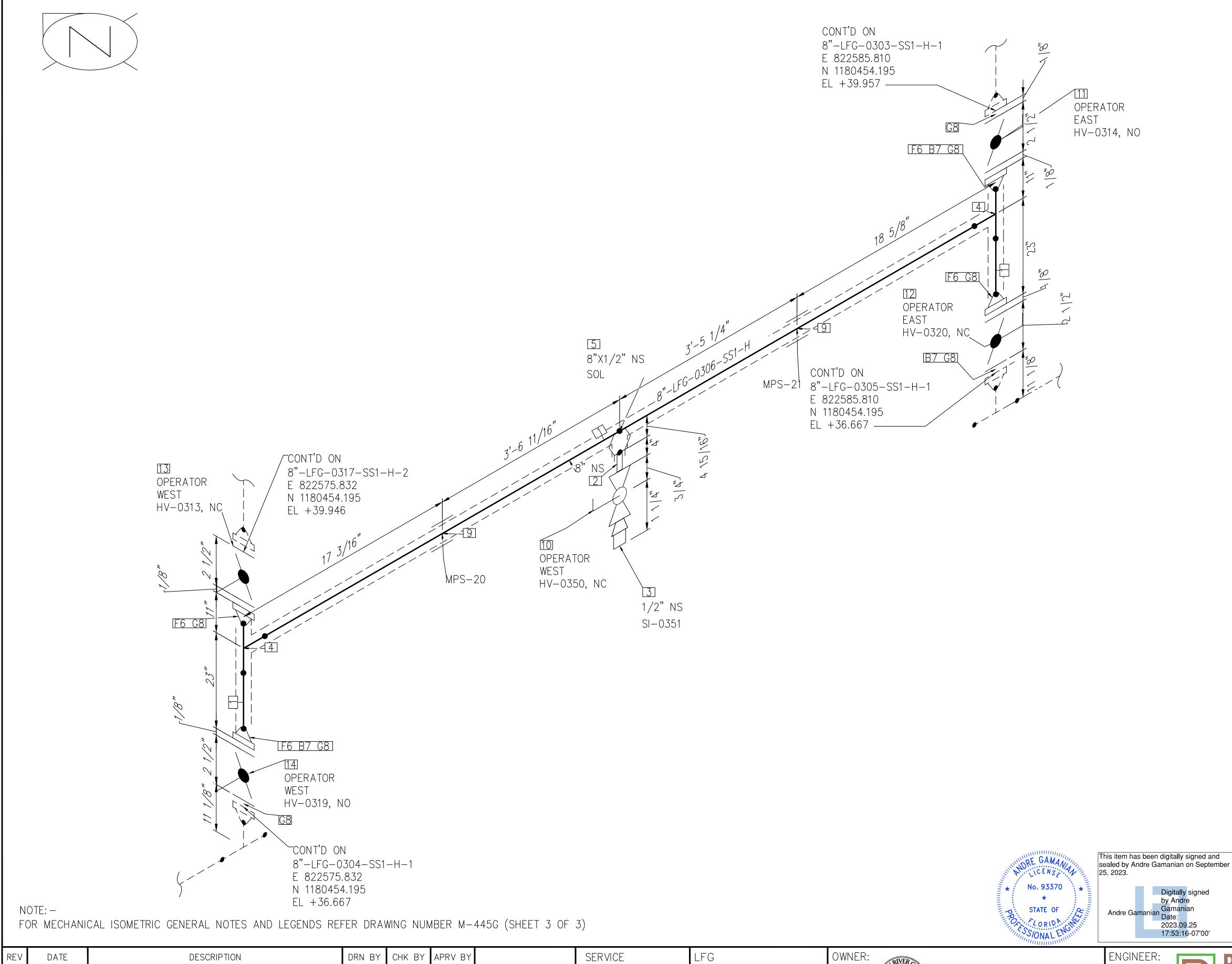
SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.03
INSULATION SPEC	Н
INSULATION THK	1"

INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

,	ENGINEER: BIOGAS
	ENGINEERING CONTRACTOR AND ADDRESS AND ADD
	2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC 8"-LFG-0305-SS1-H	SHEET 1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



	PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION	
1 10'-10" 8"		40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304		
			FITTIN		
ID	QTY	ND	SCH/CLASS	DESCRIPTION	
2	1	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304	
3	1	1/2"	3000	PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A182 GR F304	
4	2	8"	40S	EQUAL TEE, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304	
			OLE1	TS .	
ID	QTY	ND	SCH/CLASS	DESCRIPTION	
5	1	8"X1/2"	3000	SOCKOLET, CLASS 3000, BW X SW, MSS-SP-97, ASTM A182 GR F304	
			FLANC	GES	
ID	QTY	ND	SCH/CLASS	DESCRIPTION	
6	4	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304	
			FASTEN	IERS	
ID	QTY	ND	SCH/CLASS	DESCRIPTION	
7	24	3/4"X7"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2	
8	7	8"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20	
			PIPE SUP	PORTS	
ID	QTY	ND	ITEM CODE	DESCRIPTION	
9	2	8"	SS2-4"-1-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"	
	1		VALV	ES	
ID	QTY	ND	ITEM CODE	DESCRIPTION	
10	1	1/2"	HV-0350	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	
11	1	8"	HV-0314	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF	
12	1	8"	HV-0320	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF	
13	1	8"	HV-0313	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF	
14	1	8"	HV-0319	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF	
			•		

BILL OF MATERIALS

ISSUED FOR CONSTRUCTION

REV DATE DESCRIPTION DRN BY CHK BY APRV BY O1/06/2023 ISSUED FOR CONSTRUCTION MT SS AG

PIPE SPEC SS1

P&ID DWG P2.03

INSULATION SPEC H

INSULATION THK 1"

INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW,

1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

EMAIL: INFO@BIOGASENG.COM

LIGHT LERING

2321 E. 28TH STREET, SUITE 400

SIGNAL HILL, CA 90755, Ph: (562) 726–3565

EMAIL: INFO@BIOGASENG.COM

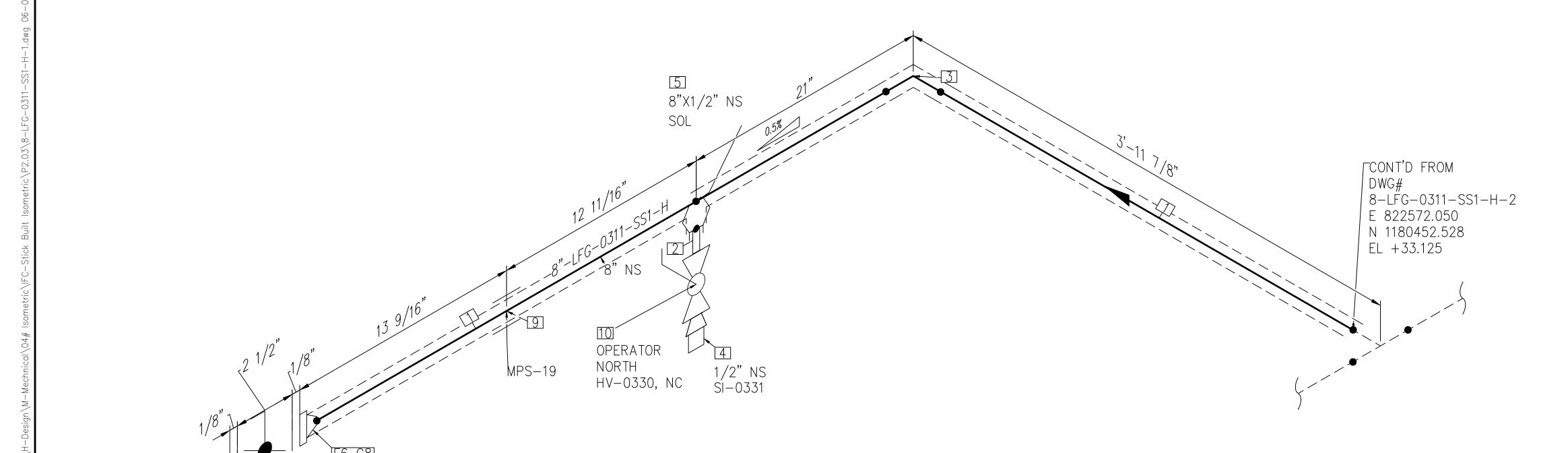
BIOGAS ENGINEERIN 2321 E. 28TH STREET, SUITE 400

	PIPING ISOMETRIC 8"-LFG-0306-SS1-H	SHEET 1
35	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

CONNECTED TO

F-302 150 E 822567.883 N 1180455.933 EL +33.125 —/

NOTE: -



This item has been digitally signed and sealed by Andre Gamanian on September No. 93370 STATE OF 2023.09.25 17:53:16-07'00' ENGINEER:

SCH/CLASS QTY DESCRIPTION ID PIPE NIPPLE, SMLS, 4" LG, SCH 1/2" 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304 ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304 PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A182 3000 GR F304 OLETS QTY SCH/CLASS DESCRIPTION SOCKOLET, CLASS 3000, BW X SW, 8"X1/2" MSS-SP-97, ASTM A182 GR F304 FLANGES SCH/CLASS DESCRIPTION QTY ID FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304 FASTENERS SCH/CLASS QTY DESCRIPTION ID STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS 3/4"X7" 8 ASTM A194 GR 8, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20 PIPE SUPPORTS ITEM CODE QTY DESCRIPTION SS2-4"-1-1 PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16" VALVES QTY ITEM CODE DESCRIPTION BALL VALVE, UNI-BODY DESIGN, 1/2" HV-0330 REGULAR BORE, NPT (F), MANUAL 10 LEVER LOCKABLE OPERATOR BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF HV-0326

BILL OF MATERIALS

PIPE

FITTINGS

DESCRIPTION

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

SCH/CLASS

QTY

5'-1"

ID

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

OPERATOR UP

HV-0326, NO

B7 G8

SERVICE	LFG	(
PIPE SPEC	SS1	
P&ID DWG	P2.03	
INSULATION SPEC	Н	
INSULATION THK	1"	

INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC 8"-LFG-0311-SS1-H	SHEET 1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

560:01	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	
5		01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG	
, ) ) / .							

SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.03
INSULATION SPEC	H
INSULATION THK	1"

INDIAN RIVER COUNTY FLORIDA

BILL OF MATERIALS

PIPE

FITTINGS

DESCRIPTION

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

DESCRIPTION

PIPE NIPPLE, SMLS, 4" LG, SCH

80S, BE X NPT (M), ASME A733,

PLUG, HEX HEAD, CLASS 3000,

NPT (M), ASME B16.11, ASTM A182

| EQUAL TEE, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP

DESCRIPTION

SOCKOLET, CLASS 3000, BW X SW,

MSS-SP-97, ASTM A182 GR F304

THREADOLET, CLASS 3000, BW X

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

DESCRIPTION

DESCRIPTION

TEMPERATURE TRANSMITTER &

BALL VALVE, UNI-BODY DESIGN,

LEVER LOCKABLE OPERÁTOR

BUTTERFLY VALVE, GEAR

OPERATED, CLASS 150, RF

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

SS2-4"-2-1 PIPE SADDLE FOR INSULATED PIPE

SS2-4"-1-1 PIPE SADDLE FOR INSULATED PIPE

HV-0323 REGULAR BORE, NPT (F), MANUAL

SIZE 8" TO 16"

SIZE 8" TO 16"

TT/TE/TW-0|TEMPERATURE ELEMENT WITH

THERMOWELL, NPT (M)

B16.5, ASTM A182 GR F304

NPT (F), MSS-SP-97, ASTM A182

ASTM A312 GR TP 304

GR F304

GR F304

B 16.20

304

OLETS

FLANGES

FASTENERS

PIPE SUPPORTS

VALVES

INSTRUMENT

SCH/CLASS

40S

SCH/CLASS

3000

40S

SCH/CLASS

3000

SCH/CLASS

SCH/CLASS

ITEM CODE

ITEM CODE

HV-0328

ITEM CODE

QTY

6'-1"

QTY

QTY

QTY

2

QTY

8

QTY

QTY

QTY

10

ID

13

ID

1/2"

ND

8"X1/2"

8"X3/4"

3/4"X7"

ND

ND

1/2"

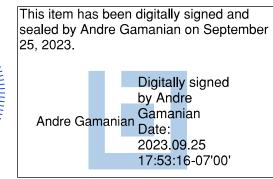
ND

3/4"

1 | 6'-9"

ID

No. 93370



NOTE: —										
FOR MECHANICAL ISOMETRIC	CENERAL NOTES	SAND	LEGENDS	RFFFR	DRAWING	NUMBER	M - 445G	(SHFFT	.3 OF	- 3)
OR MEDITATIONE TOOMETRIC	OLIVEIVILE INOTE	7 / 11 10	LLOLIVDO		DIVIVIII	NONDER	111 1 10,0		0 01	0)

11012.		
FOR MECHANICAL ISOMETRIC GENERAL	NOTES AND LEGENDS REFER DRA	WING NUMBER $M-445G$ (SHEET 3 OF 3)

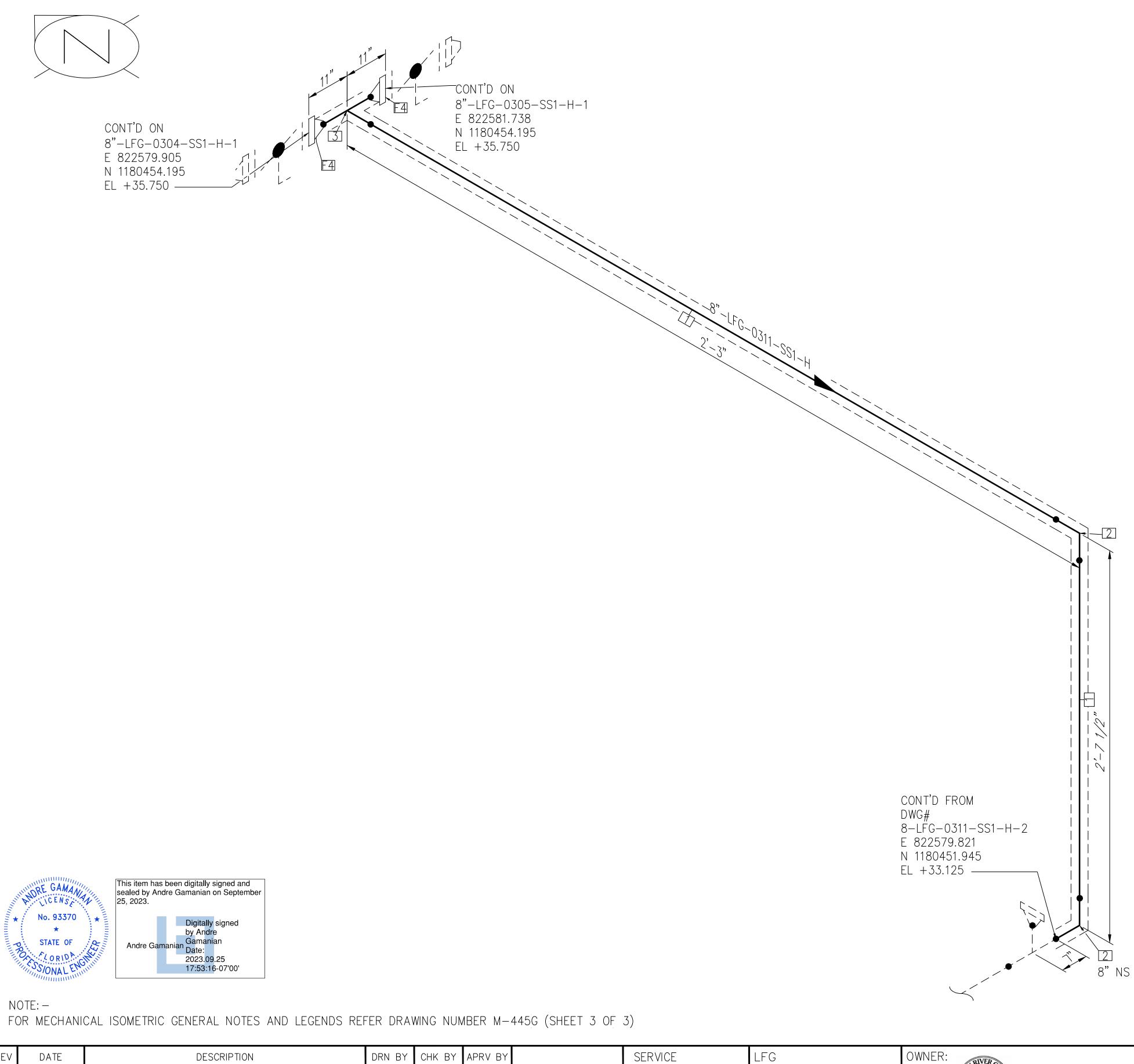
SERVICE	LF G	OWI
PIPE SPEC	SS1	
P&ID DWG	P2.03	
INSULATION SPEC	I	13
INION A TION. THE	, <sup>,</sup> ,	٧L

1325 74th AVE SW, /ERO BEACH, FLORIDA 32968

2023.09.25 17:53:16-07'00'	SSUED FOR CON	ISTRUCTION	
ENGINEER: BIOG		PIPING ISOMETE 8"-LFG-0311-S	 SHEE 2
2321 E. 28TH STREET, SUITE SIGNAL HILL, CA 90755, Ph: EMAIL: INFO@BIOGASENG.COM		LANDFILL GAS BLOW & FLARE REPLACE	SCAL N.T.S

CONT'D FROM DWG# 8-LFG-0311- E 822572.05 N 1180452.50 EL +33.125	-SS1-H-1 0 28	1/2" NS	*TT/ 3/4" NS 7] 8"X3/4" NS TOL 6] 8"X1/2" NS SOL	TE/TW-0325	S1-H-3 "NS 15	CONT'D ON DWG# 8-LFG-0311-SS1-H-3 E 822579.821 N 1180451.945 EL +33.125

CONT'D ON 8"-LFG-0312-ST1-H-1 E 822564.232 OPERATOR UP F8 G10 N 1180451.945 HV-0328, NO EL +33.125 \_\_\_\_ B9 G10



AG

INSULATION SPEC

INSULATION THK

01/06/2023

ISSUED FOR CONSTRUCTION

PIPE QTY SCH/CLASS DESCRIPTION PIPE, ERW, SCH 40S, BE, ASME 1'-4" B36.19, ASTM A312 GR TP 304 FITTINGS QTY SCH/CLASS DESCRIPTION ID ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304 EQUAL TEE, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP FLANGES QTY SCH/CLASS DESCRIPTION ND FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304

BILL OF MATERIALS

ISSUED FOR CONSTRUCTION

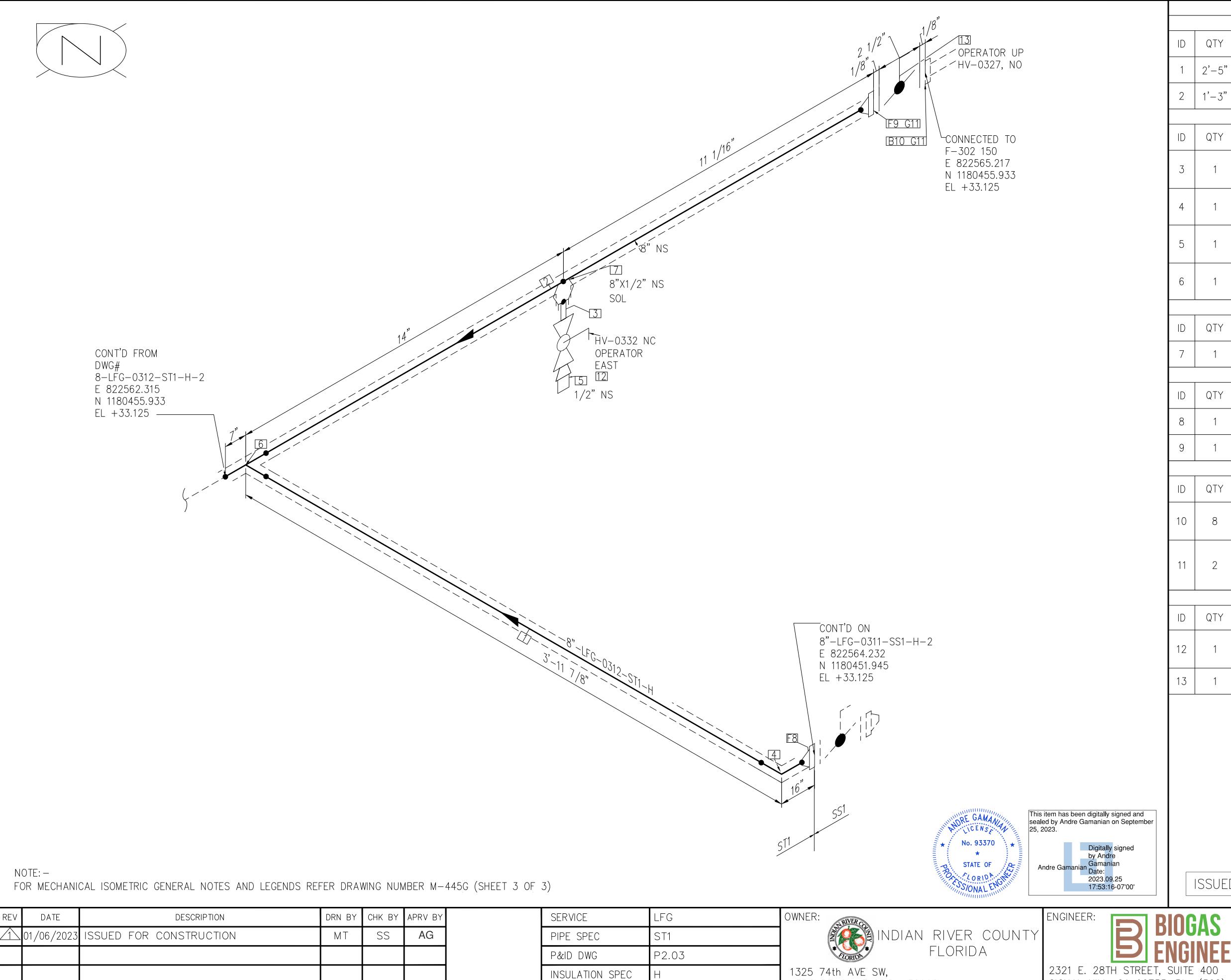
SERVICE LFG OWNER:
PIPE SPEC SS1
P&ID DWG P2.03
OWNER:
INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM

ENGINEER:

	PIPING ISOMETRIC 8"-LFG-0311-SS1-H	SHEET 3
5	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



INSULATION THK

VERO BEACH, FLORIDA 32968

ISSUED FOR CONSTRUCTION PIPING ISOMETRIC SHEET 8"-LFG-0312-ST1-H SCALE LANDFILL GAS BLOWER SKID N.T.S & FLARE REPLACEMENT SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

BILL OF MATERIALS

PIPE

FITTINGS

GR TP 304

IWP 316

GR F304

DESCRIPTION

DESCRIPTION

PIPE NIPPLE, SMLS, 4" LG, SCH

ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR

PLUG, HEX HEAD, CLASS 3000,

NPT (M), ASME B16.11, ASTM A182

EQUAL TEE, SMLS, SCH 40S, BW,

DESCRIPTION

SOCKOLET, CLASS 3000, FW X SW,

MSS-SP-97. ASTM A182 GR F304

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

SS316 WINDING MATERIAL, SS

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

BALL VALVE, UNI-BODY DESIGN,

LEVER LOCKABLE OPERATOR

HV-0332 REGULAR BORE, NPT (F), MANUAL

BUTTERFLY VALVE, GEAR

OPERATED, CLASS 150, RF

B16.5, ASTM A182 GR F316

B16.5, ASTM A182 GR F316

ASME B16.9, ASTM A403 GR WP

80S, PE, ASME A733, ASTM A312

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 316

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 316

SCH/CLASS

40S

SCH/CLASS

3000

40S

SCH/CLASS

3000

SCH/CLASS

SCH/CLASS

ITEM CODE

HV-0327

OLETS

FLANGES

FASTENERS

VALVES

QTY

1'-3"

QTY

QTY

QTY

QTY

8

QTY

1/2"

ND

8"X1/2"

ND

ND

3/4"X7"

ND

1/2"

DRN BY CHK BY APRV BY DESCRIPTION DATE 01/06/2023 ISSUED FOR CONSTRUCTION SS

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

NOTE: -

LFG SERVICE PIPE SPEC P2.03 P&ID DWG INSULATION SPEC INSULATION THK

INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW, VERO BEACH, FLORIDA 32968

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC SHEET 8"-LFG-0312-ST1-H SCALE LANDFILL GAS BLOWER SKID N.T.S & FLARE REPLACEMENT

BILL OF MATERIALS

PIPE

FITTINGS

OLETS

PIPE SUPPORTS

VALVES

PORT

INSTRUMENT

DESCRIPTION

DESCRIPTION

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 316

PIPE NIPPLE, SMLS, 4" LG, SCH

PLUG, HEX HEAD, CLASS 3000,

NPT (M), ASME B16.11, ASTM A182

DESCRIPTION

THREADOLET, CLASS 3000, FW X

NPT (F), MSS-SP-97, ASTM A182

SOCKOLET, CLASS 3000, FW X SW,

MSS-SP-97, ASTM A182 GR F316

THREADOLET, CLASS 3000, FW X

NPT (F), MSS-SP-97, ASTM A182

DESCRIPTION

DESCRIPTION

MULTIPORT BLOCK & BLEED VALVE,

DESCRIPTION

TEMPERATURE TRANSMITTER AND

BALL VALVE, UNI-BODY DESIGN,

LEVER LOCKABLE OPERÁTOR

SS2-4"-1-1 PIPE SADDLE FOR INSULATED PIPE

HV-0405 | REGULAR BORE, NPT (F), MANUAL

HV-0403 SOFT SEAT, PTFE PACKING, BLEED

PG-0406 | PRESSURE GAUGE, NPT (M)

TT/TE/TW-0 TEMPERATURE ELEMENT WITH

TG/TW-040 TEMPERATURE GAUGE WITH

PT-0404 PRESSURE TRANSMITTER NPT(M)

THERMOWELL, NPT(M)

THERMOWELL, NPT(M)

SIZE 8" TO 16"

ASTM A312 GR TP 316

GR F304

GR F316

GR F316

80S, PE X NPT (M), ASME A733,

SCH/CLASS

40S

SCH/CLASS

SCH/CLASS

3000

3000

3000

ITEM CODE

ITEM CODE

ITEM CODE

QTY

QTY

QTY

QTY

QTY

QTY

ND

1/2"

ND

8"X1/2"

8"X1/2"

8"X3/4"

ND

ND

1/2"

1/2"

ND

3/4"

3/4"

1 4'-11"

ID

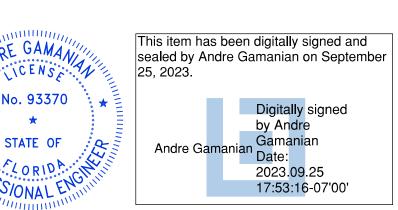
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ENGINEER:

					EL +33.125 ———
				*TT/TE/TW-0401	
				\ 3/4" NS [12]	
				Y	
					14 5/8
				10-S11-H	
			MPS-18	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
		3/4"	NC 7	8"X3/	4" NS
		*TG/TW-0402			
	*F	PT-0404	8" NS		
			1/16"		
	HV-0405, NO OPERATOR		6 13/1		
	*PG-0406 NORTH				
		19	6 TOL		
	HV-0403,	NO 15"	TOL 8"X3/4" NS		
		3			
		1/2" NS			
CONT'D FROM	1/2" NS	4 TOI			
DWG# 8-LFG-0312-ST1-H-3	15"	TOL 8"X1/2" NS			
E 822557.473 N 1180455.933					
EL +33.125	5 SOL				
	8"X1/2" NS				
	5 11				

ſ			
	ISSUED	FOR	CONSTRUCTION

.vvVIII.r.	
No. 93370 *	This item has been digitally signed and sealed by Andre Gamanian on Septembe 25, 2023.
No. 93370  * STATE OF  STATE OF  CORIDA CHARLES  STONAL ENGINEERS   Digitally signed by Andre Andre Gamanian Date: 2023.09.25 17:53:16-07'00'	

						CONT'D ON DWG# 8-LFG-0312-ST1-H-1 E 822562.315 N 1180455.933
1—H—2.dwg 06—02—2023 MukeshThakur					*TT/TE/TW	EL +33.125
Isometric\ FC-Stick Built  Isometric\P2.03\8-LFG-0312-ST		HV-0405, NO OPERATOR NORTH 8	*TG/TW-0402	[13] 3/4" NS	MPS-18 $\frac{8}{3}/16$	TOL 8"X3/4" NS
- Indian River County LF\H—Design\M—Mechnical\04# Isa	CONT'D FROM DWG#	1/2" NS 15"	-03, NO 15" 15" 1/2" NS TOL 8"X1/2" NS	TOL 8"X3/4" NS		
g\Projects\USH2126.100 —	<u></u>	SOL 8"X1/2" NS				

CONNECTED TO E-400-N-2

E 822554.207

[F3 B4 G5] N 1180455.933 EL +35.218 —

INSULATION THK

INDIAN RIVER COUNTY FLORIDA

ENGINEER: 2321 E. 28TH STREET, SUITE 400

PIPING ISOMETRIC 8"-LFG-0312-ST1-H LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

SHEET

SCALE

N.T.S

ISSUED FOR CONSTRUCTION

BILL OF MATERIALS PIPE SCH/CLASS QTY DESCRIPTION PIPE, ERW, SCH 40S, BE, ASME 1 2'-2" B36.19, ASTM A312 GR TP 316 FITTINGS ID QTY SCH/CLASS DESCRIPTION ELBOW 45 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 316 FLANGES SCH/CLASS DESCRIPTION QTY ND FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F316 FASTENERS SCH/CLASS QTY DESCRIPTION ID STUD BOLT ASTM A193 GR B8, 3/4"X7" ASME 18.2.1, HEXAGONAL NUTS 12 ASTM A194 GR 8, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS316 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20

No. 93370 STATE OF

This item has been digitally signed and sealed by Andre Gamanian on September 2023.09.25 17:53:16-07'00'

NOTE: -

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	SERVICE	LFG
1	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG	PIPE SPEC	ST1
						P&ID DWG	P2.03
						INSULATION SPEC	Н
						INICIU ATIONI TIIIZ	1"

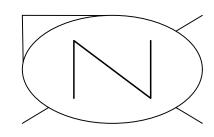
1325 74th AVE SW, VERO BEACH, FLORIDA 32968

CONT'D ON

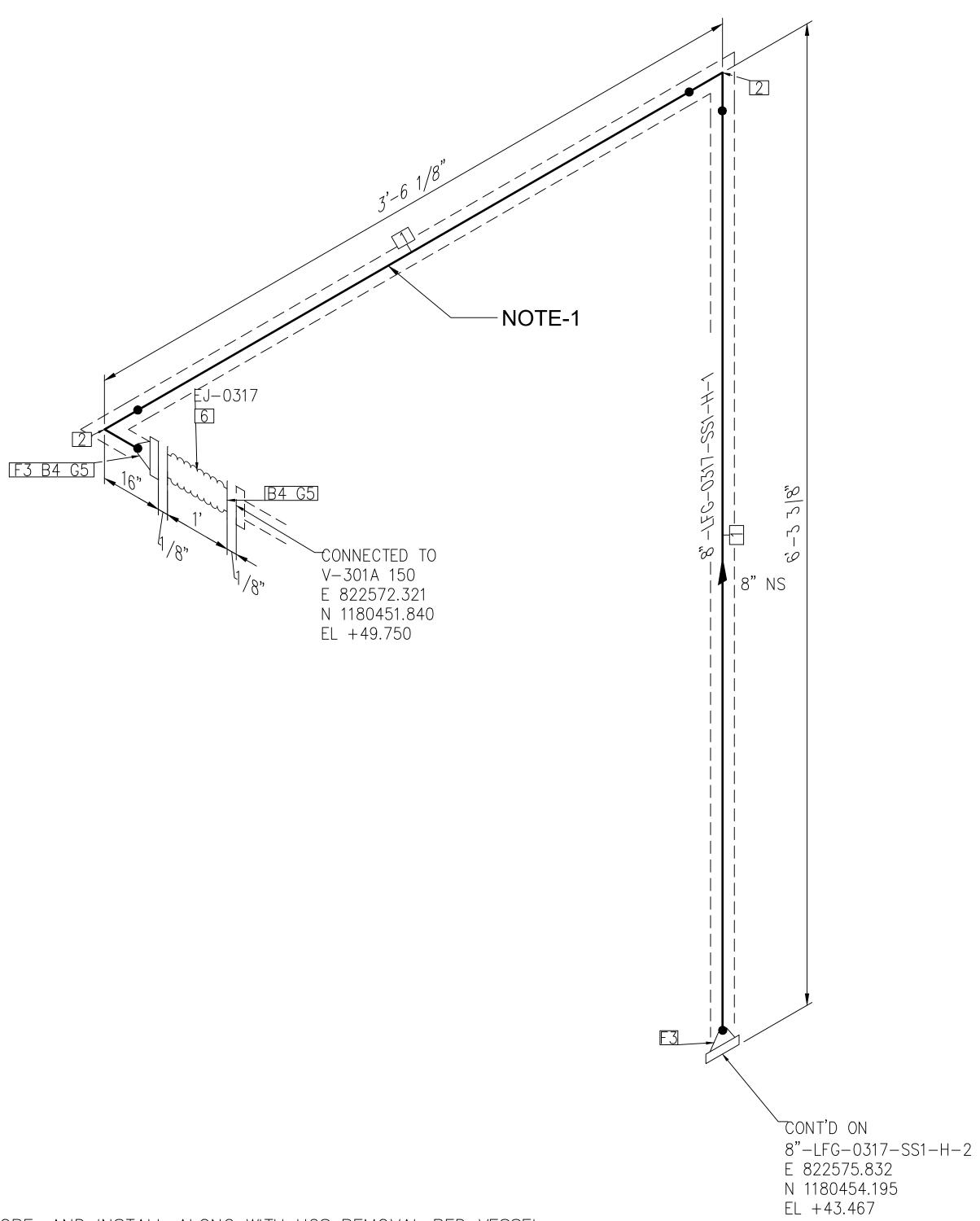
E 822557.473

N 1180455.933 EL +33.125

8-LFG-0312-ST1-H-2



NOTE:



			BILL OF MA	ATERIALS
			PIPI	<u>-</u>
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	6'-6"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304
			FITTIN	IGS
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	2	8"	40S	ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304
			FLAN	GES .
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	2	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
			FASTEN	IERS
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	16	3/4"X4 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
5	2	8"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
			VALV	ES
ID	QTY	ND	ITEM CODE	DESCRIPTION
6	1	8"	EJ-0317	STAINLESS STEEL, 12" LG BELLOW WITH TIE RODS, CLASS 150, RF, ASME B16.5

ISSUED FOR CONSTRUCTION

PIPE SPOOL TO BE FABRICATE IN CURRENT SCOPE, AND INSTALL ALONG WITH H2S REMOVAL BED VESSEL.
 FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

SERVICE LFG

PIPE SPEC SS1

P&ID DWG P2.03

INSULATION SPEC H

INSULATION THK 1"

INDIAN RIVER COUNTY FLORIDA

STATE OF

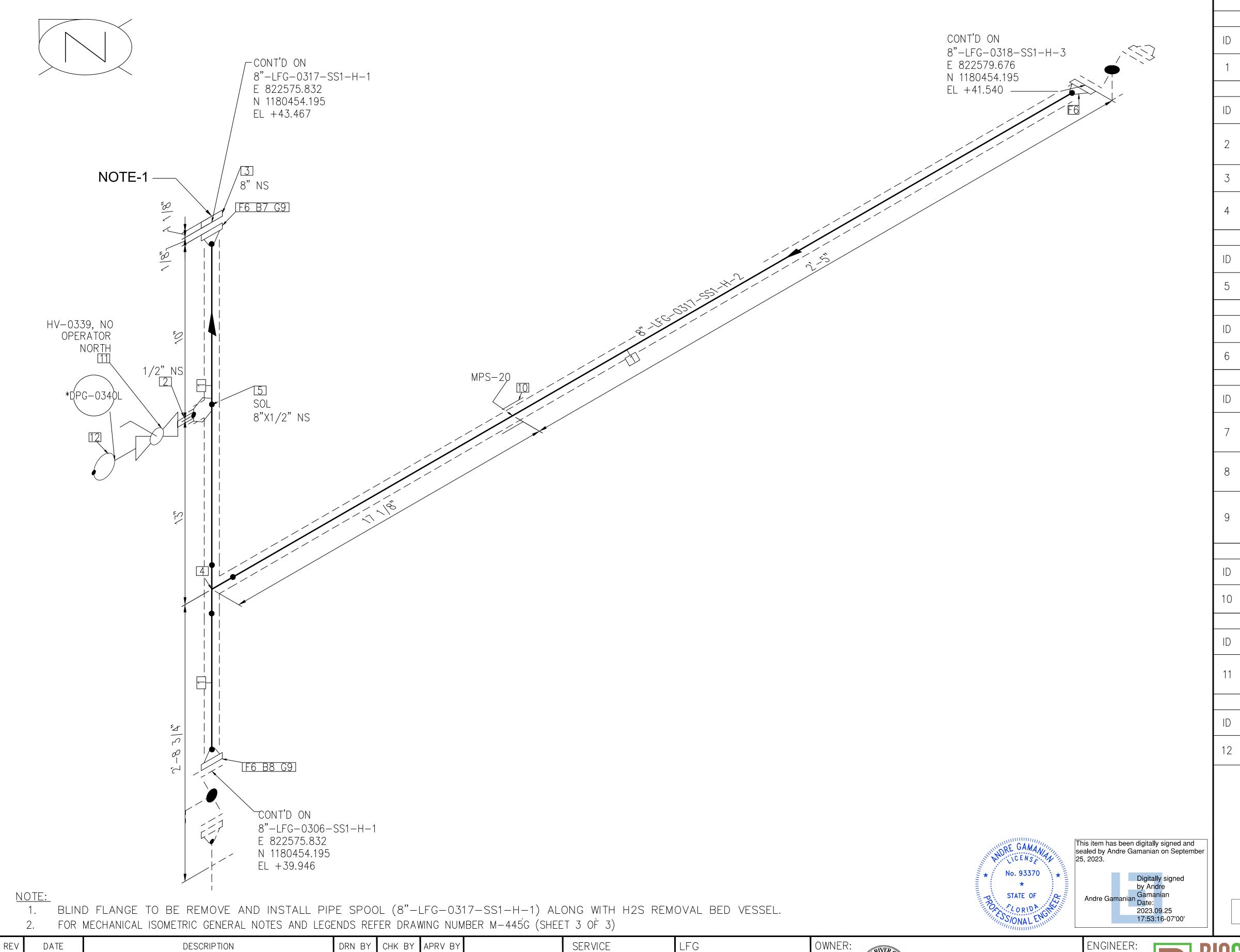
1325 74th AVE SW, VERO BEACH, FLORIDA 32968

/	ENGINEER: BIOGAS
	ENGINEERING PROPERTY AND ADDRESS AND ADDRE
	2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.

Digitally signed by Andre Gamanian Date: 2023.09.25 17:53:16-07'00'

	PIPING ISOMETRIC 8"-LFG-0317-SS1-H	SHEET 1
35	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



BILL OF MATERIALS

PIPE

FITTINGS

OLETS

FLANGES

FASTENERS

DESCRIPTION

DESCRIPTION

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

PIPE NIPPLE, SMLS, 4" LG, SCH

BLIND FLANGE, CLASS 150, RF,

ASME B16.5, ASTM A182 GR F304

EQUAL TEE, SMLS, SCH 40S, BW,

DESCRIPTION

SOCKOLET, CLASS 3000, BW X SW,

MSS-SP-97, ASTM A182 GR F304

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

SS2-4"-2-1 PIPE SADDLE FOR INSULATED PIPE

HV-0339 REGULAR BORE, NPT (F), MANUAL

SIZE 8" TO 16"

B 16.20

PIPE SUPPORTS

VALVES

INSTRUMENT

DPG-0340L | NPT (M)

ITEM CODE

ITEM CODE

ITEM CODE

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

DESCRIPTION

DESCRIPTION

DIFFERENTIAL PRESSURE GAUGE,

BALL VALVE, UNI-BODY DESIGN,

LEVER LOCKABLE OPERATOR

B16.5, ASTM A182 GR F304

ASME B16.9, ASTM A403 GR WP

ASTM A312 GR TP 304

80S, BE X NPT (M), ASME A733,

SCH/CLASS

SCH/CLASS

40S

SCH/CLASS

SCH/CLASS

SCH/CLASS

QTY

4'-8"

QTY

QTY

QTY

QTY

8

QTY

QTY

QTY

ND

1/2"

8"X1/2"

3/4"X4

3/4"X7"

ND

1/2"

INDIAN RIVER COUNTY FLORIDA

2321 E. 28TH STREET, SUITE 400

SIGNAL HILL, CA 90755, Ph: (562) 726-3565

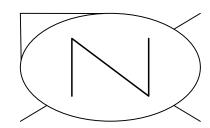
EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
8"-LFG-0317-SS1-H	2
LANDFILL GAS BLOWER SKID	SCALE
& FLARE REPLACEMENT	N.T.S

REV	DATE	DESCRIPTION	DKN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

PIPE SPEC P2.03 P&ID DWG INSULATION SPEC INSULATION THK

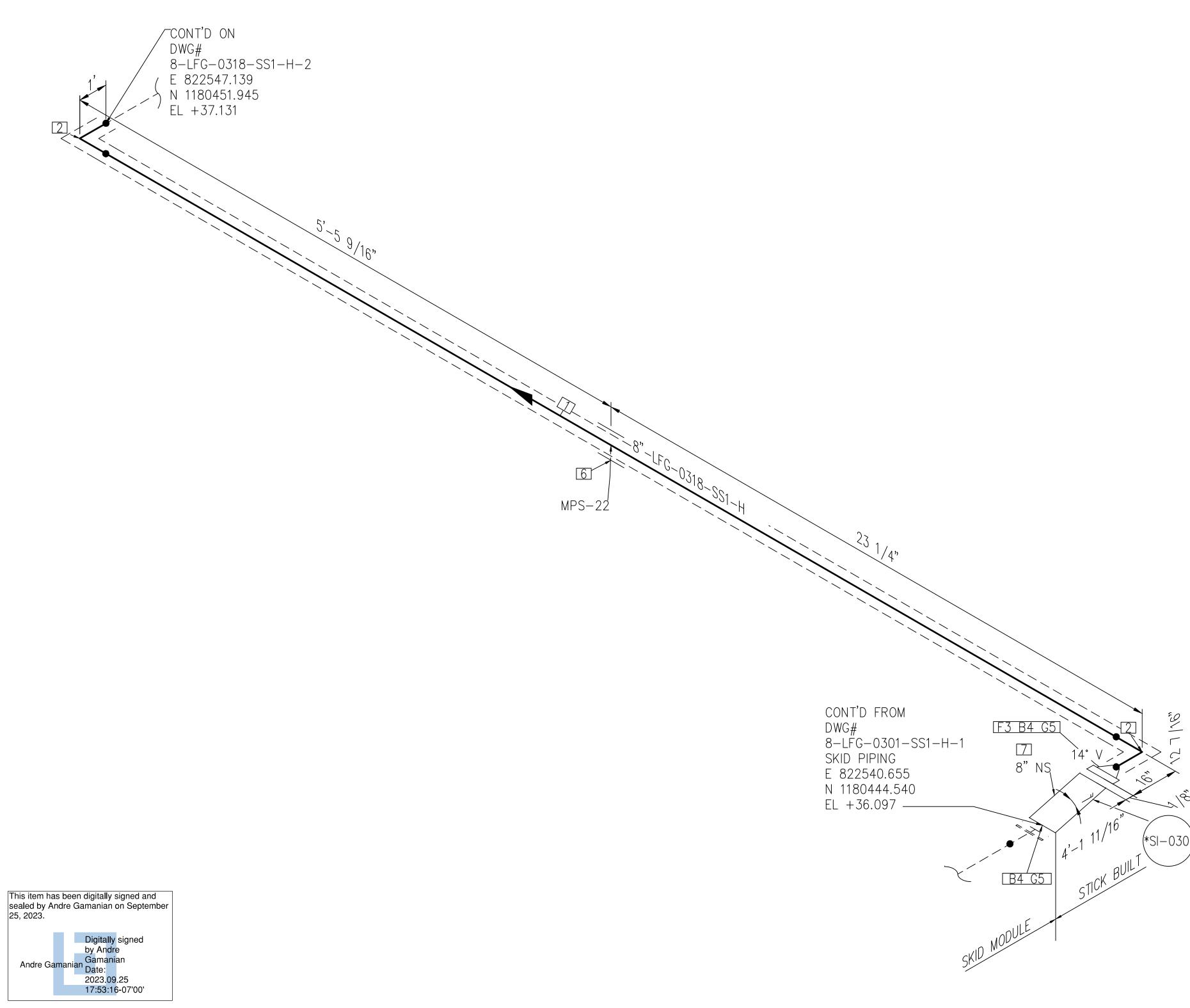
1325 74th AVE SW, VERO BEACH, FLORIDA 32968



No. 93370

STATE OF

CORIDA



PIPE QTY SCH/CLASS DESCRIPTION PIPE, ERW, SCH 40S, BE, ASME 5'-5" B36.19, ASTM A312 GR TP 304 FITTINGS QTY SCH/CLASS DESCRIPTION ID ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304 FLANGES SCH/CLASS QTY DESCRIPTION ND FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304 FASTENERS QTY SCH/CLASS ID | DESCRIPTION STUD BOLT ASTM A193 GR B8, 3/4"X4 ASME 18.2.1, HEXAGONAL NUTS 16 ASTM A194 GR 8, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20 PIPE SUPPORTS QTY DESCRIPTION ID ITEM CODE ND SS2-4"-4-1 PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16" INSTRUMENT QTY ID ITEM CODE DESCRIPTION FLEXIBLE HOSE, RF, CLASS 150 SI - 0301

BILL OF MATERIALS

ISSUED FOR CONSTRUCTION

(C)							
, Biogas	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	
hakur\		01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG	
\Mukesh							
; \M							

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

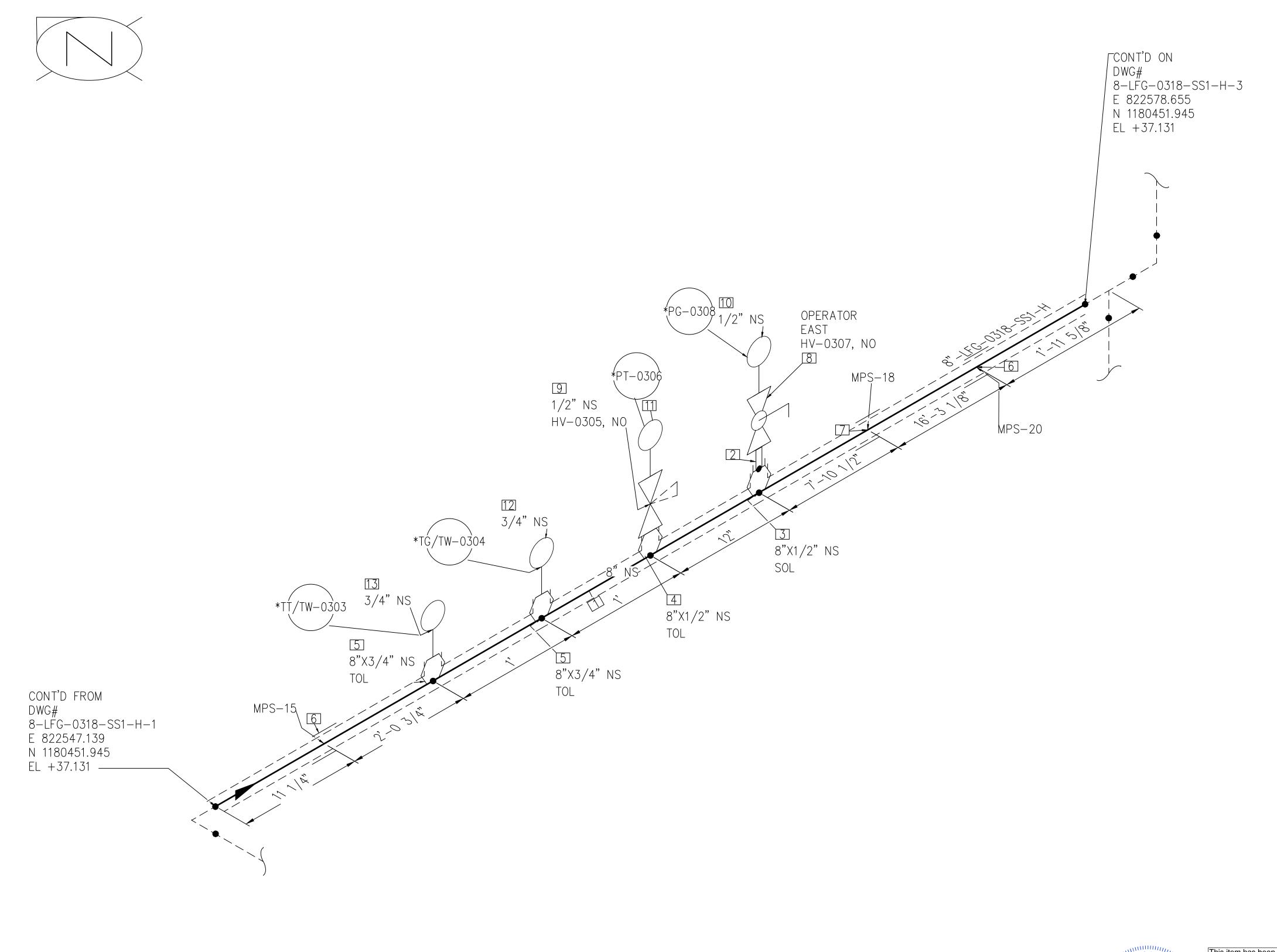
SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.03
INSULATION SPEC	Н
INSULATION THK	1"
	PIPE SPEC P&ID DWG INSULATION SPEC

NDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

EMAIL: INFO@BIOGASENG.COM

ENGINEER: BIOGAS	PIPING ISOMETRIC 8"-LFG-0318-SS1-H	SHEET 1	
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S	



QTY SCH/CLASS DESCRIPTION ID PIPE, ERW, SCH 40S, BE, ASME 1 31'-7" B36.19, ASTM A312 GR TP 304 FITTINGS SCH/CLASS QTY DESCRIPTION ID ND PIPE NIPPLE, SMLS, 4" LG, SCH 1/2" 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304 OLETS SCH/CLASS DESCRIPTION QTY ID ND SOCKOLET, CLASS 3000, BW X SW, 8"X1/2" MSS-SP-97, ASTM A182 GR F304 THREADOLET, CLASS 3000, BW X 8"X1/2" NPT (F), MSS-SP-97, ASTM A182 GR F304 THREADOLET, CLASS 3000, BW X 8"X3/4" NPT (F), MSS-SP-97, ASTM A182 3000 GR F304 PIPE SUPPORTS QTY DESCRIPTION ID ITEM CODE ND SS2-4"-1-1 PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16" SS2-4"-2-1 PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16" VALVES QTY DESCRIPTION ID ITEM CODE BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL HV-0307 LEVER LOCKABLE OPERÁTOR MULTIPORT BLOCK & BLEED VALVE, HV-0305 SOFT SEAT, PTFE PACKING, BLEED PORT INSTRUMENT QTY DESCRIPTION ITEM CODE PG-0308 | PRESSURE GAUGE, NPT (M) 10 1/2" PRESSURE TRANSMITTER, NPT (M) PT-0306 TG/TW-030 TEMPERATURE GAUGE WITH THERMOWELL, NPT (M) TT/TW-0303 TEMPERATURE TRANSMITTER WITH THERMOWELL, NPT (M)

BILL OF MATERIALS

PIPE

No. 93370

This item has been digitally signed and sealed by Andre Gamanian on September

2023.09.25 17:53:16-07'00'

ISSUED FOR CONSTRUCTION

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

NOTE: -

SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.03
INSULATION SPEC	Н
INSULATION THK	1"

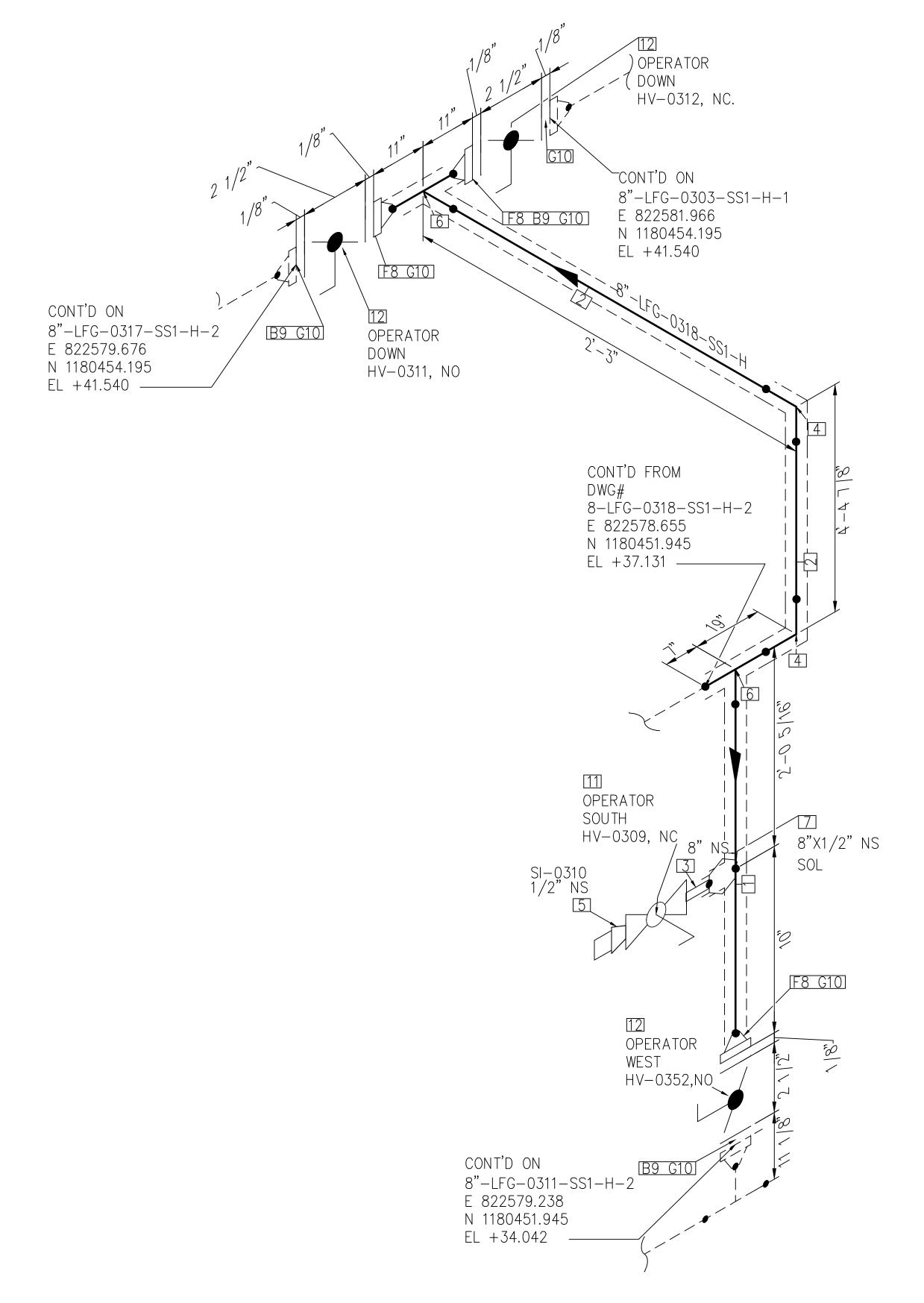
NDIAN RIVER COUNTY FLORIDA

1325	74th AV	/E SW,	
VERO	BEACH,	FLORIDA	32968

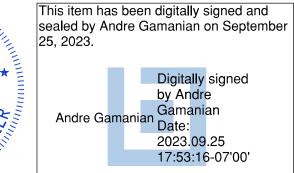
ER:	Ð	BIOGAS
	9	<b>ENGINEERING</b>
281	H STRF	FT. SUITE 400

ENGINEER: BIOGAS	PIPING ISOMETRIC 8"-LFG-0318-SS1-H	SHEET 2
ENGINEERING  2321 E. 28TH STREET, SUITE 400  SIGNAL HILL, CA 90755, Ph: (562) 726-3565  EMAIL: INFO@BIOGASENG.COM	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

NOTE: -







ENGINEER:

ISSUED FOR CONSTRUCTION

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	SERVICE	LFG
	1	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG	PIPE SPEC	SS1
							P&ID DWG	P2.03
							INSULATION SPEC	Н
ſ							INISHII ATION THE	1 "

PIPE SPEC	SS1
P&ID DWG	P2.03
INSULATION SPEC	Н
INSULATION THK	1"

NDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

<b>ENGINEERING</b>
2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC 8"-LFG-0318-SS1-H	SHEET 3
<b>G</b>	LANDFILL GAS BLOWER SKID	SCALE
3565	& FLARE REPLACEMENT	N.T.S

BILL OF MATERIALS

PIPE

FITTINGS

DESCRIPTION

DESCRIPTION

PIPE NIPPLE, SMLS, 4" LG, SCH

80S, BE X NPT (M), ASME A733,

ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR

PLUG, HEX HEAD, CLASS 3000,

NPT (M), ASME B16.11, ASTM A182

EQUAL TEE, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP

DESCRIPTION

SOCKOLET, CLASS 3000, BW X SW,

MSS-SP-97, ASTM A182 GR F304

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

BALL VALVE, UNI-BODY DESIGN,

LEVER LOCKABLE OPERÁTOR

BUTTERFLY VALVE, GEAR

OPERATED, CLASS 150, RF

HV-0309 REGULAR BORE, NPT (F), MANUAL

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

B16.5, ASTM A182 GR F304

ASTM A312 GR TP 304

WP 304

GR F304

OLETS

FLANGES

FASTENERS

VALVES

B 16.20

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

SCH/CLASS

40S

SCH/CLASS

3000

SCH/CLASS

SCH/CLASS

SCH/CLASS

ITEM CODE

HV-0311

HV-0312

HV-0352

QTY

3'-1"

QTY

QTY

QTY

QTY

24

QTY

ID

ID

ID

10

ND

ND

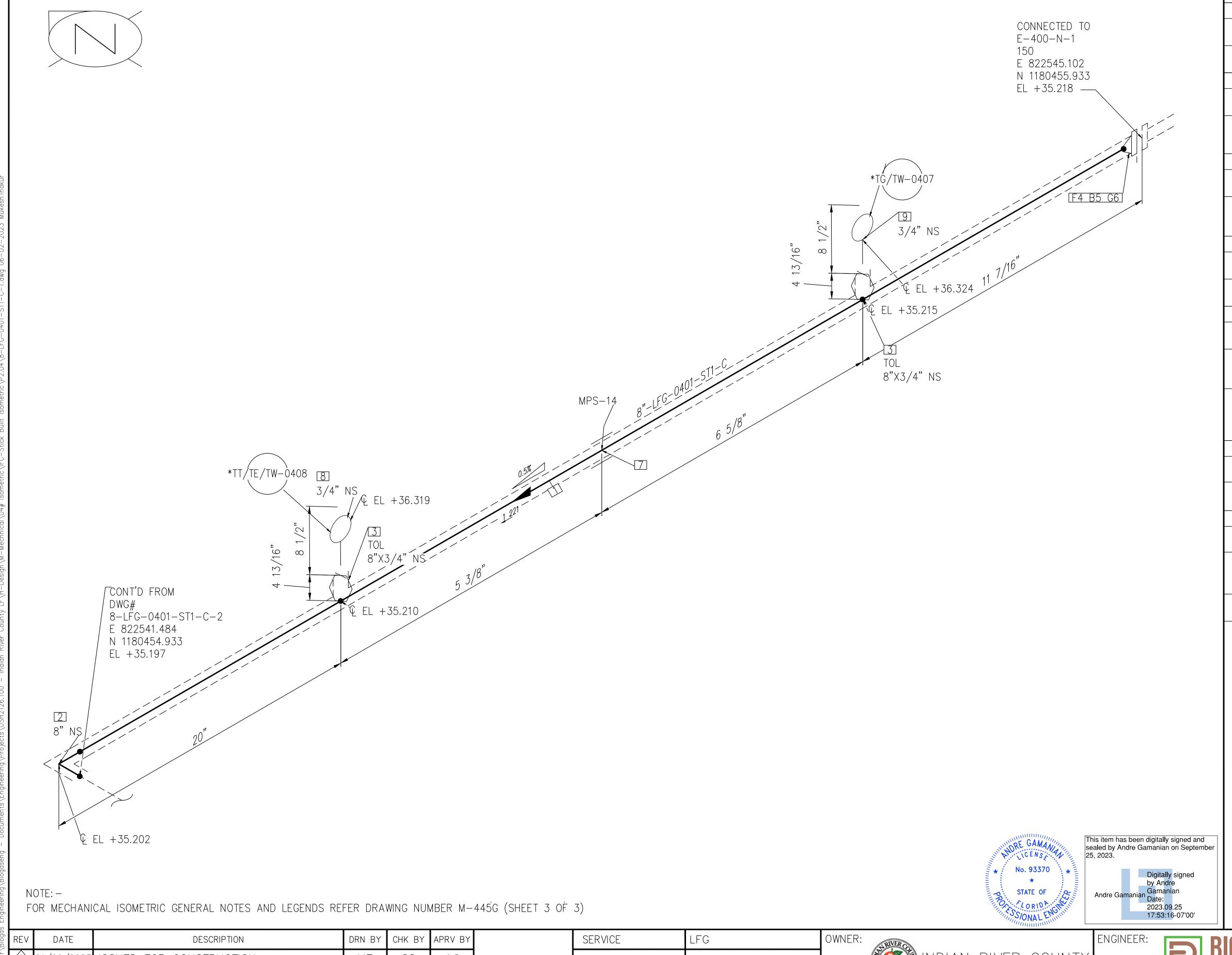
8"X1/2"

ND

ND

3/4"X7"

ID



	BILL OF MATERIALS					
	<u> </u>		PIPI			
ID	QTY	ND	SCH/CLASS	DESCRIPTION		
1	2'-4"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 316		
			FITTIN	GS		
ID	QTY	ND	SCH/CLASS	DESCRIPTION		
2	1	8"	40S	ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 316		
			OLE 7	[S		
ID	QTY	ND	SCH/CLASS	DESCRIPTION		
3	2	8"X3/4"	3000	THREADOLET, CLASS 3000, FW X NPT (F), MSS-SP-97, ASTM A182 GR F316		
			FLANC	GES		
ID	QTY	ND	SCH/CLASS	DESCRIPTION		
4	1	8"	150	FLANGE WN, CLASS 150, FF, ASME B16.5, ASTM A182 GR F316		
	I	I	FASTEN	IERS		
ID	QTY	ND	SCH/CLASS	DESCRIPTION		
5	8	3/4"X4 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2		
6	1	8"	150	SPIRAL WOUND GASKET, 1/8" THK, SS316 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20		
	1	ı	PIPE SUP	PORTS		
ID	QTY	ND	ITEM CODE	DESCRIPTION		
7	1	8"	SS2-4"-1-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"		
INSTRUMENT						
ID	QTY	ND	ITEM CODE	DESCRIPTION		
8	1	3/4"	TT/TE/TW-0 408	TEMPERATURE TRANSMITTER & TEMPERATURE ELEMENT WITH THERMOWELL, NPT (M)		
9	1	3/4"	TG/TW-040 7	TEMPERATURE GAUGE, NPT (M)		

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

SERVICE	LFG
PIPE SPEC	ST1
P&ID DWG	P2.04
INSULATION SPEC	С
INSULATION THK	1"

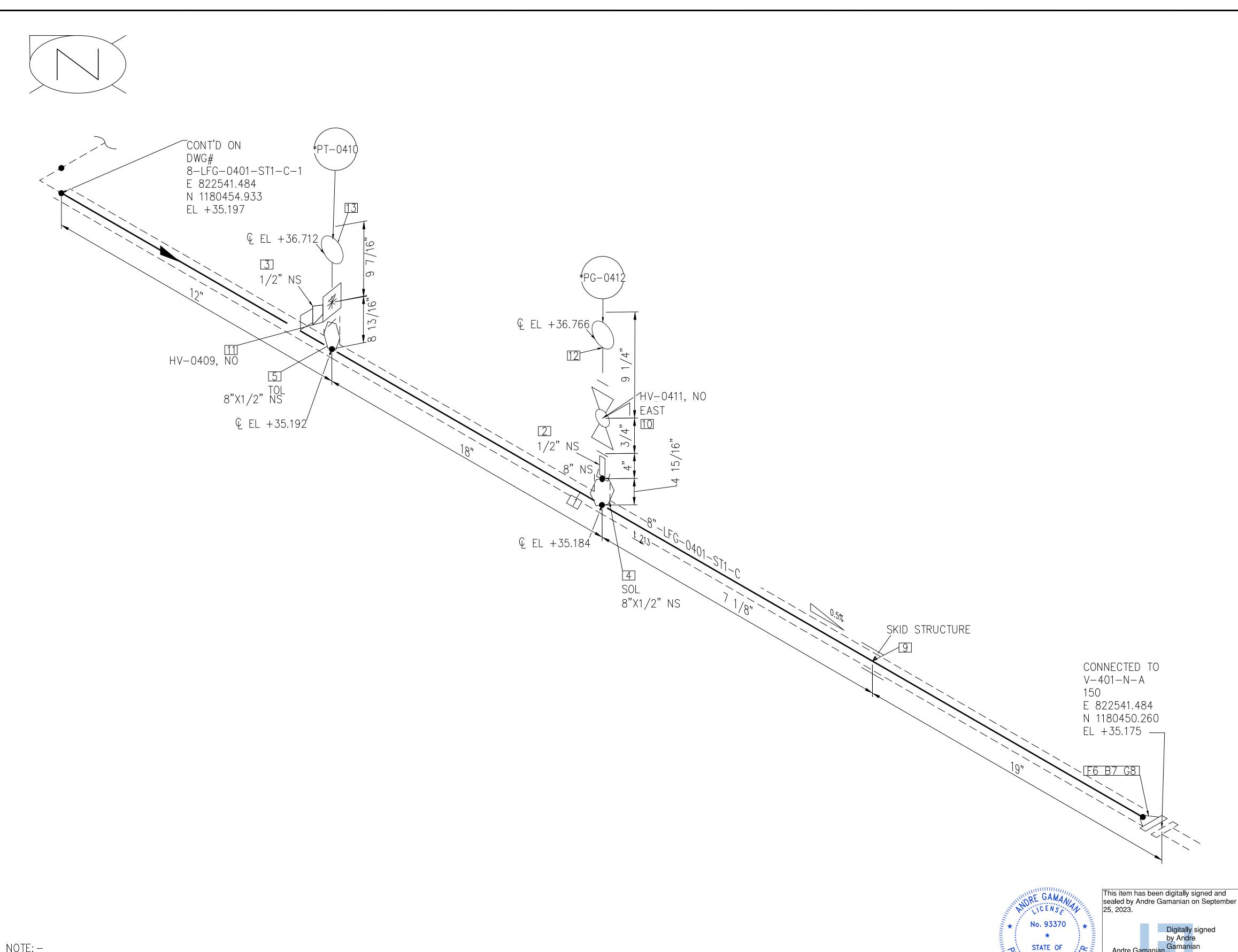
INDIAN RIVER COUNTY
FLORIDA

1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

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ENGINEER:
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ENGINEERING

2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-356
EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC 8"-LFG-0401-ST1-C	SHEET 1
65	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



SERVICE LFG P2.04

INDIAN RIVER COUNTY FLORIDA

2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

2023.09.25 17:53:16-07'00'

ENGINEER:

	PIPING ISOMETRIC 8"-LFG-0401-ST1-C	SHEET 2
)	LANDFILL GAS BLOWER SKID	SCALE
65	& FLARE REPLACEMENT	N.T.S

BILL OF MATERIALS

PIPE

FITTINGS

OLETS

FLANGES

FASTENERS

PIPE SUPPORTS

VALVES

INSTRUMENT

DESCRIPTION

DESCRIPTION

PIPE NIPPLE, SMLS, 4" LG, SCH

PLUG, HEX HEAD, CLASS 3000,

NPT (M), ASME B16.11, ASTM A182

DESCRIPTION

SOCKOLET, CLASS 3000, FW X SW,

MSS-SP-97, ASTM A182 GR F316

THREADOLET, CLASS 3000, FW X

NPT (F), MSS-SP-97, ASTM A182

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

DESCRIPTION

MULTIPORT BLOCK & BLEED VALVE,

DESCRIPTION

BALL VALVE, UNI-BODY DESIGN,

LEVER LOCKABLE OPERÁTOR

PRESSURE GAUGE, NPT (M)

PT-0410 PRESSURE TRANSMITTER, NPT (M)

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2

SS316 WINDING MATERIAL, SS

SS2-4"-1-1 PIPE SADDLE FOR INSULATED PIPE

HV-0411 REGULAR BORE, NPT (F), MANUAL

HV-0409 SOFT SEAT, PTFE PACKING, BLEED

SIZE 8" TO 16"

B16.5, ASTM A182 GR F316

ASTM A312 GR TP 316

GR F304

GR F316

B 16.20

80S, PE X NPT (M), ASME A733,

PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 316

SCH/CLASS

SCH/CLASS

SCH/CLASS

3000

SCH/CLASS

SCH/CLASS

ITEM CODE

ITEM CODE

ITEM CODE

PG-0412

QTY

QTY

QTY

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ID

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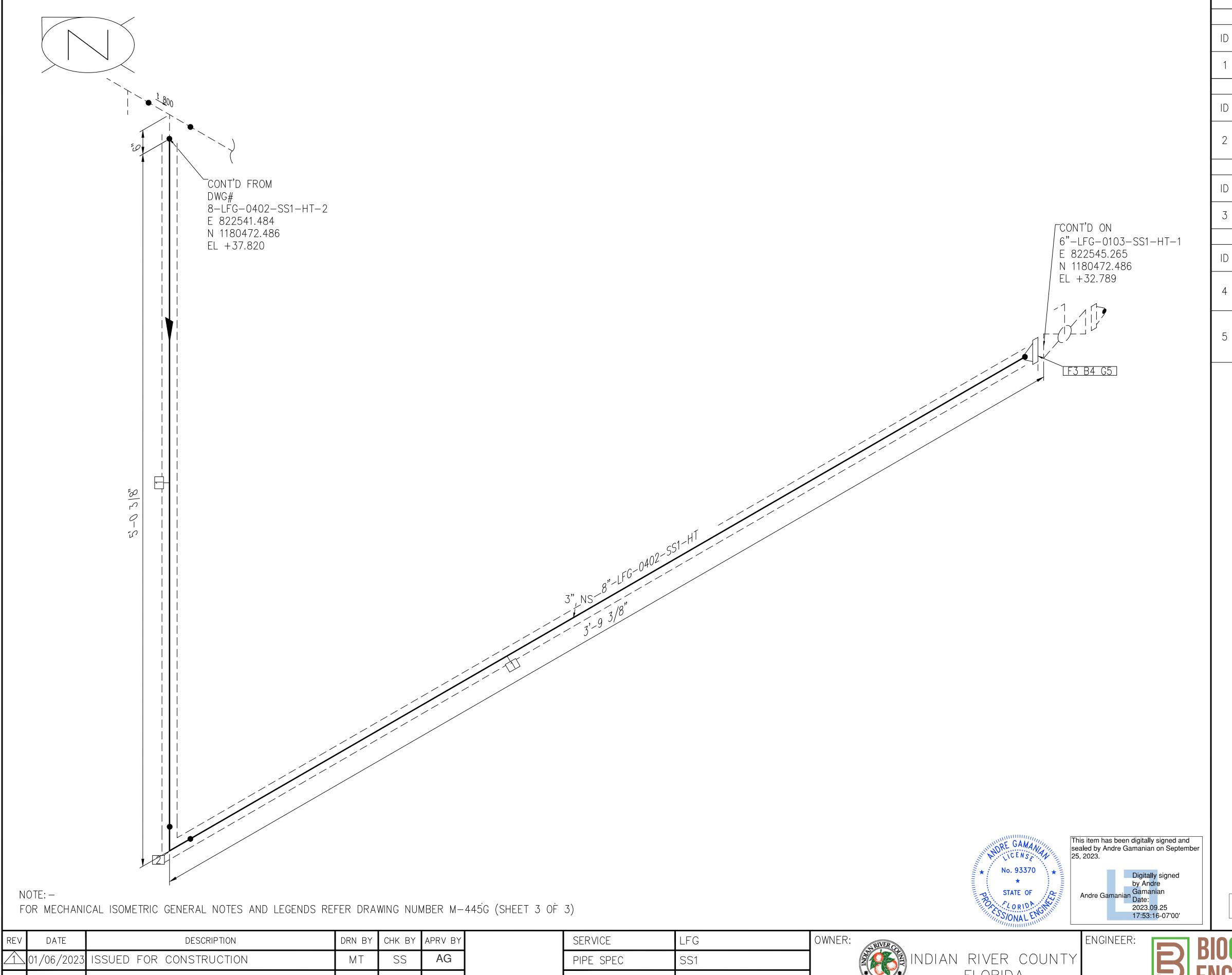
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

PIPE SPEC P&ID DWG INSULATION SPEC INSULATION THK

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

NOTE: -

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)



	BILL OF MATERIALS						
	PIPE						
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
1	7'-10"	3"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304			
			FITTIN	IGS			
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
2	1	3"	40S	ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304			
			FLANC	GES			
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
3	1	3"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304			
			FASTEN	VERS			
ID	QTY	ND	SCH/CLASS	DESCRIPTION			
4	4	5/8"X3 1/2"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2			
5	1	3"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20			

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.04
INSULATION SPEC	НТ
INSULATION THK	1"

INDIAN RIVER COUNTY
FLORIDA

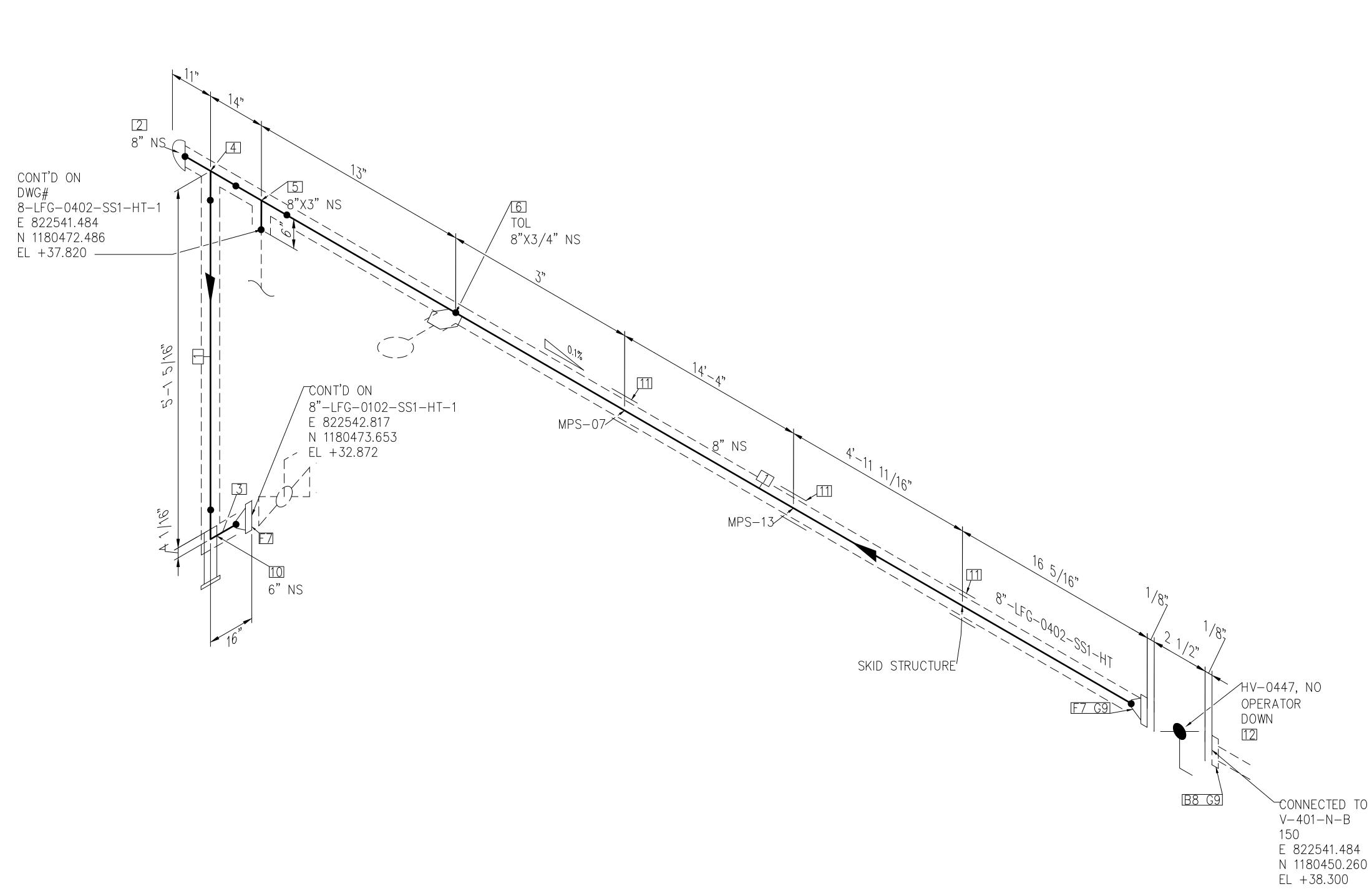
1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

BIOGAS
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ENGINEER:

2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-356
EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC 8"-LFG-0402-SS1-HT	SHEET 1
G	LANDFILL GAS BLOWER SKID & FLARF REPLACEMENT	SCALE N.T.S
565	S TENNETHER ENGLINETY	

NOTE: -



No. 93370

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This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.

Digitally signed by Andre Gamanian

Andre Gamanian

Date:

ENGINEER:

2023.09.25 17:53:16-07'00' ISSUED FOR CONSTRUCTION

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

SERVICE LFG
PIPE SPEC SS1
P&ID DWG P2.04
INSULATION SPEC HT
INSULATION THK 1"

INDIAN RIVER COUNTY
FLORIDA

1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

ENGINEERING

2321 E. 28TH STREET, SUITE 400

SIGNAL HILL, CA 90755, Ph: (562) 726-3565

EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC 8"-LFG-0402-SS1-HT	SHEET 2
65	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

BILL OF MATERIALS

PIPE

FITTINGS

DESCRIPTION

DESCRIPTION

CAP, SMLS, SCH 40S, BW, ASME

B16.9, ASTM A403 GR WP 304

ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR

EQUAL TEE, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP

TEE REDUCING, SMLS, SCH 40S,

BW, ASME B16.9, ASTM A403 GR

DESCRIPTION

THREADOLET, CLASS 3000, BW X

NPT (F), MSS-SP-97, ASTM A182

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

DESCRIPTION

LOW SUPPORT SLIDING FOR BARE

AND INSULATED PIPE - SIZE 2"

SS2-4"-1-1 PIPE SADDLE FOR INSULATED PIPE

BUTTERFLY VALVE, GEAR

OPERATED, CLASS 150, RF

SIZE 8" TO 16"

B16.5, ASTM A182 GR F304

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

SCH/CLASS

SCH/CLASS

40S

40S

40S

SCH/CLASS

3000

SCH/CLASS

SCH/CLASS

ITEM CODE

LS3-33

1/2"-1-3

ITEM CODE

HV-0447

WP 304

GR F304

B 16.20

OLETS

FLANGES

FASTENERS

PIPE SUPPORTS

VALVES

QTY

25'

QTY

QTY

QTY

QTY

ID

ID

10

ID

12

QTY

ND

8"X3"

ND

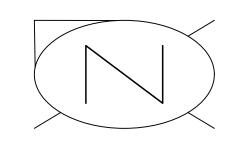
8"X3/4"

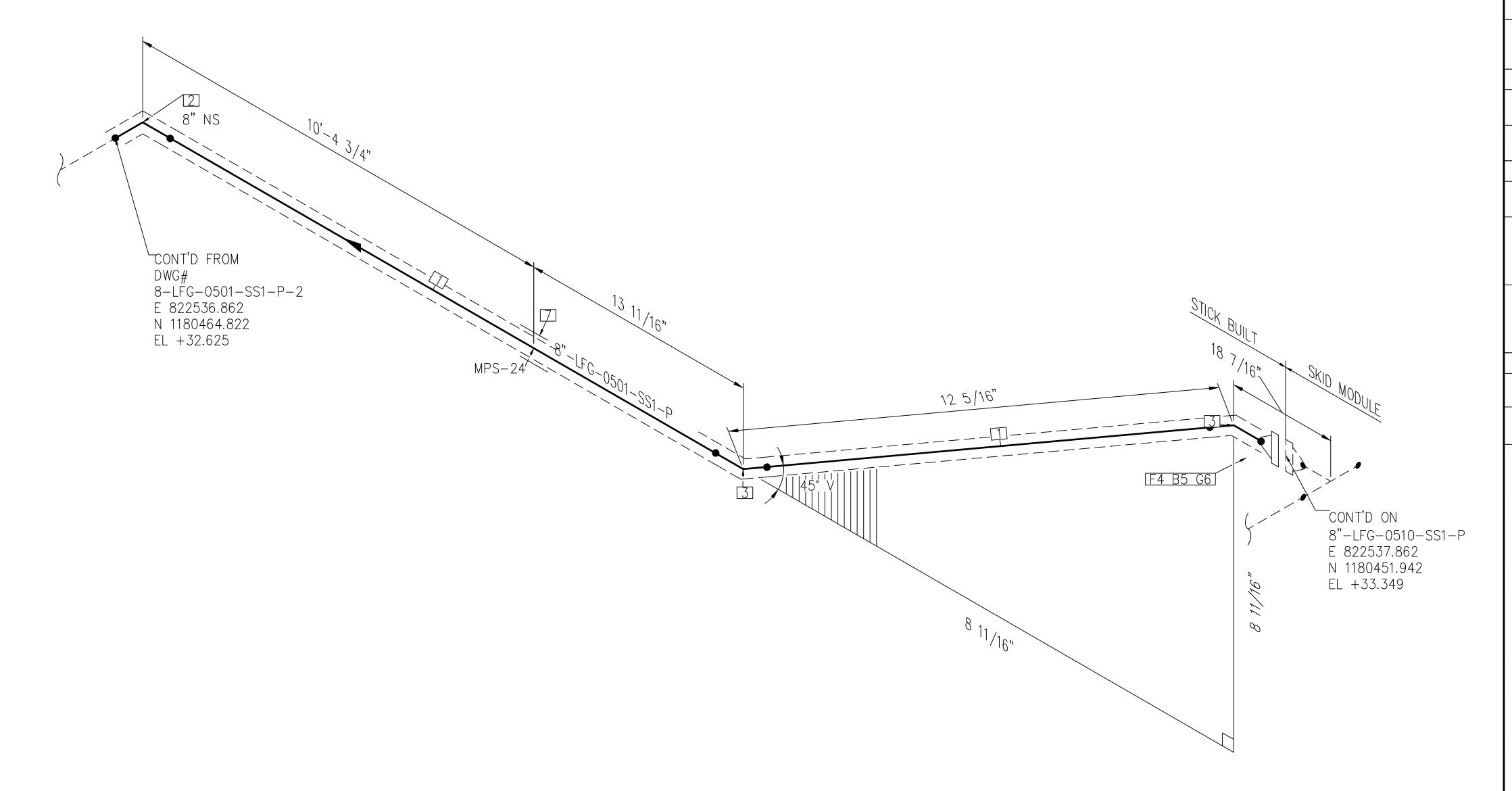
3/4"X7"

ND

ID

ID





BILL OF MATERIALS PIPE QTY SCH/CLASS DESCRIPTION ID PIPE, ERW, SCH 40S, BE, ASME 1 10'-9" B36.19, ASTM A312 GR TP 304 FITTINGS SCH/CLASS ID QTY DESCRIPTION ND ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304 ELBOW 45 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304 FLANGES QTY SCH/CLASS DESCRIPTION ID ND FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304 FASTENERS QTY SCH/CLASS DESCRIPTION ID ND STUD BOLT ASTM A193 GR B8, 3/4"X4 ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20 PIPE SUPPORTS QTY ITEM CODE DESCRIPTION SS2-4"-2-1 PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"

STATE OF

This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Andre Gamanian Date:
2023.09.25
17:53:16-07'00'

ENGINEER:

ISSUED FOR CONSTRUCTION

NOTE: -FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
$\triangle$	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

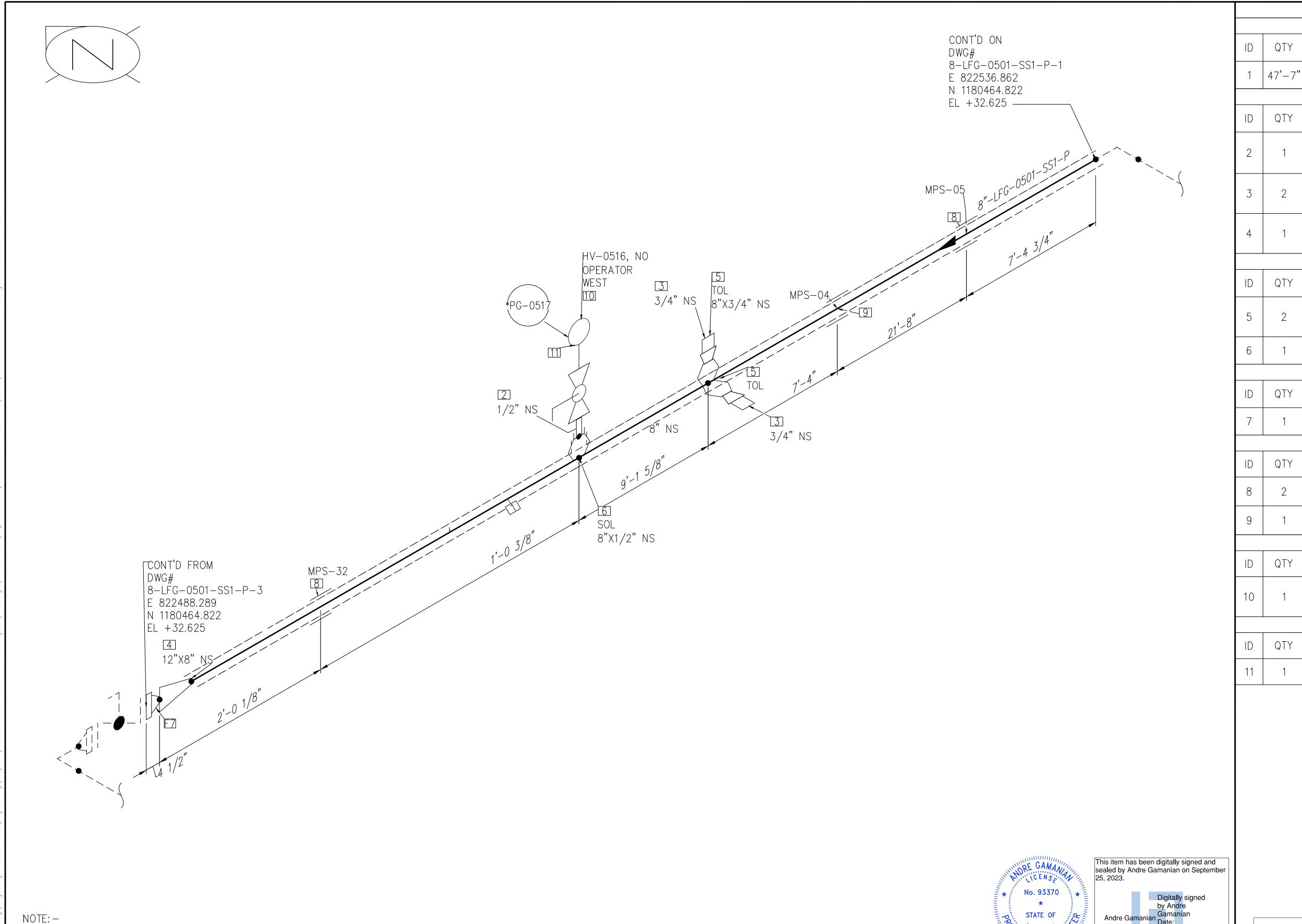
SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.05
INSULATION SPEC	Р
INSULATION THK	1"

INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

Y	ENGINEER: BIOGAS
•	<b>ENGINEERING</b>
	2321 E. 28TH STREET, SUITE 400
	SIGNAL HILL, CA 90755, Ph: (562) 726-3565
	EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC	SHEET
	8"-LFG-0501-SS1-P	1
EERING		SCALE
) 2) 726–3565	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	N.T.S
		i



Andre Gamanian Date: STATE OF 2023.09.25 17:53:16-07'00'

ENGINEER:

ISSUED FOR CONSTRUCTION

Biogo	REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	
⊺hakur\		01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG	
AukeshTI							
$\mathbb{N}$							

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.05
INSULATION SPEC	Р
INSULATION THK	1"

INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

ENGINEEKING
2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM ` ´

	PIPING ISOMETRIC 8"-LFG-0501-SS1-P	SHEET 2
<b>G</b>	LANDFILL GAS BLOWER SKID	SCALE
3565	& FLARE REPLACEMENT	N.T.S

BILL OF MATERIALS

PIPE

FITTINGS

OLETS

FLANGES

PIPE SUPPORTS

VALVES

INSTRUMENT

DESCRIPTION

DESCRIPTION

PIPE, ERW, SCH 40S, BE, ASME

B36.19, ASTM A312 GR TP 304

PIPE NIPPLE, SMLS, 4" LG, SCH

PLUG, HEX HEAD, CLASS 3000,

NPT (M), ASME B16.11, ASTM A182

REDUCER (CONC), ERW, SCH 10S X

DESCRIPTION

THREADOLET, CLASS 3000, BW X

NPT (F), MSS-SP-97, ASTM A182

SOCKOLET, CLASS 3000, BW X SW,

MSS-SP-97, ASTM A182 GR F304

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

DESCRIPTION

DESCRIPTION

BALL VALVE, UNI-BODY DESIGN,

LEVER LOCKABLE OPERATOR

B16.5, ASTM A182 GR F304

SS2-4"-1-1 PIPE SADDLE FOR INSULATED PIPE

SS2-4"-2-1 PIPE SADDLE FOR INSULATED PIPE

HV-0516 REGULAR BORE, NPT (F), MANUAL

PG-0517 PRESSURE GAUGE, NPT (M)

SIZE 8" TO 16"

SIZE 8" TO 16"

ASTM A312 GR TP 304

10S X 40S | SCH 40S, BW, ASME B16.9, ASTM

A403 GR WP 304

GR F304

GR F304

80S, BE X NPT (M), ASME A733,

SCH/CLASS

40S

SCH/CLASS

SCH/CLASS

3000

3000

SCH/CLASS

ITEM CODE

ITEM CODE

ITEM CODE

QTY

QTY

QTY

QTY

QTY

QTY

QTY

ND

1/2"

3/4"

12"X8"

ND

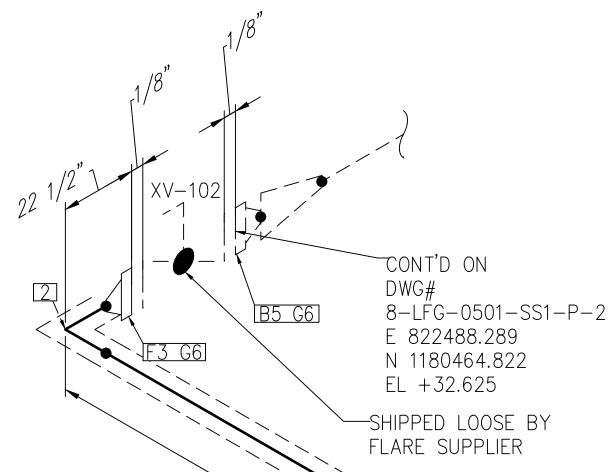
8"X3/4"

8"X1/2"

ND

ND

ND



12" NS

5'-75/16"

5/16"

F3 B4 G6

SHIPPED LOOSE BY
FLARE SUPPLIER

CONNECTED TO F-500-N-1 150 E 822486.131 N 1180453.343

EL +32.625

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This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.

Digitally signed by Andre Gamanian Date:
2023.09.25
17:53:16-07'00'

ENGINEER:

ISSUED FOR CONSTRUCTION

FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

NOTE: -

SERVICE LFG
PIPE SPEC SS1
P&ID DWG P2.05
INSULATION SPEC P
INSULATION THK 1"

INDIAN RIVER COUNTY
FLORIDA

1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

ENGINEERING

2321 E. 28TH STREET, SUITE 400

SIGNAL HILL, CA 90755, Ph: (562) 726-3565

EMAIL: INFO@BIOGASENG.COM

	PIPING ISOMETRIC 8"-LFG-0501-SS1-P	SHEET 3
35	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

BILL OF MATERIALS

PIPE

FITTINGS

FLANGES

FASTENERS

1304

DESCRIPTION

DESCRIPTION

ELBOW 90 LR, ERW, SCH 10S, BW,

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

SS2-4"-2-1 PIPE SADDLE FOR INSULATED PIPE

SIZE 8" TO 16"

B 16.20

PIPE SUPPORTS

ITEM CODE

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

B16.5, ASTM A182 GR F304

ASME B16.9, ASTM A403 GR WP

PIPE, ERW, SCH 10S, BE, ASME

B36.19, ASTM A312 GR TP 304

SCH/CLASS

10S

SCH/CLASS

SCH/CLASS

SCH/CLASS

QTY

8'

QTY

QTY

QTY

24

12

QTY

ID

ID

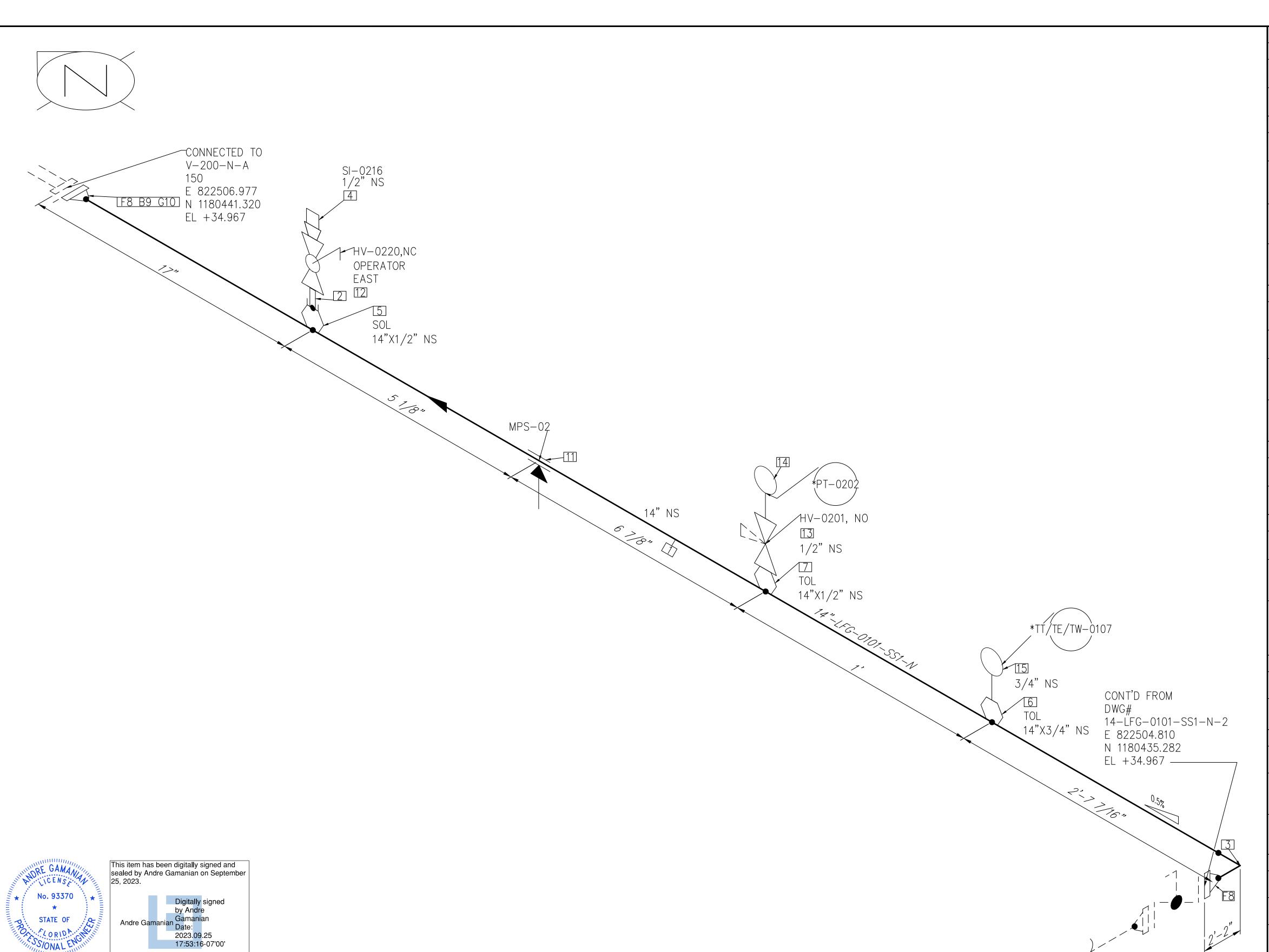
ID |

12"

ND

7/8"X4

7/8"X8



PIPE QTY SCH/CLASS DESCRIPTION ID PIPE, ERW, SCH 10S, BE, ASME 1 | 3'-11" 14" 10S B36.19, ASTM A312 GR TP 304 FITTINGS QTY SCH/CLASS ID DESCRIPTION ND PIPE NIPPLE, SMLS, 4" LG, SCH 1/2" 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304 ELBOW 90 LR, ERW, SCH 10S, BW, ASME B16.9, ASTM A403 GR WP 14" 10S PLUG, HEX HEAD, CLASS 3000, 1/2" NPT (M), ASME B16.11, ASTM A182 3000 IGR F304 OLETS QTY SCH/CLASS DESCRIPTION SOCKOLET, CLASS 3000, BW X SW, 14"X1/2" 3000 MSS-SP-97, ASTM A182 GR F304 THREADOLET, CLASS 3000, BW X 14"X3/4" 3000 NPT (F), MSS-SP-97, ASTM A182 GR F304 THREADOLET, CLASS 3000, BW X 14"X1/2" NPT (F), MSS-SP-97, ASTM A182 3000 IGR F304 FLANGES SCH/CLASS QTY DESCRIPTION ND FLANGE WN, CLASS 150, RF, ASME 14" B16.5, ASTM A182 GR F304 FASTENERS SCH/CLASS QTY DESCRIPTION STUD BOLT ASTM A193 GR B8, 1"X5 1/4" ASME 18.2.1, HEXAGONAL NUTS 12 ASTM A194 GR 8, ASME 18.2.2 SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20 PIPE SUPPORTS QTY ITEM CODE ID DESCRIPTION GUIDE SUPPORT FOR BARE GS2-14" PIPE-SIZE 14" TO 24" VALVES QTY ITEM CODE ID ND DESCRIPTION BALL VALVE, UNI-BODY DESIGN, 1/2" HV-0220 REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERÁTOR MULTIPORT BLOCK & BLEED VALVE, HV-0201 SOFT SEAT, PTFE PACKING, BLEED PORT INSTRUMENT QTY ID DESCRIPTION ITEM CODE ND PRESSURE TRANSMITTER, NPT (M) PT-0202 TEMPERATURE TRANSMITTER & TT/TE/TW-0 TEMPERATURE ELEMENT WITH 3/4" THERMOWELL, NPT (M) ISSUED FOR CONSTRUCTION

BILL OF MATERIALS

NOTE: FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
$\triangle$	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG
-					
-					

SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.01
INSULATION SPEC	N
INSULATION THK	
	PIPE SPEC P&ID DWG INSULATION SPEC

INDIAN RIVER COUNTY FLORIDA

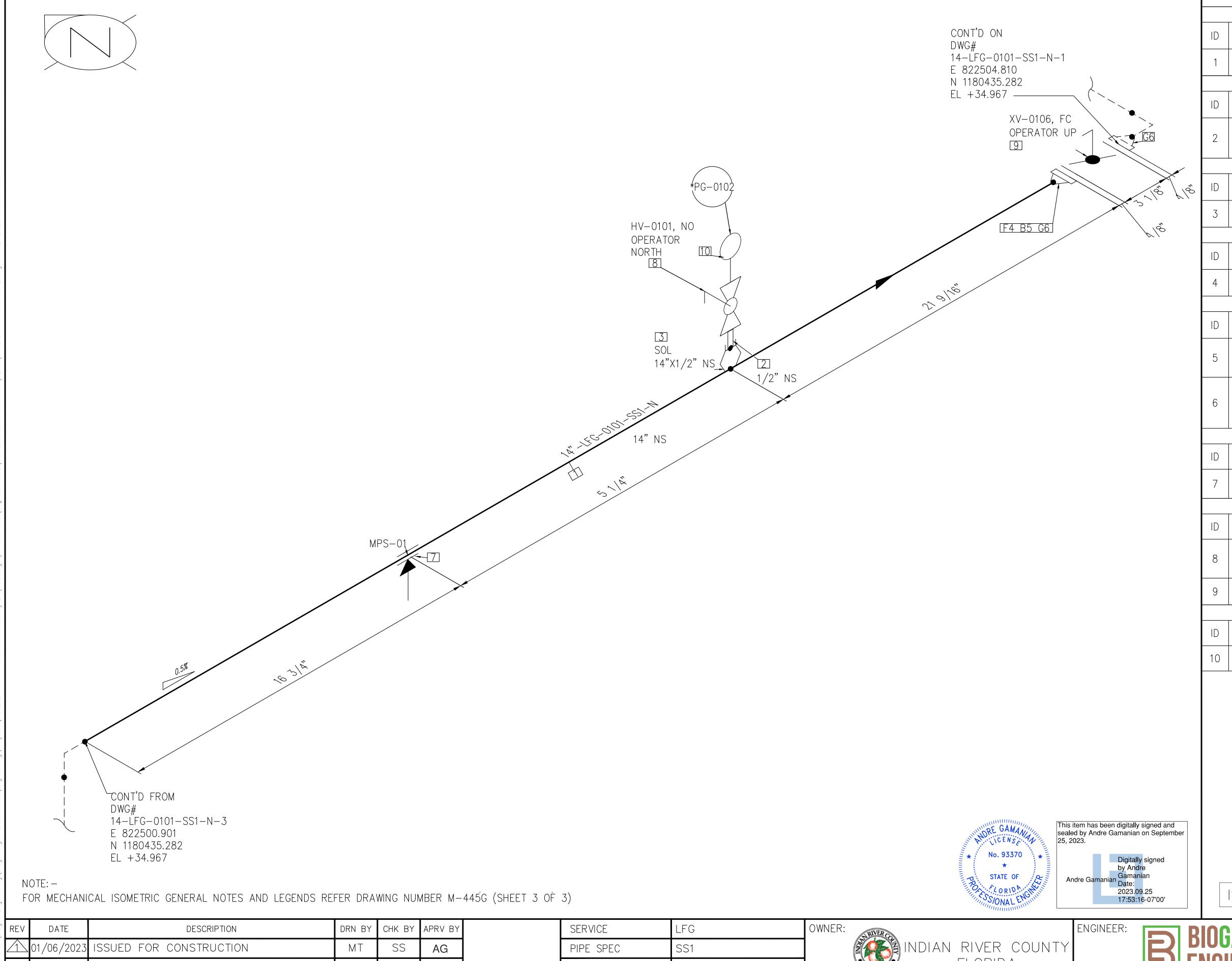
1325 74th AVE SW,

1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

SIGNAL HILL, CA 90755, Ph: (562) 726-EMAIL: INFO@BIOGASENG.COM

ENGINEER:

IOGAS	PIPING ISOMETRIC 14"-LFG-0101-SS1-N	SHEET 1
NGINEERING SUITE 400 Ph: (562) 726-3565	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



BILL OF MATERIALS				
	T	1	PIPI	E
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	3'-3"	14"	10S	PIPE, ERW, SCH 10S, BE, ASME B36.19, ASTM A312 GR TP 304
			FITTIN	IGS
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304
	T	T	OLE <sup>-</sup>	TS
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	1	14"X1/2"	3000	SOCKOLET, CLASS 3000, BW X SW, MSS-SP-97, ASTM A182 GR F304
			FLANC	GES
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	1	14"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
			FASTEN	VERS
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	12	1"X8 3/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
6	2	14"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
	T	I	PIPE SUP	PORTS
ID	QTY	ND	ITEM CODE	DESCRIPTION
7	1	14"	GS2-14"	GUIDE SUPPORT FOR BARE PIPE-SIZE 14" TO 24"
			VALV	ES
ID	QTY	ND	ITEM CODE	DESCRIPTION
8	1	1/2"	HV-0101	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
9	1	14"	XV-0106	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF
			INSTRUI	MENT
ID	QTY	ND	ITEM CODE	DESCRIPTION
10	1	1/2"	PG-0102	PRESSURE GAUGE, NPT (M)
	1			

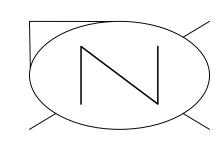
P2.01 P&ID DWG INSULATION SPEC INSULATION THK

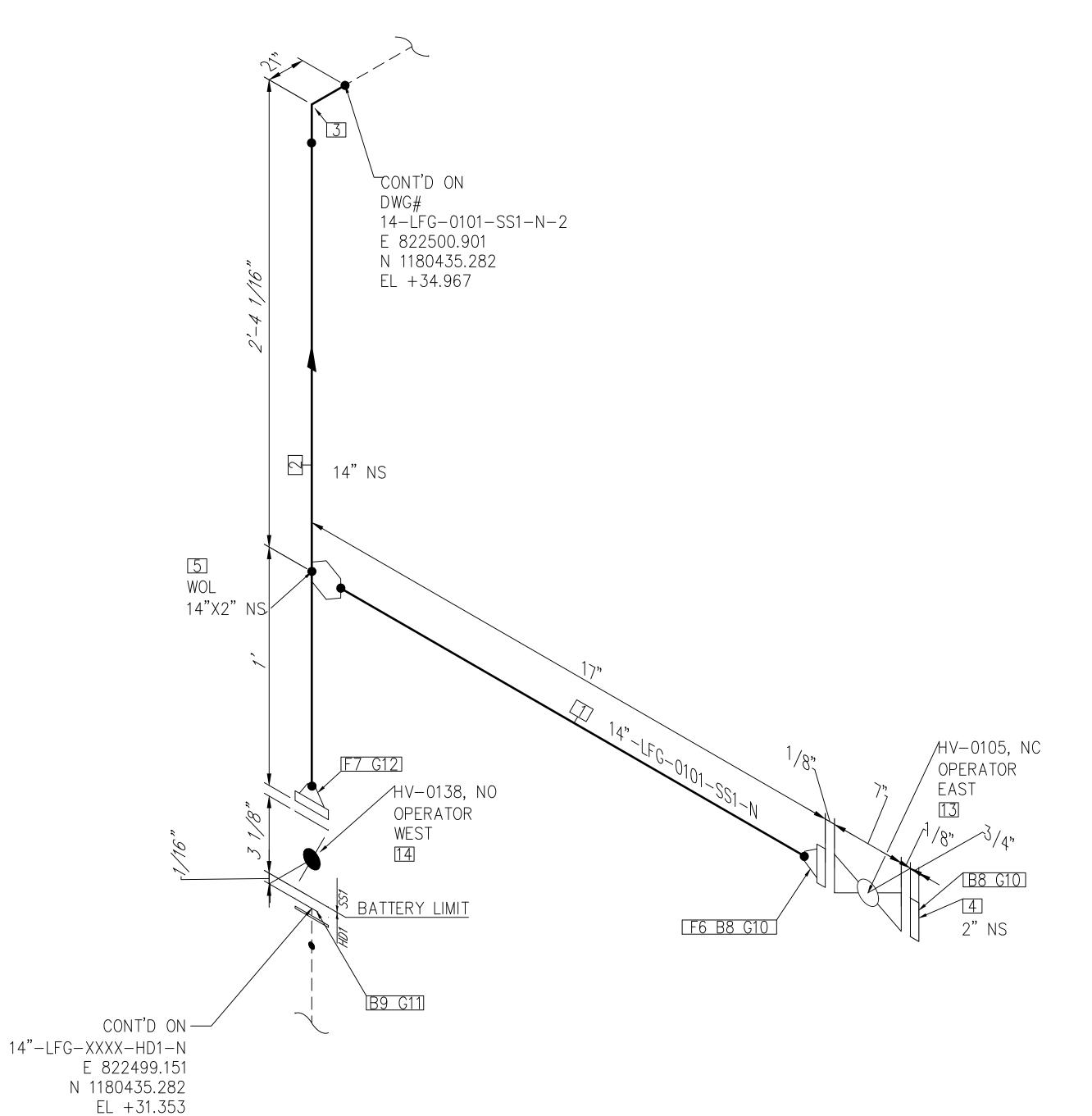
FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

	BIC FN	DGAS GINEERIN	IG
2321 E. 28TH			

BIOGAS	PIPING ISOMETRIC  14"-LFG-0101-SS1-N	SHEET 2
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 7 EMAIL: INFO@BIOGASENG.COM	LANDFILL GAS BLOWER SKID	SCALE N.T.S





This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. Digitally signed by Andre Gamanian Date: 2023.05 2023.09.25 17:53:16-07'00'

ISSUED FOR CONSTRUCTION

NOTE: -FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
	01/06/2023	ISSUED FOR CONSTRUCTION	МТ	SS	AG

SERVICE	LFG	
PIPE SPEC	SS1	
P&ID DWG	P2.01	
INSULATION SPEC	Ν	
INSULATION THK	_	

INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW,

VERO BEACH, FLORIDA 32968

Y		ENGINEERING BIUGAS
	2321 E. 28TH STREET	Γ, SUITE 400
	SIGNAL HILL, CA 907	55, Ph: (562) 726-35

BIOGAS	PIPING ISOMETRIC 14"-LFG-0101-SS1-N
ENGINEERING  2321 E. 28TH STREET, SUITE 400  SIGNAL HILL, CA 90755, Ph: (562) 726-3565  EMAIL: INFO@BIOGASENG.COM	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

BILL OF MATERIALS

PIPE

FITTINGS

OLETS

FLANGES

FASTENERS

DESCRIPTION

PIPE, ERW, SCH 80S, BE, ASME B36.19, ASTM A312 GR TP 304

PIPE, ERW, SCH 10S, BE, ASME

B36.19, ASTM A312 GR TP 304

DESCRIPTION

ELBOW 90 LR, ERW, SCH 10S, BW, ASME B16.9, ASTM A403 GR WP

BLIND FLANGE, CLASS 150, RF,

ASME B16.5, ASTM A182 GR F304

DESCRIPTION

DESCRIPTION

FLANGE WN, CLASS 150, RF, ASME

FLANGE WN, CLASS 150, RF, ASME

DESCRIPTION

STUD BOLT ASTM A193 GR B8,

ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS

ASTM A194 GR 8, ASME 18.2.2

SS304 WINDING MATERIAL, SS

GASKET NEOPRENE, ASME 16.5,

SS304 WINDING MATERIAL, SS

CLASS 150, FLAT FACED

B 16.20

B 16.20

VALVES

ITEM CODE

HV-0138

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

SPIRAL WOUND GASKET, 1/8" THK,

OUTER RING, CLASS 150, RF, ASME

DESCRIPTION

SHEET

SCALE

N.T.S

BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF

BUTTERFLY VALVE, GEAR

OPERATED, CLASS 150, RF

B16.5, ASTM A182 GR F304

B16.5, ASTM A182 GR F304

WELDOLET, LIGHTWEIGHT, CLASS

3000, BW, MSS-SP 97, ASTM

A182 GR F304

SCH/CLASS

SCH/CLASS

SCH/CLASS

3000

SCH/CLASS

SCH/CLASS

QTY

1'-3"

QTY

QTY

QTY

QTY

12

QTY

ND

14"X2"

ND

ND

5/8"X3

1/4"

3/4"

14"

ND

14"

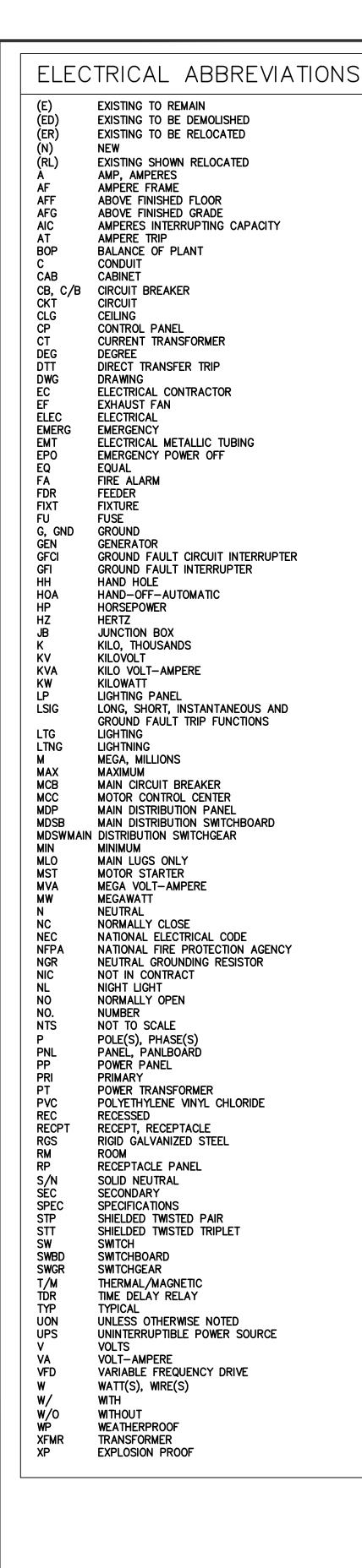
ID

ID

ID

ID

10



POV	POWER DISTRIBUTION						
	208/120 VOLT PANELBOARD						
	480/277 VOLT PANELBOARD						
Т	TRANSFORMER						
0	JUNCTION BOX						
다	NON-FUSED DISCONNECT SWITCH						
C/B <b>L</b>	ENCLOSED CIRCUIT BREAKER						
	FUSED DISCONNECT SWITCH						
	SELECTOR SWITCH HOA = HAND-OFF-AUTO						
	MAGNETIC MOTOR STARTER						
$\boxtimes$	COMBINATION MAGNETIC MOTOR STARTER AND DISCONNECT SWITCH						
/M/	MOTOR HORSEPOWER AS INDICATED						
	HOMERUN TO PANEL (REFER TO LOW VOLTAGE CIRCUITRY ON THIS DRAWING)						
	CONCEALED WIRING IN WALL OR CEILING						
	CONCEALED WIRING IN OR UNDER FLOOR SLAB OR ACCESS FLOOR						
*	CONDUIT SEAL						
	EXPOSED WIRING						
<del></del>	UNDERGROUND WIRING						
<b></b>	CONDUIT DOWN						
<b></b>	CONDUIT UP						
$rac{PE}{1}$	EQUIPMENT DESIGNATION						
5	REFER TO NOTE						
	NUMBER INDICATES EQUIPMENT ITEM No. UPPER CASE LETTER INDICATES CONTINUATION LINE						
PRC	CESS EQUIPMENT						
	ER AND CONTROL						
VSHH 1200M	PROCESS INSTRUMENT/DEVICE TOP LINE IS DEVICE TYPE BOTTOM LINE IS IDENTIFIER						
(CP)	CONTROL PANEL (PROVIDED BY EQUIPMENT						
	MANUFACTURER)						

## MANUFACTURER) (JB) JUNCTION BOX (PROVIDED BY EQUIPMENT MANUFACTURER) HC HEATER CONNECTION BOX (PROVIDED BY EQUIPMENT MANUFACTURER) (HT) HEAT TRACE CONTROLLER (PROVIDED BY EQUIPMENT MANUFACTURER) (MC) MOTOR CONNECTION BOX (PROVIDED BY EQUIPMENT MANUFACTURER) (TE) TEMPERATURE ELEMENT/THERMOCOUPLE (PROVIDED BY EQUIPMENT MANUFACTURER) (VB) VIBRATION SWITCH (PROVIDED BY EQUIPMENT MANUFACTURER)

**SWITCHES** 

SINGLE POLE SWITCH:

DEVICE CONTROLLED

THREE WAY SWITCH

FOUR WAY SWITCH

KEY OPERATED SWITCH

CIRCUIT (RED BODY)

CONTROL ZONE.

PUSH BUTTON

SWITCH WITH PILOT LIGHT

STOP/START PUSH BUTTON

SINGLE POLE SWITCH ON EMERGENCY

LOWER CASE LETTER INDICATES

MANUAL MOTOR STARTER W/THERMAL OVERLOAD

TWO BUTTON (ON/OFF) LOW VOLTAGE MOMENTARY

CONTACT SWITCH. LOWER CASE LETTER INDICATE

R	EQUIPMENT. RELAY
	OUTLETS
₩₩₩	DUPLEX RECEPTACLE OUTLET QUADRUPLEX RECEPTACLE OUTLET DEDICATED DUPLEX RECEPTACLE OUTLET DEDICATED QUADRUPLEX RECEPTACLE OUTLET QUADRUPLEX RECEPTACLE OUTLET FLOOR MOUNTED
GFI <b>⊖</b>	DUPLEX RECEPTACLE OUTLET WITH GROUND FAULT INTERRUPTER
хр⊖⊐	CLASS I DIV 2 EXPLOSION PROOF RECEPTACLE
<b>⊙</b> -1 6-30R	SPECIAL PURPOSE RECEPTACLE OUTLET NEMA CONFIGURATION AS INDICATED ON DRAWING
<b>•</b>	TELEPHONE OUTLET
<b>&gt;</b>	COMBINATION DATA/TELEPHONE OUTLET

SINGLE LINE DIAGRAM

CURRENT LIMITING CIRCUIT BREAKER

DISCONNECT DEVICE FOR DRAWOUT EQUIPMENT

TRANSFORMER

THERMAL OVERLOAD

NON-FUSED SWITCH

LIGHTNING ARRESTOR

CURRENT TRANSFORMER

POTENTIAL TRANSFORMER

GROUND CONNECTION

NORMALLY OPEN CONTACT

NORMALLY CLOSED CONTACT

BATTERY

METER

**GENERATOR** 

AMMETER

VOLTMETER

TRANSFER SWITCH

AMMETER SWITCH

**VOLTMETER SWITCH** 

KIRK KEY INTERLOCK

WATTHOUR METER

DELTA CONNECTION

INDICATING LAMP

ELECTRIC POLE

CONTACTOR

C/B WITH SHUNT TRIP

GROUNDED WYE CONNECTION

POWER FACTOR CORRECTION CAPACITOR

TRANSIENT VOLTAGE SURGE SUPPRESSION

POINT OF CONNECTION TO EXISTING EQUIPMENT.

POINT OF DISCONNECTION TO EXISTING

POTENTIAL TRANSFORMER WITH FUSE

STOP BUTTON MOMENTARY CONTACT

START BUTTON MOMENTARY CONTACT

FUSED SWITCH

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#### MOUNTING HEIGHTS-ELEC. EQPT. -WALL-MOUNTED BELLS AND FIRE ALARM SOUNDING DEVICE (BELOW CIRCUIT BREAKER 100 AF - INDICATES AMP FRAME 100 AT - INDICATES AMP TRIP FINISHED -TV MONITOR OUTLETS AND SERVICE RECEPTACLES FOR CEILING) SHELF MOUNTED TV CENTERED ABOVE DOOR -WARNING AND SIGNALING FIXTURES/SIGNS OR WINDOW OPENING -FIRE ALARM STROBES MOUNTED AT 6'-8" OR 6" 6'-8" AFF BELOW FINISHED CEILING (WHICHEVER IS LOWER) -TOP OF FLUSH AND SURFACE MOUNTED ELECTRICAL 6'-6" AFF LIGHTING OR POWER PANELBOARDS AND TELEPHONE -TOP OF BACK MOUNTED WALL EXIT FIXTURES (NOT 6'-3" AFF MOUNTED ABOVE DOORS) -TOP OF HIGHEST ELECTRICAL SAFETY DISCONNECT 6'-0" AFF SWITCHES, MAGNETIC STARTERS AND CONTACTORS -WALL-MOUNTED TELEPHONE AND PAY STATIONS 4'-6" AFF (3'-6" AT HANDICAP LOCATIONS) -WALL MOUNTED ELECTRICAL DEVICE LIGHTING SWITCHES, MANUAL MOTOR STARTERS, THERMOSTATS AND FIRE 3'-10" AFF ALARM PULL STATIONS. (CENTER OF DEVICE) (4'-0" MAXIMUM -INCLUDES ALL FLOOR EQUIPMENT IN LABS AND HEIGHT TO THE TOP EQUIPMENT ROOMS. OF THE OPERABLE DEVICE) -GFI OUTLETS IN TOILET ROOMS -ELECTRICAL RECEPTACLES WITHIN MECHANICAL SPACES, ELECTRICAL ROOMS. -ELECTRICAL RECEPTACLES 1'-6" AFF -TELEPHONE, DATA AND COMMUNICATIONS OUTLETS

## NOTES:

- MOUNTING HEIGHTS TO CENTER OF OUTLETS, U.O.N. FOR MASONRY CONSTRUCTION. THE ABOVE REFERENCED HEIGHTS SHALL BE USED FOR REFERENCE TO NEAREST BLOCK OR BRICK COURSING.
- 2. THE ABOVE NOTED MOUNTING HEIGHTS SHALL BE ADHERE TO, UNLESS SPECIFICALLY INDICATED OR OTHERWISE DETAILED ON THE SPECIFICATIONS.

-CATV AND A/V JUNCTION BOXES

ALL DEVICES SHOWN ON DRAWINGS ARE DIAGRAMATICALLY IN LOCATION AND SHOWN FOR GENERAL WIRING PURPOSES ONLY. ALL DEVICES INDICATED TO BE INSTALLED IN THE SAME LOCATIONS BUT WITH DIFFERENT ELEVATIONS SHALL BE ALIGNED VERTICALLY AND HORIZONTALLY. COORDINATE ALL LOCATIONS BETWEEN TRADES.

	LIGHTING
	CEILING LIGHTING FIXTURE, SURFACE MOUNT LUMINAIRE. TYPE AS INDICATED
* H H	EXTERIOR WALLPACK LUMINAIRE. TYPE AS INDICATED.
*	LIGHTING FIXTURE, PENDANT MOUNT LUMINAIRE. TYPE AS INDICATED.
Ä	WEATHER PROOF LIGHTING FIXTURE, STANCHION MOUNT LUMINAIRE. TYPE AS INDICATED
Ю-	WALL LIGHTING FIXTURE, SURFACE MOUNT LUMINAIRE. TYPE AS INDICATED
⊢⊗	WALL LIGHTING FIXTURE, SURFACE MOUNT EXIT LIGHT. TYPE AS INDICATED
<b></b>	1'X4' INDUSTRIAL STRIP LIGHT FIXTURE
zX	CONTROL DEVICE OR ZONE ASSOCIATED WITH LIGHT FIXTURE

EMERGENCY CIRCUIT.

\* SHADED SYMBOLS INDICATE FIXTURE POWERED FROM

## **ELECTRICAL GENERAL NOTES:**

- 1. ENTIRE INSTALLATION, INCLUDING MATERIALS, EQUIPMENT AND WORKMANSHIP, SHALL CONFORM WITH THE LOCALLY ADOPTED NATIONAL ELECTRICAL CODE (NEC 2017 EDITION.) AND WITH ALL APPLICABLE LAWS, CODES AND REGULATIONS AND REGULATORY BODIES HAVING JURISDICTION OVER THIS WORK.
- 2. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING DELIVERIES, RECEIVING, RIGGING, BOLTING TO PADS (TYPICAL FOR ALL STUB-UPS AND EQUIPMENT ON ALL CONCRETE PADS) AND APPURTENANCES REQUIRED FOR INSTALLATION PER MANUFACTURER'S REQUIREMENTS AND THE CONTRACT DOCUMENTS.
- 3. ALL NEW ELECTRICAL MATERIAL AND EQUIPMENT SHALL BE LISTED AND LABELED BY AN OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) NATIONALLY RECOGNIZED TESTING LABRATORY (NRTL), AND INSTALLED IN A MANNER CONSISTENT WITH ITS LISTING AND LABELING.
- 4. WHERE EQUIPMENT AND CONDUITS PENETRATE FIRE AND SMOKE BARRIERS INCLUDING WALLS, PARTITIONS, FLOORS AND CEILINGS, INSTALL FIRE STOPPING AT PENETRATIONS AFTER CABLES ARE INSTALLED.
- TO PROVIDE A COMPLETE INSTALLATION, IN A NEAT WORKMANLIKE MANNER. 6. UNLESS OTHERWISE NOTED ALL INDOOR ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH, AND HOUSED IN, A NEMA 1 ENCLOSURE.

5. THE DRAWINGS ARE DIAGRAMMATIC AND ALL SPECIALTIES AND APPURTENANCES ARE NOT SHOWN, HOWEVER THE E.C. SHALL BE REQUIRED

- ALL OUTDOOR ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN NEMA 3R OR 4X ENCLOSURE. 7. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE BEFORE PROCEEDING WITH THE WORK.
- 8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY FIELD CONDITIONS AT THE SITE AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCING WITH THE WORK.
- 9. EFFECTIVELY PROTECT ALL MATERIALS AND EQUIPMENT FROM ENVIRONMENTAL AND PHYSICAL DAMAGE UNTIL FINAL ACCEPTANCE. CLOSE AND PROTECT ALL OPENINGS DURING CONSTRUCTION. PROVIDE NEW MATERIALS AND EQUIPMENT TO REPLACE ITEMS DAMAGED. EXISTING ELECTRICAL EQUIPMENT THAT INTERFERES WITH NEW ARRANGEMENT SHALL BE REMOVED, REINSTALLED, RELOCATED, REROUTED, EXTENDED OR ABANDONED AS REQUIRED. TO SUIT THE NEW ARRANGEMENT AFTER COORDINATION WITH EXISTING ELECTRICAL EQUIPMENT OWNER.
- 10. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR REVIEWING AND COORDINATING WITH THE DOCUMENTS OF ALL TRADES.
- 11. DURING CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN A RECORD SET OF INSTALLATION PRINTS. THEY SHALL NEATLY AND CLEARLY RECORD ON THESE PRINTS ALL DEVIATIONS FROM THE CONTRACT DRAWINGS IN SIZES, LOCATIONS AND DETAILS. AT THE COMPLETION OF THE WORK, THE CONTRACTOR SHALL RETURN THE MARKED PRINTS WITH ALL INFORMATION OBTAINED DURING THE CONSTRUCTION PROCESS TO THE ENGINEER FOR SUBMISSION TO OWNER
- 12. CONTACT SITE UTILITY LOCATOR PRIOR TO EXCAVATING. CONTRACTOR IS RESPONSIBLE FOR LOCATING EXISTING UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
- 13. ELECTRICAL CONTRACTOR SHALL REVIEW DOCUMENTS FROM ALL TRADES FOR LOCATIONS OF EQUIPMENT, DEVICES AND INSTRUMENTATION. THIS SHALL INCLUDE (BUT NOT BE LIMITED TO) PROCESS, HVAC, PLUMBING, OEM EQUIPMENT MANUFACTURERS, FIRE ALARM, SECURITY, AND SAFETY PLANS..
- 14. KUPPER ENGINEERING LLC, INCORPORATES COMMERCIALLY MANUFACTURED ITEM(S) OR COMPONENT(S) IN THE PREPARATION OF THIS PLAN, AND RELIES UPON THE MANUFACTURER'S STATED OR IDENTIFIED SPECIFICATIONS AND PROPERTIES IN THE PREPARATION OF THIS PLAN. KUPPER ENGINEERING LLC, HAS NOT UNDERTAKEN ANY INDEPENDENT EXAMINATION. TESTING OR ANALYSIS TO VERIFY THE MANUFACTURERS' SPECIFICATIONS OR PROPERTIES FOR ANY ITEM OR COMPONENT, KUPPER ENGINEERING LLC MAKES NO REPRESENTATIONS OR WARRANTIES AS TO THE ACCURACY OF THE SPECIFICATIONS OR PROPERTIES ASSOCIATED WITH ANY ITEM OR COMPONENT UTILIZED IN THIS PLAN.)
- 15. KUPPER ENGINEERING LLC, HAS RELIED UPON INFORMATION PROVIDED TO IT BY OTHERS IN PREPARATION OF THESE PLANS. THIS INFORMATION HAS BEEN USED IN THE DEVELOPMENT OF THESE PLANS. KUPPER ENGINEERING LLC SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY OF THIS INFORMATION; NOR FIELD CHANGES DURING INSTALLATION AND CONSTRUCTION RESULTING FROM CHANGES TO OR INACCURACIES OF INFORMATION PROVIDED TO KUPPER ENGINEERING, LLC.

LIN	IE TYPES
	"LIGHT" LINES AND SYMBOLS INDICATE EXISTING  "BOLD LINES" AND SYMBOLS INDICATE NEW WORK  "BOLD DASHED LINES" AND SYMBOLS INDICATE DEMOLITION
	WORK OR UNDERGROUND WORK

						PROFESSIONAL ENGINEER
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						No. 67828
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1	09/08/2023	ISSUE FOR CONSTRUCTION	JML	CY	MAM	SVD 03/39/3035 / JULIAN

SS



1325 74th AVE SW,



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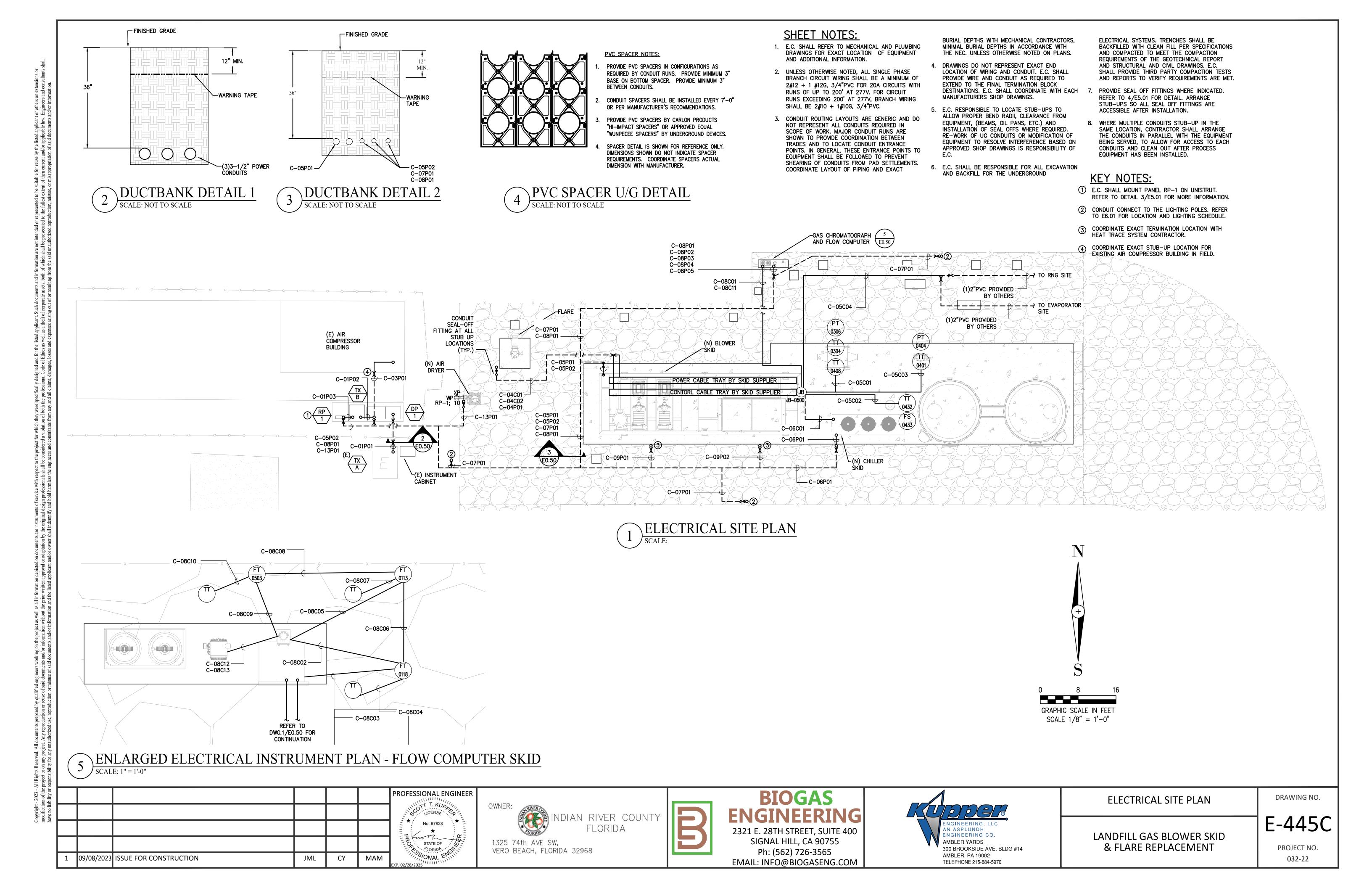
ELECTRICAL LEGENDS, NOTES AND ABBREVIATIONS

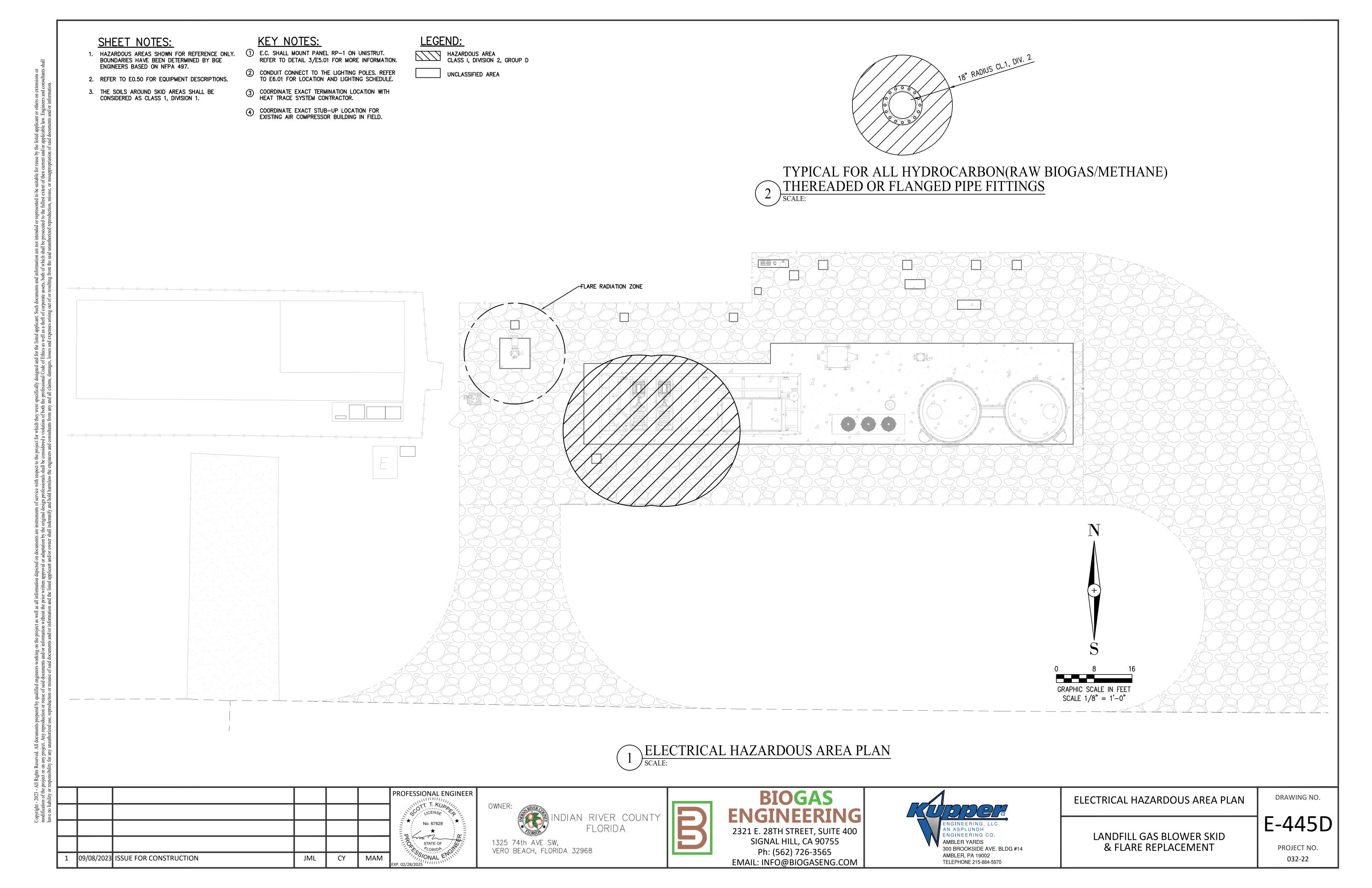
> LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO.

E-445B PROJECT NO.

032-22





## 1. REFER TO DRAWING E4.01 FOR EQUIPMENT SCHEDULE.

- 2. E.C. SHALL PROVIDE ALLOWANCE IN THE BID FOR 10% ADDITIONAL GROUNDING CONNECTIONS. ENGINEER WILL INDICATE IN FIELD WHERE THESE SHALL BE REQUIRED.
- 3. DRAWINGS DOES NOT INCORPORATE ALL BONDING CONNECTIONS. THIS IS A GUIDE ONLY. E.C. SHALL BOND ALL EQUIPMENT INCLUDING PIPE RACK FOR SAFE TOUCH POTENTIALS.
- 4. E.C. SHALL COORDINATE LOCATIONS FOR GROUND CABLE STUB-UPS WITH EQUIPMENT SHOP DRAWINGS. GROUND CABLES SHALL STUB UP IN AREAS THAT DO NOT CREATE A TRIPPING HAZARD OR LEAVE THE CABLES SUBJECT TO PHYSICAL DAMAGE.
- 5. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATION AND BACKFILL FOR THE UNDERGROUND ELECTRICAL SYSTEMS. TRENCHES SHALL BE BACKFILLED COMPACTED TO MEET THE COMPACTION REQUIREMENTS OF THE GEOTECHNICAL REPORT AND STRUCTURAL AND CIVIL DRAWINGS. E.C. SHALL PROVIDE THIRD PARTY COMPACTION TESTS AND REPORTS TO VERIFY REQUIREMENTS ARE MET.

## KEY NOTES:

- 1) #4/0 CU GROUND CABLE BOND TO CONCRETE REBAR PER DWG. DETAIL 4/E5.02.
- 2) BOND WELL CASING TO #4/0 GROUND RING.
- 3 PROVIDE AND COORDINATE EXACT LOCATION OF TWO GROUNDING WELL TEST STATION IN FIELD. SEE DRAWING DETAIL 3/E2.01 FOR DETAILS.
- 4 #4/0 CU CABLE BOND EQUIPMENT TO GROUND RING
- (5) #4/0 CU CABLE BOND METAL LADDER/STAIRWAY TO GROUND RING
- (6) #4/0 CU CABLE BOND LIGHT POLE REBAR TO GROUND RING.
- #10G CU CABLE BOND LIGHT POLE GROUND CLAMP TO GROUND RING.

## <u>LEGEND</u>

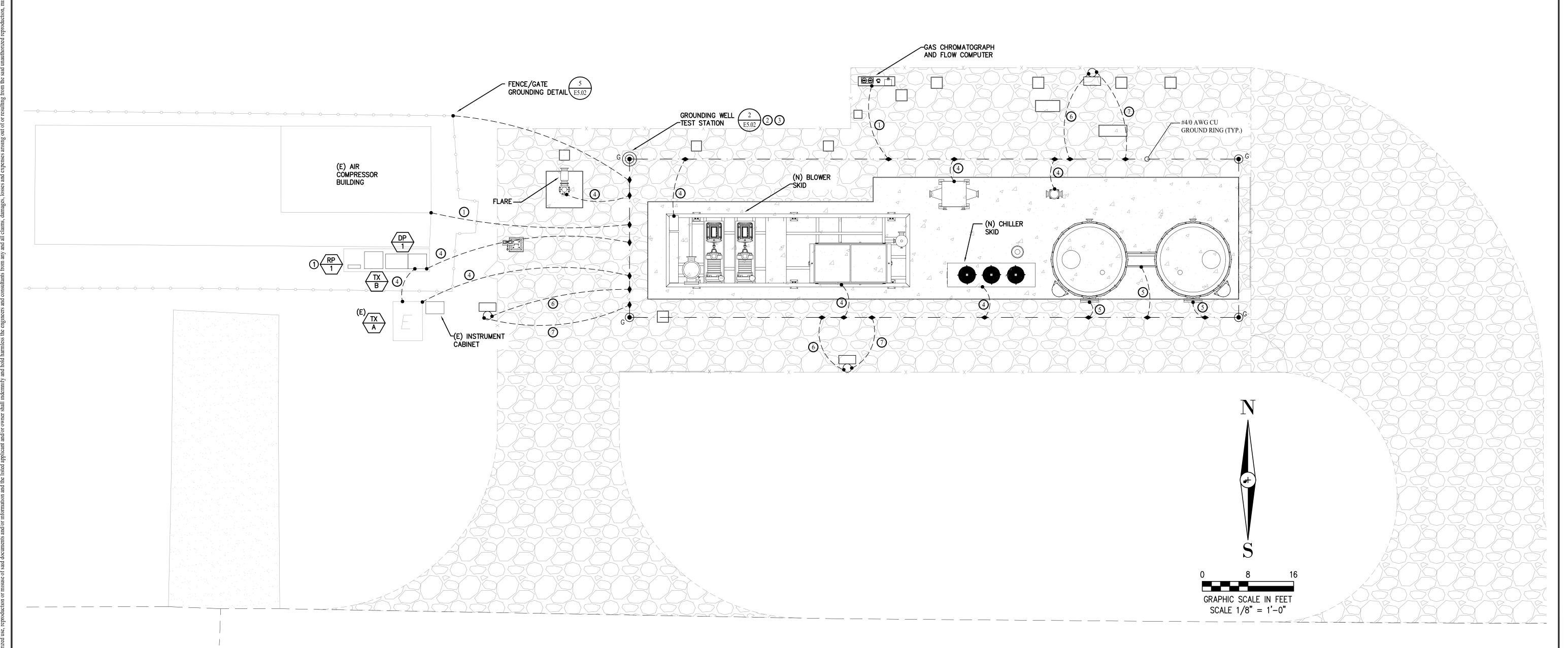
NO. 4/0-19, SOFT DRAWN STRANDED COPPER CONDUCTOR.

• 3/4" x 10' COPPER CLAD GROUND RODS WITH GROUND ROD COUPLER AND EXOTHERMIC WELD CONNECTIONS.

3/4" x 10' COPPER CLAD GROUND RODS WITH GROUND ROD COUPLER AND EXOTHERMIC WELD CONNECTIONS IN TEST WELL.

SEE DETAIL 2/E5.02.

SOFT DRAWN STRANDED COPPER CONDUCTOR. REFER TO KEY NOTE FOR SIZE AND FUNCTION.









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ELECTRICAL GROUNDING PLAN

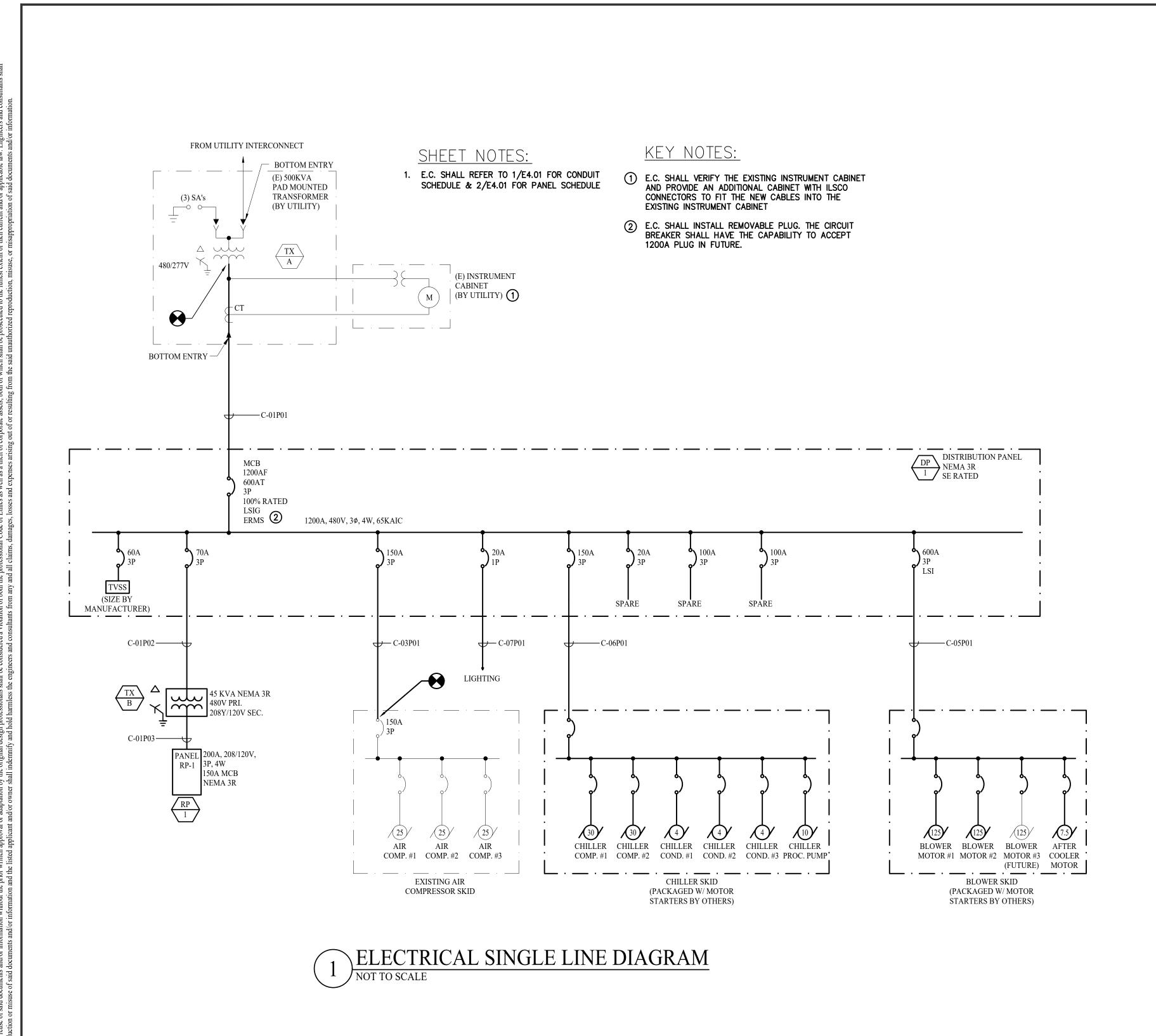
LANDFILL GAS BLOWER SKID

& FLARE REPLACEMENT

DRAWING NO.

E-445E

PROJECT NO. 032-22



PROFESSIONAL ENGINEER

PROFESSIONAL ENGINEER

No. 67828

No. 67828

1 09/08/2023 ISSUE FOR CONSTRUCTION

JML CY MAM





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ELECTRICAL SINGLE LINE DIAGRAM

& FLARE REPLACEMENT

LANDFILL GAS BLOWER SKID

E-445F

PROJECT NO. 032-22

DRAWING NO.

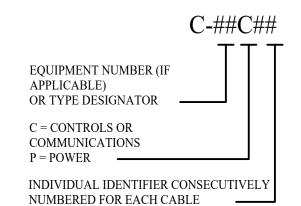
	ORIGIN					CONDUIT AND FEEDER SCHEDULE				<del></del>	Г	Γ	
ID	UG/OH	VOLTAGE	EQUIPMENT/	DEVICE/	REF. EQUIPMENT/	TERMINATION DEVICE/	REF.	QTY	SIZE	REF. DUCTBANK	CONDUCTORS OR CABLE REFERENCE	CONDUCTOR TYPE	REMARKS
			LOCATION	ENCLOSURE	DETAIL LOCATION	ENCLOSURE	DETAIL			DOCTBANK		ITPE	
C-01P01	UG	480VAC	(E.)TRANSFORMER		DP-1			4	3-1/2"	2/E0/50	(4)350KCMIL + (1)#3/0G		
C-01P02	ОН	480VAC	DP-1		TX-B		<u> </u>	1	1"		(3)#4 + (1)#8G		
C-01P03	ОН	208VAC	TX-B		RP-1	_		1	2"		(4)#1/0 + (1)#6G		
C-03P01	UG	480VAC	DP-1		(E.) AIR COMPRESSO BUILDING	K		1	2"		(4)#1/0 + (1)#6G		
C-04C01	UG	LV	BLOWER	BLOWER PLC CABINET	FLARE			1	2"		4 SETS OF 2C#16 + 2C#18 OAL SHLD	TYPKE K TC CABLE	3 SETS GO TO JUNCTION BOX, 1 SET GOES TO FLAME ARRESTER, REFER TO P&ID FOR DETAILS
C-04C02	UG	LV	BLOWER	BLOWER PLC CABINET	FLARE	FLARE VALVE		1	1"		2C#16 + 5C#16		
C-04P01	UG	120VAC	BLOWER	BLOWER PLC CABINET	FLARE	PNL 103		1	3/4"		(3)#12 + (1)#12G		
C-05C01	ОН	LV	BLOWER CONTROL CABLE TRAY	JB-0500	LOW PRESSURE COOL	ER PT0306,TT0304,TT0408		1	3/4"		3 SETS OF 2C#18 OAL SHLD		
C-05C02	ОН	LV	BLOWER CONTROL CABLE TRAY	JB-0500	PARTICULATE FILTER	R FS0433,TT0432		1	3/4"		2 SETS OF 2C#18 OAL SHLD		
C-05C03	ОН	LV	BLOWER CONTROL CABLE	JB-0500	PARTICULATE FILTER	PT0404,TT0401		1	3/4"		2 SETS OF 2C#18 OAL SHLD		
C-05C04	ОН	LV	BLOWER CONTROL CABLE TRAY	JB-0500	RNG SITE/EVAPORATO			2	2"		3 SETS OF 6 PAIR SINGLEMODE FIBER CABLE IN EACH CONDUIT + 4 SETS OF 2C#18 OAL SHLD		
C-05P01	UG	480VAC	DP-1		BLOWER	BLOWER POWER CABINET		2	3"		(3)350KCMIL + (1)#1G		
C-05P02	UG	120VAC	RP-1		BLOWER	BLOWER PLC CABINET		1	3/4"		(2)#10 +(1)#10G		
C-06C01	ОН	LV	BLOWER CONTROL CABLE TRAY	JB-0500	CHILLER SKID			1	3/4"		1 SET OF CAT5E		
C-06P01	UG	480VAC	DP-1		CHILLER SKID	CHILLER MAIN CIRCUIT BREAKER		1	2"		(3)#1/0 + (1)#6G		
C-07P01	UG	277VAC	DP-1		LIGHTING POLES	DREARER		1	3/4"		(2)#10 +(1)#10G		
C-08C01	UG	LV	BLOWER CONTROL CABLE TRAY	JB-0500	GC			1	1"		2 SETS OF CAT5E		
C-08C02	ОН	LV	GC SKID	12VDC JUNCTION BOX	FLOW METER	FT-0118		1	3/4"		4C#16		
C-08C03	ОН	LV	GC SKID	FLOW COMPUTER	FLOW METER	FT-0118		1	3/4"		2C#18 TWST PAIR SHIELD	RS-485 CABLE	
C-08C04	ОН	LV	FLOW METER	TT	FLOW METER	FT-0118		1	3/4"		4W RTI	RTD CALBE	
C-08C05	ОН	LV	GC SKID	12VDC JUNCTION BOX	FLOW METER	FT-0113		1	3/4"		4C#16		
C-08C06	ОН	LV	FLOW METER	FT-0118	FLOW METER	FT-0113		1	3/4"		2C#18 TWST PAIR SHIELD	RS-485 CABLE	
C-08C07	ОН	LV	FLOW METER	TT	FLOW METER	FT-0113		1	3/4"		4W RTI	RTD CALBE	
C-08C08	ОН	LV	GC SKID	12VDC JUNCTION BOX	FLOW METER	FT-0503		1	3/4"		4C#16		
C-08C09	ОН	LV	FLOW METER	FT-0113	FLOW METER	FT-0503		1	3/4"		2C#18 TWST PAIR SHIELD	RS-485 CABLE	
C-08C10	ОН	LV	FLOW METER	TT	FLOW METER	FT-0503		1	3/4"		4W RTI	RTD CALBE	
C-08C11	UG	LV	BLOWER CONTROL CABLE TRAY	JB-0500	CC			1	1"		8C#16		
C-08C12	ОН	LV	GC		NGC-8203			1	3/4"		2C#18 TWST PAIR SHIELD		
C-08C13	ОН	LV	GC		NGC-8203			1	1"		(2) SETS OF 2C#18 TWST PAIR SHIELD		
C-08P01	UG	120VAC	RP-1		GC			1	3/4"		(2)#10 + (1)#10G		
C-08P02	UG	120VAC	RP-1		STRIP HEATER		1	1	3/4"		(2)#10 + (1)#10G		
C-08P03	UG	120VAC	RP-1		GC AIR CONDITIONE	۶	†	1	3/4"	1	(2)#10 + (1)#10G		
C-08P04	UG	120VAC	RP-1		GC ENC82S HEATER		†	1	3/4"		(2)#10 + (1)#10G		
C-08P05	UG	120VAC	RP-1		GC HEAT TRACE		†	1	3/4"		(2)#10 + (1)#10G		
C-09P01	UG	208VAC	RP-1		HEAT TRACE SYSTEM	<u> </u>	1	1	3/4"	<u> </u>	(3)#10 + (1)#10G	<del> </del>	
C-09P02	UG	208VAC	RP-1		HEAT TRACE SYSTEM		+	1	3/4"	<del> </del>	(3)#10 + (1)#10G	<del> </del>	
C-13P01	UG	120VAC	RP-1		AIR DRYER		+	1	3/4"		(2)#10 + (1)#10G		
0-10FU1		120740	ΩΓ*Ι		AIL DLIEL			<u> </u>	3/4	1	(2)#10 · (1)#100		

## SHEET NOTES:

- 1. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CONDUIT, CABLE AND WIRE SHOWN ON THESE SCHEDULES.
- CONTROL CABLE SCOPE IS NOT FINALIZED. ADDITIONAL CONDUITS MAY BE REQUIRED AS CONTROL CABLE SCOPE IS FINALIZED.

PANEL:	RP-1	VOLT:	208	Y/120	PHASE	3	WIRE:	4	LOCAT	ION:			
MAIN:		AMPS:	_	1,120	M CB:			10K				SURFACE	
CKT	AREA SERVED/	BREA		L	OAD (V.			OAD (V.				AREA SERVED/	CKT
NO.	DESCRIPTION OF LOADS	AMP	POLE	С	В	A	A	В	C	AMP		DESCRIPTION OF LOADS	NO.
					_	500	600	_					21.21
1	BLOWER PLC CABINET	20	1			500	000				2.98	HEAT TRACE(PROVIDE	2
					1500			600		30	2	GFCI BREAKER)	
	GC	30	1		1300			000				GI OI BREZINERO	4
3				1000					600				4
-	STRIP HEATER/AC	20	1	1000					600			HEAT TRACE/DROVIDE	
5										30	2	HEAT TRACE(PROVIDE	6
	AIR CONDITIONER	20	1			300	600			,		GFCI BREAKER)	
7													8
	GC ENC82S HEATER	15	1		500			1500		20	1	AIR DRYER(PROVIDE	
9												GFCI BREAKER)	10
	GC HEAT			500									
	TRACE(PROVIDE GFCI	20	1							20	1	SPARE	
1.1	BREAKER)												10
11													12
	SPARE	20	1							20	1	SPARE	
13													14
	SPARE	20	1							20	1	SPARE	
15													16
	SPARE	20	1							20	1	SPARE	
17			_								•		18
	SPARE	20	1							20	20 1 SPA	SPARE	
19		20	1							20		STARL	20
	SPARE	20	1							20	1	SPARE	
21		20	1							20	1	SPARE	22
	SPARE SPARE	20	,							20	,	CDADE	
23		20	1							20	1	SPARE	24
											_		
25		20	1							20	1	SPARE	26
27	SPARE	20	1							20	1	SPARE	28
21													20
29	SPARE	20	1							20 1	1	SPARE	30
29													30
	SPARE	20	1							20	1	SPARE	
31													32
	SPARE	20	1							20	1	SPARE	
33													34
	SPARE	20	1							20	1	SPARE	
35											_		36
	SPARE	20	1	/					/	20	1	SPARE	
37	SIARE	20	1							20	1	SIARE	38
	CDADE	20	1							20	1	CDADE	
39	SPARE	20	1							20	1	SPARE	40
		20										OD + OF	
41	SPARE	20	1									SPACE	42
	14			1500	2000	800	1200	2100	600				
				1500	2000	000	1200	2100	000				
			Α	2000		В	4100			С	2100		
			А	2000		D	4100			U	2100		
					TOTAL	1/1/4	0.0	1	ANADO	00.70			
					TOTAL	KVA:	8.2		AMPS:	22.79			

## CONDUIT NUMBER DESCRIPTION



ELECTRICAL CONDUIT SCHEDULE

WHERE NO EQUIPMENT NUMBER IS ASSIGNED IN THE TABLE, A NUMBER WILL BE ASSIGNED TO THE EQUIPMENT AND BE CONSISTENT BETWEEN THE CONDUIT AND CABLE NUMBERS, I.E. BOP SHALL BE 99.

# 2 ELECTRICAL PANEL SCHEDULE NOT TO SCALE

PROFESSIONAL ENGINEER No. 67828 STATE OF 1 09/08/2023 ISSUE FOR CONSTRUCTION MAM JML CY

INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW, VERO BEACH, FLORIDA 32968



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ELECTRICAL CONDUIT & PANEL SCHEDULE

LANDFILL GAS BLOWER SKID

& FLARE REPLACEMENT

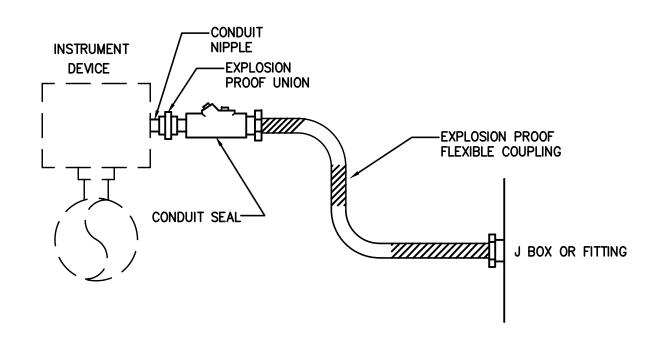
DRAWING NO.

E-445G

PROJECT NO. 032-22

## TYP. GROUND FILL AND CONDUIT STUB UP DETAIL NOT TO SCALE

- 1. WHERE CONDUITS STUB-UP WITHIN EQUIPMENT/ENCLOSURES, THE CONDUIT STUB-UP MAY BE PVC. WHERE CONDUIT STUBS UP EXPOSED THE CONDUIT ABOVE GRADE SHALL BE RIGID METAL CONDUIT.
- 2. CONDUIT TRANSITIONS FOR STUB-UP SHALL BE BELOW GRADE.

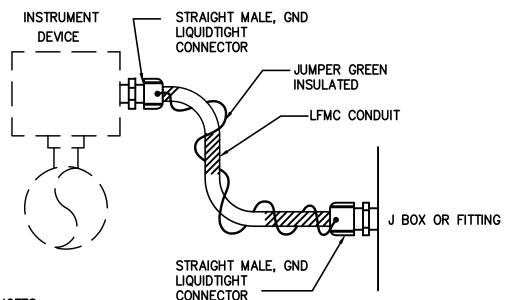


I. INSTALLATION APPLIES TO CLASS I, DIVISION 1 AREAS, GROUPS A, B, C, D. 2. CONDUIT SEAL SHALL BE WITHIN 18" OF THE INSTRUMENT/DEVICE PORTION OF

4. ALL CONDUIT SEAL OFF FITTINGS SHALL BE CROUSE-HINDS EYS OR APPROVED

- CONDUIT BETWEEN SEAL AND DEVICE SHALL BE IN ACCORDANCE WITH NEC 501.10. 3. WHERE INSTRUMENT/DEVICE IS PROVIDED WITH FLYING LEADS PROVIDE JUNCTION BOX FOR WIRE SPLICES. SPLICES SHALL NOT BE MADE IN CONDUIT OR CONDUIT FITTINGS.
- 5. FLEXIBLE COOUPLING SHALL BE CROUSE-HINDS ECLK OR APPROVED EQUAL.

## TYP. DEVICE CONNECTION DETAIL FOR EXPLOSION PROOF DEVICES

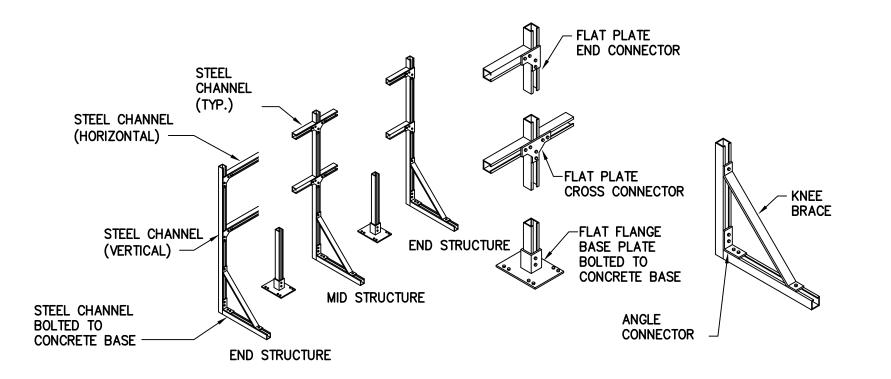


NOTES:

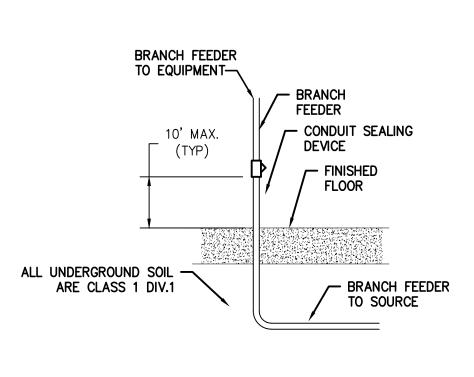
1. INSTALLATION APPLIES TO CLASS I, DIVISION II OR UNCLASSIFIED AREAS.

2. WHERE INSTRUMENT/DEVICE IS PROVIDED WITH FLYING LEADS PROVIDE JUNCTION BOX FOR WIRE SPLICES. SPLICES SHALL NOT BE MADE IN CONDUIT OR CONDUIT FITTINGS.

# TYP. DEVICE CONNECTION DETAIL FOR STANDARD DEVICES



## YP. PANEL STEEL SUPPORTS NOT TO SCALE

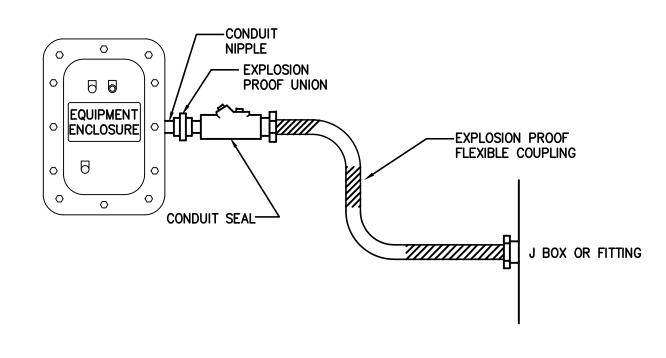


- 1. INSTALLATION APPLIES TO CONDUITS CROSSING BOUNDARIES OF CLASS I, DIVISION II AREAS AND UNCLASSIFIED AREAS. 2. CONDUIT SEAL SHALL BE WITHIN 10' OF THE BOUNDARY AND ANY PORTION OF CONDUIT BETWEEN THE SEAL AND AND THE BOUNDARY SHALL BE PER NEC 501.15 (B)(2). COORDINATE
- FITTING SHALL BE WITHIN 18" OF FLOOR/BORDER. 3. ALL CONDUIT SEAL OFF FITTINGS SHALL BE CROUSE-HINDS EYS OR APPROVED EQUAL.

EXACT HEIGHT OF FITTING WITH INSTALLATION. IN GENERAL,

TRADE SIZE	EYS TURNING RADIUS	EYS BODY DIAMETER (b)	MINIMUM SPACING (CENTER-TO-CENTER)
3/4"	1-29/32"	1-1/2"	2"+.5*b
1"	2-3/8"	1-3/4"	2"+.5*b
1-1/4"	1-23/32"	2-3/16"	2"+.5*b
1-1/2"	2-1/16"	2-7/16"	2"+.5*b
2"	2-5/16"	3-0"	2-1/2"+.5*b
2-1/2"	2-11/16"	3-1/2"	2-1/2"+.5*b
3"	3-5/16"	4-1/4"	3"+.5*b
3-1/2"	3-7/16"	4-3/4"	3"+.5*b
4"	3-11/16"	5-1/4"	3-1/2"+.5*b
5"	4-19/32"	6-1/2"	4"+.5*b
6"	5-11/32"	7-5/8"	4-1/2"+.5*b

## CLASS I DIV. II AREA CONDUIT STUB UP INSTALLATION NOT TO SCALE



- NOTES:

  1. INSTALLATION APPLIES TO CLASS I, DIVISION 1 AREAS, GROUPS A, B, C, D.

  2. CONDUIT SEAL SHALL BE WITHIN 18" OF THE ENCLOSURE. PORTION OF CONDUIT BETWEEN SEAL AND ENCLOSURE SHALL BE IN ACCORDANCE WITH NEC 501.10.
- 3. ALL CONDUIT SEAL OFF FITTINGS SHALL BE CROUSE-HINDS EYS OR APPROVED
- 4. FLEXIBLE COOUPLING SHALL BE CROUSE-HINDS ECLK OR APPROVED EQUAL.

LIQUIDTIGHT CONNECTOR — JUMPER GREEN INSULATED EQUIPMENT ENCLOSURE -LFMC CONDUIT J BOX OR FITTING STRAIGHT MALE, GND LIQUIDTIGHT CONNECTOR

-STRAIGHT MALE, GND

NOTES:

1. INSTALLATIONS APPLIES TO CLASS I, DIVISION II OR UNCLASSIFIED AREAS.

# TYP. EQUIPMENT CONNECTION DETAIL FOR EXPLOSION PROOF ENCLOSURES

# TYP. EQUIPMENT CONNECTION DETAIL FOR STANDARD ENCLOSURES

۱							
							PROFESSIONAL ENGINEER
							COTT T. KUDS
							No. 67828
							O STATE OF
	1	09/08/2023	ISSUE FOR CONSTRUCTION	JML	CY	MAM	EVD 03/38/3035

OWNER: INDIAN RIVER COUNTY FLORIDA
1325 74th AVE SW, VERO BEACH, FLORIDA 32968





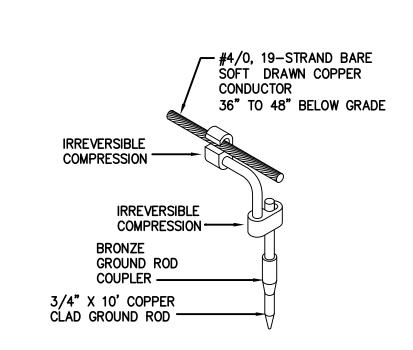
**ELECTRICAL DETAILS** 

E-445H

DRAWING NO.

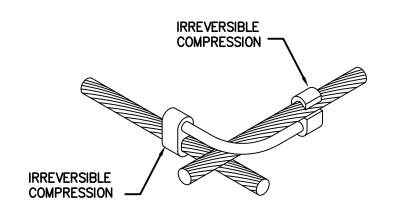
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

PROJECT NO. 032-22



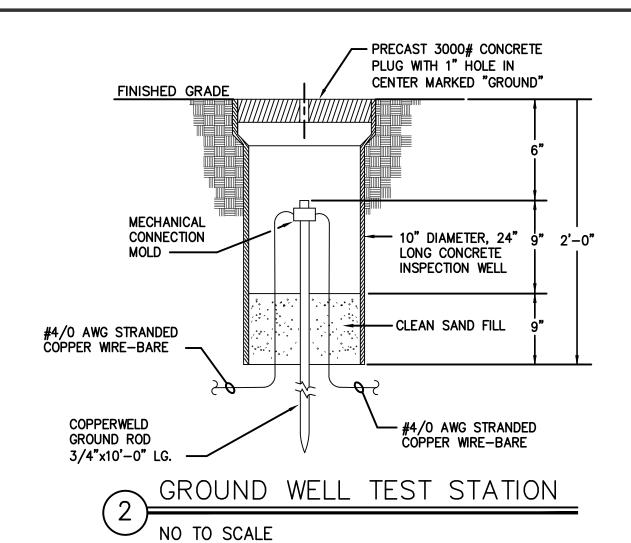
TYP. GROUND WIRE TO GROUND ROD CONNECTION DETAIL

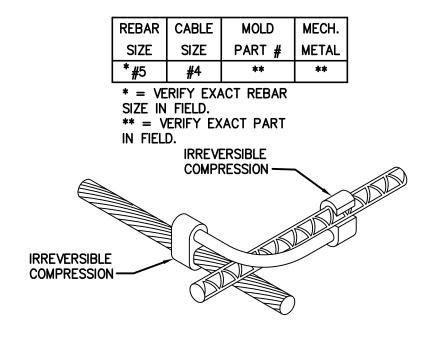
NOT TO SCALE



TYPICAL MECHANICAL GROUND CONNECTION DETAIL

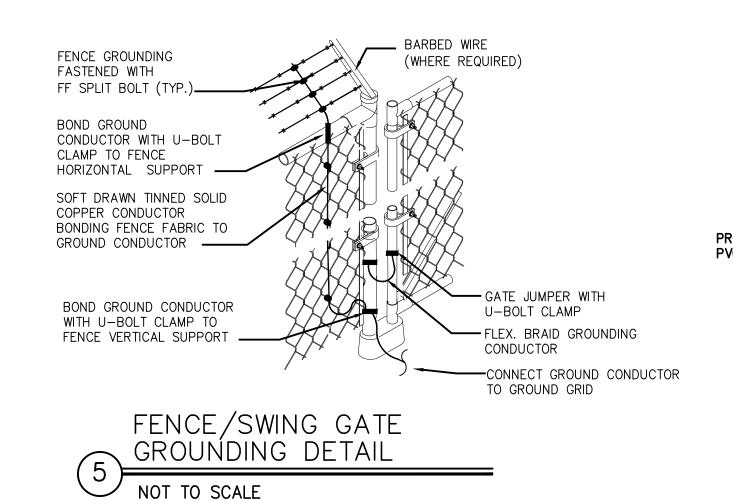
NOT TO SCALE





NOTE: REBAR SHALL BE INSTALLED IN A MINIMUM OF ONE CONTINUOUS 20FT LENGTH PER NEC250.52(A)(3).

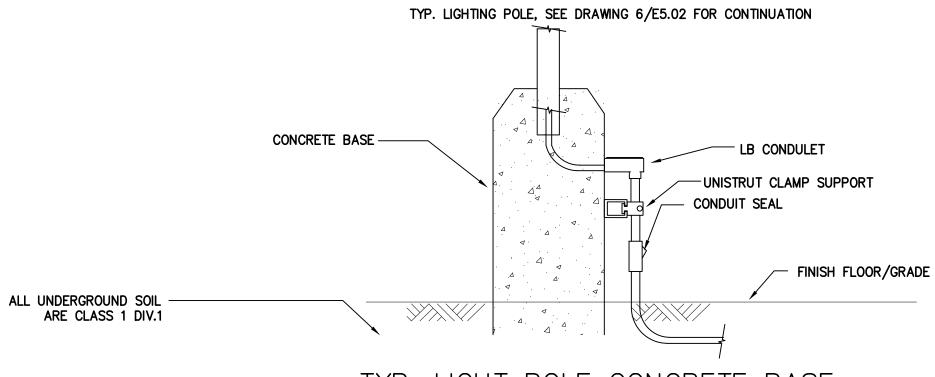
TYPICAL GROUND WIRE TO REBAR CONNECTION NOT TO SCALE



LED FLOOD LIGHT — AIR TERMINAL (TYP. FOR 2) -3/C#12 CABLE & CGB CONNECTORS —— 2", 2 LIGHT POLE ADAPTER - CONNECT AIR TERMINAL TO POLE WITH U-BOLT CONNECT DOWN WIRE TO GROUND ----- WJM 15'ROUND TAPER POLE RT5401115 - RIGID GALVANIZED CONDUITS 15' MAX. GROUND CLAMP TO BASE AND CONDUIT ----STUP-UP INTO POLE 6" GROUT PACKED UNDER POLE TO ASSURE FULL CONTACT WITH BASE - HANDHOLE CONCRETE BASE-- ANCHOR BOLTS LB CONDULET 36" A.F.G. 3/4" PVC CONDUIT FOR GROUND CABLE TO GROUND ROD -CONDUIT SEAL-OFF FINISHED GRADE CABLE TO GROUND GRID 24" MIN. ALL UNDERGROUND SOIL ARE CLASS 1 DIV.1 36" MIN. PROVIDE CONDUIT COUPLING/ADAPTOR TO PVC CONDUIT FOR POWER WIRING 30" DIA. CONCRETE

> TYP. LIGHT POLE DETAIL NOT TO SCALE

> > NOTES:
> > 1. COORDINATE ALL ANCHORS, PLATES, ETC. WITH SPECIFIC APPROVED FIXTURE MANUFACTURER'S RECOMMENDATIONS.



TYP. LIGHT POLE CONCRETE BASE ENLARGED DETAIL(SIDE VIEW) NOT TO SCALE

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	1	09/08/2023	ISSUE FOR CONSTRUCTION	JML	CY	MAM	EXP. 02/28/

ESSIONAL ENGINEER · CICENSE No. 67828 STATE OF





**BIOGAS ENGINEERING** 2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755 Ph: (562) 726-3565

EMAIL: INFO@BIOGASENG.COM



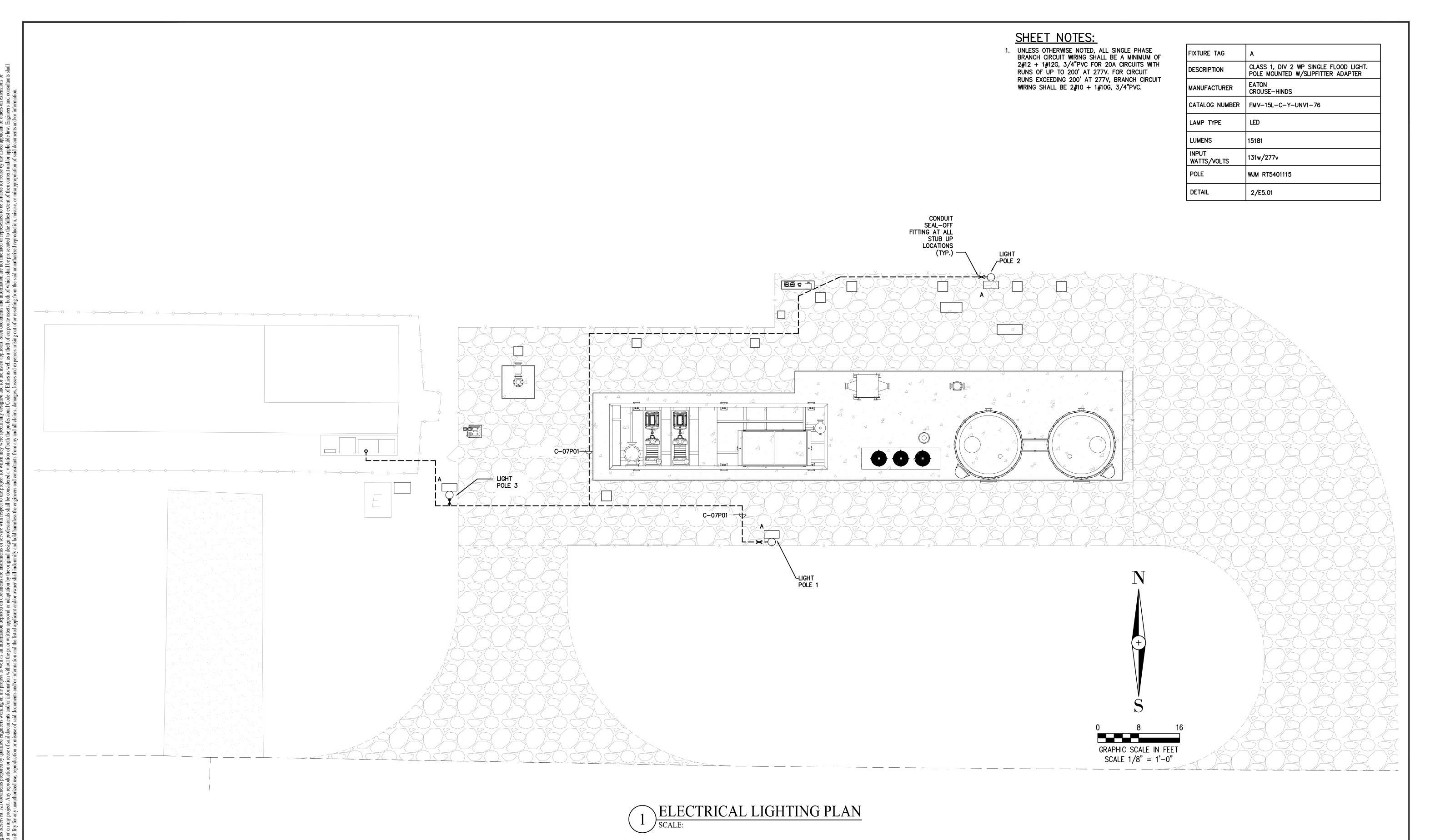
**ELECTRICAL DETAILS** 

& FLARE REPLACEMENT

E-4451

DRAWING NO.

LANDFILL GAS BLOWER SKID PROJECT NO. 032-22



PROFESSIONAL ENGINEER STATE OF 1 09/08/2023 ISSUE FOR CONSTRUCTION MAM

JML

CY





BIOGAS ENGINEERING 2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755



TELEPHONE 215-884-5970

ELECTRICAL LIGHTING PLAN

E-445J

DRAWING NO.

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT PROJECT NO. 032-22

- 1. ELECTRICAL EQUIPMENT, DEVICES, AND CONDUIT ROUTINGS ARE SHOWN ON DRAWINGS TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY AND MAY NOT INDICATE ALL EQUIPMENT AND DEVICES REQUIRED FOR A COMPLETE SYSTEM. THE ELECTRICAL CONTRACTOR (EC) SHALL PROVIDE ALL REQUIRED ELECTRICAL EQUIPMENT, DEVICES, WIRE, AND CONDUIT AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.
  COORDINATE INSTALLATION OF ELECTRICAL SYSTEMS WITH BUILDING STRUCTURE AND OTHER UTILITIES IN FIELD.
- 2 CONTRACTORS BIDDING ON THE PROJECT SHALL VISIT THE IOB SITE AND BECOME FAMILIAR WITH ALL JOB CONDITIONS PRIOR TO SUBMITTING BID. NO EXTRA COMPENSATION SHALL BE PAID FOR EXTRA WORK MADE NECESSARY BY THE CONTRACTOR'S FAILURE TO DO SO. ALL WORK REQUIRED TO ACCOMMO CONDITIONS, WHETHER SHOWN ON CONTRACT DRAWINGS OR NOT, SHALL BE COORDINATED AND ALL COSTS TO DO SO SHALL BE INCLUDED IN THE BIDS. CONTRACTOR SHALL PAY EXTRA ATTENTION TO EXISTING CONDITIONS AFFECTING REMOVAL C EXISTING EQUIPMENT AND THE ENTRANCE OF NEW EQUIPMENT
- 3. CONTRACTOR SHALL REFER TO MECHANICAL, PLUMBING AND FIRE PROTECTION DRAWINGS FOR EXACT LOCATION OF HVAC, PLUMBING OR OTHER EQUIPMENT REQUIRING ELECTRIC SERVICE NY DISCREPANCIES BETWEEN DRAWINGS SHALL BE CLARIFIED BY THE ARCHITECT OR ENGINEER.
- 4. COORDINATE ELECTRICAL WORK WITH THE WORK OF OTHER INTERRUPTION OF SERVICE IN ANY AREA.
- 5. ELECTRICAL WORK SHALL BE DONE AT SUCH TIME, AND IN SUCH MANNER, TO LEAST INTERFERE WITH THE MAINTENANCE AND OPERATION OF THE SITE'S AND/OR BUILDING'S ACTIVITIES. PROVISIONS SHALL BE MADE TO PERMIT THE USE OF ALL EXISTING ELECTRICAL SYSTEMS AT ALL TIMES. PROVIDE TEMPORARY FACILITIES TO SECURE THESE CONDITIONS AN REMOVE SUCH TEMPORARY FACILITIES WHEN NO LONGER
- 6. ELECTRICAL SHUTDOWN WORK SHALL BE SCHEDULED AT SUCH OWNER AND TENANT. PROVIDE A MINIMUM ONE (1) WEEK NOTICE 7. WHERE SHUTDOWN PERIODS CANNOT BE OF DURATION TO
- ACCOMMODATE THE NEW WORK, THE CONTRACTOR SHALL PERFORM THE WORK IN A SERIES OF PRE-PLANNED STAGES OF MINIMAL ALLOWABLE SHUTDOWN PERIODS, PROVIDE TEMPORARY FACILITIES TO ALLOW RE-ENERGIZING OF SERVICE BETWEEN WORKING STAGES.
- 8. THE CONTRACTOR SHALL PROVIDE TEMPORARY POWER AND LIGHTING FOR ALL TRADES AS REQUIRED FOR CONSTRUCTION OF AS REQUIRED TO MAINTAIN NORMAL OPERATIONS OF THE SITE AND/OR BUILDING'S ACTIVITIES. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL EQUIPMENT, MAKING ALL ARRANGEMENTS WITH THE UTILITY CO. WHERE ADEQUATE, EXISTING SERVICES MAY BE USED UPON PERMISSION OF OWNER
- 9. CONTRACTOR, UPON COMPLETION OF EACH DAYS WORK, SHALL REMOVE ALL TOOLS, MATERIALS, APPARATUS AND RUBBISH OF ANY SORT. PREMISES SHALL BE KEPT NEAT AND ORDERLY AND IN A "BROOM CLEAN" CONDITION.
- 10. CUTTING AND PATCHING SHALL BE DONE BY THIS CONTRACTOR AS REQUIRED FOR THE INSTALLATION OF ELECTRICAL WORK.
  CUTTING SHALL BE DONE BY COMPETENT MECHANICS. SURFACES
  SHALL BE PATCHED AND REFINISHED TO MATCH ORIGINAL
- 11. WORK SHALL NOT BE COVERED OR CONCEALED UNTIL IT HAS COVERED OR CONCEALED PRIOR TO INSPECTION AND TESTING SHALL BE UNCOVERED, AND AFTER IT HAS BEEN INSPECTED TESTED, AND APPROVED, SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
- 12. METALLIC MATERIALS SHALL BE PROTECTED AGAINST CORROSION. EOUIPMENT ENCLOSURES SHALL BE GIVEN A RUST-INHIBITING TREATMENT AND THE STANDARD FINISH BY THE MANUFACTURER. ALUMINUM SHALL NOT BE USED IN CONTACT WITH EARTH AND, WHERE CONNECTED TO DISSIMILAR METAL SHALL BE PROTECTED BY APPROVED FITTINGS AND TREATME ROUS METALS NOT OF CORROSION-RESISTANT STEEL SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 OR ASTM A153 EXCEPT WHERE ER EQUIVALENT PROTECTIVE TREATMENT IS SPECIFICALLY APPROVED IN WRITING.
- 1. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING SPECIFICATION SECTIONS APPLY TO THIS SPECIFICATION
- 2. FURNISH ALL LABOR, EQUIPMENT, MATERIALS, SERVICES, FESTING, APPURTENANCES, AND PROGRAMMING REQUIRED FOR A COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM IN ACCORDANCE WITH THE DRAWINGS, SPECIFICATIONS, MANUFACTURER'S INSTRUCTIONS, AND CODES AND REGULATIONS
- 3. PROCURE ALL PERMITS AND INSPECTIONS AND PAY FOR SAME
- 4. THE ELECTRICAL WORK SHALL INCLUDE, BUT NOT BE LIMITED TO,
- b. DEMOLITION AND INSTALLATION OF WIRING DEVICES.
- DEMOLITION AND INSTALLATION OF FIRE ALARM EQUIPMENT AND DEVICES. d. DEMOLITION AND INSTALLATION OF POWER DISTRIBUTION e. DEMOLITION AND RELOCATION OF TELEPHONE AND DATA
- f. INSTALLATION OF TELEPHONE AND DATA RACEWAYS
- g. DEMOLITION AND INSTALLATION OF ACCESS CONTROL SYSTEM EQUIPMENT AND DEVICES.
- h. DEMOLITION OF HVAC AND PLUMBING EQUIPMENT FEEDERS i. WIRING OF HVAC AND PLUMBING EQUIPMENT.

- 1 WHEREVER THE WORD "PROVIDE" APPEARS ON THE DRAWINGS OR WITH ALL REQUIRED WORK, MATERIALS, EQUIPMENT AND
- 2. WHEREVER THE WORD "FURNISH" APPEARS ON THE DRAWINGS OR EQUIPMENT AND ACCESSORIES AS SPECIFIED.
- INSPECT FOR PROPER CONDITION AND INSTALL WITH ALL REQUIRED ASSOCIATED WORK MATERIALS, EQUIPMENT AND

3 WHEREVER THE WORD "INSTALL" APPEARS ON THE DRAWINGS OR

- 1. PRIOR TO ROUGH-IN OR ORDERING ANY EQUIPMENT, SUBMIT SHOP DRAWINGS FOR EACH TYPE OF PRODUCT. INCLUDE DETAILED DIAGRAMS FOR POWER, CONTROL, AND SIGNAL WIRING. WIRING DIAGRAMS SHALL DIFFERENTIATE BETWEEN MANUFACTURER-INSTALLED AND FIELD-INSTALLED WIRIN RWISE NOTED, ELECTRONIC COPIES OF SUBMITTALS
- 2. SHOP DRAWINGS SUBMITTED WITHOUT CONTRACTOR'S APPROVAL STAMP SHALL NOT BE REVIEWED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING OF PROPOSED EQUIPMENT PRIOR TO SUBMITTING TO ARCHITECT/ENGINEER. THE COST OF ANY REDESIGNING CAUSED BY A SUBSTITUTION OR LACK OF
- NOTHER EQUAL TYPE OR MANUFACTURER OTHER THAN SPECIFIED, WHERE SUCH SUBSTITUTIONS ARE ALLOWED, AND CONTRACTOR SHALL PAY FOR ALL COSTS INVOLVED SUCH AS ARCHITECTS AND ENGINEER'S REDESIGN FEES AND ANY TIONAL CONSTRUCTION COSTS FOR HIS OWN WORK AND
  OF OTHER TRADES. EQUIPMENT SHALL NOT BE PURCHASED OR WORK STARTED UNTIL SHOP DRAWINGS ARE APPROVED. SHOULD A SUBSTITUTION BE SUBMITTED FOR REVIEW, AND NOT APPROVED, THERE SHALL BE NO COST TO THE OWNER FOR A PRODUCT BY THE LISTED MANUFACTURERS.

### E. QUALITY ASSURANCE

- 1. INSTALLER QUALIFICATIONS: PERSONNEL WITH THE EXPERIENCE ND CAPABILITY TO CONDUCT THE WORK INDICATED, AND WHOM TRAINED AND CERTIFIED BY NFPA 70E AND OSHA REGULATION
- 2. OBTAIN EACH TYPE OF PRODUCT THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER.
- SUBJECT TO COMPLIANCE WITH REQUIREMENTS; PROVIDE PRODUCTS BY ONE OF THE MANUFACTURERS LISTED IN SECTION 2 ARTICLES HEREIN.
- 4. ALL PRODUCTS SHALL BE LISTED AND LABELED AS DEFINED BY NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE. LISTING AND LABELING AGENCY SHALL BE A NATIONALLY RECOGNIZED TESTING LABORATORY AS DEFINED BY OSHA REGULATION 1910.7

### F. OPERATION AND MAINTENANCE DATA

- 1. SUBMIT THREE (3) BOUND MANUALS CONTAINING COMPLETE TYPE WRITTEN INSTRUCTIONS ON OPERATION, CARE, AND MAINTENANCE FOR EACH TYPE OF PRODUCT. INCLUDE THE
- a. MANUFACTURER'S PRODUCT DATA SHEETS STATING FQUIPMENT RATING AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY
- b. NAMES AND ADDRESSES OF AT LEAST ONE QUALIFIED SERVICE c. COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO
- d. SPARE PARTS LISTS e. WIRING DIAGRAMS.

#### f. WARRANTIES. G. WARRANTY

1. SUBMIT A WRITTEN WARRANTY TO OWNER AGREEING TO REPAIR OR REPLACE PRODUCTS AND ASSOCIATED COMPON FAIL IN MATERIALS OR WORKMANSHIP FOR A PERIOD OF ONE ( YEAR FROM DATE OF FINAL ACCEPTANCE. WARRANTY SHALL BE COMPREHENSIVE. NO DEDUCTIBLE SHALL BE ALLOWED FOR TRAVEL TIME SERVICE HOURS OR REPAIR PARTS

#### H. RECORD DRAWINGS

KEEP ONE SET OF CONTRACT DRAWINGS ASIDE AT THE SITE. EATLY AND CLEARLY MARK ALL DEVIATIONS FROM CONTRAC DRAWINGS AND ANY DATA THAT IS PERTINENT FOR COMPLETION OF DOCUMENTS. AT COMPLETION OF PROJECT, TRANSFER MARKS TO A SET OF REPRODUCIBLE DRAWINGS AND DELIVER THIS SET OF DRAWINGS TO ARCHITECT/ENGINEER FOR SUBMISSION TO OWNER PRIOR TO FINAL ACCEPTANCE. A FULL SET OF ELECTRONIC, SCANNED, DRAWINGS IN ADOBE .PDF FORMAT SHALL BE PROVIDED ALONG WITH THE HARDCOPIES.

#### I. CERTIFICATIONS

- . PROVIDE THE OWNER WITH ALL APPLICABLE CERTIFICATIONS REQUIRED BY THE PROJECT.
- 2. AT THE END OF THE PROJECT, PROVIDE THE OWNER WITH A LETTER STATING THAT THE PROJECT HAS BEEN COMPLETED I COMPLIANCE WITH CODES, STANDARDS AND THE CONTRACT

### SECTION 2 - PRODUCTS

- 1. COMPLY WITH UL 467 FOR GROUNDING AND BONDING MATERIALS AND EQUIPMENT
- 2. INSULATED CONDUCTORS: COPPER WIRE OR CABLE INSULATED
- 3. BARE COPPER CONDUCTORS:
- a. SOLID CONDUCTORS: ASTM B 3 c. TINNED CONDUCTORS: ASTM B 33.
- 4. GROUND BUS: RECTANGULAR BARS OF ANNEALED COPPER, 1/4 X 2 INCHES IN CROSS SECTION. STAND-OFF INSULATORS FOR MOUNTING.
- 5. CONNECTORS
- a. LISTED AND LABELED BY AN NRTL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION FOR APPLICATIONS IN WHICH USED FOR SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS CONNECTED. b. BOLTED CONNECTORS FOR CONDUCTORS AND PIPES: COPPER

OR COPPER ALLOY, PRESSURE TYPE WITH AT LEAST TWO

- BOLTS. PIPE CONNECTORS SHALL BE CLAMP TYPE, SIZED FOR WELDED CONNECTORS: EXOTHERMIC-WELDING KITS OF YPES RECOMMENDED BY KIT MANUFACTURER FOR
- MATERIALS BEING JOINED AND INSTALLATION CONDITIONS d. BUS-BAR CONNECTORS: MECHANICAL TYPE, CAS SILICON BRONZE, SOLDERLESS COMPRESSION-TYPE WIRE TERMINALS
- e. COMPRESSION CABLE CONNECTORS: IRREVERSIBLE

- a. CONDUCTORS: INSTALL SOLID CONDUCTORS FOR NO. 10 AWG AND SMALLER AND STRANDED FOR NO. 8 AND LARGER. b. UNDERGROUND GROUNDING CONDUCTORS: INSTALL BARE
- TINNED-COPPER, NO. 4/0 AWG MINIMUM. c. GROUNDING ELECTRODE CONDUCTORS: BARE TINNED-COPPER.
- d. BONDING JUMPERS: BARE COPPER. e. EQUIPMENT GROUNDING CONDUCTORS: COPPER WITH GREEN-COLORED INSULATION.
- 8. CONDUCTOR TERMINATIONS AND CONNECTIONS:
- a. PIPE AND EQUIPMENT GROUNDING CONDUCTOR ERMINATIONS: BOLTED CONNECTIONS. b. UNDERGROUND CONNECTIONS (EXCEPT AT TEST WELLS): WELDED CONNECTORS. c. CONNECTION TO GROUND RODS AT TEST WELLS: BOLTED
- d. CONNECTION TO STRUCTURAL STEEL: WELDED CONNECTORS. B. HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
- . SEISMIC BRACING DRAWINGS AND CALCULATIONS SHALL BE
- 2. SEISMIC BRACING DESIGN AND LAYOUT DRAWINGS SHALL BE EITHER PREPARED BY A REGISTERED STRUCTURAL ENGINEER NSED IN Pennsylvania OR PREPARED BY QUALIFIED ESIGNER/ENGINEER WITH EXPERIENCE IN THE DESIGN ( SEISMIC BRACING FOR ELECTRICAL SYSTEMS, AND REVIEWED BY
- 12-GAGE THICK STEEL WITH HOLES 1-1/2 INCHES ON CENTER.
- 4. HANGER RODS: THREADED HIGH TENSILE STRENGTH GALVANIZE BON STEEL WITH FREE RUNNING THREADS, WITH MINIMUM 1/4
- a. PROVIDE PROTECTIVE CAPS ON THE END OF EACH HANGER . BEAM CLAMPS: MALLEABLE IRON WITH TAPERED HOLE IN BAS
- AND BACK TO ACCEPT EITHER BOLT OR HANGER ROD. SET SCREW SHALL BE HARDENED STEEL. 6. CONDUIT CLAMPS FOR TRAPEZE HANGERS: GALVANIZED STEEL NOTCHED TO FIT TRAPEZE WITH SINGLE BOLT TO TIGHTEN.

7. CONDUIT CLAMPS: ONE-HOLE MALLEABLE IRON FOR SURFACE

8. CABLE TIES: SELF-LOCKING HIGH STRENGTH NYLON WITH 185 DEGREE F TEMPERATURE RATING.

### 9. ALL CONDUIT SUPPORTS SHALL BE DESIGNED WITH A MINIMUM OF

- 10. FIRE STOPPING: UL CLASSIFIED AND/OR FM SYSTEM APPROVED AND TESTED TO THE REQUIREMENTS OF ASTM 814 AND UL 1479 FIRE STOPPING MATERIAL SHALL BE FM APPROVED WITH AN HOURLY RATING GREATER THAN OR EQUAL TO THE ASSOCIATED CEILING, FLOOR, OR WALL CABLE OR CONDUIT PENETRATES.
- 11. CONCRETE BASES: COORDINATE WEIGHTS, DIMENSIONS, AND INSTALLATION DETAILS FOR FREE-STANDING EQUIPMENT WITH THE GENERAL CONTRACTOR.

#### C. ELECTRICAL IDENTIFICATION

- EQUIPMENT IDENTIFICATION LABELS: ENGRAVED, LAMINATED MOUNTING. SCREWS SHALL BE STAINLESS STEEL. MINIMUM ETTER HEIGHT SHALL BE 3/8 INCH.
- 2. COLOR FOR PRINTED LEGEND: BLACK LETTERS ON WHITE FIELD. a. LEGEND: INDICATE EQUIPMENT DESIGNATION, VOLTAGE, PHASE, AND NUMBER OF WIRES.
- D. CONDUCTORS AND CABLES 1. INSULATED CURRENT CARRYING WIRE AND GROUNDING
- NDUCTORS SHALL BE COPPER AND SHALL CONFORM TO NFPA

S-95-658 FOR TYPE THHN-THWN-

- 2. COPPER CONDUCTORS: COMPLY WITH NEMA WC 70/ICEA S-95-658. 3. CONDUCTOR INSULATION: COMPLY WITH NEMA WC 70/ICEA
- 4. MULTICONDUCTOR CABLE: COMPLY WITH NEMA WC 70/ICEA S-95-658 FOR METAL CLAD CABLE, TYPE MC, WITH GALVANIZE INTERLOCKING STEEL ARMOR AND FULL SIZE GREEN INSULATED
- 5. VARIABLE FREQUENCY CONTROLLER (VFC) CABLE: COMPLY WITH UL 1277, UL 1685, AND NFPA 70 FOR TYPE TC-ER CABLE.
- a TYPE TC-ER WITH OVERSIZED CROSSLINKED POLYETHYLENE COVERAGE BRAIDED SHIELDS AND INSULATED FULL-SIZ GROUND WIRE, AND SUNLIGHT- AND OIL-RESISTANT OUTER
- $6. \quad \text{CONDUCTORS NO. 10 OR SMALLER SHALL BE SOLID COPPER WIRE.} \\$ CONDUCTORS NO. 8 OR LARGER SHALL BE STRANDED COPPER
- 7. CONDUCTORS NOT SMALLER THAN 12 AWG FOR POWER CIRCUITS. CONDUCTORS NOT SMALLER THAN 14 AWG FOR CONTROL CIRCUITS, UNLESS OTHERWISE NOTED.
- 8. COLOR-CODING FOR PHASE AND VOLTAGE LEVEL IDENTIFICATION COLORS SHALL BE FACTORY APPLIED, OR FOR SIZES LARGER THAN 6 AWG, FIELD APPLIED WITH COLOR-CODING CONDUCTOR
- a. COLORS FOR 208Y/120V CIRCUITS:
- PHASE A: BLACK. • PHASE B: RED. PHASE C: BLUE.
- NEUTRAL: WHITE GROUND: GREEN. ISOLATED GROUND: GREEN WITH YELLOW STRIPE
- b. COLORS FOR 480Y/277V CIRCUITS:
- PHASE B: ORANGE. PHASE C: YELLOW NEUTRAL: GRAY

GROUND: GREEN.

- 9. CONDUCTOR AND CABLE METHODS SHALL CONFORM TO THE LOWING, REFER TO SINGLE LINE DIAGRAM FOR OTHER CABLE REQUIREMENTS:
- a. FEEDERS: TYPE THHN-THWN-2, SINGLE CONDUCTORS IN b. BRANCH CIRCUITS HOMERUNS: TYPE THHN-THWN-2, SINGLE CONDUCTORS IN RACEWAY. c. BRANCH CIRCUITS EXPOSED IN MECHANICAL AND
- ELECTRICAL ROOMS: TYPE THHN-THWN-2, SINGLE DUCTORS IN RACEWAY. d. RACEWAYS EXPOSED TO DIRECT SUNLIGHT ON OR ABOVE  ${\bf ROOFTOPS: TYPE\ XHHW-2, SINGLE\ CONDUCTORS\ IN\ RACEWAY}.$
- e. VFC OUTPUT CIRCUITS (IN CONDUIT, ISOLATED FROM OTHER CIRCUITS): TYPE XHHW-2, SINGLE CONDUCTORS IN RACEWAY f. VFC OUTPUT CIRCUITS (IN CABLE TRAY OR ALONGSIDE OTHER POWER CIRCUITS): TYPE TC-ER CABLE IN RACEWAY

g. UNDERGROUND LOCATIONS: TYPE XHHW-2, SINGLE

CONDUCTORS IN RACEWAY. 10. SPLICES: UNLESS NOTED OTHERWISE, FEEDERS SHALL NOT BE

### E. RACEWAYS AND BOXES

- 2. ELECTRICAL METALLIC TUBING (EMT): ANSI C80.3
- 3. FLEXIBLE METALLIC CONDUIT (FMC): INTERLOCKED GALVANIZED 4. LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT (LFMC): FMC WITH PVC JACKET.
- 5. FITTINGS FOR CONDUIT: NEMA FB 1
- MALLER. STEEL SET-SCREW FOR 2-1/2 INCH AND LARGER. DIE-CAST NOT PERMITTED. 6. SHEET METAL OUTLET AND DEVICE BOXES: NEMA OS 1.
- 7. CAST METAL OUTLET AND DEVICE BOXES: NEMA FB 1, FERROUS 8. SHEET METAL PULL AND JUNCTION BOXES: NEMA OS 1
- 9. CAST METAL PULL AND JUNCTION BOXES: NEMA FB 1,
- SURFACE RACEWAYS: TWO-PIECE, GALVANIZED STEEL WITH SNAP-ON COVERS, CONTINUOUS DIVIDER, AND GRAY BAKED ENAMEL FINISH. WIREMOLD G4000 SERIES OR APPROVED EQUAL
- 11. SLEEVES FOR RACEWAYS: ASTM A 53/A 53M, TYPE E, GRADE B, SCHEDULE 40, GALVANIZED STEEL, PLANE ENDS.
- 12. RACEWAY AND BOX METHODS SHALL CONFORM TO THE
- b. OUTDOOR BOXES, ABOVEGROUND: NEMA 250, TYPE 3R. c. INTERIOR LOCATIONS: EMT (DRY AREAS), RSC (DAMP OR WET d. INTERIOR BOXES: NEMA 250, TYPE 1. CLEAN PROCESS LOCATIONS: PVC-COATED STEEL CONDUIT
- CONDENSING UNITS, AND TRANSFORMERS): LFMC, MAXIMUM LENGTH 3 FEET 0 INCH. h. ENCLOSURES: NEMA 250 TYPE 1, EXCEPT USE NEMA 250 TYPE 3R IN DAMP OR WET LOCATIONS. i. MINIMUM RACEWAY SIZE: 3/4-INCH TRADE SIZE

f. HAZARDOUS AREAS: RSC WITH SEAL FITTINGS.

#### NSION FITTINGS SHALL BE PROVIDED WITH INTERNAL BONDING JUMPERS. F. WIRING DEVICES

- REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING: b. ARROW HART
- d. PASS &SEYMOUR/LEGRAND

PROFESSIONAL ENGINEER

2. ALL DEVICES SHALL BE SPECIFICATION GRADE.

# **ELECTRICAL SPECIFICATIONS**

- 3. SWITCHES: 120/277VAC, 20 AMP. COMPLY WITH NEMA WD 1, UL 20,
- 4. DUPLEX RECEPTACLES: 125VAC, 20 AMP. COMPLY WITH NEMA WD1, NEMA WD6 CONFIGURATION 5-20R, UL 498, AND FS W-C-596.
- 5. ISOLATED GROUND RECEPTACLES: 125VAC, 20 AMP. COMPLY WITH NEMA WD1, NEMA WD6 CONFIGURATION 5-20R, UL 498, AND FS 6. GFCI RECEPTACLES: STRAIGHT BLADE, NON-FEED-THROUGH TYPE

WITH AUTO-MONITORING (SELF-TEST) FOR PERIODIC AUTOMATIC

- GROUND FAULT. COMPLY WITH NEMA WDI, NEMA WD6, UL 498, UL 943 CLASS A, AND FS W-C-596. a. DAMP AND WET LOCATIONS: LISTED WEATHER-RESISTANT VR) TYPE, WITH WR MARKING ON FACE WHEN INSTALLED
- AMPERE RATINGS AS INDICATED IN SCHEDULE ON DRAWINGS.
  - 8. FINISH: UNLESS OTHERWISE NOTED, ALL FINISHES SHALL BE SELECTED BY THE ARCHITECT.
- a. NORMAL CIRCUITS: GRAY PLASTIC b. EMERGENCY CIRCUITS: RED PLASTIC . UPS CIRCUITS: [ORANGE] PLASTIC. ORANGE IS ONLY APPLICABLE

a. INDOOR, FINISHED AREAS: PER ARCHITECTURAL DRAWINGS. IF

NOT NOTED ON ARCHITECTURAL DRAWINGS PROVIDE WHITE

- 9. COVER PLATES: ONE PIECE TO SUIT WIRING DEVICES INSTALLED
- WITH SMOOTH SATIN FINISH. b. INDOOR, UNFINISHED AND BACK OF HOUSE AREAS: c. OUTDOOR LOCATIONS, RECEPTACLES: NEMA 250, TYPE 3R, EXTRA-DUTY" WEATHER RESISTANT, DIE-CAST ALUMINU
- d. OUTDOOR LOCATIONS, SWITCHES: NEMA 250, TYPE 3R WEATHERPROOF CLEAR SILICONE RUBBER BUBBLE PLATE.

WHILE-IN-USE TYPE WITH FOAM GASKET AND LOCKABLE

- G. PANELBOARDS 10. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
- e. EATON ELECTRICAL INC; CUTLER-HAMMER f. GE CO., GE BUSINESS INFORMATION CENTER. g. SIEMENS ENERGY & AUTOMATION, INC
- h. SQUARE-D; A BRAND OF SCHNEIDER ELECTRIC 2. GENERAL REQUIREMENTS
- a. ENCLOSURES: NEMA 250, TYPE 1, SURFACE-MOUNTED CABINETS. b. FINISHES: GALVANIZED STEEL BACK BOXES AND STEEL PANELS AND TRIM.
- c. PHASE, NEUTRAL AND GROUND BUSES: COPPER. d. EXTRA-CAPACITY NEUTRAL BUS: RATED 200 PERCENT OF PHASE BUS AND UL LISTED AS SUITABLE FOR NONLINEAR LOADS AS INDICATED ON PLANS. EQUIPMENT GROUND BUS: ADEQUATE FOR FEEDER AND BRANCH-CIRCUIT EQUIPMENT GROUNDING CONDUCTORS,
- BONDED TO BOX. f. ISOLATED GROUND BUS: ADEQUATE FOR BRANCH-CIRCUIT GROUND CONDUCTORS, INSULATED FROM BOX AS INDICATED ON PLANS.
- g. CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL AND SIZES. h. SERVICE ENTRANCE LABEL: NRTL LABELED FOR USE AS SERVICE EOUIPMENT, AS INDICATED ON PLANS. SERVICE ENTRANCE BARRIER: UL 67 COMPLIANT BARRIER ON
- CONTACT WITH LIVE CIRCUIT PARTS. PANELBOARD SHORT CIRCUIT RATING: FULLY RATED TO INTERRUPT SYMMETRICAL SHORT CIRCUIT CURRENT AVAILABLE AT TERMINALS; SERIES OR INTEGRATED RATINGS ARE NOT PERMITTED.
- 3. DISTRIBUTION PANELBOARDS a. PANELBOARDS: NEMA PB 1, POWER AND FEEDER DISTRIBUTION TYPE

b. MAINS: CIRCUIT BREAKER OR MAIN LUG ONLY, AS INDICATED

LINE SIDE OF SERVICE DISCONNECT TO PREVENT ACCIDENTAL

- BRANCH OVERCURRENT PROTECTIVE DEVICES: PLUG-IN CIRCUIT BREAKERS.
- 4. LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS a. PANELBOARDS: NEMA PB 1, LIGHTING AND BRANCH-CIRCUIT

b. MAINS: CIRCUIT BREAKER OR MAIN LUG ONLY, AS INDICATED

- ON PLAINS. c. BRANCH OVERCURRENT PROTECTIVE DEVICES: BOLT-ON CIRCUIT BREAKERS. d. DOORS: HINGED TRIM TYPE WITH CONCEALED HINGE INNER AND OUTER DOOR, SECURED FLUSH LATCH ON INNER DOOR,
- MOLDED-CASE CIRCUIT BREAKERS: COMPLY WITH UL 489, WITH INTERRUPTING CAPACITY TO MEET AVAILABLE FAULT CURRENTS. TIME-CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS, AND

IRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR

CIRCUIT-BREAKER FRAME SIZES 250 A AND LARGER

b. ELECTRONIC TRIP CIRCUIT BREAKERS WITH RMS SENSING FIELD REPLACEABLE RATING PLUG OR FIELD-REPLICABLE LECTRONIC TRIP; AND THE FOLLOWING FIELD-ADJUSTABLE

TUMBLER LOCK, AND KEYED ALIKE.

- ◆ INSTANTANEOUS TRIP  $\blacklozenge$  LONG- AND SHORT-TIME PICKUP LEVELS. ◆ LONG- AND SHORT-TIME ADJUSTMENTS.
- . GFCI CIRCUIT BREAKERS FOR PERSONNEL PROTECTION d. : SINGLE- AND TWO-POLE CONFIGURATIONS WITH CLASS A GROUND-FAULT PROTECTION (6-MA TRIP). e. GROUND-FAULT EQUIPMENT PROTECTION (GFEP) CIRCUI BREAKERS: CLASS B GROUND-FAULT PROTECTION (30-MA
- f. LUGS: MECHANICAL STYLE, SUITABLE FOR NUMBER, SIZE, TRIP RATINGS, AND CONDUCTOR MATERIALS. g. APPLICATION LISTING: APPROPRIATE FOR APPLICATION; TYPE SWD FOR SWITCHING FLUORESCENT LIGHTING LOADS; TYPE HID FOR FEEDING FLUORESCENT AND HID LIGHTING CIRCUITS.

### h. HANDLE PADLOCKING DEVICE: FIXED ATTACHMENT, FOR LOCKING MAIN AND BRANCH CIRCUIT BREAKER HANDLES IN THE ON OR OFF POSITION.

- 6. SURGE PROTECTION DEVICES a. DESCRIPTION: IEEE C62.41-COMPLIENT, INTEGRALLY MOUNTED, SOLID-STATE TYPE WITH 200KA SHORT-CIRCUIT
- RATING, INDIVIDUALLY FUSED SUPPRESSION MODES, AND AUDIBLE ALARM b. PEAK SURGE CURRENT RATING: 160KA FOR DISTRIBUTION PANELBOARDS; 120KA FOR BRANCH-CIRCUIT PANELBOARDS SYSTEM VOLTAGE: VOLTAGE AS INDICATED ON DRAWINGS. d. MODES OF PROTECTION: L-N, L-G, L-L, AND N-G. SURGE COUNTER: DISPLAYS THE COMBINED TOTAL NUMBER

# OF TRANSIENT VOLTAGE SURGES DETECTED SINCE THE COUNTER WAS LAST RESET

- H. DRY-TYPE TRANSFORMERS MANUFACTURERS: SUBJECT TO COMPLIANCE WITH PROVIDE PRODUCTS BY ONE OF THE
- a. EATON ELECTRICAL INC. CUTLER-HAMMER. b. GE CO., GE BUSINESS INFORMATION CENTER SIEMENS ENERGY & AUTOMATION, INC. d. SQUARE-D; A BRAND OF SCHNEIDER ELECTRIC

. DESCRIPTION: NEMA ST 20, AIR-COOLED GENERAL-PURPOS

3. RATINGS: VOLTAGE AND KVA RATINGS AS INDICATED ON 4. SOUND LEVELS: NOT EXCEEDING ANSI AND NEMA SOUND LEVELS 5. COILS: CONTINUOUS WINDINGS WITHOUT SPLICES EXCEPT FOR

LISTED AND LABELED AS COMPLYING WITH UL

## ENSURE A SATISFACTORY MECHANICAL AND ELECTRICAL JOINT

- COIL MATERIAL: COPPER.
- CORES: ONE PER PHASE.
- SHIELD FOR ALL OUTDOOR INSTALLATION TAPS: TWO (2) 2-1/2 PERCENT TAPS ABOVE AND FOUR (4) 2-1/2"
- 9. INSULATION CLASS: 220 DEG. C WITH MAXIMUM 115 DEG. C RISE
- ABOVE 40 DEG. C AMBIENT TEMPERATURE. 10. ENERGY EFFICIENCY: COMPLY WITH DOE 2016 ENERGY EFFICIENCY LEVELS, 10 CFR PART 431 CANDIDATE STANDARD
  LEVEL 3 (CSL-3) EFFICIENCY WITH EXTREME NO LOAD LOSSES AS TESTED PER NEMA TP-2
- 11. K-FACTOR RATING: COMPLY WITH UL 1561 REQUIREMENTS FOR NONSINUSOIDAL LOAD CURRENT-HANDLING CAPABILITY TO THE DEGREE DEFINED BY DESIGNED K-FACTOR. UNIT SHALL NOT OVERHEAT WHEN CARRYING FULL-LOAD CURRENT WITH HARMONIC DISTORTION CORRESPONDING TO DESIGNE
  K-FACTOR. 'INDICATE VALUE OF K-FACTOR ON
- TRANSFORMER NAMEPLATE. 12. WALL BRACKETS: MANUFACTURER'S STANDARD BRACKETS (WHERE INDICATED).
- 13. PROVIDE VIBRATION ISOLATION BETWEEN MOUNTING FRAME AND

## SECTION 3 - EXECUTION

A. EQUIPMENT FURNISHED BY OTHERS 11. ELECTRICAL CONTRACTOR SHALL PROVIDE INSTALLATION AND ESTING FOR ELECTRICAL EQUIPMENT PROVIDED BY OTHERS. THIS SHALL INCLUDE: a. ELECTRICAL DISCONNECTS PROVIDED WITH MECHANICAL

b. OWNER-FURNISHED MATERIALS, AS NOTED ON THE DRAWINGS

c. PRE-PURCHASED MATERIALS, AS NOTED ON THE DRAWINGS B. GROUNDING

GROUNDING SHALL BE IN ACCORDANCE WITH NFPA 70.

- 2. THE NON-CURRENT CARRYING PARTS OF ALL ELECTRICAL EQUIPMENT SHALL BE BONDED TO THE EQUIPMENT GROUND SERVING THIS EQUIPMENT. 3. INSTALL A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN
- CONDUITS WITH ALL BRANCH CIRCUITS AND FEDERS. SIZE EQUIPMENT GROUNDING CONDUCTORS IN ACCORDANCE WITH NFPA 70. TERMINATE EACH END ON SUITABLE LUG, BUS, OR
- . BURY UNDERGROUND GROUNDING CONDUCTORS AT LEAST 30 INCHES BELOW GRADE. 5. UNDER GROUND (CONCRETE-ENCASED GROUNDING ELECTRODE)
- FABRICATE ACCORDING TO NFPA 70; USE A MINIMUM OF 20 FEET OF BARE COPPER CONDUCTOR NOT SMALLER THAN NO. 4/0 AWG. a. IF CONCRETE IS LESS THAN 20 FEET LONG, COIL EXCESS CONDUCTOR WITHIN BASE OF FOUNDATION.
  b. BOND GROUNDING CONDUCTOR TO REINFORCING STEEL IN AT LEAST FOUR LOCATIONS AND TO ANCHOR BOLTS, EXTEND GROUNDING CONDUCTOR BELOW GRADE AND CONNECT TO BUILDINGS GROUNDING GRID OR TO GROUNDING ELECTRODE
- 6. ISOLATED GROUNDING CONDUCTORS: GREEN-COLORED WITH CONTINUOUS YELLOW STRIPE. ON FEEDERS WITH ISOLATED GROUND, IDENTIFY GROUNDING CONDUCTOR WHERE VISIBLE TO NORMAL INSPECTION, WITH ALTERNATING BANDS OF GREEN AN ELLOW TAPE, WITH AT LEAST THREE BANDS OF GREEN AND TWO
- ISOLATED GROUNDING RECEPTACLE CIRCUITS: INSTALL AN ISOLATED EQUIPMENT GROUNDING CONDUCTOR CONNECTED TO THE RECEPTACLE GROUNDING TERMINAL. ISOLATE CONDUCTOR FROM RACEWAY AND FROM PANELBOARD GROUNDING TERMINALS. TERMINATE AT EQUIPMENT GROUNDING TERMINAL OF THE APPLICABLE DERIVED SYSTEM OR SERVICE, UNLESS

EXTERNAL TO CONCRETE.

- 8. PERFORM TESTS AND INSPECTIONS. a. INSPECT PHYSICAL AND MECHANICAL CONDITION. VERIFY
- IGHTNESS OF ALL BOLTED CONNECTIONS WITH CALIBRATE TORQUE WRENCH ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. b. TEST GROUND RESISTANCE AT SERVICE DISCONNECT ENCLOSURE GROUNDING TERMINAL, AT GROUND TEST WELLS,

GROUND RESISTANCE SHALL NOT EXCEED 5 OHMS

AND AT INDIVIDUAL GROUND RODS. MAXIMUM MEASURED

. MEASURE GROUND RESISTANCE NO FEWER THAN TWO FULL

DAYS AFTER LAST TRACE OF PRECIPITATION AND WITHOUT d. PREPARE AND SUBMIT TEST AND INSPECTION REPORTS

C. HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

RECOMMENDATIONS.

- SELECT SIZES OF COMPONENTS SO STRENGTH WILL BE ADEQUATE TO CARRY PRESENT AND FUTURE STATIC LOADS WITHIN SPECIFIED LOADING LIMITS. MINIMUM STATIC DESIGN LOAD USED FOR STRENGTH DETERMINATION SHALL BE WEIGHT OF
- D. ELECTRICAL IDENTIFICATION SERVICE-ENTRANCE FOLIPMENT: INSTALL NAMEPLATE ON SERVICE EQUIPMENT RATED 1200 AMPS OR MORE IDENTIFYING SYSTEM VOLTAGE, AVAILABLE FAULT CURRENT, CLEARING TIM OF SERVICE PROTECTIVE DEVICE BASED ON AVAILABLE FAUL

CURRENT, AND DATE NAMEPLATE IS INSTALLED

ANCHOR EQUIPMENT TO CONCRETE BASES PER MANUFACTURER'S

CONTROL CENTERS, AND AIR-CONDITIONING AND REFRIGERATING FOLIPMENT: INSTALL NAMEDI ATE IDENTIFYING SYSTEM LTAGE, AVAILABLE FAULT CURRENT, AND DATE NAMEPLATE IS

. PROVIDE REVISED TYPED PANEL INDEX TO INDICATE SPARE AND

NSTALLED CIRCUITS AFTER BALANCING PANELBOARD ON ORPORATING OWNER'S FINAL ROOM DESIGNATIONS.

HANDWRITTEN DIRECTORIES ARE NOT PERMITTED. 3. EOUIPMENT IDENTIFICATION LABELS: ON EACH UNIT OF EQUIPMENT, INSTALL A UNIQUE IDENTIFICATION LABEL THAT IS CONSISTENT WITH DESIGNATIONS ON CONTRACT DRAWINGS.

a. UNLESS OTHERWISE INDICATED, PROVIDE SINGLE LINE OF

TEXT WITH 1/2-INCH HIGH LETTERS ON 1-1/2-INCH HIGH LABELS; WHERE TWO LINES OF TEXT ARE REQUIRED, USE LABELS 2-INCHES HIGH. b. ATTACH NON-ADHESIVE IDENTIFICATION PRODUCTS WITH SCREWS AND AUXILIARY HARDWARE APPROPRIATE TO THE LOCATION AND SUBSTRATE.

NOT PERMITTED.

- E. CONDUCTORS AND CABLES 1. INSTALL SEPARATE DEDICATED NEUTRAL CONDUCTOR WITH EACH 120V AND 277V BRANCH CIRCUIT. SHARED NEUTRALS ARE
- CONDUITS SHALL BE COMPLETELY INSTALLED, WITH INTERIORS PROTECTED FROM WEATHER, BEFORE PROCEEDING WITH THE INSTALLATION OF CONDUCTORS AND CABLES.

3. CONDUCTORS SHALL BE CONTINUOUS WITH SPLICES AND

CONNECTIONS ONLY MADE IN OUTLET, JUNCTION, OR PULL BOXES.

COMPOUND OR LUBRICANT WHERE NECESSARY; COMPOUND USE

MUST NOT DETERIORATE CONDUCTOR OR INSULATION. DO NOT

- 4. PHASE CONDUCTORS AND THE NEUTRAL CONDUCTOR OF EACH FEEDER OR BRANCH CIRCUIT SHALL BE CONTAINED IN A SINGLE CONDUIT OR PARALLELED IN SEPARATE CONDUITS TO AVOID OVERHEATING THE CONDUIT BY INDUCTION. 5. USE MANUFACTURER'S APPROVED NON-CONDUCTIVE PULLIN
- XCEED MANUFACTURER'S RECOMMENDED MAXIMUM PULLING ENSIONS AND SIDEWALL PRESSURE VALUES. 6. SPLICES IN CONDUCTORS NO. 8 AND SMALLER SHALL BE MADE WITH INSULATED SPRING WIRE, CONNECTORS WITH PLASTIC CAPS

- OR WITH CRIMP TYPE CONNECTORS AND COMPRESSION TOOLS TO
- . SPLICES IN CONDUCTORS NO. 6 AND LARGER SHALL BE MADE WITH CRIMP-TYPE CONNECTORS AND COMPRESSION TOOLS OR WITH BOLTED CLAMP-TYPE CONNECTORS TO ENSURE A
- SATISFACTORY MECHANICAL AND ELECTRICAL JOINT. 8. SPLICES SHALL BE WRAPPED WITH TAPE THAT HAS AN INSULATION AND TEMPERATURE RATING EQUIVALENT TO THAT OF THE CONDUCTOR.
- 9. WHERE 20-AMP FEEDERS AND BRANCH CIRCUITS EXCEED 60 FEET 2% FOR FEEDERS AND 3% FOR BRANCH CIRCUITS.
- 10. HOME RUNS MAY BE COMBINED INTO A SINGLE CONDUIT. HOWEVER, MAXIMUM NUMBER OF CONDUCTORS SHALL MEET CONDUIT FILL AND DERATING REQUIREMENTS OF NFPA 70. DERATE CONDUCTORS WHERE MULTIPLE CIRCUITS HOMERUN ARE INSTALLED IN A SINGLE CONDUIT. SEPARATE DEDICATED NEUTRALS SHALL BE INSTALLED AND CLASSIFIED AS A CURRENT CARRYING CONDUCTOR. DIVERSITY FACTOR FOR EACH CIRCUIT IS
- 100 PERCENT. 11. PERFORM TESTS AND INSPECTIONS.
- a. PERFORM EACH ELECTRICAL TEST AND VISUAL AND MECHANICAL INSPECTION STATED IN NETA ACCEPTANCE TESTING SPECIFICATION. CERTIFY COMPLIANCE WITH TEST

### b. PREPARE AND SUBMIT TEST AND INSPECTION REPORTS.

F. RACEWAYS AND BOXES

- 1. SUPPORTS AND BOXES SHALL MATCH RACEWAY APPLICATION.
- INSTALL RACEWAYS AT LEAST 6 INCHES AWAY FROM MECHANICAL PIPING.
- 3. INSTALL RACEWAYS SUPPORTS ACCORDING TO NFPA 70 AND AS
- 4. INSTALL NO MORE THAN THE EQUIVALENT OF THREE 90-DEGREE BENDS IN ANY CONDUIT RUN EXCEPT FOR COMMUNICATIONS CONDUITS, FOR WHICH NO MORE THAN TWO 90-DEGREE BENDS IN ANY CONDUIT RUN ARE ALLOWED.
- 5. INSTALL EXPANSION-JOINT FITTINGS WHERE RACEWAYS CROSS BUILDING EXPANSION JOINTS.
- 6. SEAL RACEWAYS PASSING FROM WARM TO COLD LOCATIONS. SUCH AS IN COLD STORAGE AREAS OF BUILDING, OR WHERE PASSING FROM THE INTERIOR TO THE EXTERIOR OF A BUILDING INTERIOR TO THE EXTERIOR OF ROOFTOP EQUIPMENT HOUSING OR WHERE OTHERWISE REQUIRED BY NFPA 70. FILL WITH LISTED SEALING COMPOUND TO PREVENT THE CIRCULATION OF WARM AIR TO A COLDER SECTION OF THE RACEWAY.
- 7. RACEWAYS SHALL BE CONCEALED IN OR BEHIND WALLS OR ABOVE CEILINGS IN FINISHED AREAS.
- 8. RACEWAYS SHALL BE FASTENED TO BOXES WITH TWO LOCKNUTS AND A BUSHING. 9. CONDUIT AND BOXES SHALL NOT BE SUPPORTED FROM T-BAR
- 10. CONDUITS SHALL BE SECURELY FASTENED WITH HOT-DIPPED GALVANIZED STEEL SUPPORTS.

11. CONDUITS SHALL BE CONTINUOUS FROM TERMINATION TO

#### 12. CONDUITS THREADED IN FIELD SHALL BE COATED WITH AN APPROVED ELECTRICALLY CONDUCTIVE, CORROSION-RESISTANT COMPOUND.

BRANCH CIRCUIT.

- G. WIRING DEVICES SWITCHES CONTROLLING LIGHTING LOADS: INSTALL A GROUNDED CIRCUIT CONDUCTOR (NEUTRAL) FOR THE CONTROLLED LIGHTING CIRCUIT AT LOCATION WHERE SWITCHES CONTROL LIGHTING OADS THAT ARE SUPPLIED BY A GROUNDED GENERAL-PURPOSE
- 2. RECEPTACLE ORIENTATION: INSTALL GROUND PIN OF MOUNTED ABOVE 48-INCHES, AND ON HORIZONTALLY MOUNTED RECEPTACLES TO THE RIGHT.
- ROUGH WALL OPENING. 4. ARRANGEMENT OF DEVICES: UNLESS OTHERWISE INDICATED, MOUNT FLUSH, WITH LONG DIMENSION VERTICAL. ADJACENT DEVICES MAY BE GROUPED TOGETHER UNDER A SINGL

MULTIGANG WALL PLATE WHERE PERMITTED BY NFPA 70.

5. RECEPTACLE IDENTIFICATION: IDENTIFY PANELBOARD AND

3. DEVICE PLATES: DO NOT USE OVERSIZE OR EXTRA-DEEP PLATES. REPAIR WALL FINISHES AND REMOUNT OUTLET BOXES WHEN

STANDARD DEVICE PLATES DO NOT FIT FLUSH OR DO NOT COVER

CIRCUIT NUMBER FROM WHICH SERVED. USE HOT, STAMPED OF ENGRAVED MACHINE PRINTING WITH BLACK-FILLED LETTERING ON FACE OF PLATE, AND DURABLE WIRE MARKERS OR TAGS PANEL SCHEDULES: PROVIDE REVISED TYPED PANEL INDEX TO

#### INDICATE SPARE AND INSTALLED CIRCUITS AFTER BALANCING INDICATE SPARE AND INSTALLED CIRCUITS AFTER BALANCING PANELBOARD LOADS, INCORPORATING OWNER'S FINAL ROOM DESIGNATIONS. HANDWRITTEN DIRECTORIES ARE NOT

- . PERFORM TESTS AND INSPECTIONS FOR CONVENIENCE
- a. USE INSTRUMENTS THAT COMPLY WITH UL 1436. USE DIGITAL WRING ANALYZER WITH DIGITAL READOUT OR ILLUMINATED LED INDICATORS OF MEASUREMENTS FOR CONVENIENCE RECEPTACLES.

b. Test line voltage. Acceptable range is 105 to 132 V.

f. VERIFY DEVICE AND ITS OUTLET BOX ARE SECURELY

- c. TEST PERCENT VOLTAGE DROP WITH 15-A LOAD. A VALUE ABOVE 3 PERCENT IS NOT ACCEPTABLE. d. TEST GROUND IMPEDANCE. A VALUE ABOVE 2 OHMS IS NOT ACCEPTABLE. e. TEST GFCI TRIP FOR COMPLIANCE WITH UL 1436 AND UL 943.
- g.  $\,$  PREPARE AND SUBMIT TEST AND INSPECTION REPORTS.
- MOUNT ENCLOSURES WITH TOPS AT UNIFORM HEIGHT, WITH
- OPERATING HANDLES, MAXIMUM 72 INCHES ABOVE FINISHED

3. INSTALL IDENTIFICATION PLATE

2. INSTALL FILLER PLATES IN UNUSED SPACES.

4. PROVIDE TYPED PANEL INDEX TO INDICATE INSTALLED CIRCUITS AFTER BALANCING PANELBOARD LOADS, INCORPORATING OWNER'S FINAL ROOM DESIGNATIONS. HANDWRITTEN DIRECTORIES ARE NOT PERMITTED.

5. SET ADJUSTABLE TRIP SETTINGS TO FULLY COORDINATE WITH

#### 6. LOAD BALANCING: AFTER SUBSTANTIAL COMPLETION, MEASURE LOAD BALANCING AND MAKE CIRCUIT CHANGES. AFTER CIRCUIT CHANGES, RECHECK LOADS DURING NORMAL PERIOD. RECORD L LOAD READINGS BEFORE AND AFTER CHANGES AND SUBMIT

SSOCIATED PROTECTIVE DEVICES.

7. PERFORM TESTS AND INSPECTIONS AFTER INSTALLATION AND PRIOR TO STARTUP VERIFYIN INSTALLATION IS IN ACCORDANCE WITH SPECIFICATIONS AND

b. PERFORM EACH ELECTRICAL TEST AND VISUAL AND

1. ADJUST TRANSFORMER TAPS TO PROVIDE OPTIMAL VOLTAGE

MECHANICAL INSPECTION STATED IN NETA ACCEPTANC

ESTING SPECIFICATION. CERTIFY COMPLIANCE WITH TEST

PERCENT BETWEEN PHASE LOADS, WITHIN A PANELBOARD

CORDS. LOAD DIFFERENCE SHALL NOT EXCEED 2

c. PREPARE AND SUBMIT TEST AND INSPECTION REPORTS. I. DRY-TYPE TRANSFORMERS

MANUFACTURER'S RECOMMENDATIONS.

a. INSPECT TRANSFORMERS AND ASSOCIATED COMPONENT AFTER INSTALLATION AND PRIOR TO STARTUP VERIFYING INSTALLATION IS IN ACCORDANCE WITH SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS. b. PERFORM EACH ELECTRICAL TEST AND VISUAL AND MECHANICAL INSPECTION STATED IN NETA ACCEPTANCE TESTING SPECIFICATION. CERTIFY COMPLIANCE WITH TEST

CONDITIONS AT SECONDARY TERMINALS

2. INSTALL IDENTIFICATION PLATE.

3. PERFORM TESTS AND INSPECTIONS

PARAMETERS.

- c. PREPARE AND SUBMIT TEST AND INSPECTION REPORTS. J. SHORT CIRCUIT & ARC FLASH STUDY
- PROVIDE SHORT CIRCUIT AND ARC FLASH STUDIES OF ALL NEW 2. STUDY SHALL BE PERFORMED USING COMPUTER PROGRAMS THAT ARE DISTRIBUTED NATIONALLY AND WIDELY IN USE. SOFTWARE SHALL BE ABLE TO PERFORM CALCULATIONS NFPA AND IEEE
- STANDARDS. MANUAL CALCULATIONS WILL NOT BE ACCEPTABLE 3. STUDY SHALL INCLUDE:
- n. POINT OF ELECTRICAL CONNECTION TO EXISTING SYSTEM o. SWITCHGEAR
- p. SWITCHBOARDS
- q. UPS SYSTEMS r. MOTOR CONTROL CENTERS
- s. 480V PANELBOARDS t. LOW VOLTAGE TRANSFORMERS 4. SWITCHBOARDS AND SWITCHGEAR RATED 1200A OR MORE WILI
- - NOT BE APPROVED WITHOUT COMPLETED SHORT CIRCUIT STUDY 5. PROVIDE ARC FLASH WARNING LABELS FOR ALL NEW EQUIPMENT.

**ENGINEERING** 2321 E. 28TH STREET, SUITE 400 Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

ENGINEERING, LLC AN ASPLUNDH ENGINEERING CO. AMBLER YARDS 300 BROOKSIDE AVE. BLDG #14 AMBLER, PA 19002 TELEPHONE 215-884-5970

LANDFILL GAS BLOWER SKID

PROJECT NO.

DRAWING NO.

E-445K

09/08/2023 ISSUE FOR CONSTRUCTION JML CY MAM

OWNER: . MCENSE. No. 67828 Some STATE OF MORIDA. SOIONAL

NDIAN RIVER COUNTY 1325 74th AVE SW,

FLORIDA VERO BEACH, FLORIDA 32968

SIGNAL HILL, CA 90755

**BIOGAS** 

& FLARE REPLACEMENT

**ELECTRICAL** 

**SPECIFICATIONS** 

032-22

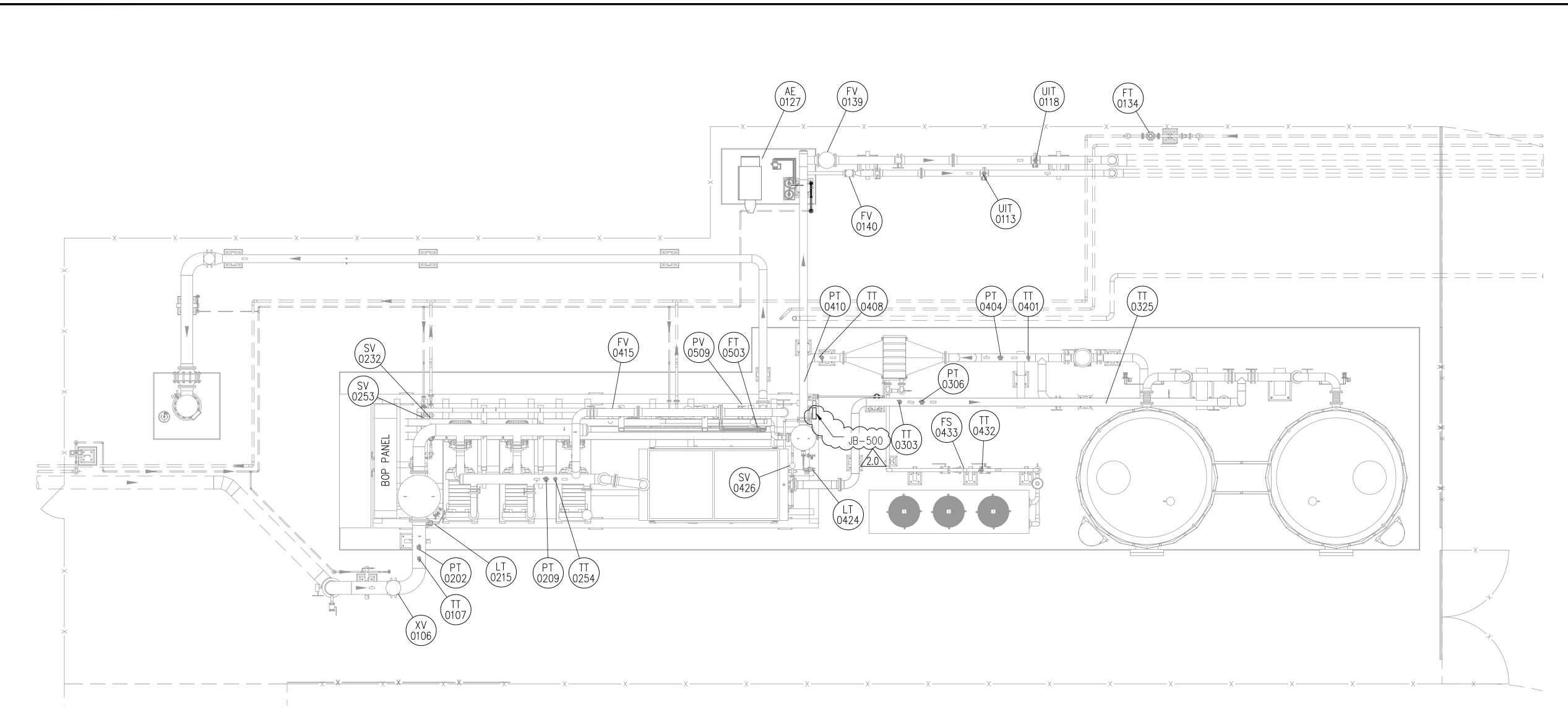


TABLE 1:INSTRUMENT LIST STICK BUILT

SR. NO.	INSTRUMENT TAG	P&ID NO.	APPROX. ELEVATION FTIN.
1	XV-0106	P2.01	35'-0 11/16"
2	TT-0107	P2.01	35'-8 3/16"
3	UIT-0113	P2.01A	33'-10 13/16"
4	UIT-0118	P2.01A	33'-10 13/16"
5	AE-0127 (NGC ANALYZER)	P2.01A	33'-10 13/16"
6	AE-0127 (SAMPLE CONDITIONER)	P2.01A	33'-10 13/16"
7	AE-0127 (GENIE PROBE)	P2.01A	33'-10 13/16"
8	FT-0134	P2.01	33'-10 13/16"
9	FV-0139	P2.01	32'-10 1/2"
10	FV-0140	P2.01	32'-9 1/2"
11	PT-0202	P2.02	36'-8 1/2"
12	TT-0254	P2.02	36'-8 1/2"
13	TT-0303	P2.03	38'-1 1/8"

TABLE 1:-

INSTRUMENT LIST STICK BUILT

SR. NO.	INSTRUMENT TAG	P&ID NO.	APPROX. ELEVATION FT.—IN.
14	PT-0306	P2.03	38'-7 3/4"
15	TT-0325	P2.03	35'-11 3/8"
16	TT-0401	P2.04	33'-11 15/16"
17	PT-0404	P2.04	34'-6 9/16"
18	TT-0408	P2.04	36'-0 5/8"
19	PT-0410	P2.04	36'-7 5/16"
20	TT-0432	P2.04	35'-9 3/8"
21	FS-0433	P2.04	35'-9 3/8"

TABLE 2:-

INSTRUMENT LIST SKID MODULE

SR.	NO.	INSTRUMENT TAG	P&ID NO.	APPROX. ELEVATION FT.—IN.
	1	LT-0215	P2.02	32'-11 7/8"
	2	PT-0209	P2.02	40'-1 9/16"
	3	SV-0232	P2.02	32'-4 7/16"
	4	SV-0253	P2.02	32'-4 7/16"
	5	FV-0415	P2.04	32'-6 15/16"
	6	LT-0424	P2.04	35'-0 1/8"
	7	SV-0426	P2.04	33'-1 11/16"
	8	FT-0503	P2.05	35'-1 1/16"
	9	PV-0509	P2.05	33'-5 5/16"

TABLE 3:-

BBREVATI	BBREVATIONS		
TAG	DESCRIPTION		
ΑE	ANALYZER TAPPING		
FT	FLOW TRANSMITTER		
FE	FLOW ELEMENT		
LT	LEVEL TRANSMITTER		
PT	PRESSURE TRANSMITTER		
PV	PRESSURE VALVE		
SV	SOLENOID VALVE		
TT	TEMPERATURE TRANSMITTER		
XV	PNEUMATIC ON/OFF VALVE		

## NOTES:

1. FOR P&ID REFER DRAWING P-445G TO P-445L.

2. REFER VALVE/SP-ITEM LIST & INSTRUMENT LIST DRAWING M-445S to M-445AE (13 SHEETS) FOR THE SCOPE OF SUPPLY OF INSTRUMENTS, GAUGES, VALVES AND SP-ITEM

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER	
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG		11111
2.0	02/03/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG		инни
						ANDRE GAMANIAN, P.E.	11111
						FL LICENCE NO.93370 EXP. 02/28/2025	

No. 93370

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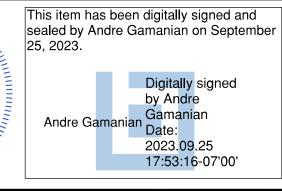
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INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968



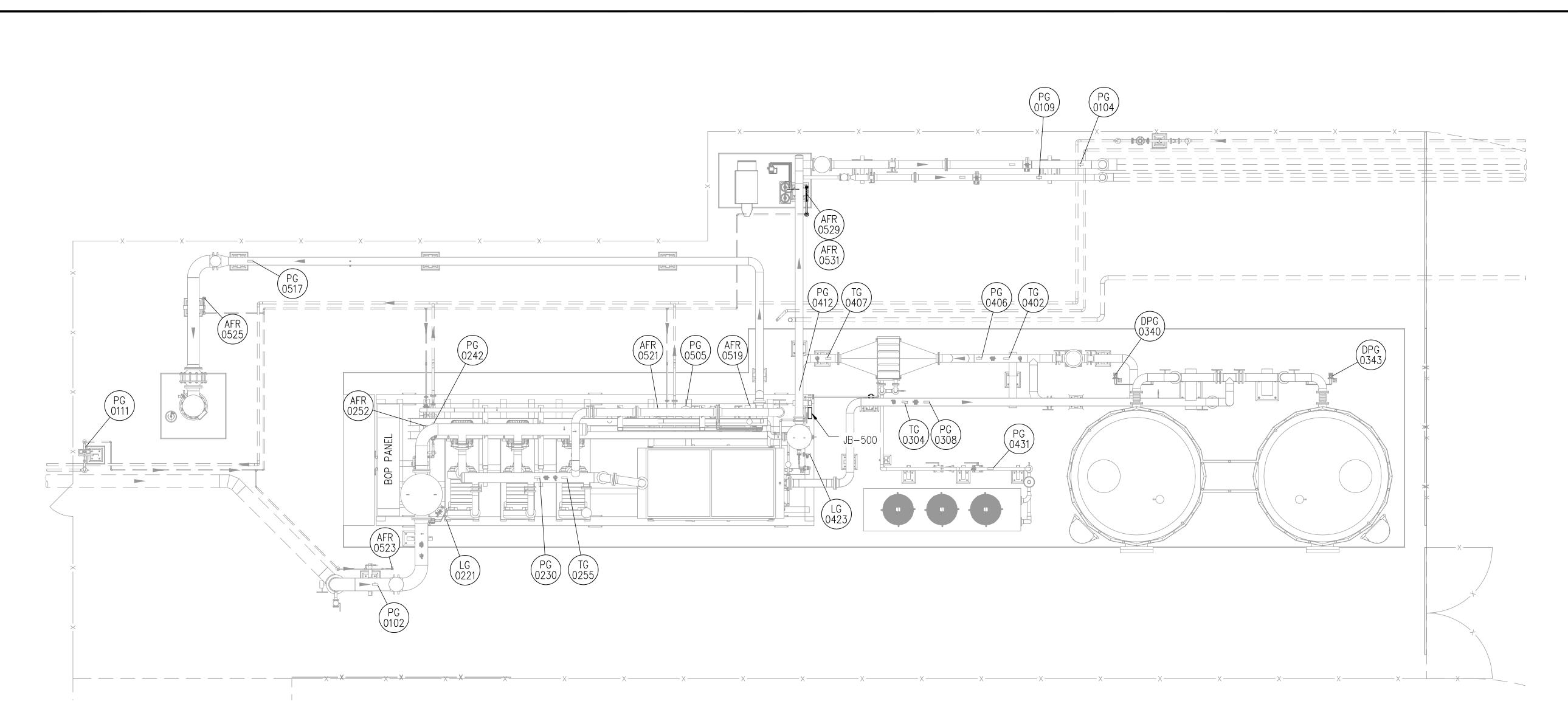
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

INSTRUMENT LOCATION PLAN

SCALE 3/16" = 1'-0"

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT





**TABLE 1:-**

GAUGE/VALVE LIST STICK BUILT

SR. NO.	INSTRUMENT TAG	P&ID NO.	APPROX. ELEVATION FT.—IN.
1	PG-0102	P2.01	36'-10 3/8"
2	PG-0104	P2.01	34'-5 7/16"
3	PG-0109	P2.01	34'-5 7/16"
4	PG-0111	P2.01	33'-10 13/16"
5	PG-0230	P2.02	36'-8 1/2"
6	AFR-0252	P2.02	33'-1 1/8"
7	TG-0255	P2.02	36'-8 1/2"
8	TG-0304	P2.03	38'-4"
9	PG-0308	P2.03	38'-9 11/16"
10	DPG-0340	P2.03	35'-3 9/16"
11	DPG-0343	P2.03	35'-3 9/16"
12	TG-0402	P2.04	34'-2 13/16"
13	PG-0406	P2.04	34'-8 1/2"

**TABLE 1:-**

GAUGE/VALVE LIST STICK BUILT

SR. NO.	INSTRUMENT TAG	P&ID NO.	APPROX. ELEVATION FT.—IN.
14	TG-0407	P2.04	36'-3 1/2"
15	PG-0412	P2.04	36'-9 3/16"
16	PG-0431	P2.04	36'-5 15/16"
17	PG-0517	P2.05	34'-1"
18	AFR-0523	P2.05	34'-6 3/8"
19	AFR-0525	P2.05	31'-3 7/8"
20	AFR-0529	P2.05	35'-0 7/16"
21	AFR-0531	P2.05	34'-0"

**TABLE 2:-**

GAUGE/VALVE LIST SKID MODULE

SR. NO.	INSTRUMENT TAG	P&ID NO.	APPROX. ELEVATION FT.—IN.
1	LG-0221	P2.02	36'-6 11/16"
2	PG-0230	P2.02	40'-3 7/16"
3	PG-0242	P2.02	34'-9 3/4"
4	LG-0423	P2.04	35'-11 11/16"
5	PG-0505	P2.05	36'-4 1/4"
6	AFR-0519	P2.05	33'–1 5/8"
7	AFR-0521	P2.05	33'-1 5/8"

**TABLE 3:-**

BBREVATIONS		
TAG	DESCRIPTION	
AFR	AIR FILTER REGULATOR	
LG	LEVEL GAUGE	
PG	PRESSURE GAUGE	
PVRV	PRESSURE VACUUM RELIEF VALVE	
PSV	PRESSURE SAFETY VALVE	
TG	TEMPERATURE GAUGE	
OPG/PDG	DIFFERENTIAL PRESSURE GAUGE	
PG PVRV PSV TG	PRESSURE GAUGE  PRESSURE VACUUM RELIEF VALVE  PRESSURE SAFETY VALVE  TEMPERATURE GAUGE	

NOTES:

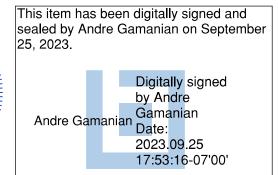
1. FOR P&ID REFER DRAWING P-445G TO P-445L.

2. REFER VALVE/SP-ITEM LIST & INSTRUMENT LIST DRAWING M-445S to M-445AE (13 SHEETS) FOR THE SCOPE OF SUPPLY OF INSTRUMENTS, GAUGES, VALVES AND SP-ITEM

ISSUED FOR CONSTRUCTION

DESCRIPTION DRN BY CHK BY APRV BY PROFESSIONAL ENGINEER DATE ISSUED FOR BID 08/24/2022 02/03/202 ISSUED FOR CONSTRUCTION ANDRE GAMANIAN, P.E. FL LICENCE NO.93370 EXP. 02/28/2025

ICENS A No. 93370 STATE OF CORIDA CHAMINE





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GAUGE AND VALVE LOCATION PLAN

SCALE 3/16" = 1'-0"

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. J-445B