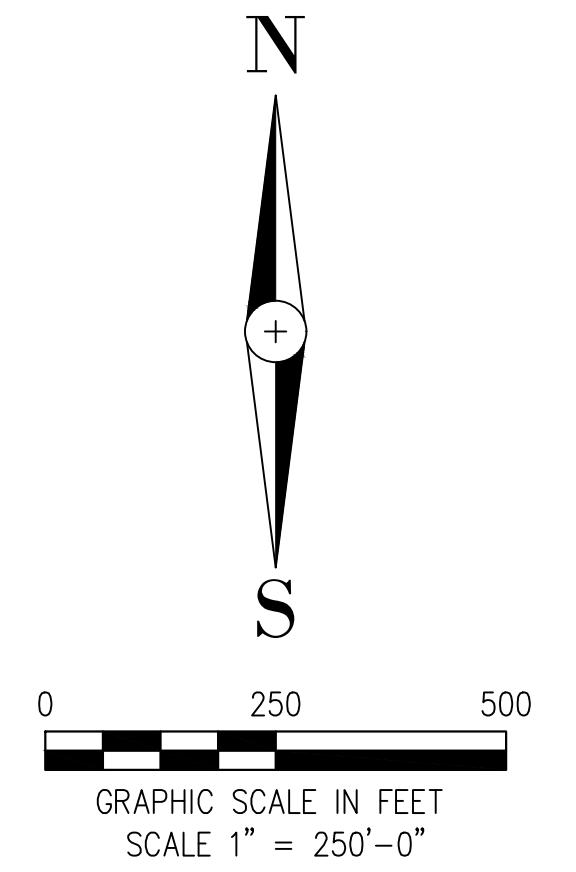
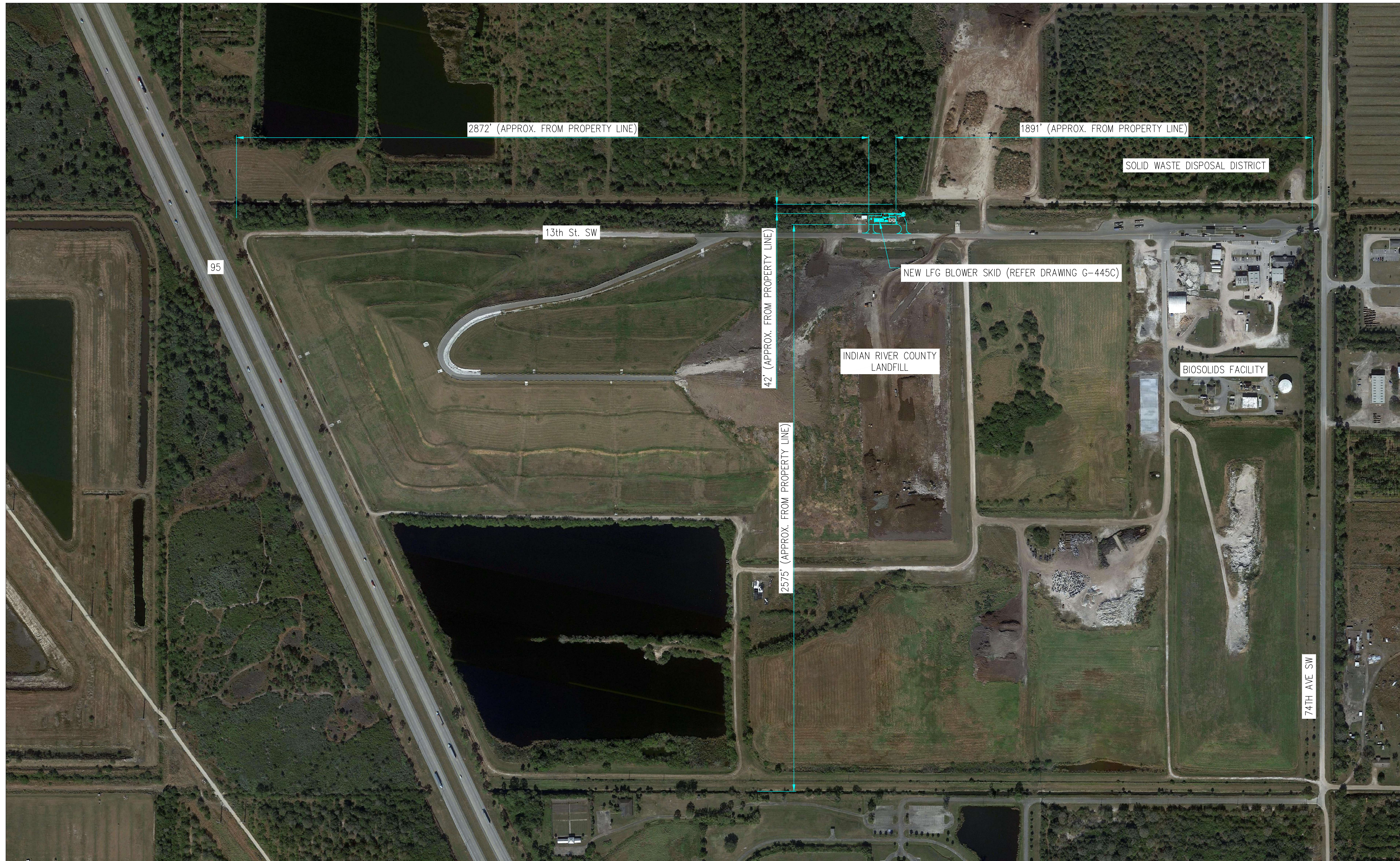


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NOTES:-

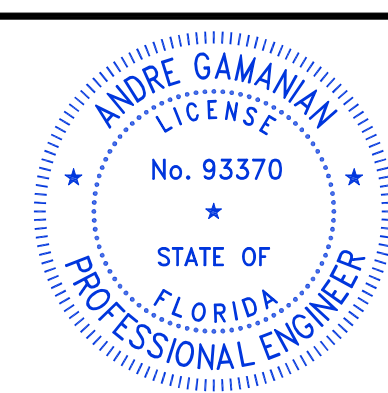
- 1) IF UNDERGROUND SERVICES ARE PRESENT. CALL 811 OR CONSULT WWW.SUNSHINE811.COM WELL BEFORE DRILLING OR EXCAVATION.
- 2) IMAGE USED FOR PLANNING PURPOSE ONLY. DIMENSIONAL ACCURACY SUBJECT TO PHOTO RESOLUTION, REGISTRATION AND CAMERA ANGLE DISTORTION.

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
3.0	08/24/2022	ISSUED FOR BID	AK	TP	AG
4.0	02/03/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG
5.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	AK	TP	AG
6.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG


PROFESSIONAL ENGINEER

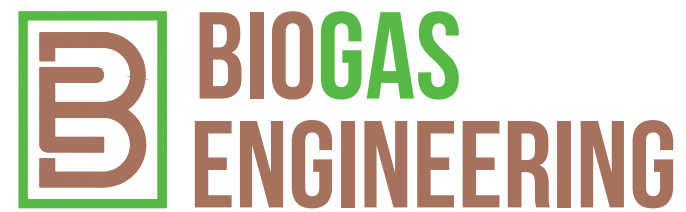
ANDRE GAMANIAN, P.E.
FL LICENSE NO.93370
EXP. 02/28/2025



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'

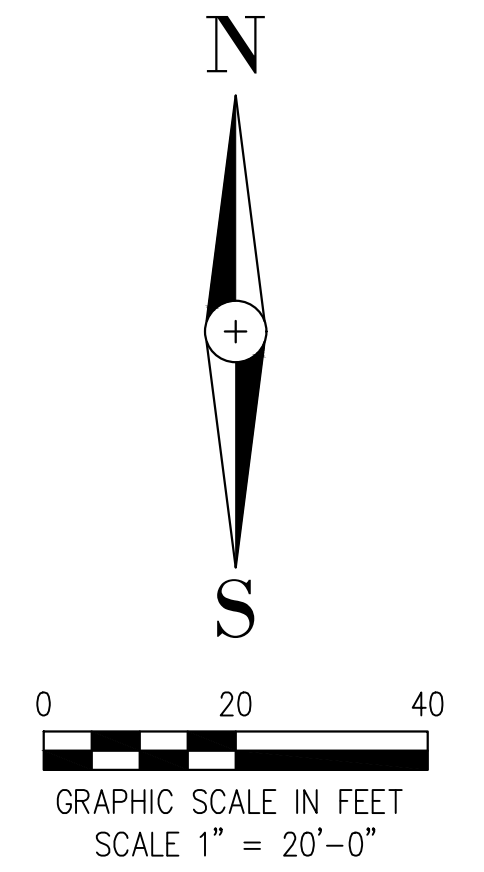
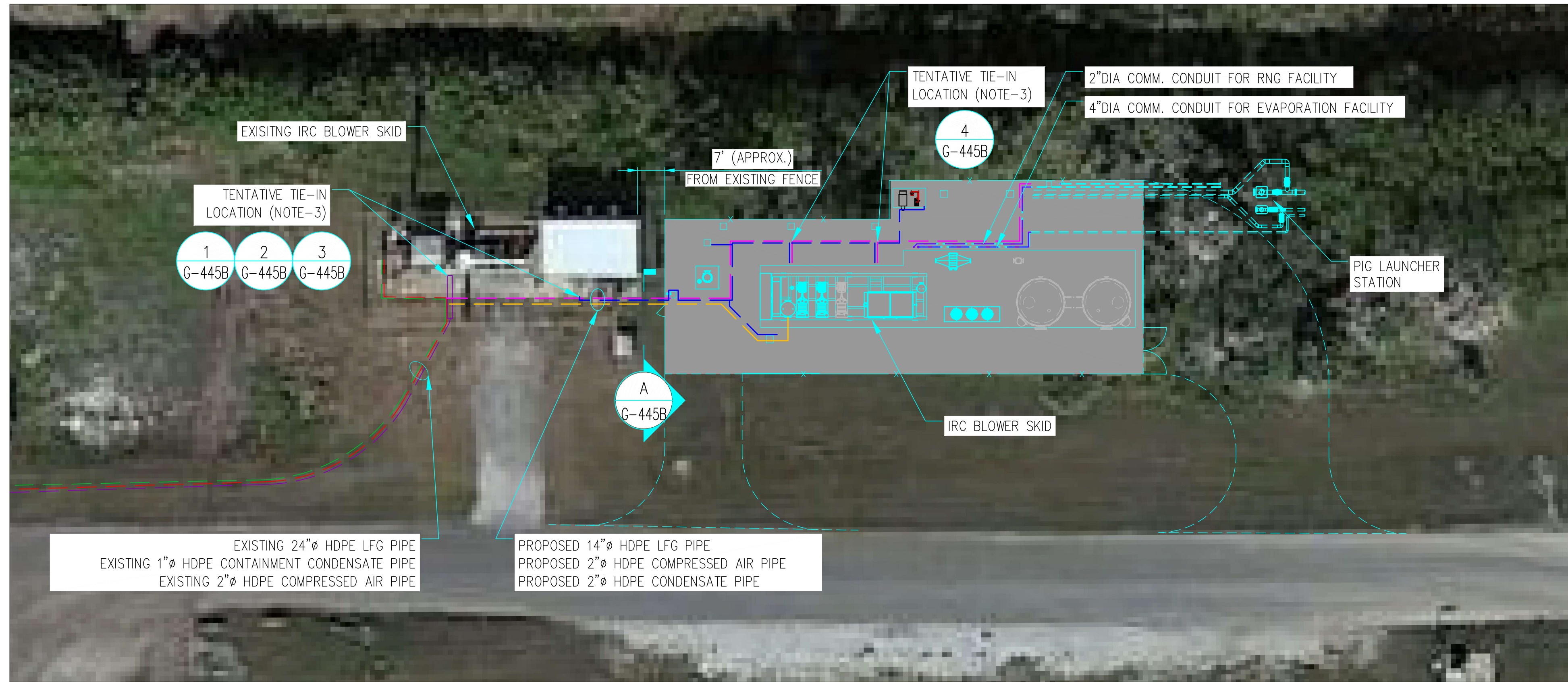
OWNER:
 INDIAN RIVER COUNTY FLORIDA
1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

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

LFG BLOWER SKID & FLARE LOCATION PLAN

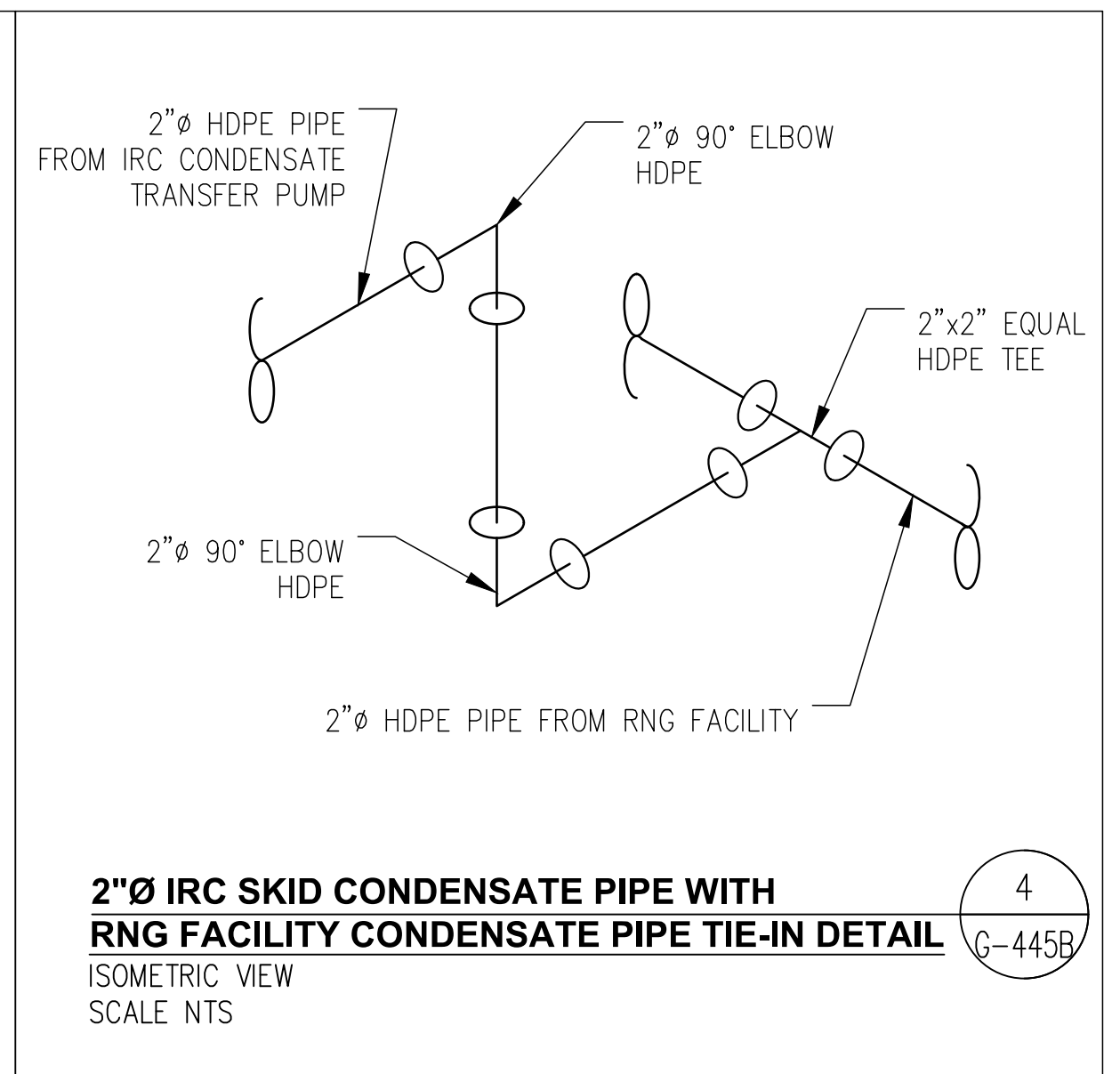
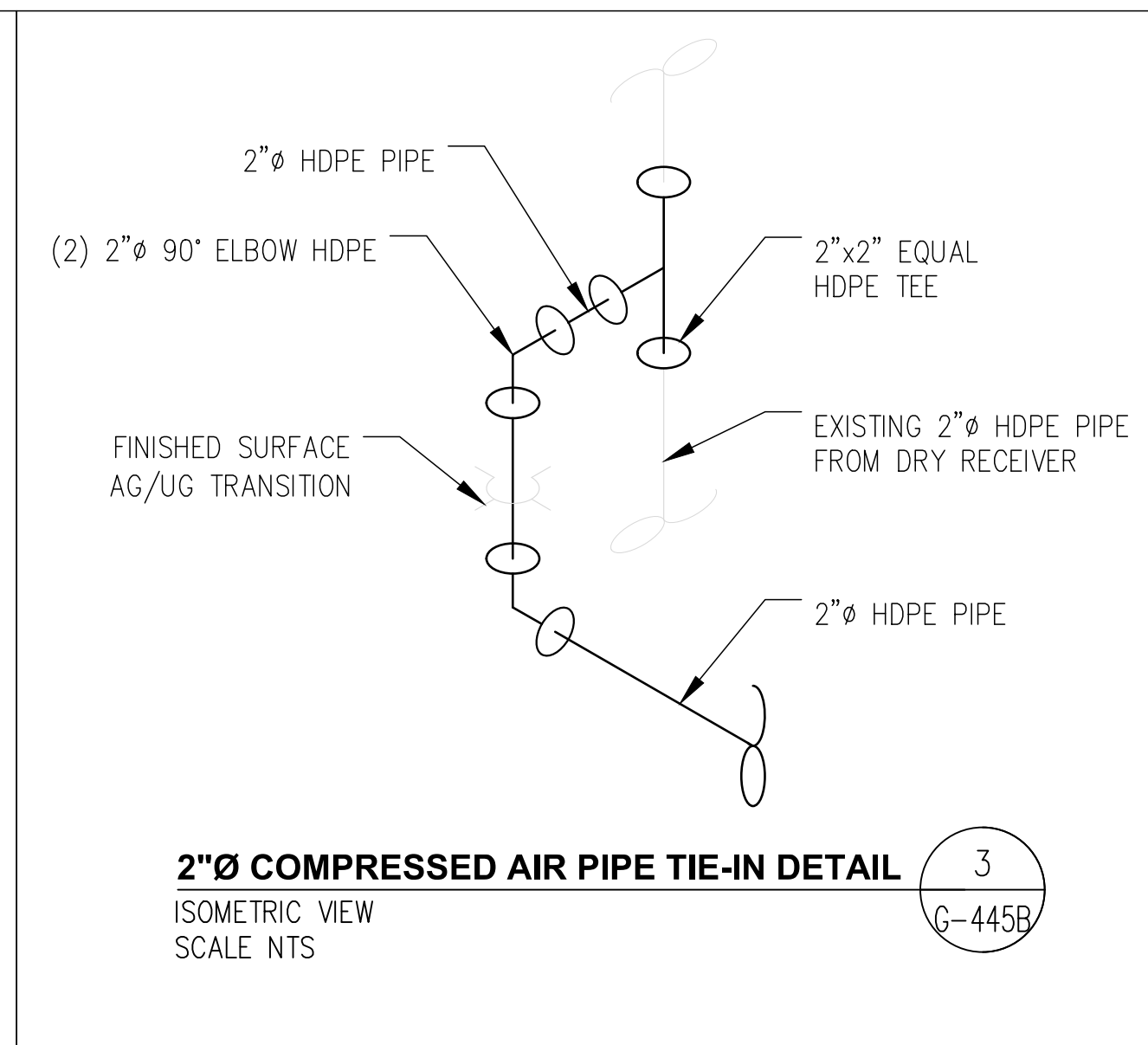
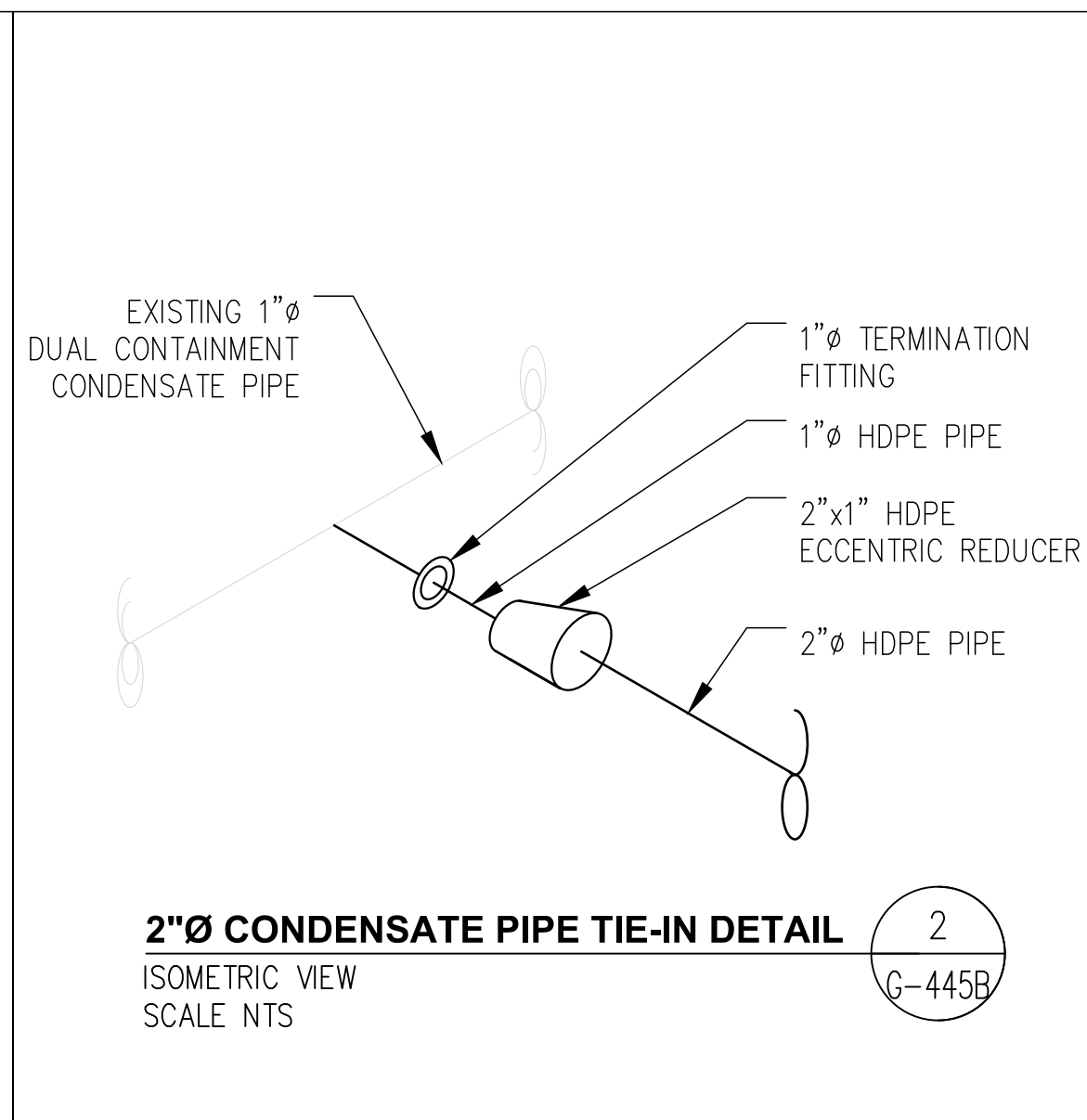
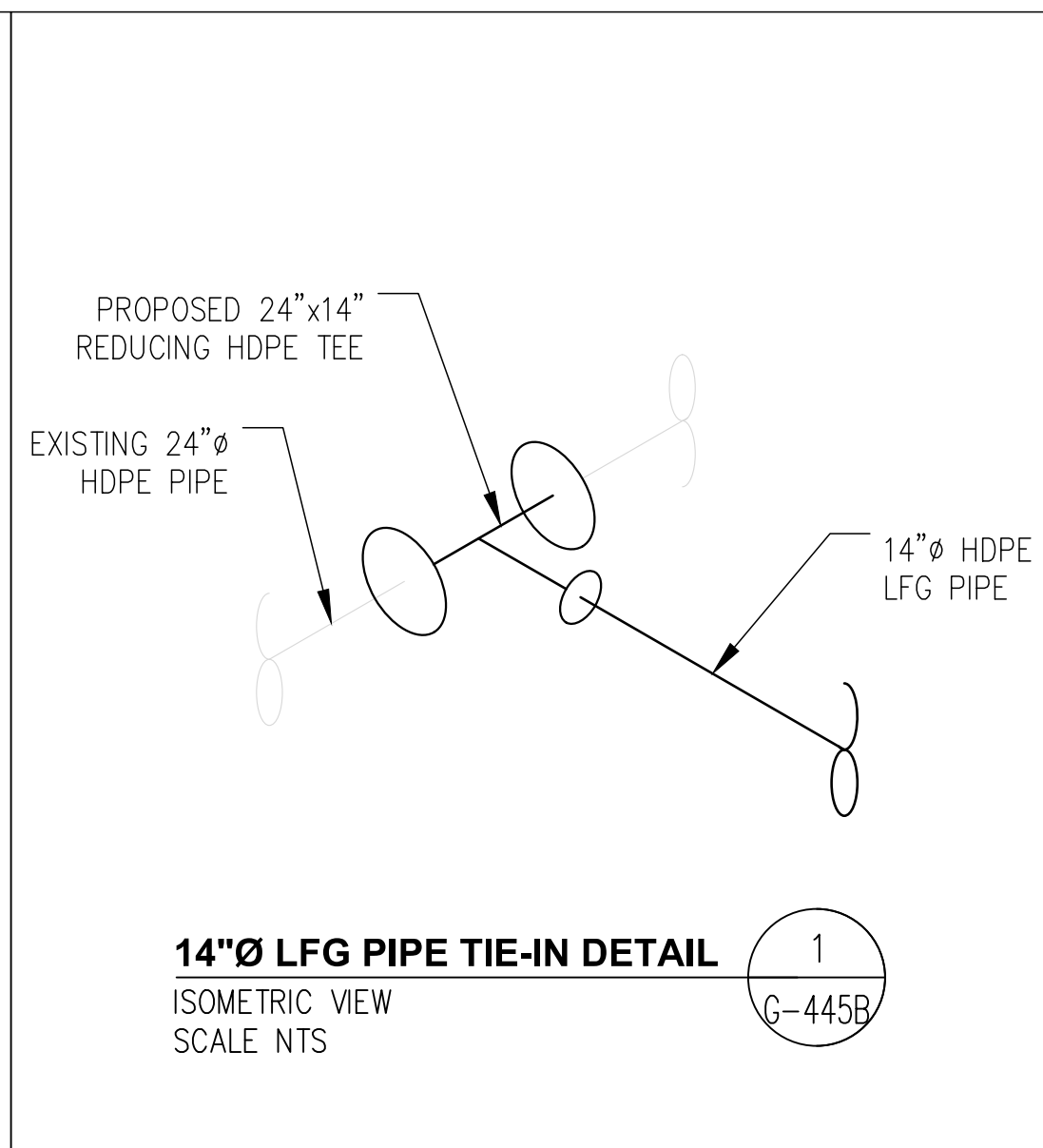
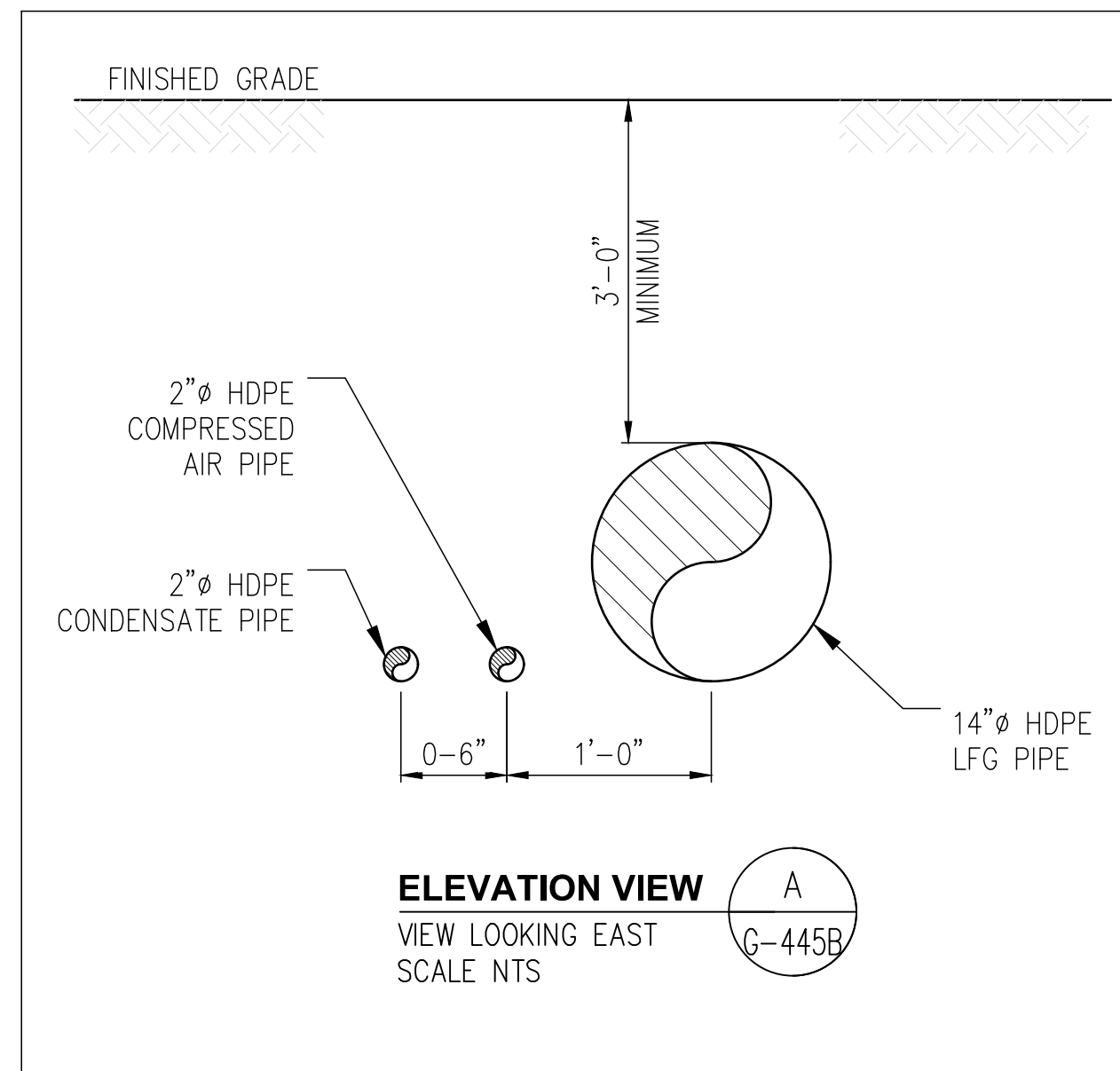
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **G-445A**



LEGEND

- PROPOSED 14"Ø HDPE LFG PIPE ---
- PROPOSED 2"Ø HDPE CONDENSATE PIPE ---
- PROPOSED 2"Ø HDPE COMPRESSED AIR PIPE ---
- EXISTING 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 ---



NOTES:-

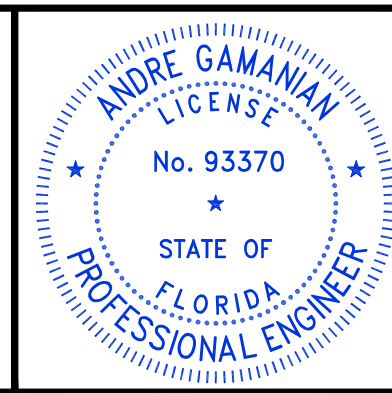
- 1) IF UNDERGROUND SERVICES ARE PRESENT, CALL 811 OR CONSULT WWW.SUNSHINE811.COM WELL BEFORE DRILLING OR EXCAVATION.
- 2) IMAGE USED FOR PLANNING PURPOSE ONLY. DIMENSIONAL ACCURACY SUBJECT TO PHOTO RESOLUTION, REGISTRATION AND CAMERA ANGLE DISTORTION.
- 3) EXACT TIE-IN LOCATION TO BE FIELD VERIFIED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

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
2.0	08/24/2022	ISSUED FOR BID	AK	TP	AG
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PROFESSIONAL ENGINEER

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ENGINEER: **BIOGAS ENGINEERING**
2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
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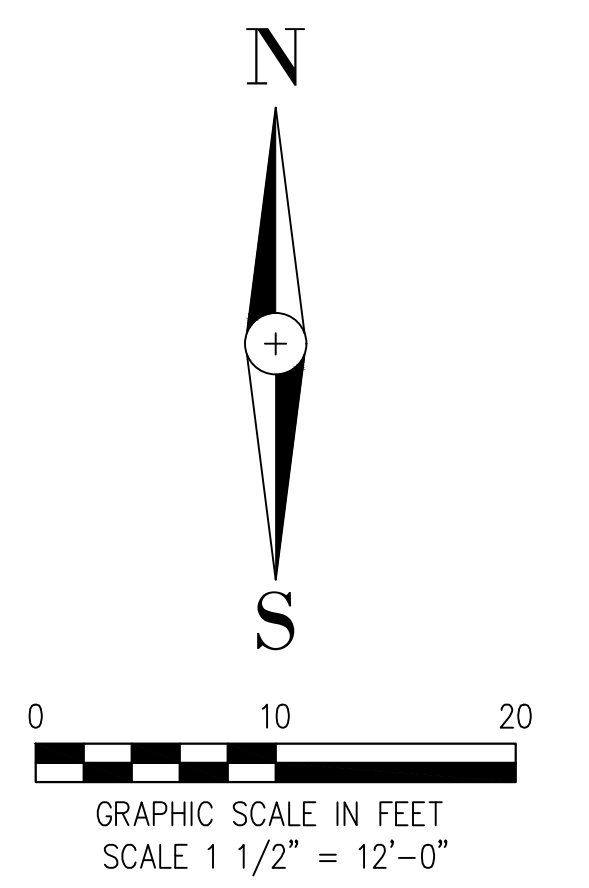
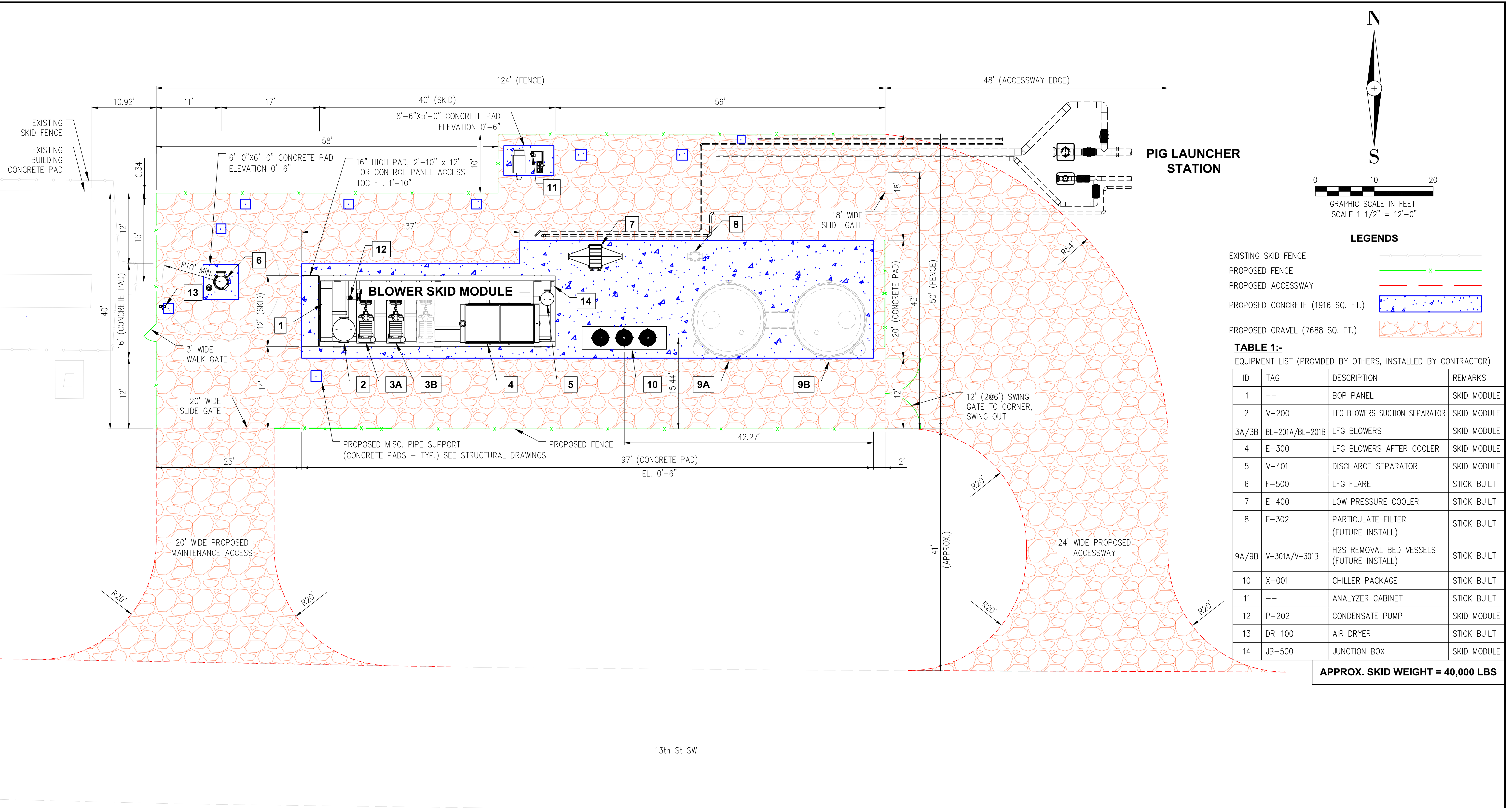
**LFG BLOWER SKID
PIPELINE INTERFACE PLAN**

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO.
G-445B

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LEGENDS

- EXISTING SKID FENCE
- PROPOSED FENCE
- PROPOSED ACCESSWAY
- PROPOSED CONCRETE (1916 SQ. FT.)
- PROPOSED GRAVEL (7688 SQ. FT.)

TABLE 1:-
EQUIPMENT LIST (PROVIDED BY OTHERS, INSTALLED BY CONTRACTOR)

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

APPROX. SKID WEIGHT = 40,000 LBS

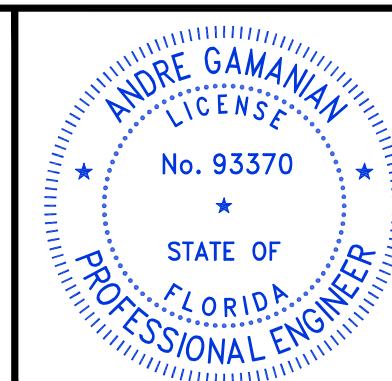
NOTE:-
1) BLOWER SKID MODULE IS SUPPLIED BY BGE AND TO BE INSTALLED BY CONTRACTOR.

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
3.0	08/24/2022	ISSUED FOR BID	AK	TP	AG
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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

SITE PLAN
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. G-445C

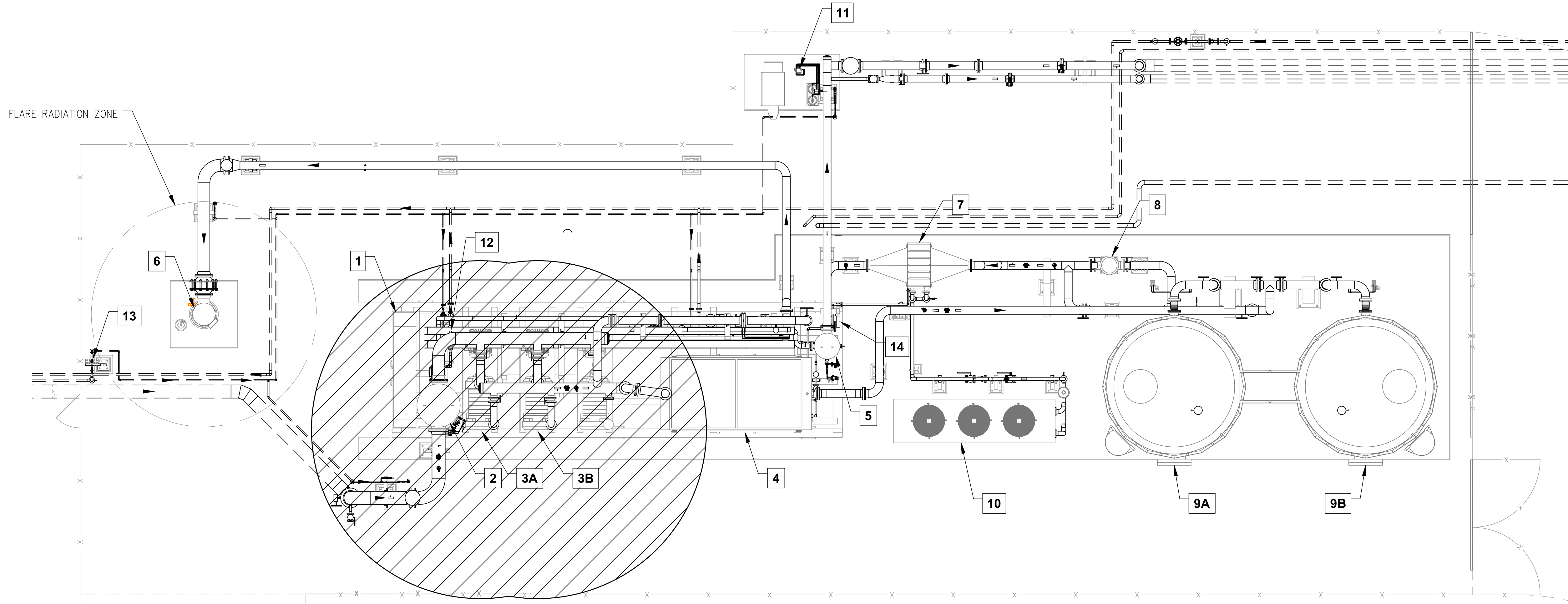
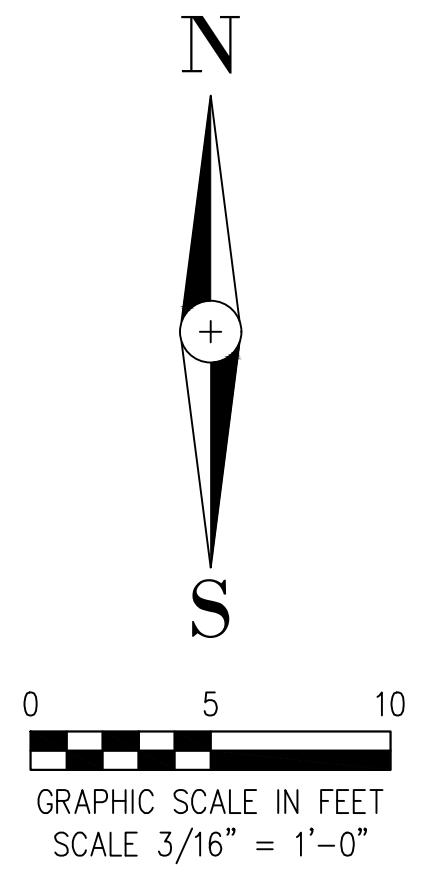
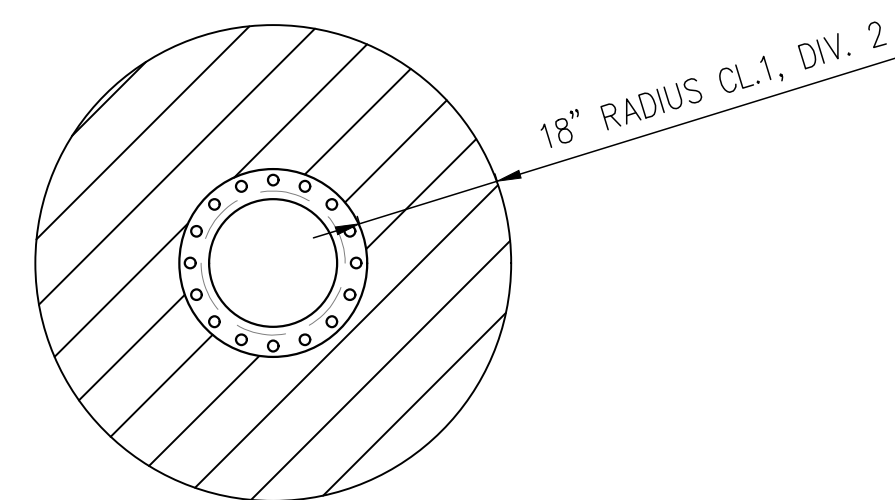


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11	--	ANALYZER CABINET	STICK BUILT
12	P-202	CONDENSATE PUMP	SKID MODULE
13	DR-100	AIR DRYER	STICK BUILT
14	JB-500	JUNCTION BOX	SKID MODULE

LEGENDS

- HAZARDOUS AREA
CLASS 1, DIVISION 2, GROUP D
- UNCLASSIFIED AREA



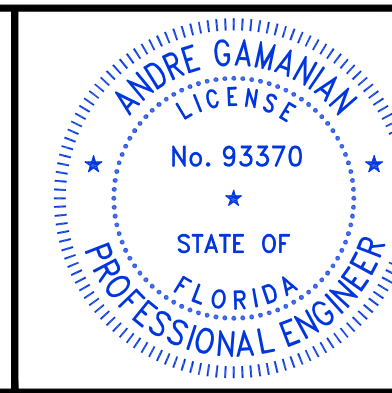
TYPICAL FOR ALL HYDROCARBON (RAW BIOGAS/METHANE)
THREADED OR FLANGED PIPE FITTINGS
SCALE: NTS

ISSUED FOR CONSTRUCTION

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	AK	TP	AG
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	AK	TP	AG
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PROFESSIONAL ENGINEER

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FL LICENSE NO.93370
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OWNER:
 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

AREA CLASSIFICATION		DRAWING NO.
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT		G-445D



NOTES:

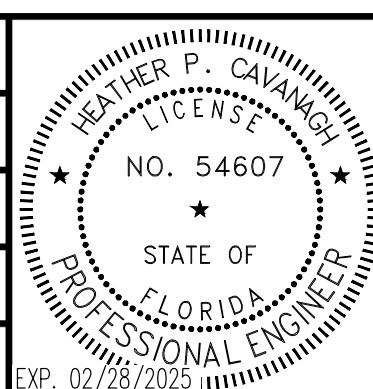
- FOR SITE SURVEY DETAILS REFER DRAWING NO. 6366-13A (3 SHEETS).
- COORDINATE INSTALLATION OF THE LFG HEADER WITH OPERATIONS TO LIMIT TRAFFIC INTERFERENCE.
- CONTRACTOR TO FIELD VERIFY THE UTILITY LOCATION AT SITE PRIOR TO DIGGING; CALL SUNSHINE 811 AT LEAST TWO DAYS PRIOR TO DIGGING IN CASE UTILITIES HAVE TO BE LOCATED AND MARKED.
- THE CONTRACTOR SHALL MAINTAIN A MINIMUM COVER OF 3'-0" ON THE LFG HEADER AT ALL TIMES, UNLESS SHOWN OTHERWISE.
- 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".
- ALL BELOW GRADE HDPE BENDS SHALL BE LONG SWEEP BENDS.
- 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.
- 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	CHK BY	APRV BY
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
6.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	RR	SK



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

OWNER:

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

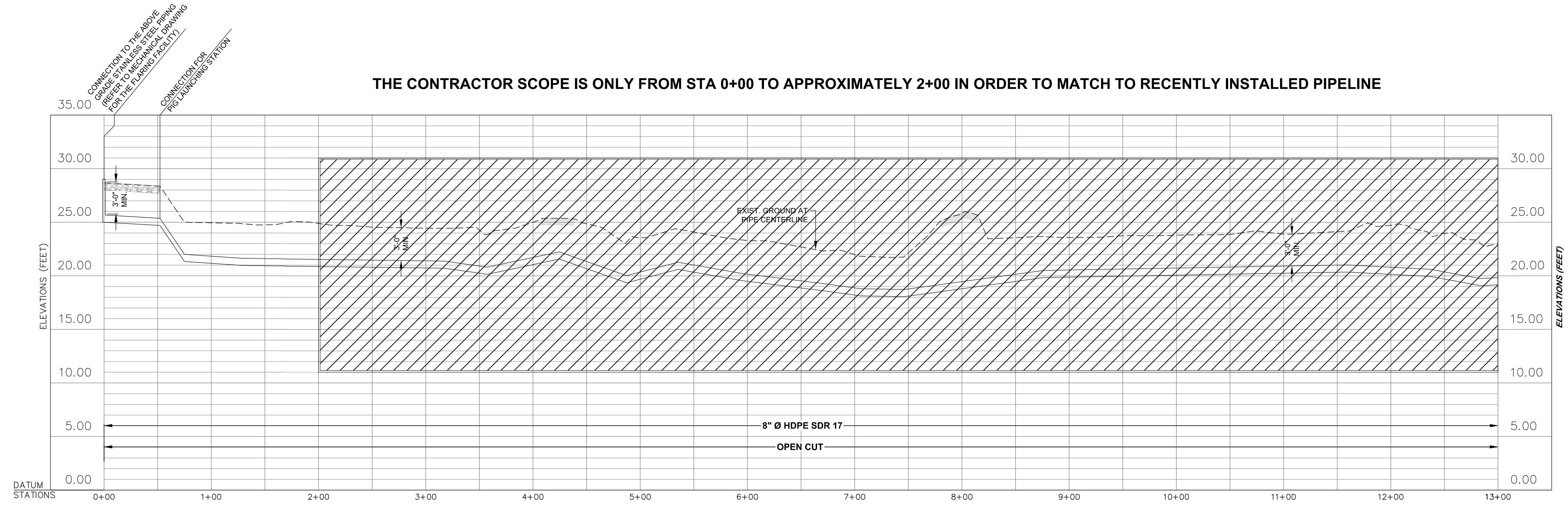
ENGINEER:

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

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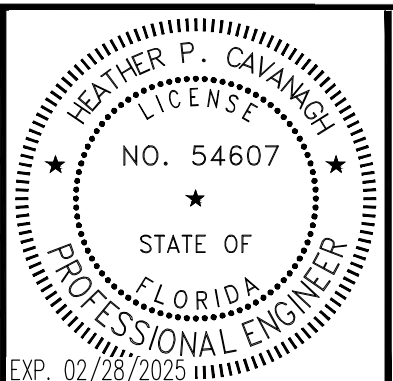
THE CONTRACTOR SCOPE IS ONLY FROM STA 0+00 TO APPROXIMATELY 2+00 IN ORDER TO MATCH TO RECENTLY INSTALLED PIPELINE



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

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

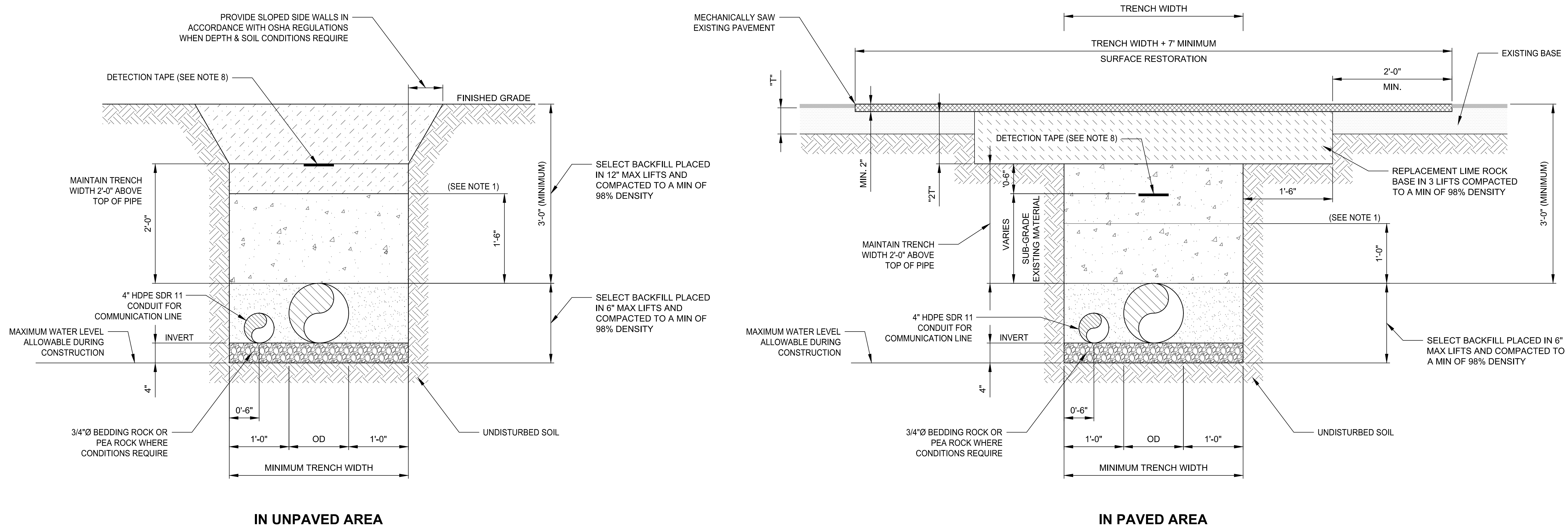
ENGINEER: **BIOGAS ENGINEERING**
2321 E. 28TH STREET, SUITE 400
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**8" Ø LFG HEADER PROFILE
STA. 0+00 TO STA. 2+00**

**LANDFILL GAS
PIPELINE EXTENSION**

DRAWING NO. **C-445B**

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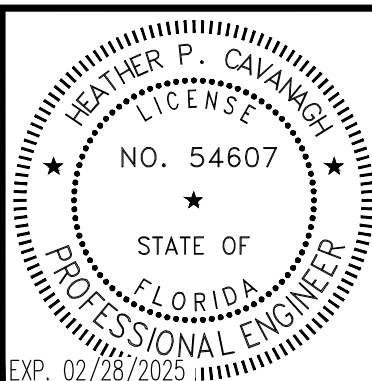


DETAIL - 8"Ø PIPE TRENCH (TYP) 1
 SCALE: N.T.S. C-445C

- TRENCH DETAIL NOTES**
1. MECHANICAL COMPACTION SHALL NOT BE ALLOWED BELOW THIS LEVEL OTHER THAN HAND VIBRATORY MEANS.
 2. WHERE REQUIRED, AS DETERMINED IN FIELD BY THE ENGINEER, SHEETING AND SHORING SHALL BE IN ACCORDANCE WITH OSHA REGULATIONS.
 3. THE PIPE SHALL BE FULLY SUPPORTED FOR ITS ENTIRE LENGTH WITH APPROPRIATE COMPACTION UNDER THE PIPE HAUNCHES.
 4. THE PIPE SHALL BE PLACED IN A DRY TRENCH.
 5. BACKFILL SHALL BE DONE WITH APPROVED MATERIAL, CLEAN AND FREE OF ROCKS, MUCK AND OTHER DELETERIOUS MATTER.
 6. COMPACTION DENSITY PERCENTAGES SHOWN IN THE DETAILS, REFER TO AASHTO T-180 MODIFIED PROCTOR METHOD.
 7. COMPACTION DENSITY REPORT, SIGNED AND SEALED BY A FLORIDA LICENSED P.E., IS REQUIRED.
 8. 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".
 9. 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 AGENCIES SHALL CONFORM TO THE INDIAN RIVER COUNTY DEPARTMENT OF UTILITY SERVICES SPECIFICATIONS OR THE OTHER JURISDICTIONAL AGENCY 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

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	SS	TP	SK
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6.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	SK



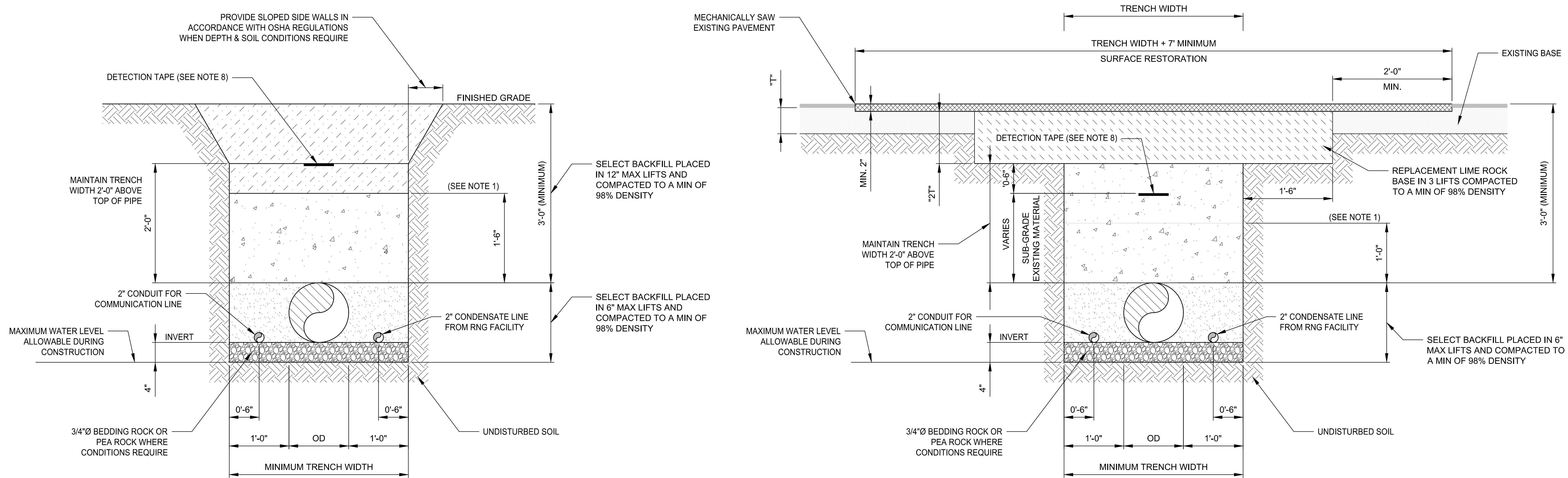
Heather Cavanagh
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OWNER:
INDIAN RIVER COUNTY FLORIDA
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ENGINEER:
BIOGAS ENGINEERING
 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
 EMAIL: INFO@BIOGASENG.COM

MISCELLANEOUS DETAILS	
LANDFILL GAS PIPELINE EXTENSION	DRAWING NO. C-445C

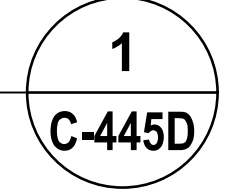
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IN UNPAVED AREA

IN PAVED AREA

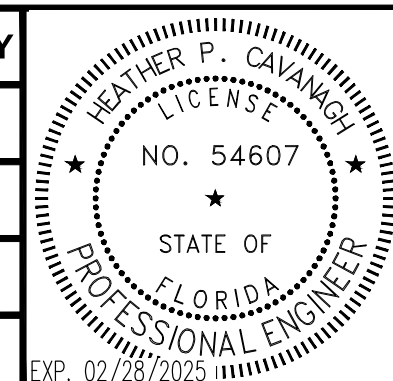
DETAIL - 12"Ø PIPE TRENCH (TYP)
 SCALE: N.T.S.



- TRENCH DETAIL NOTES**
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Heather Cavanagh
 Digitally signed by Heather Cavanagh
 Date: 2023.09.29 15:12:33 -04'00'

OWNER:

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

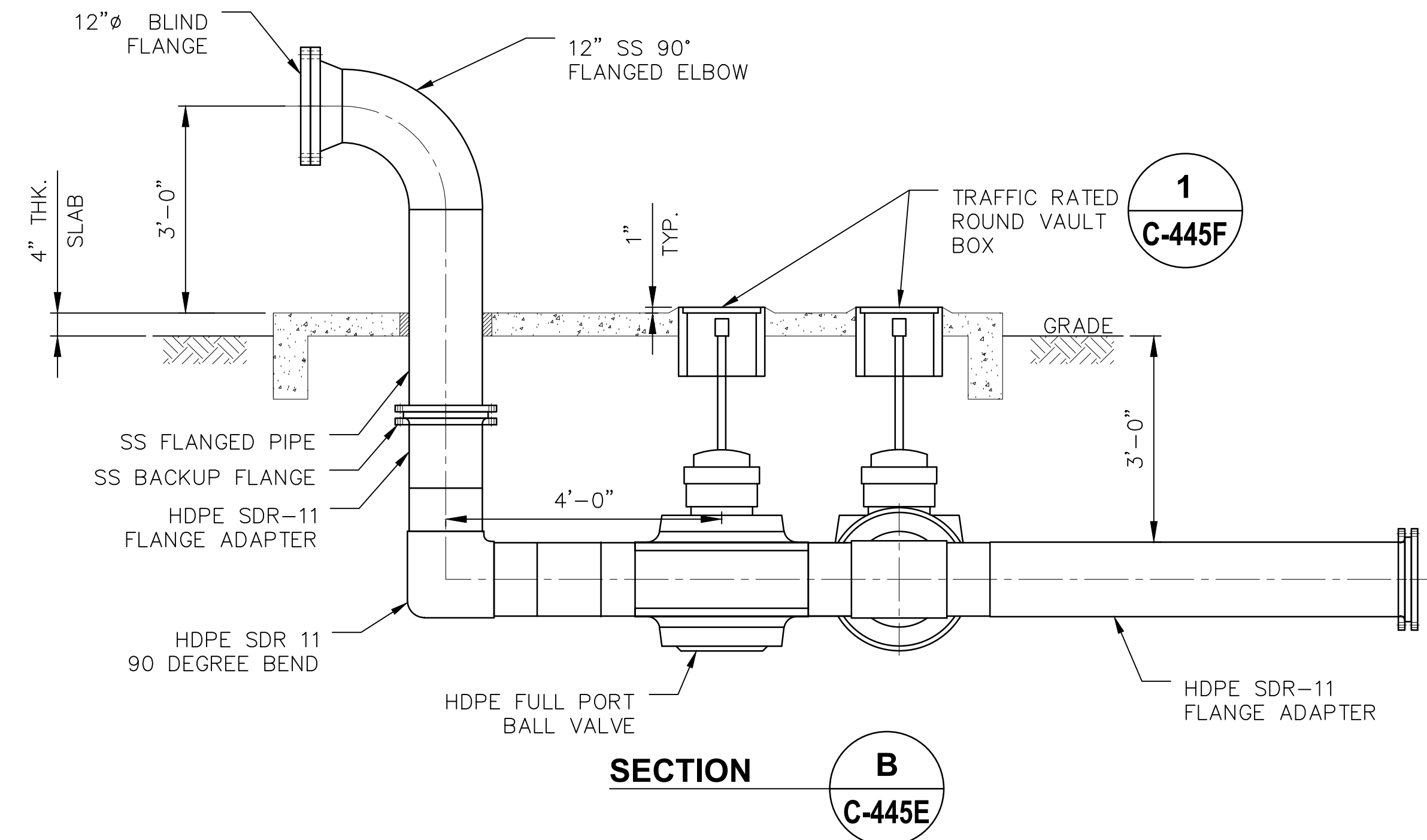
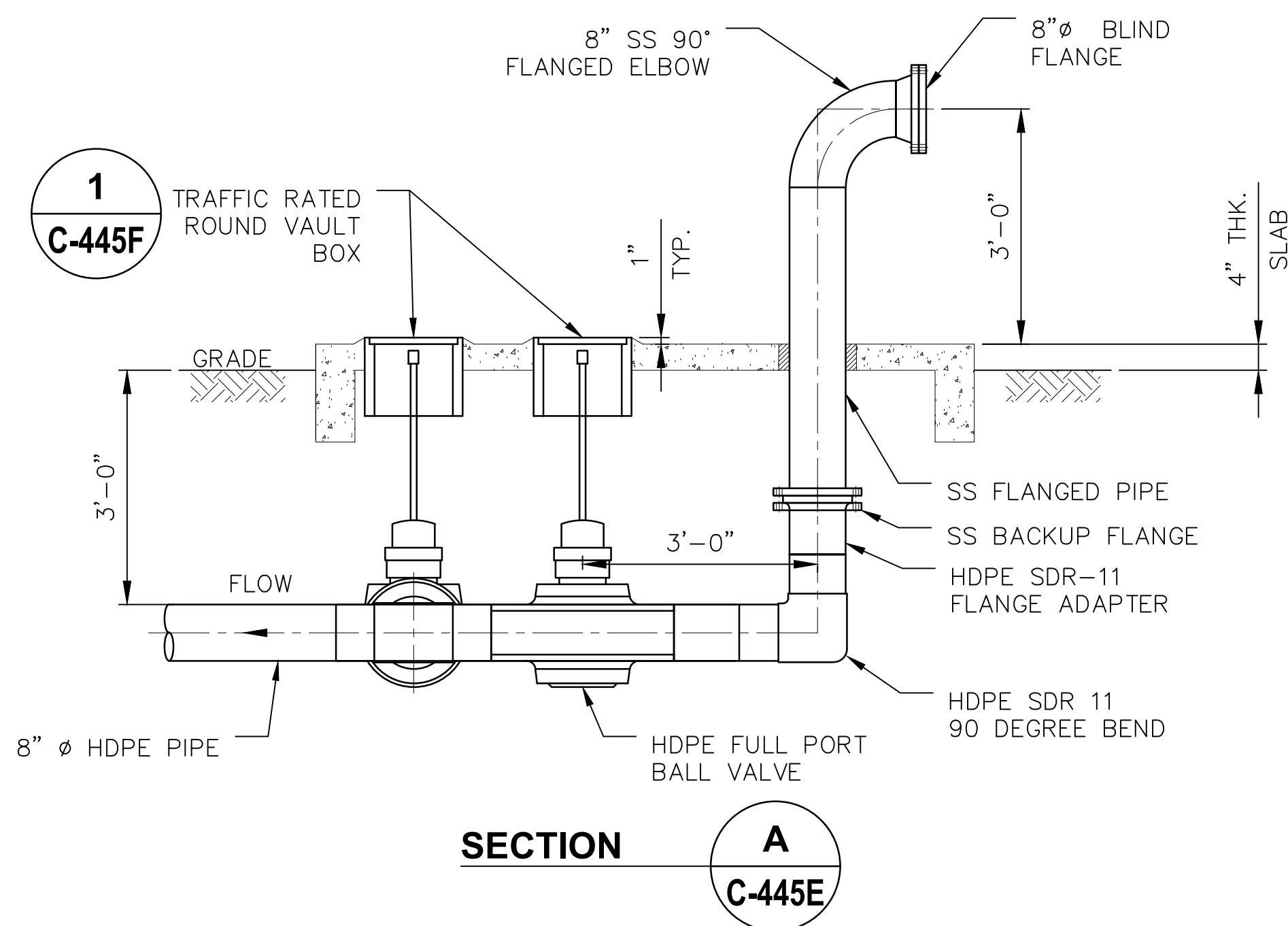
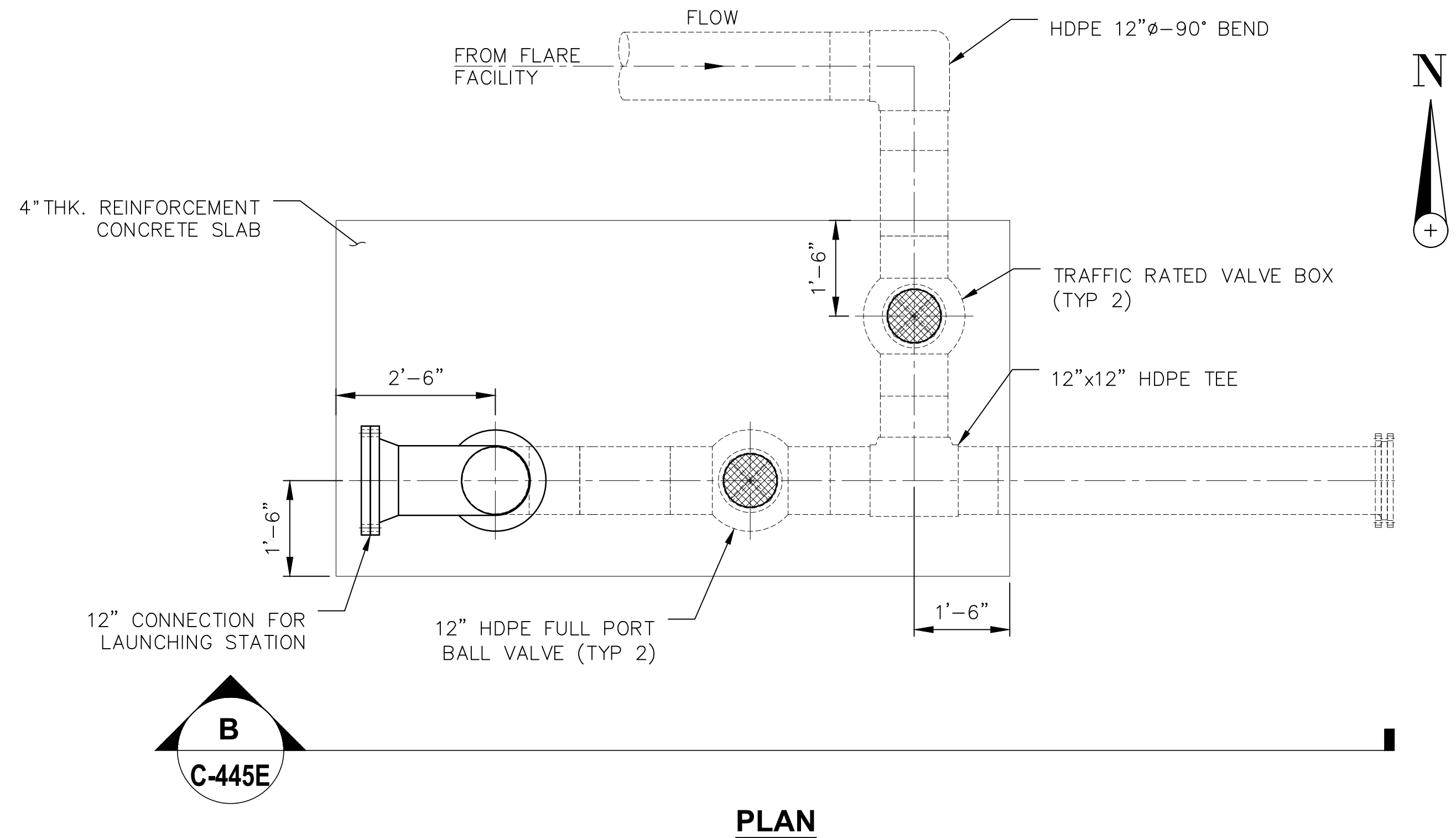
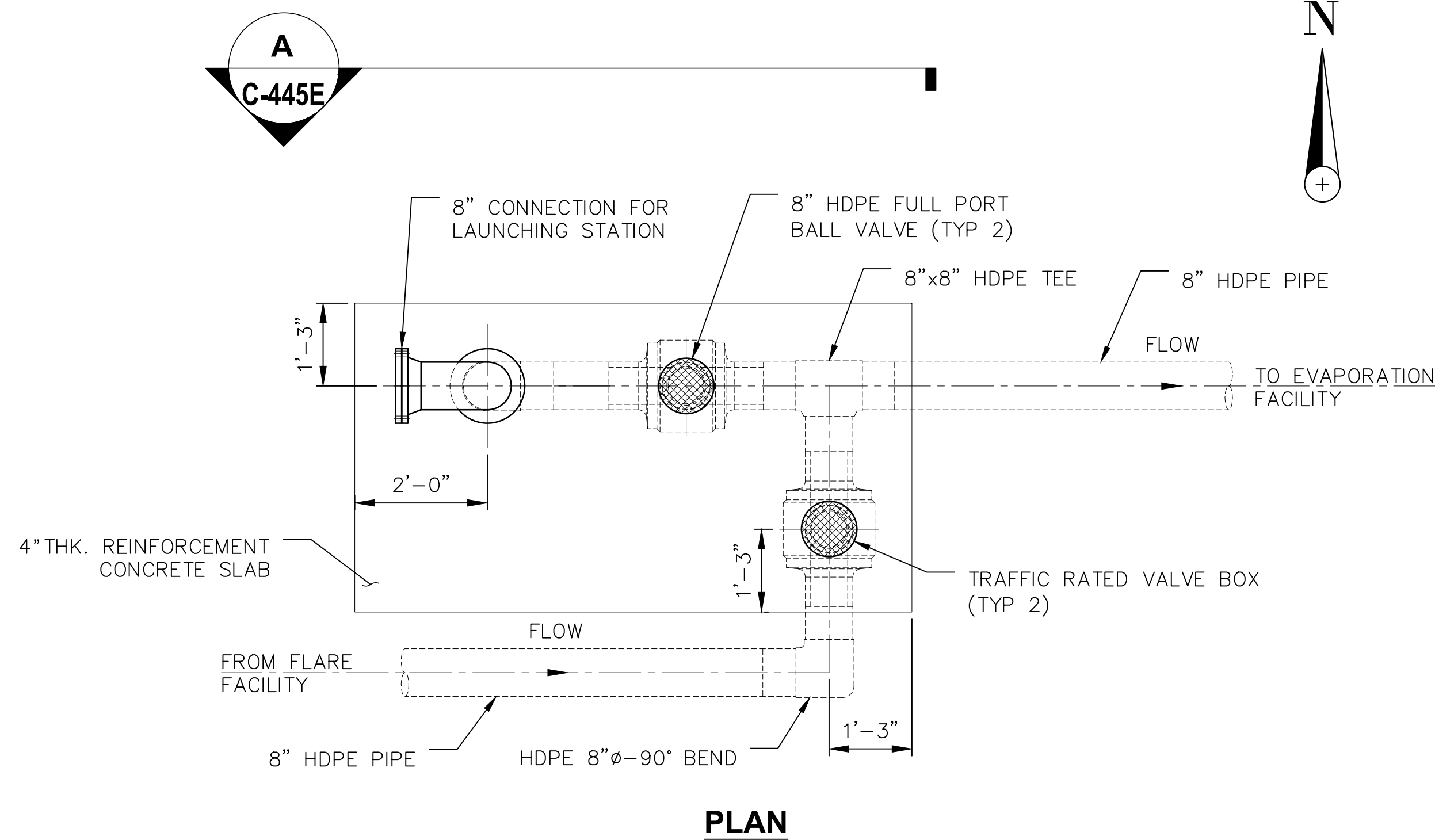
ENGINEER:

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

MISCELLANEOUS DETAILS

LANDFILL GAS PIPELINE EXTENSION

DRAWING NO. C-445D



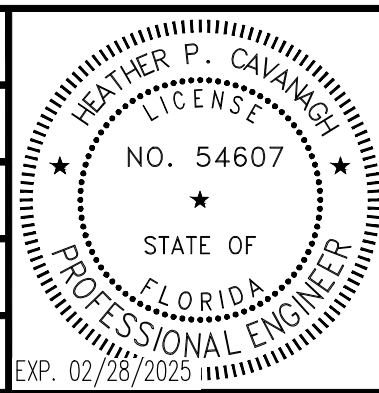
DETAIL - LAUNCHING STATION CONNECTION 1
SCALE: 1"=20"

DETAIL - LAUNCHING STATION CONNECTION 2
SCALE: 1"=20"

ISSUED FOR CONSTRUCTION

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REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1.0	03/01/2023	ISSUED FOR INTERNAL REVIEW	SS	TP	SK
2.0	01/19/2023	ISSUED FOR CONSTRUCTION	SS	TP	SK
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	SK
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	SK

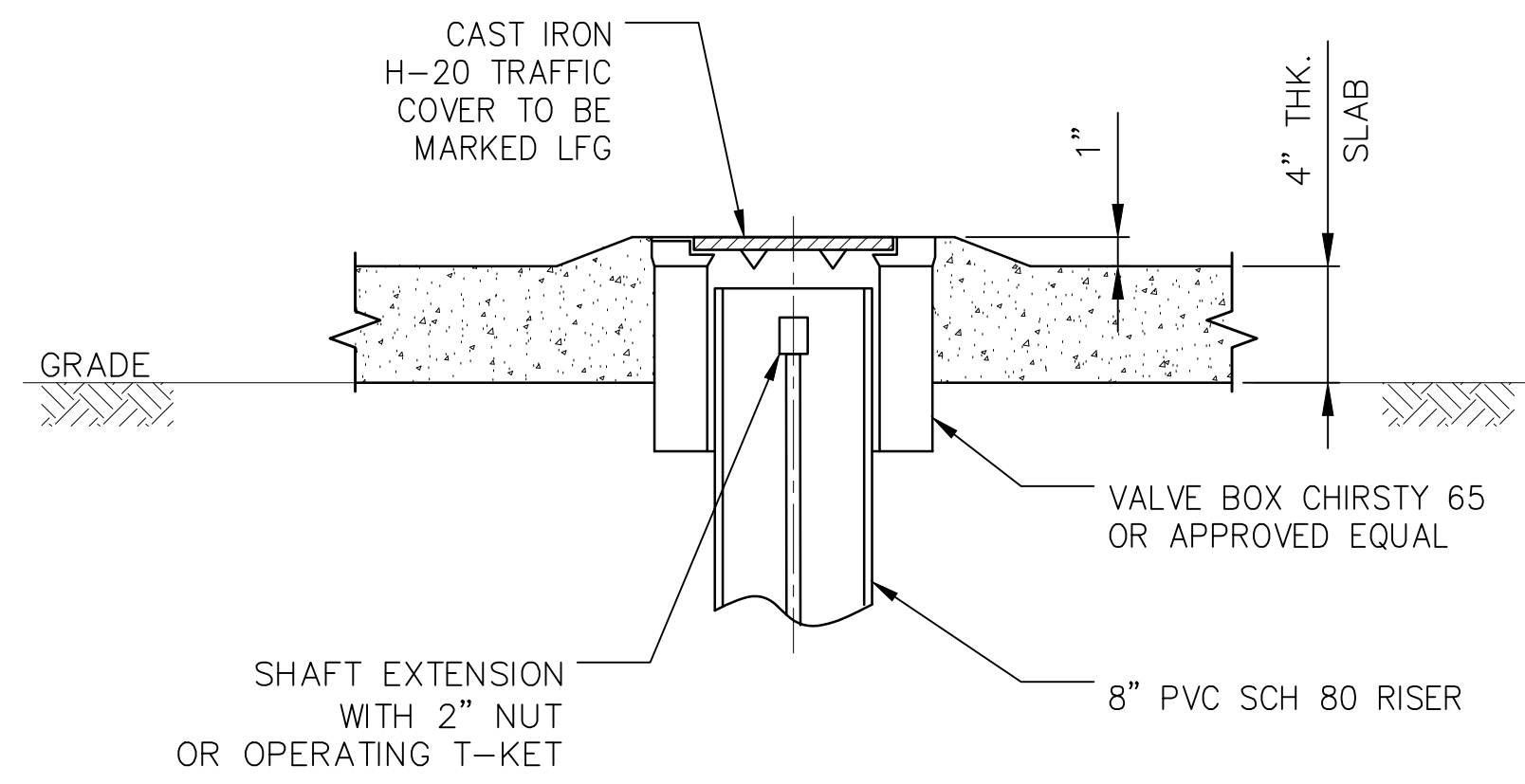


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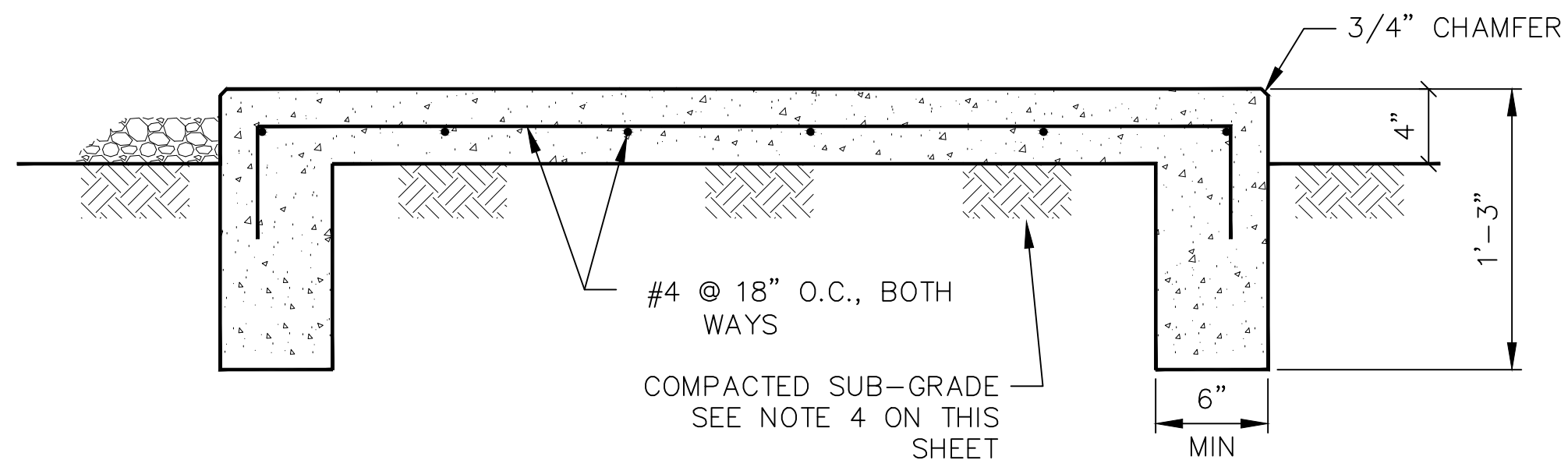
MISCELLANEOUS DETAILS
LANDFILL GAS PIPELINE EXTENSION
DRAWING NO. C-445E



DETAIL - VALVE BOX ENCLOSURE

SCALE: N.T.S.

1
C-445E



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

SCALE: NTS

2
C-445F

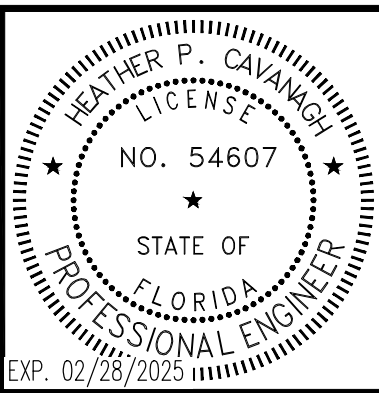
STRUCTURAL NOTES:

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%.

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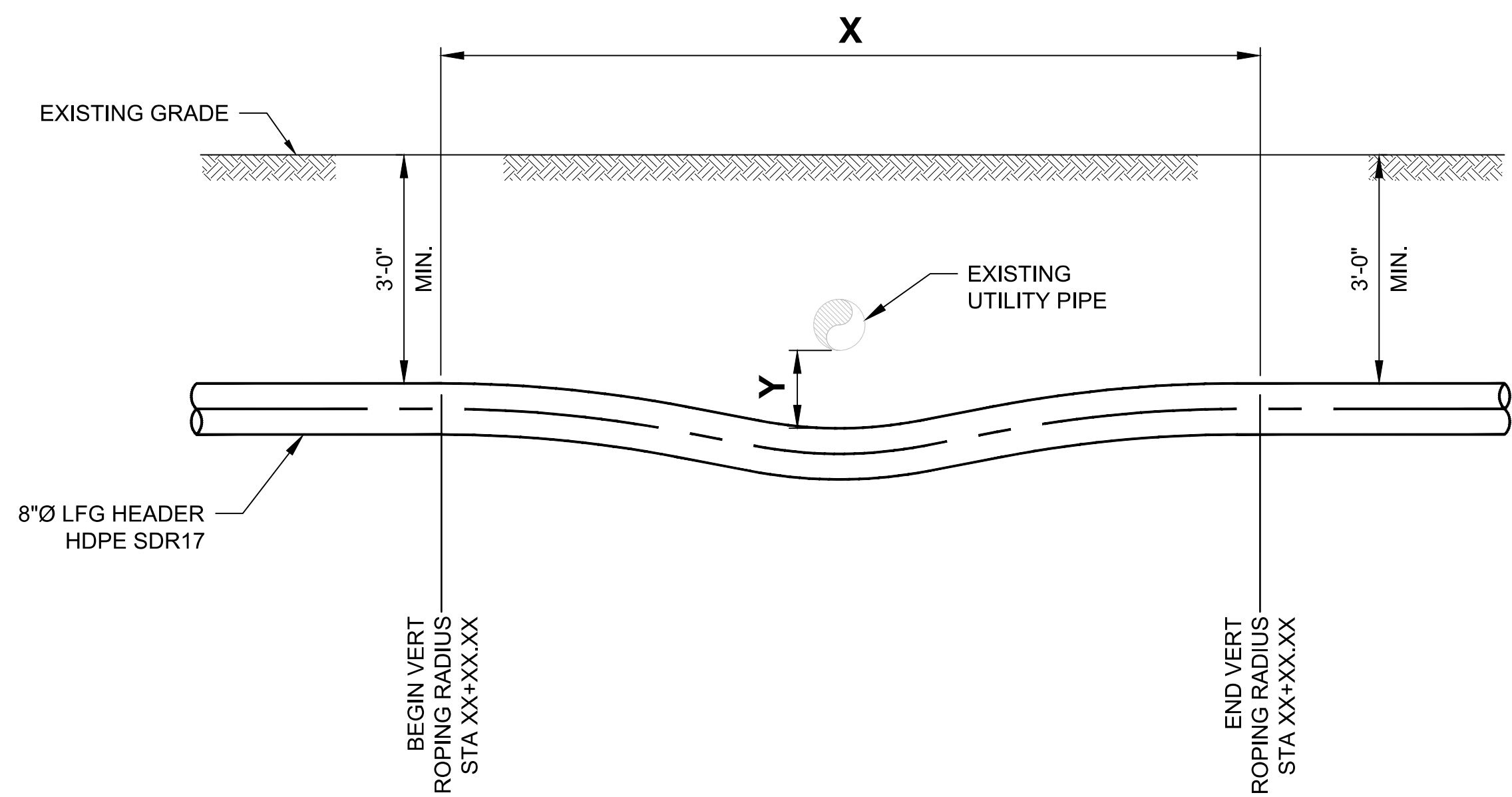
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ENGINEER: **BIOGAS ENGINEERING**
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MISCELLANEOUS DETAILS	
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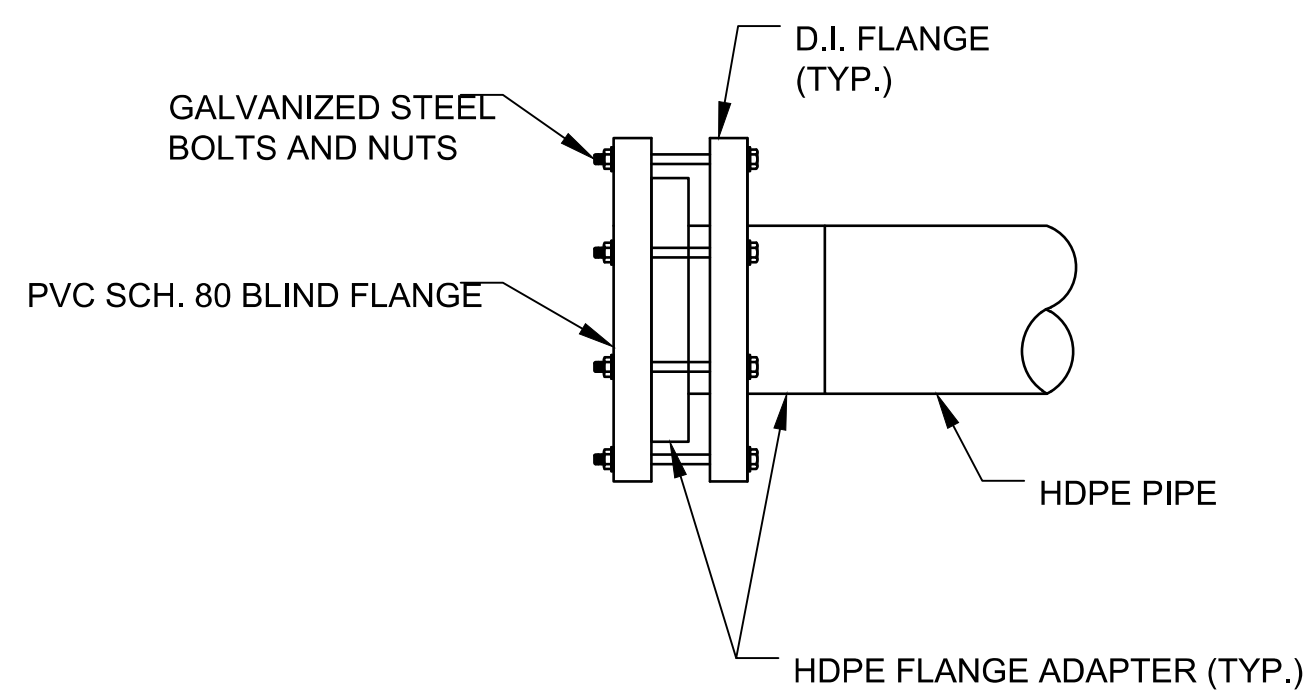
NOTE
1. REFER TO ROPING TABLE THIS SHEET

DETAIL - TYPICAL UTILITY CROSSING
SCALE: NTS

1
C-445G

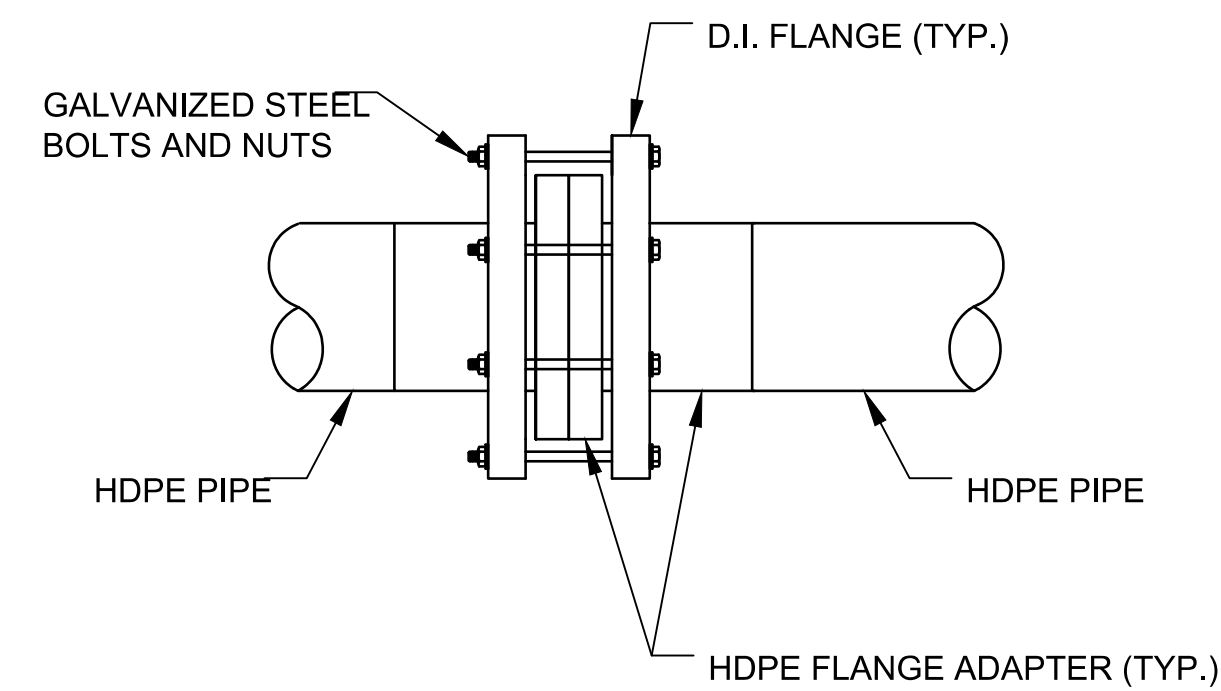
8" ROPING TABLE	
Y (FT)	X (FT)
1.0	16.0
2.0	20.0
3.0	24.0
4.0	28.0
5.0	32.0

12" 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



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

2
C-445A

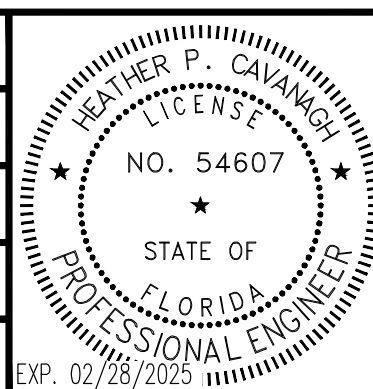


DETAIL - INSTALLATION OF FLANGE ADAPTER ON HDPE PIPE
SCALE: NTS

3
C-445G

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MISCELLANEOUS DETAILS
LANDFILL GAS PIPELINE EXTENSION
DRAWING NO. C-445G

SPECIAL NOTE

- UNDERGROUND SERVICE ALERT: CALL 811 (FLORIDA PUBLIC UTILITIES) A MINIMUM OF 2 BUSINESS DAYS (NOT INCLUDING INITIAL DAY OF CONTRACT) IN ADVANCE FOR MARKING OF UNDERGROUND UTILITIES, INCLUDING ALL NON-UTILITIES BEFORE YOU DIG, GRADE, OR EXECUTE.
- UTILITY NOTES
 - 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 COORDINATE 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 WORK.
- 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

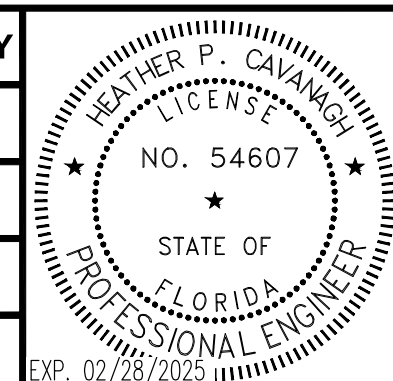
ABBREVIATIONS

ACRONYM	DEFINITION	ACRONYM	DEFINITION
BR	BRIDGE	MOI	METHOD OF INSTALLATION
BTU	BRITISH THERMAL UNITS	MON	MONUMENT
BV	BALL VALVE	MOP	MAXIMUM OPERATING PRESSURE
BW	BACK OF WALK	MP	MILE POINT
CATS	COMPUTER AUTOMATED TEST STATION	MSP	MAXIMUM STOPPING PRESSURE
CCV	CORROSION CONTROL VOLUME	MT	METER
CI	CAST IRON	MW	WORKING MONITOR
CL	CENTERLINE	MWP	MAXIMUM WORKING PRESSURE
CMP	CORRUGATED METAL PIPE	N	NORTH
CNG	COMPRESSED NATURAL GAS	NDE	NON-DESTRUCTIVE EXAMINATION
CO	COUNTY	NOP	NORMAL OPERATING PRESSURE
CONC	CONCRETE	NPC	NON-PROTECTED/NATIVE COUPON
COND	CONDUIT	NTS	NOT TO SCALE
CP	CATHODIC PROTECTION	OD	OUTSIDE DIAMETER
CPT	CATCH POINT	OG	ORIGINAL GROUND
CROP	CONDITIONAL REDUCTION OF PRESSURE	OH	OVERHEAD
CTS	COUPON TEST STATION	P	PIPELINE
CU	COPPER	P/L	PROPERTY LINE
CULV	CULVERT	PC	POINT OF CURVATURE
D	DEPTH	PCF	PRESSURE CONTROL FITTING
DE	DEAD END	PKWY	PARKWAY
DEG	DEGREE	PL	PLASTIC
DET	DETAIL	PLC	PROGRAMMABLE LOGIC CONTROLLERS
DI	DRAINAGE INLET	PPI	PLASTIC PIPE INSTITUTE
DIA	DIAMETER	PSI	POUNDS PER SQUARE INCH
DIST	DISTRIBUTION	PV	PLUG VALVE
DPV	DAMAGE PREVENTION VOLUME	PVMT	PAVEMENT
DR	DISTRIBUTION REGULATOR	QTY	QUANTITY
DSAW	DOUBLE SUBMERGED ARC-WELDED	R	RADIUS
DWA	DEEP WELL ANODE	RCP	REINFORCED CONCRETE PIPE
DWY	DRIVEWAY	RD	ROAD
E	EAST	RDWY	ROADWAY
EASE	EASEMENT	REG	REGULATOR
EC	END CURVE	REL	RELOCATE
EL	ELBOW	REPL	REPLACE
ELECT	ELECTRIC	REV	REVISION
ELEV	ELEVATION	RR	RAILROAD
EM	ELECTRONIC MARKER	RT	RIGHT
EMS	ENGINEERING MATERIAL SPECIFICATION	RTE	ROUTE
ENGR	ENGINEER	R/W	RIGHT OF WAY
EP	EDGE OF PAVEMENT	S	SOUTH
EQ	EQUATION	SAWH	SUBMERGED ARC-WELDED HELICAL
ERW	ELECTRIC RESISTANCE WELDED	SAWL	SUBMERGED ARC-WELDED LONGITUDINAL
ESA	ENVIRONMENTALLY SENSITIVE AREA	SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
ETS	ELECTROLYSIS TEST STATION	SCP	SURVEY CONTROL POINT
ETW	EDGE OF TRAVELED WAY	SD	STORM DRAIN
F	FILTER	SG	SUBGRADE
F & C	FRAME AND COVER	SHT	SHEET
FBE	FUSION BONDED EPOXY	SMLS	SEAMLESS
FC	FACE OF CURB	SMYS	SPECIFIED MINIMUM YIELD STRENGTH
FDP	FUTURE DESIGN PRESSURE	SPEC	SPECIFICATION
FG	FINISHED GRADE	SS	SANITARY SEWER
FH	FIRE HYDRANT	SSAW	SINGLE SUBMERGED ARC-WELDED
FIG	FIGURE	ST	STREET
FL	FLOW LINE	STA	STATION
FLG	FLANGE	STD	STANDARD
FWY	FREEWAY	STL	STEEL
GS	NATURAL GAS SERVICE	T	TIED (CONNECTED TO SYSTEM)
GV	GATE VALVE	TCE	TEMPORARY CONSTRUCTION EASEMENT
GW	NATURAL GAS WELL	TCP	TRAFFIC CONTROL PLAN
H	HORIZONTAL	TEL	TELEPHONE
HDD	HORIZONTAL DIRECTIONAL DRILL	TEMP	TEMPORARY
HFW	HIGH FREQUENCY WELD	TG	TOP OF GRADE
HPR	HIGH PRESSURE REGULATOR	TT	TOP TAP
HWY	HIGHWAY	TYP	TYPICAL
ID	INSIDE DIAMETER	UG	UNDERGROUND
ILI	IN-LINE INSPECTION	USA	UNDERGROUND SERVICE ALERT
INV	INVERT	UT	ULTRA-SONIC TEST
IRR	IRRIGATION	V	VALVE
JP	JOINT POLE	VERT	VERTICAL
JT	JOINT TRENCH	VIF	VERIFY IN FIELD
LAT	LATITUDE	VOL	VOLUME
LN	LANE	W	WATER
LNG	LIQUID NATURAL GAS	WT	WALL THICKNESS
LOC	LOCATION	WW	WATER VALVE
LONG	LONGITUDE	W/	WITH
LT	LEFT	W/O	WITHOUT
M	MONITOR		
MAOP	MAXIMUM ALLOWABLE OPERATING PRESSURE		
MAX	MAXIMUM		
MH	MANHOLE		
MIN	MINIMUM		
MISC	MISCELLANEOUS		

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NOTES AND ABBREVIATIONS

LANDFILL GAS PIPELINE EXTENSION

DRAWING NO. C-445H

GENERAL SPECIFICATIONS

- 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 CHANGES 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 ENGINEER.
- 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

1. PIPE MATERIALS SHALL BE AS FOLLOWS:

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

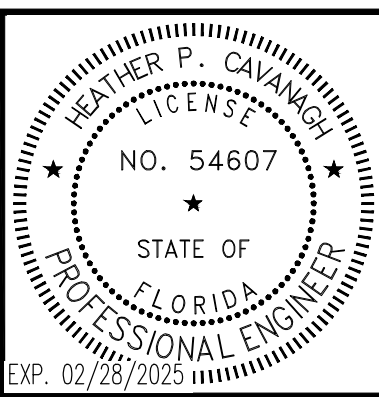
- THE CONTRACTOR SHALL CONDUCT A PNEUMATIC PRESSURE TEST ON INSTALLED HDPE HEADER. HE SHALL FURNISH ALL NECESSARY EQUIPMENTS AND MATERIALS, AND MAKES ALL TAPS IN THE PIPE, AS REQUIRED. THE COUNTY SHALL BE NOTIFIED AT LEAST 72 HOURS IN ADVANCE OF TESTING. THE TEST SHALL BE WITNESSED BY THE COUNTY.
- ALL 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 RELIEF 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

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REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1.0	08/24/2022	ISSUED FOR BID	AK	TP	SK
2.0	01/19/2023	ISSUED FOR CONSTRUCTION	SS	TP	SK
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	SK
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	SK



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

OWNER:

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) 726-3565
 EMAIL: INFO@BIOGASENG.COM

SPECIFICATIONS	
LANDFILL GAS PIPELINE EXTENSION	DRAWING NO. C-445I

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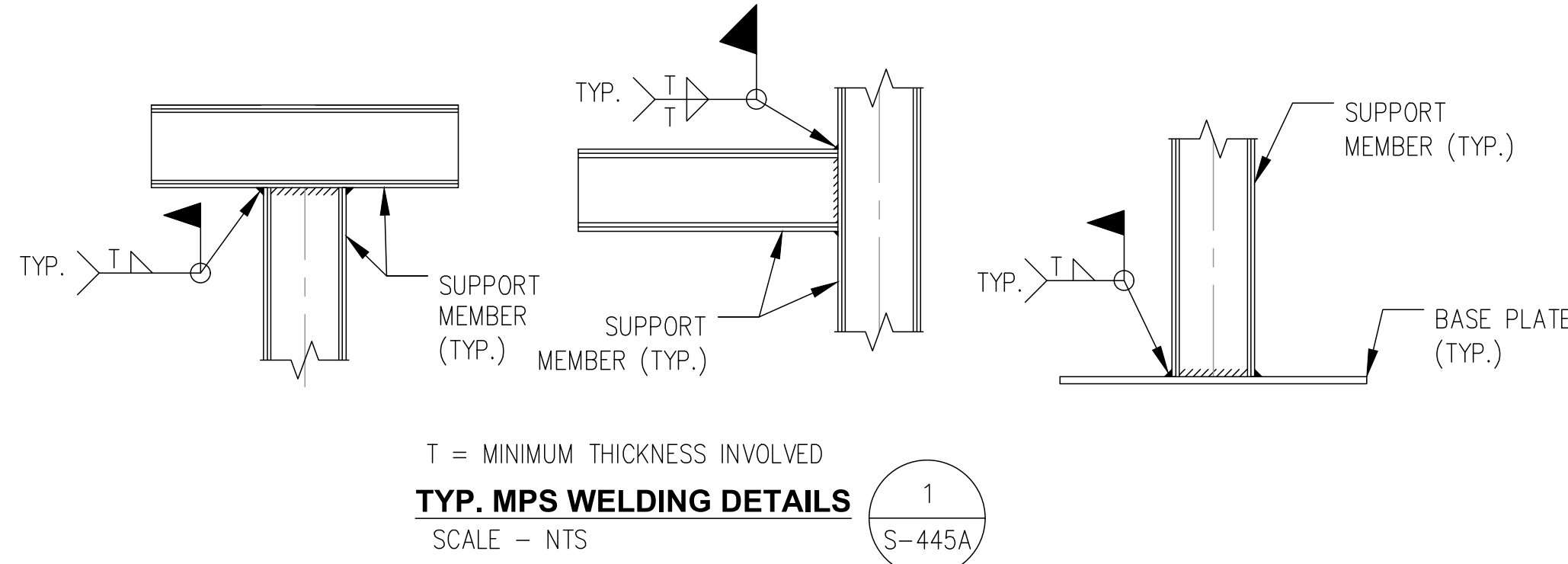
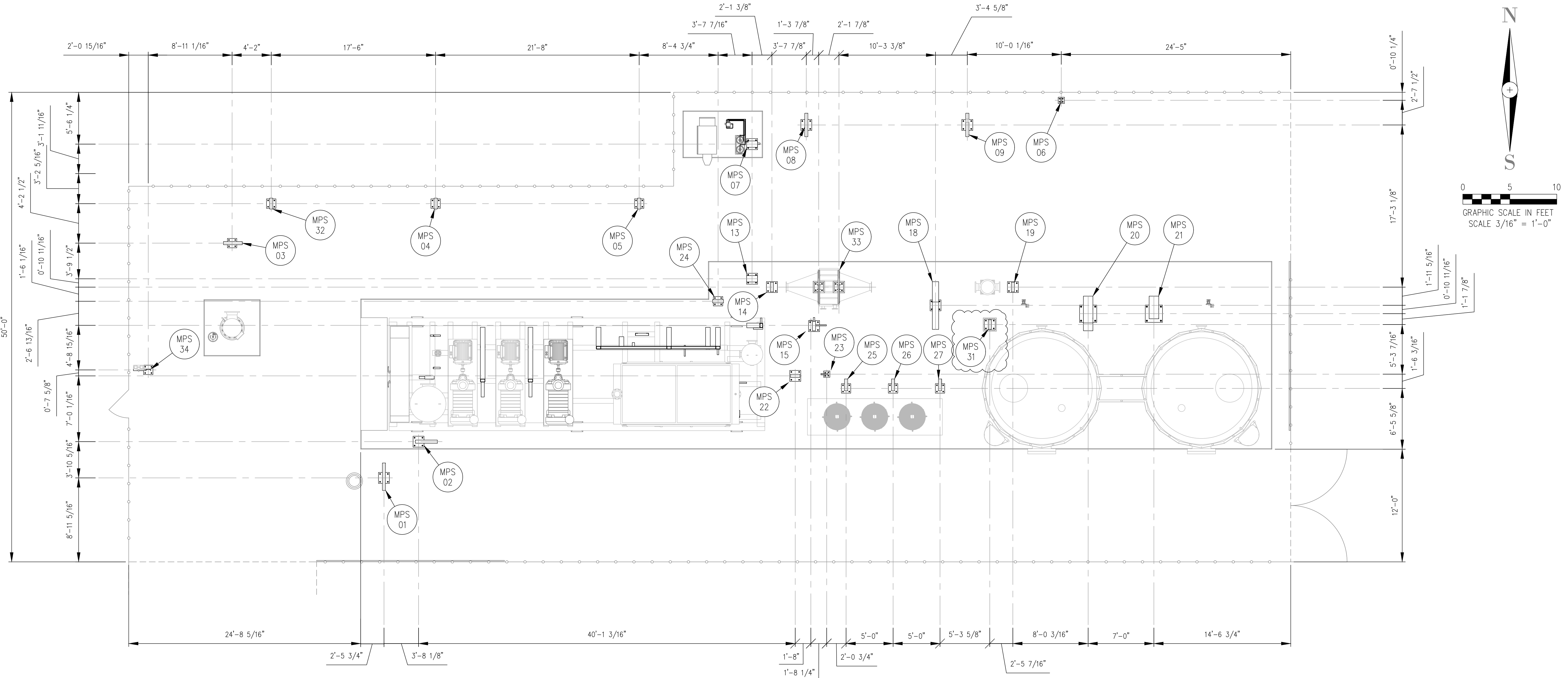


TABLE: MINIMUM FILLET WELD SIZES AS PER AWS D1.1

BASE METAL THICKNESS (T) a		MINIMUM SIZE OF FILLET WELD b
in		in
T < 1/2		3/16
1/2 < T < 3/4		1/4
3/4 < T		5/16

WHERE:
 T = BASE MATERIALS THICKNESS
 WELD SIZE SHALL NOT EXCEED THE THICKNESS OF THE THINNER PART JOINED
 (EG. PIPE WALL THICKNESS)

MPS INDEX

MPS TAG	DRAWING SHEET	TOC	MPS TAG	DRAWING SHEET	TOC
MPS 01	S-445B	30'-6"	MPS 18	S-445C	0'-6"
MPS 02	S-445B	0'-6"	MPS 19	S-445C	0'-6"
MPS 03	S-445B	30'-6"	MPS 20	S-445C	0'-6"
MPS 04	S-445B	30'-6"	MPS 21	S-445D	0'-6"
MPS 05	S-445B	30'-6"	MPS 22	S-445C	0'-6"
MPS 06	S-445B	30'-6"	MPS 23	S-445D	0'-6"
MPS 07	S-445B	30'-6"	MPS 24	S-445C	0'-6"
MPS 08	S-445B	30'-6"	MPS 25	S-445D	0'-6"
MPS 09	S-445B	30'-6"	MPS 26	S-445D	0'-6"
MPS 13	S-445C	0'-6"	MPS 27	S-445D	0'-6"
MPS 14	S-445C	0'-6"	MPS 31	S-445C	0'-6"
MPS 15	S-445D	0'-6"	MPS 32	S-445C	0'-6"
			MPS 33	S-445E	0'-6"
			MPS 34	S-445B	0'-6"

- GENERAL NOTES:**
- FOR SITE PLAN REFER DRAWING G-445C.
 - FOR MPS SECTIONS/TOC ELEVATION REFER INDEX TABLE.
 - ALL WELDS CONTINUOUS FILLET UNLESS NOTED OTHERWISE, PER AWS D1.1
 - BLOWER FOUNDATION ELEVATION = 0'-6". GRADE ELEVATION = 0'-0"
 - SEE MECHANICAL DRAWING CONSTRUCTION NOTES FOR SURFACE PREPARATION AND PAINTING OF MPS.

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	
2.0	02/03/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG	
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

ANDRE GAMANIAN, P.E.
 FL LICENSE NO. 93370
 EXP. 02/28/2025

OWNER:

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

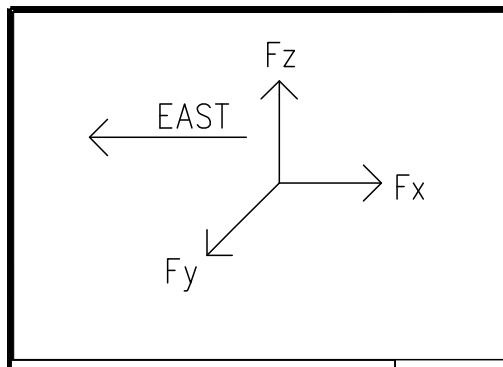
ENGINEER:
BIOGAS ENGINEERING
 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
 EMAIL: INFO@BIOGASENG.COM

MPS LOCATION PLAN

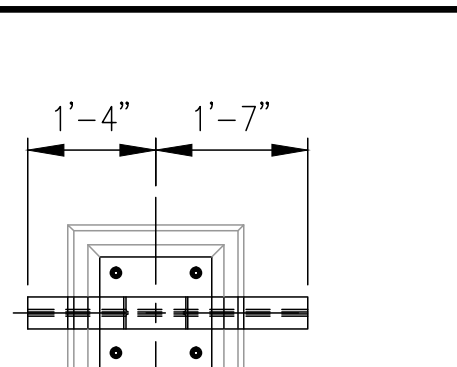
LANDFILL GAS BLOWER SKID
 & FLARE REPLACEMENT

DRAWING NO.
S-445A

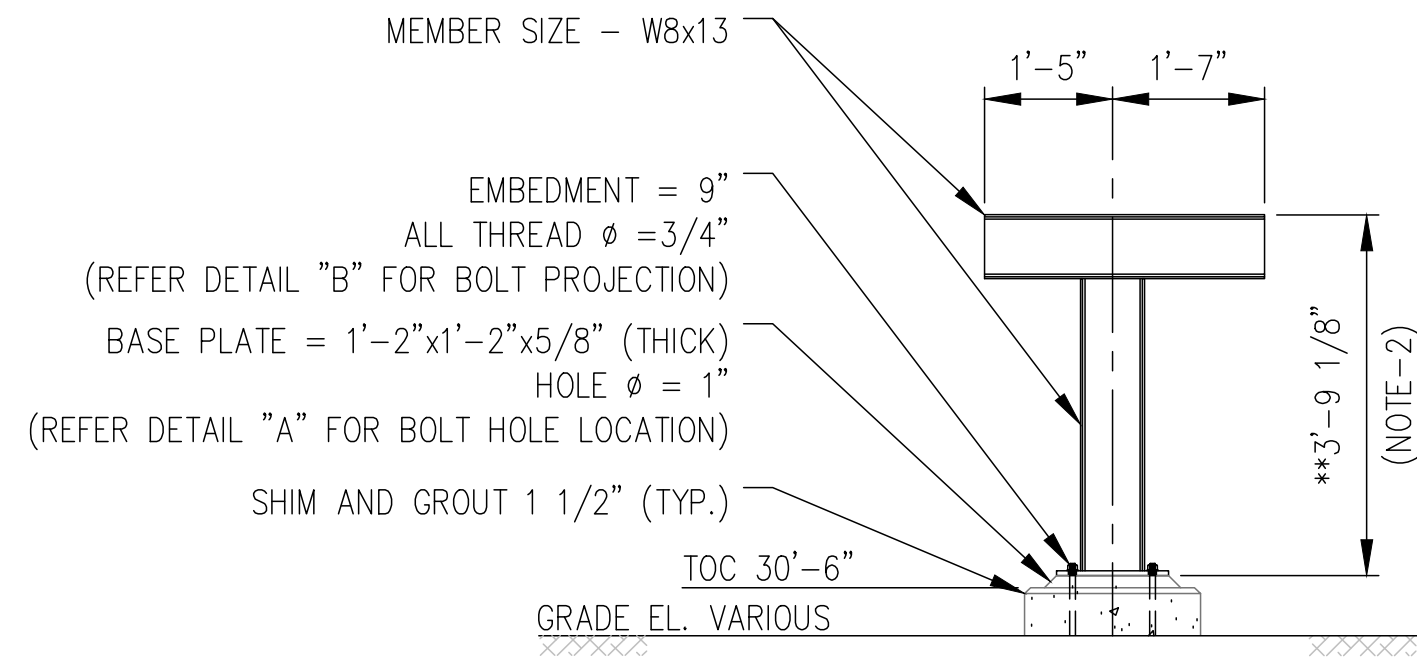
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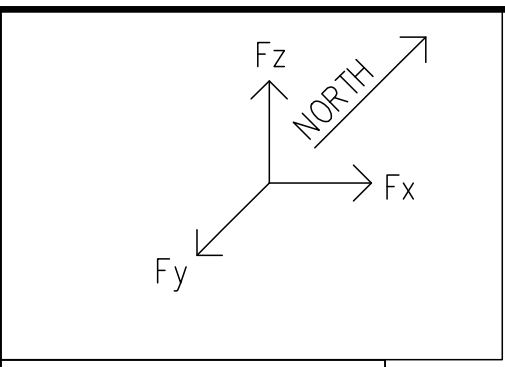
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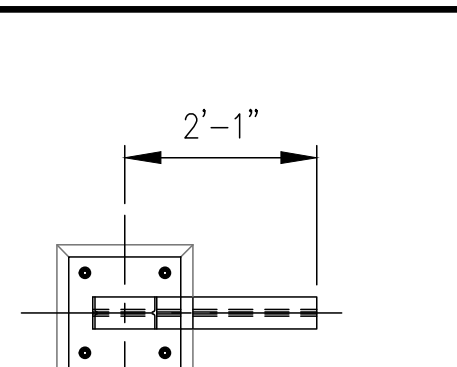
PLAN VIEW



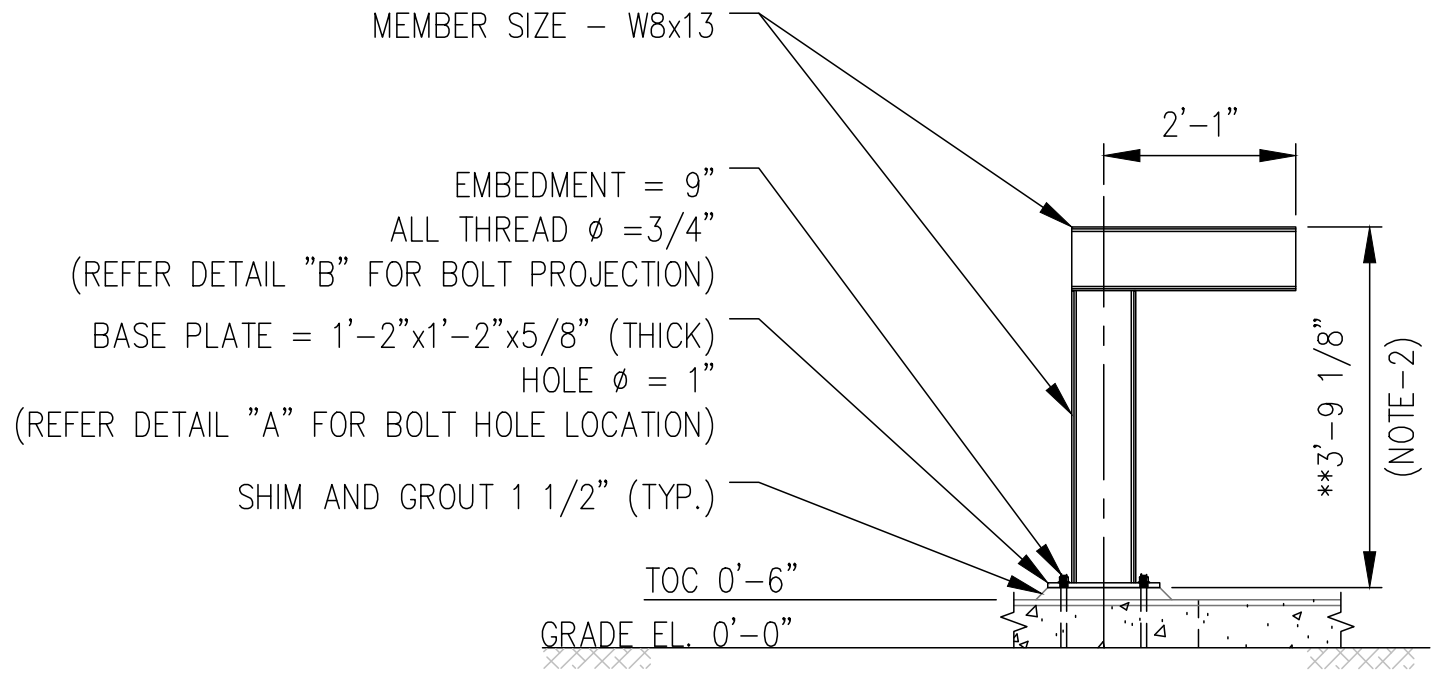
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(VIEW LOOKING WEST)
SCALE - NTS



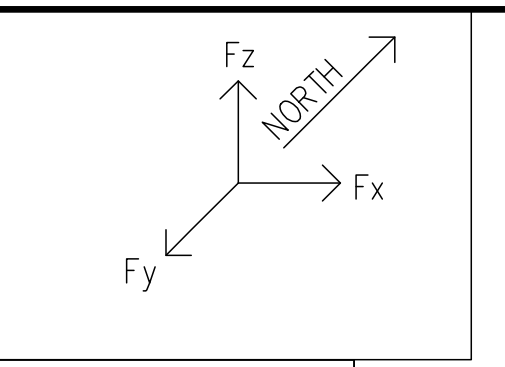
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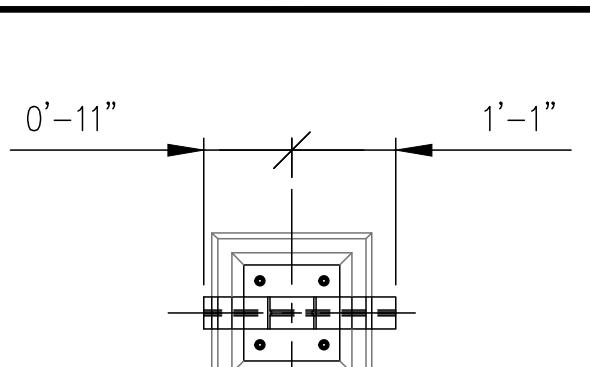
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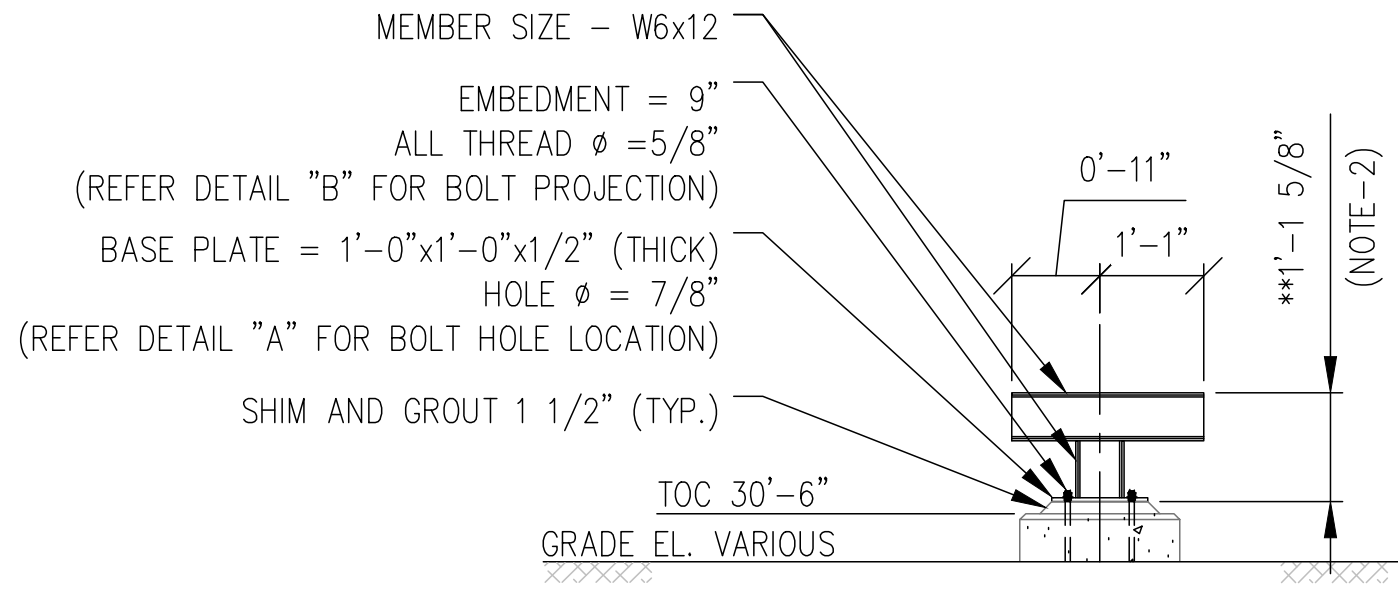
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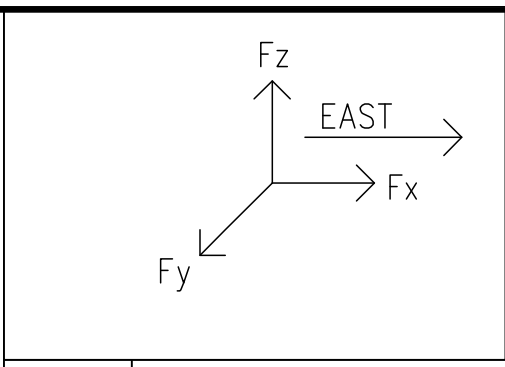
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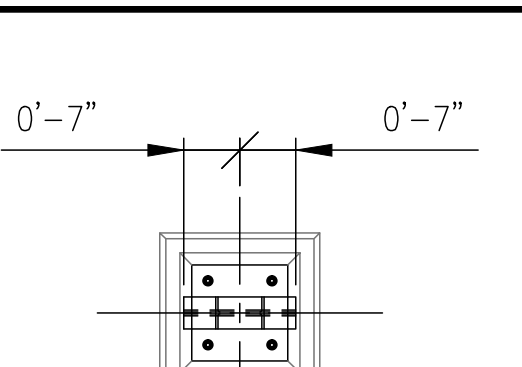
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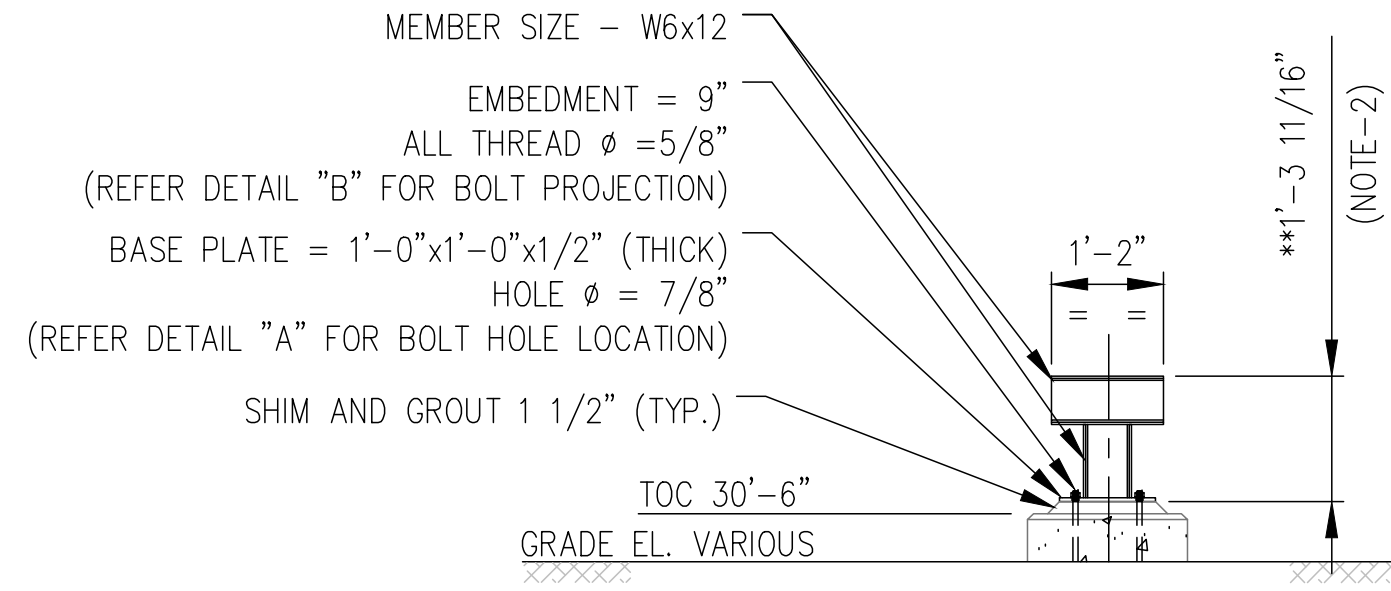
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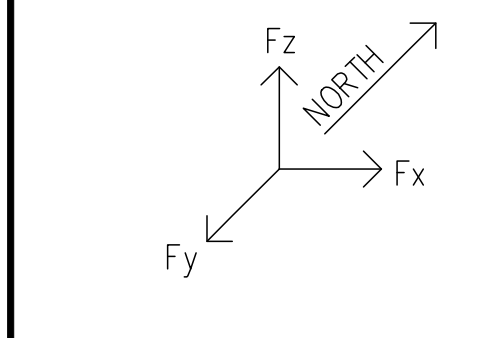
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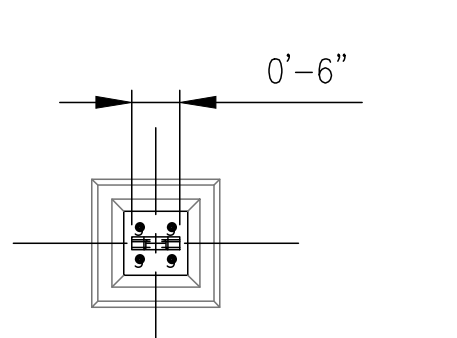
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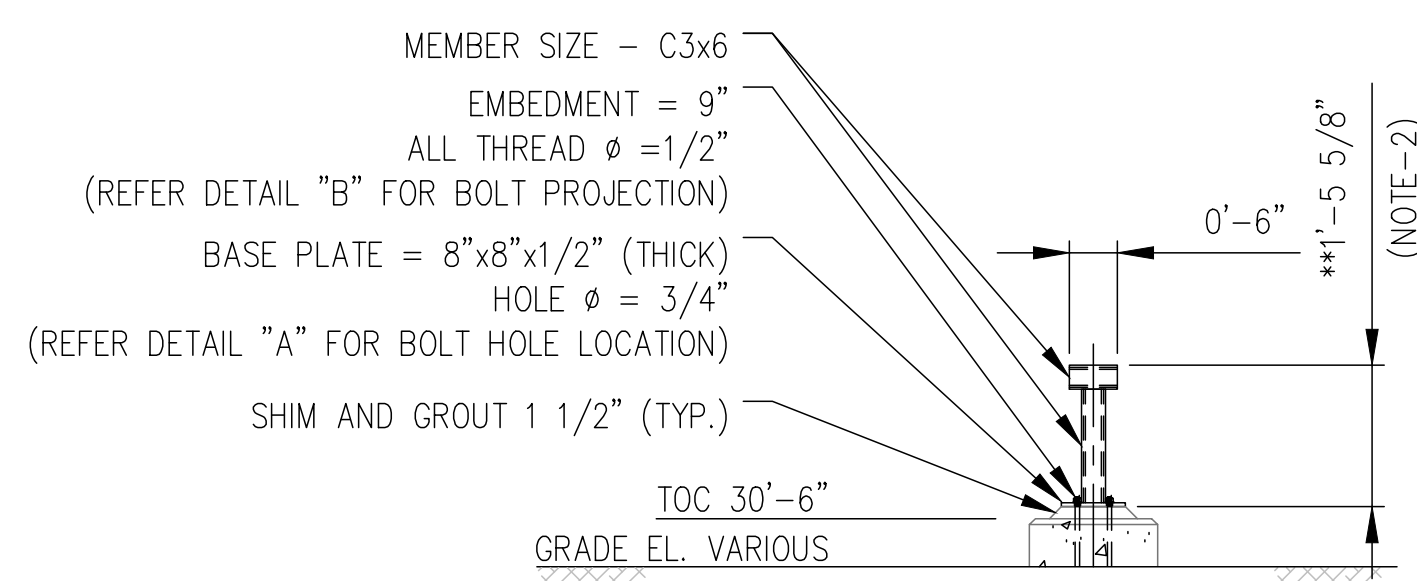
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(VIEW LOOKING EAST)
SCALE - NTS



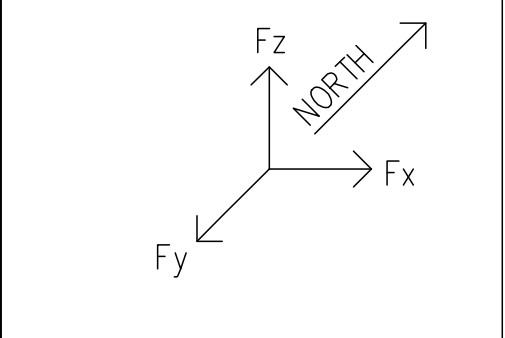
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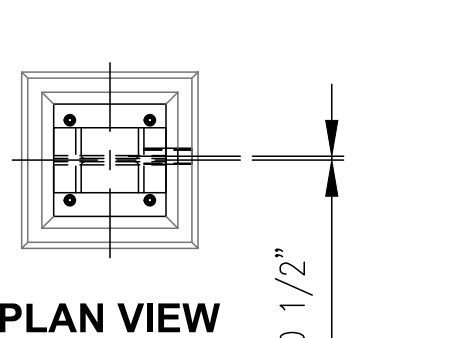
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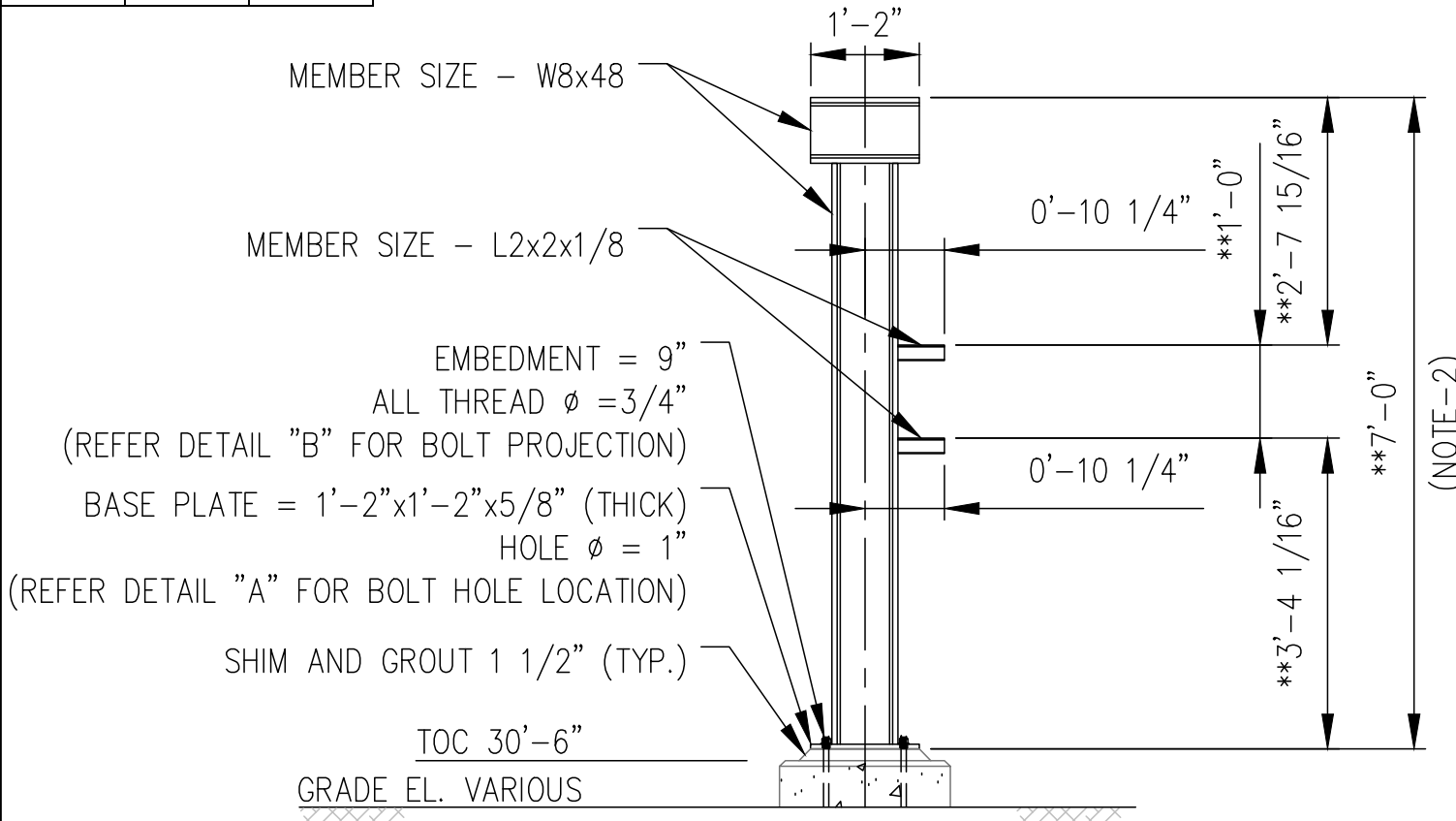
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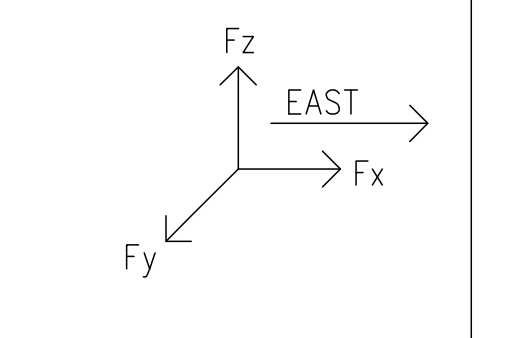
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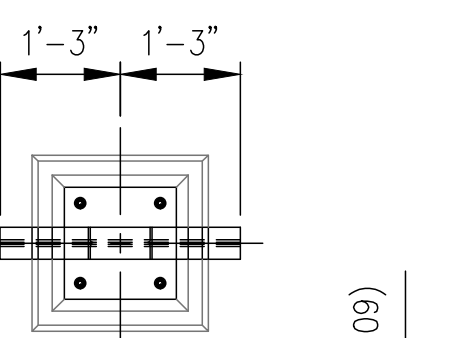
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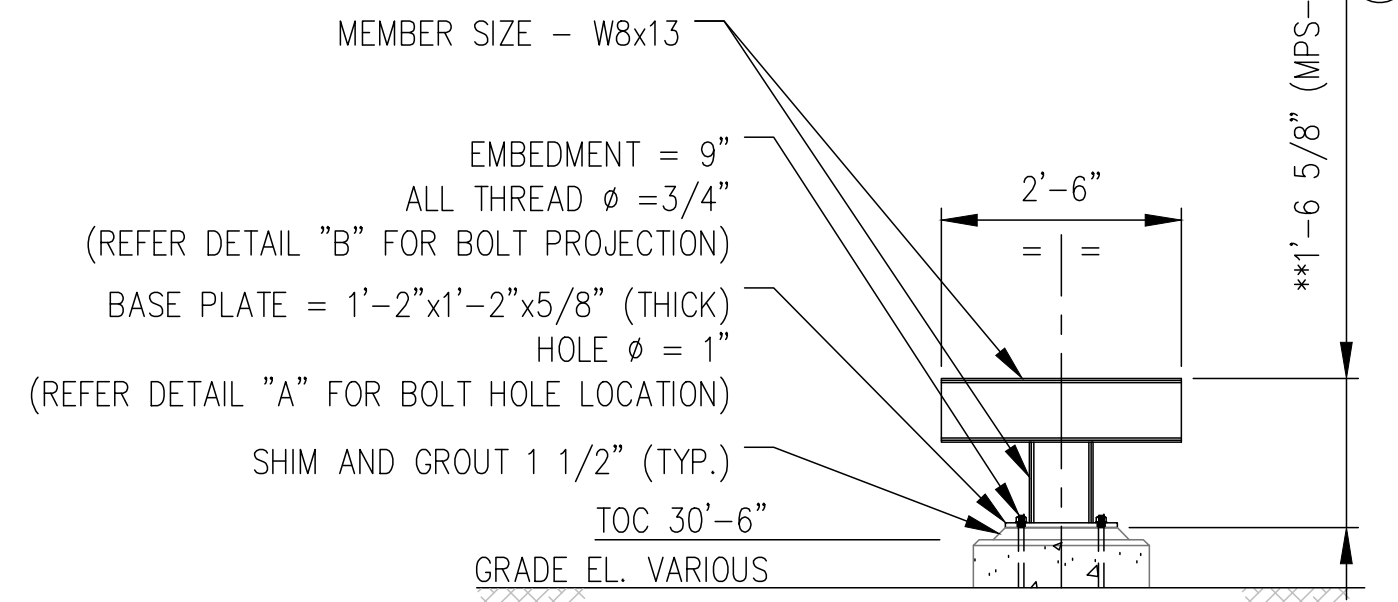
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SCALE - NTS



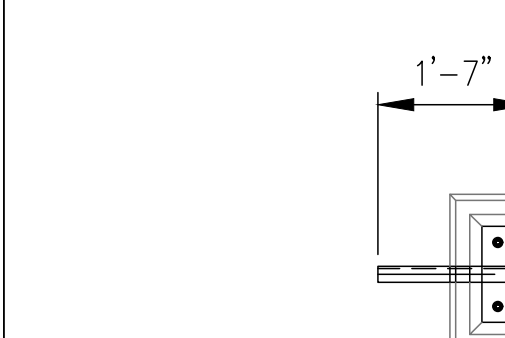
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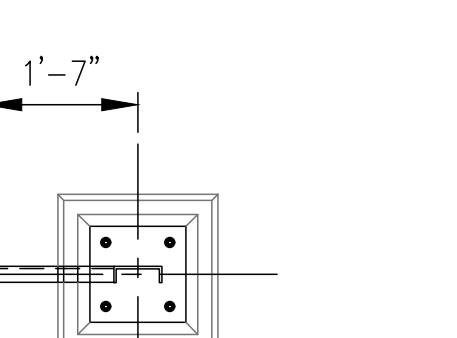
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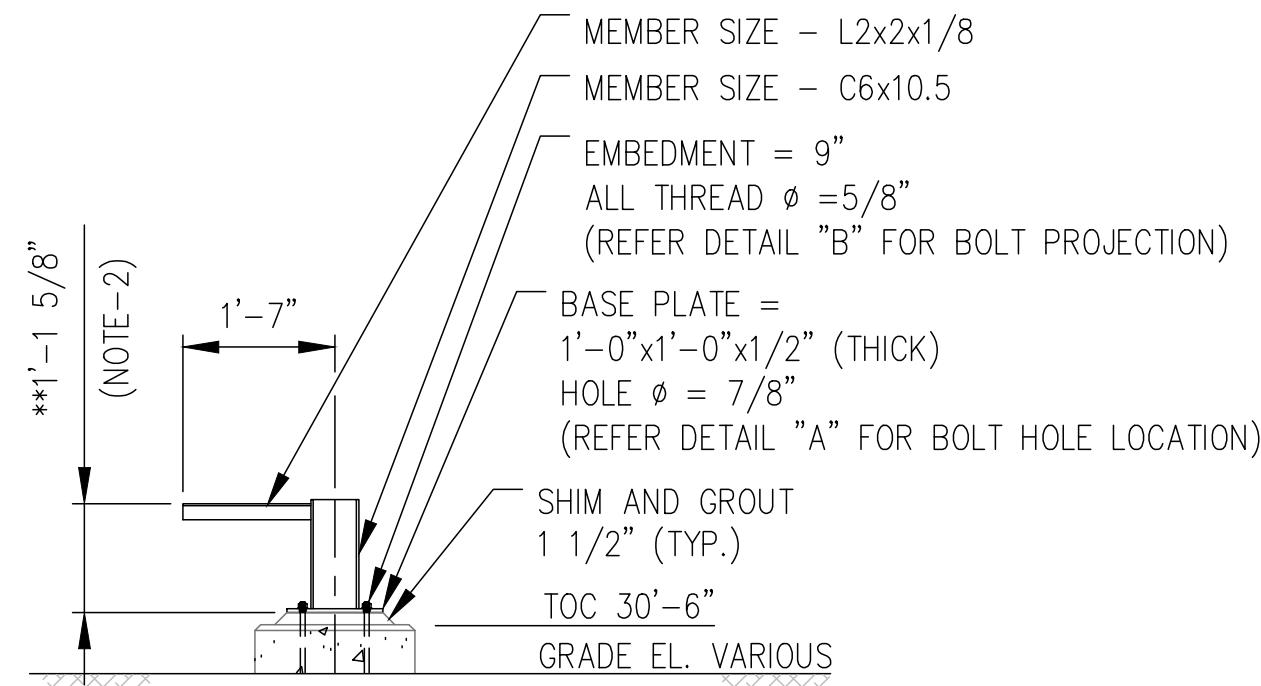
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SCALE - NTS



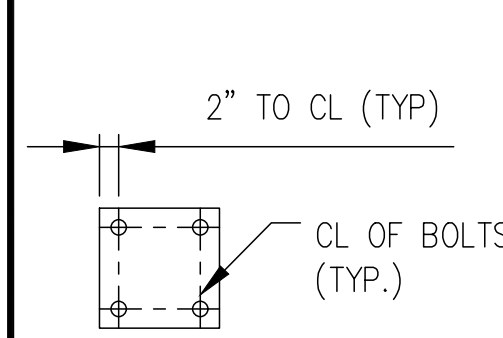
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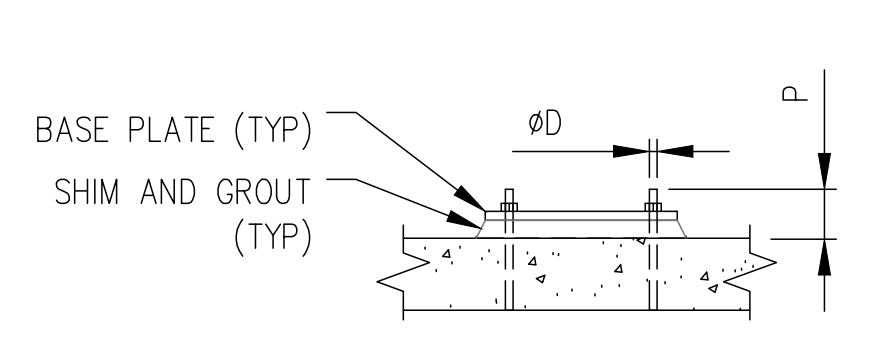
PLAN VIEW



ELEVATION VIEW - MPS 34
(VIEW LOOKING NORTH)
SCALE - NTS



BASE PLATE HOLE DETAILS
(DETAIL - A)



TYP. ANCHOR BOLTS PROJECTION DETAIL
(DETAIL - B)

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

NOTE:

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

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	
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

ANDRE GAMANIAN, P.E.
FL LICENSE 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'

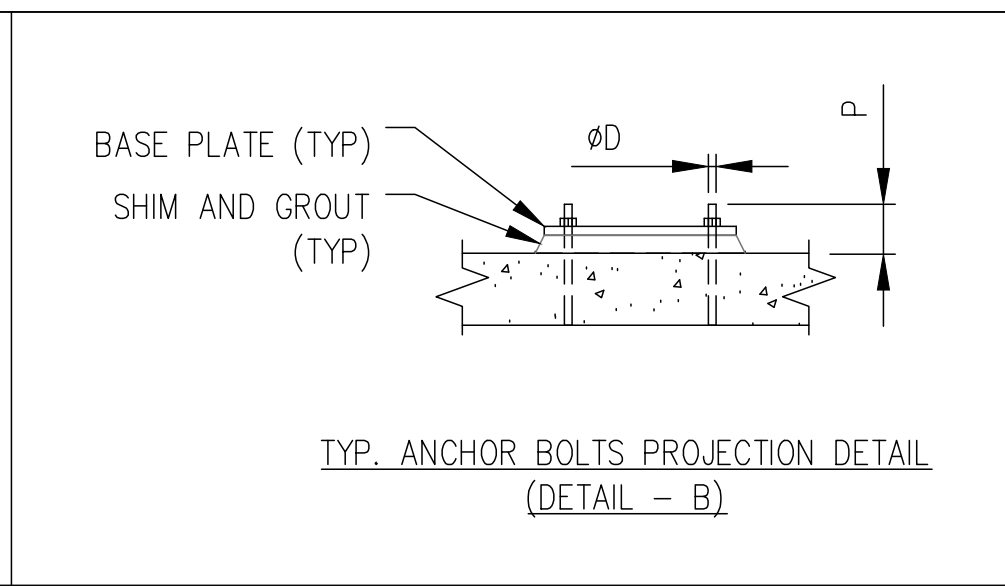
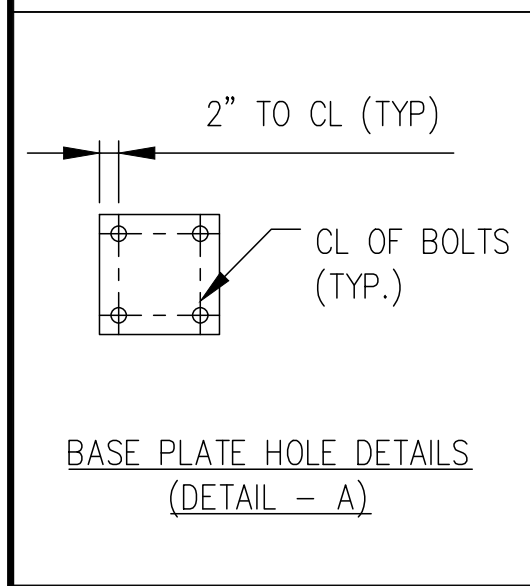
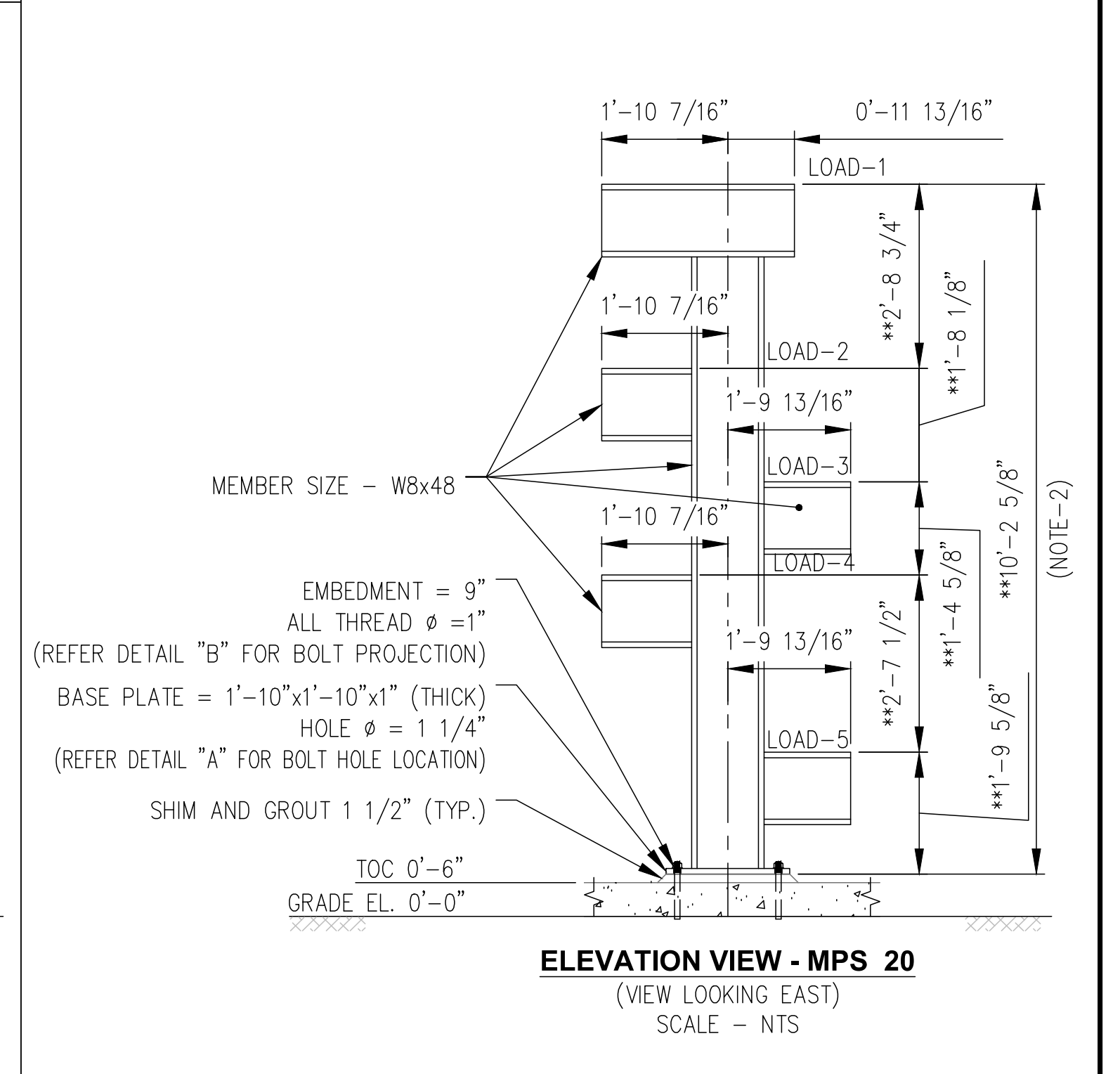
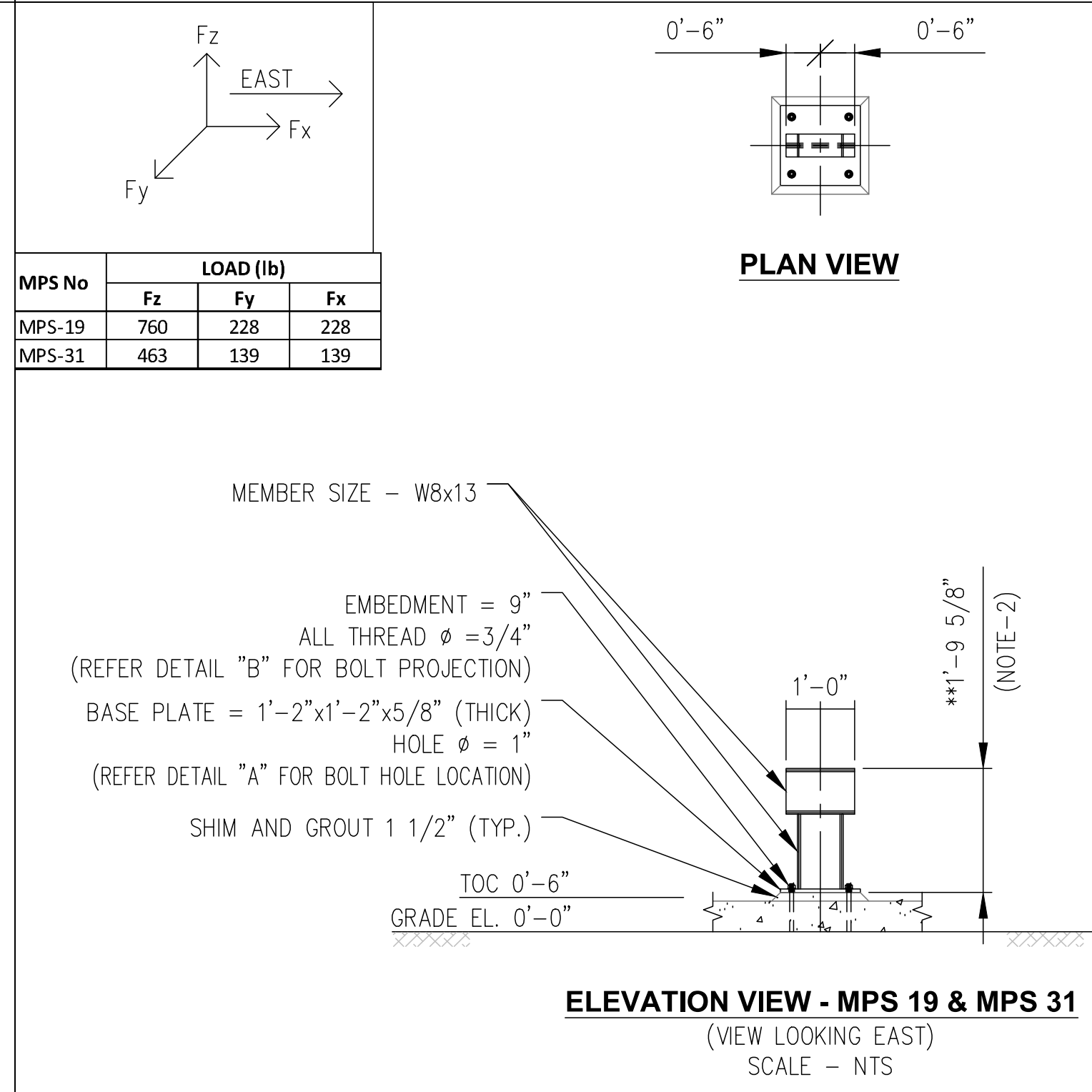
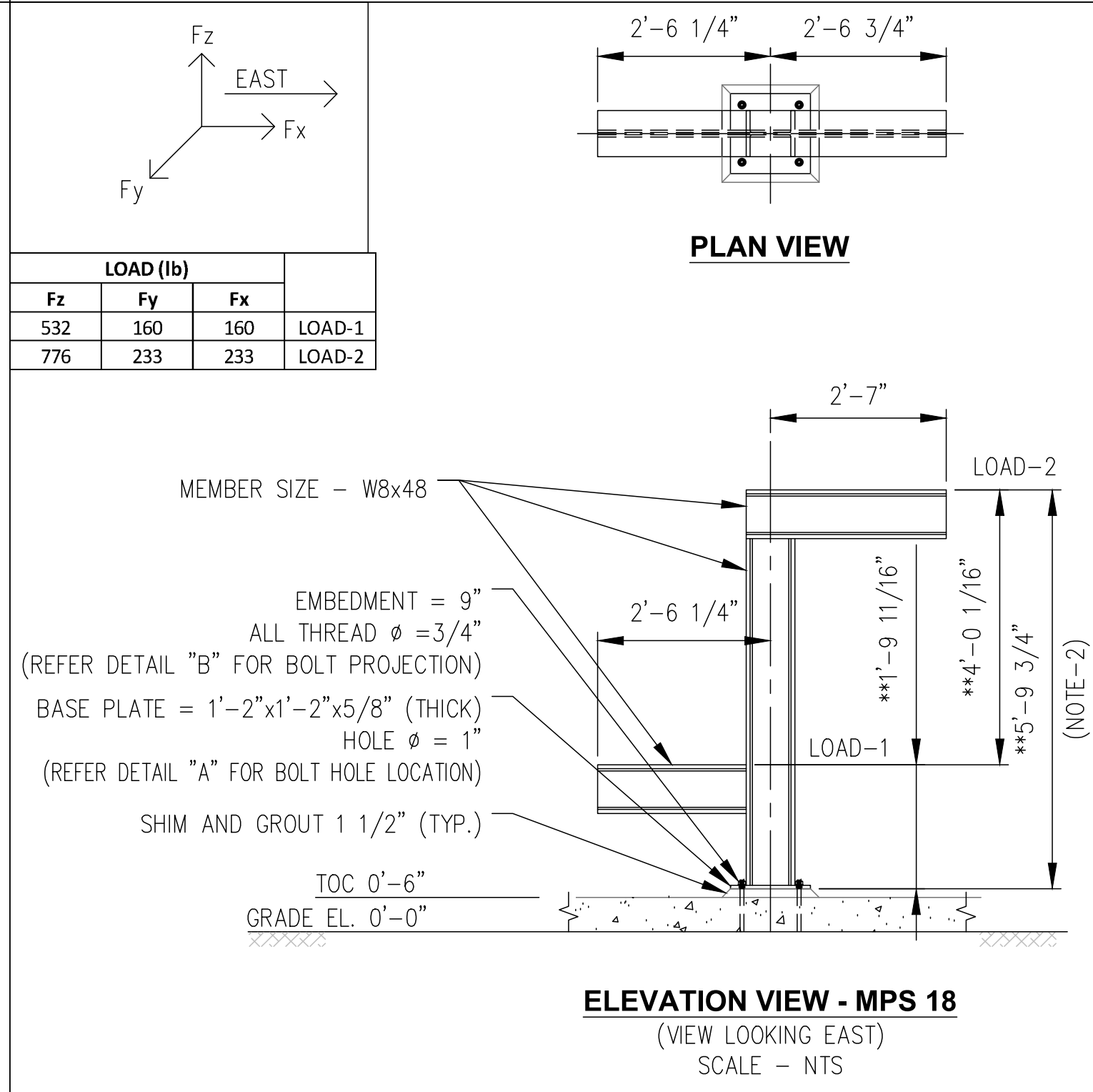
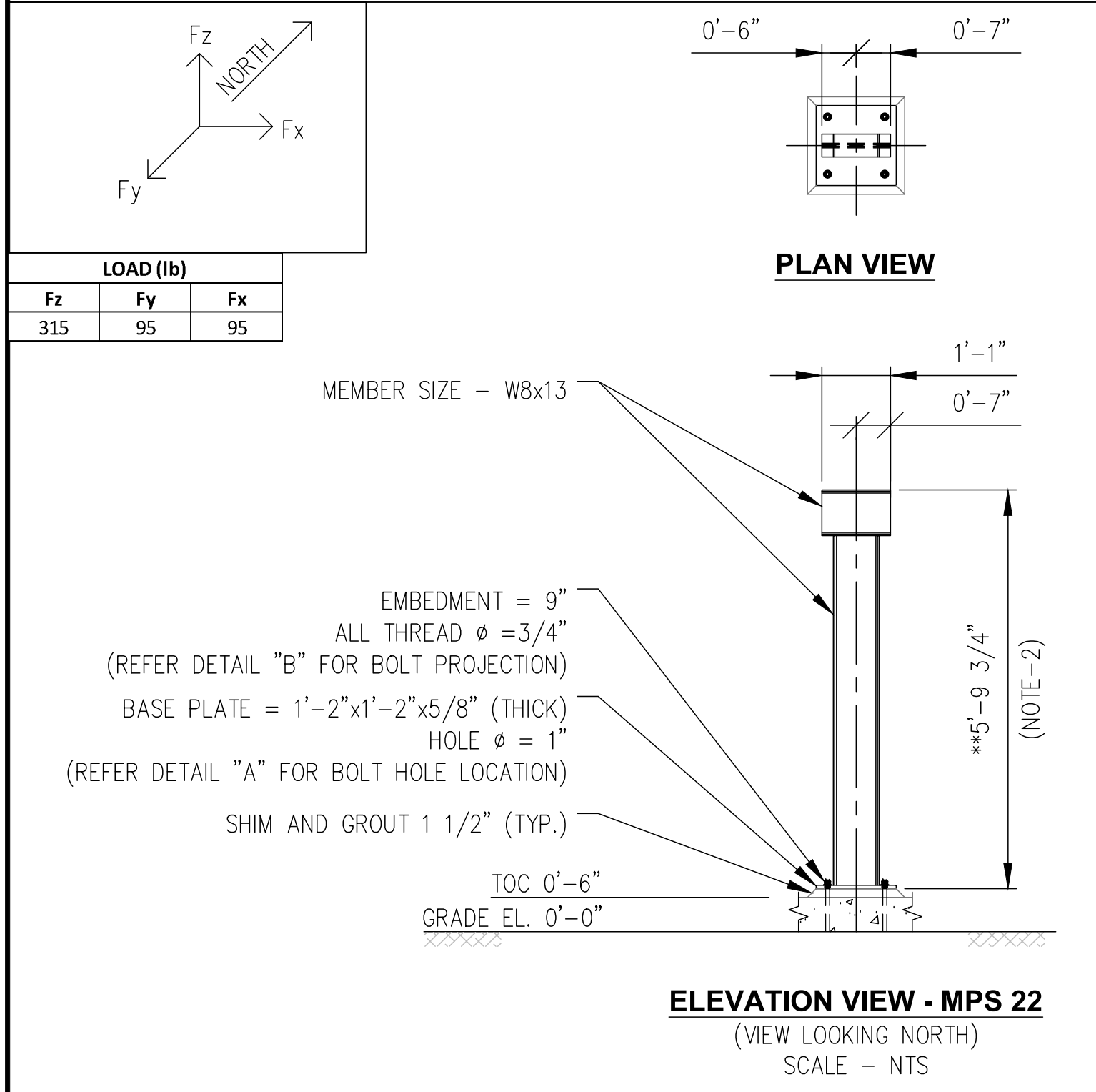
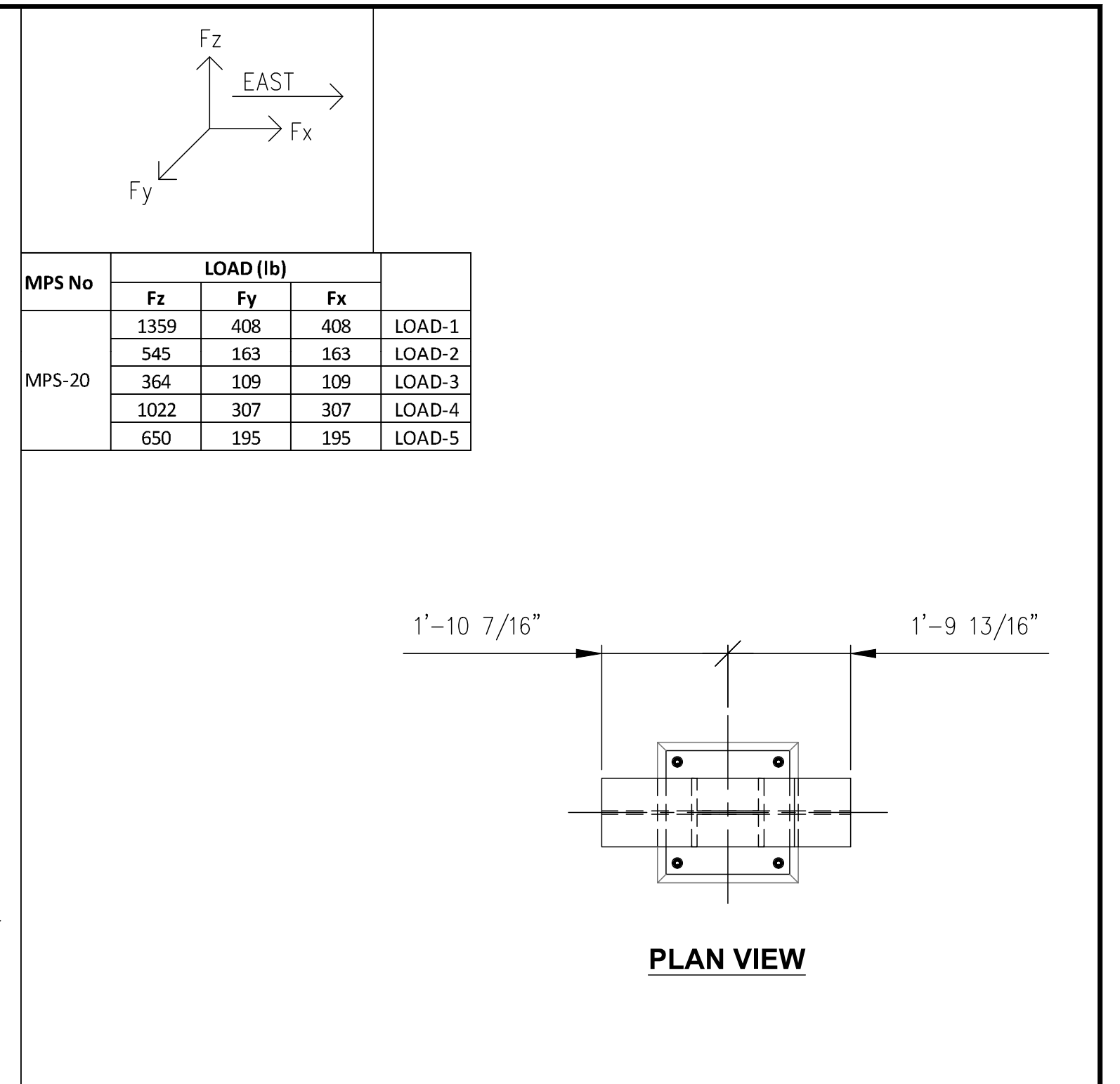
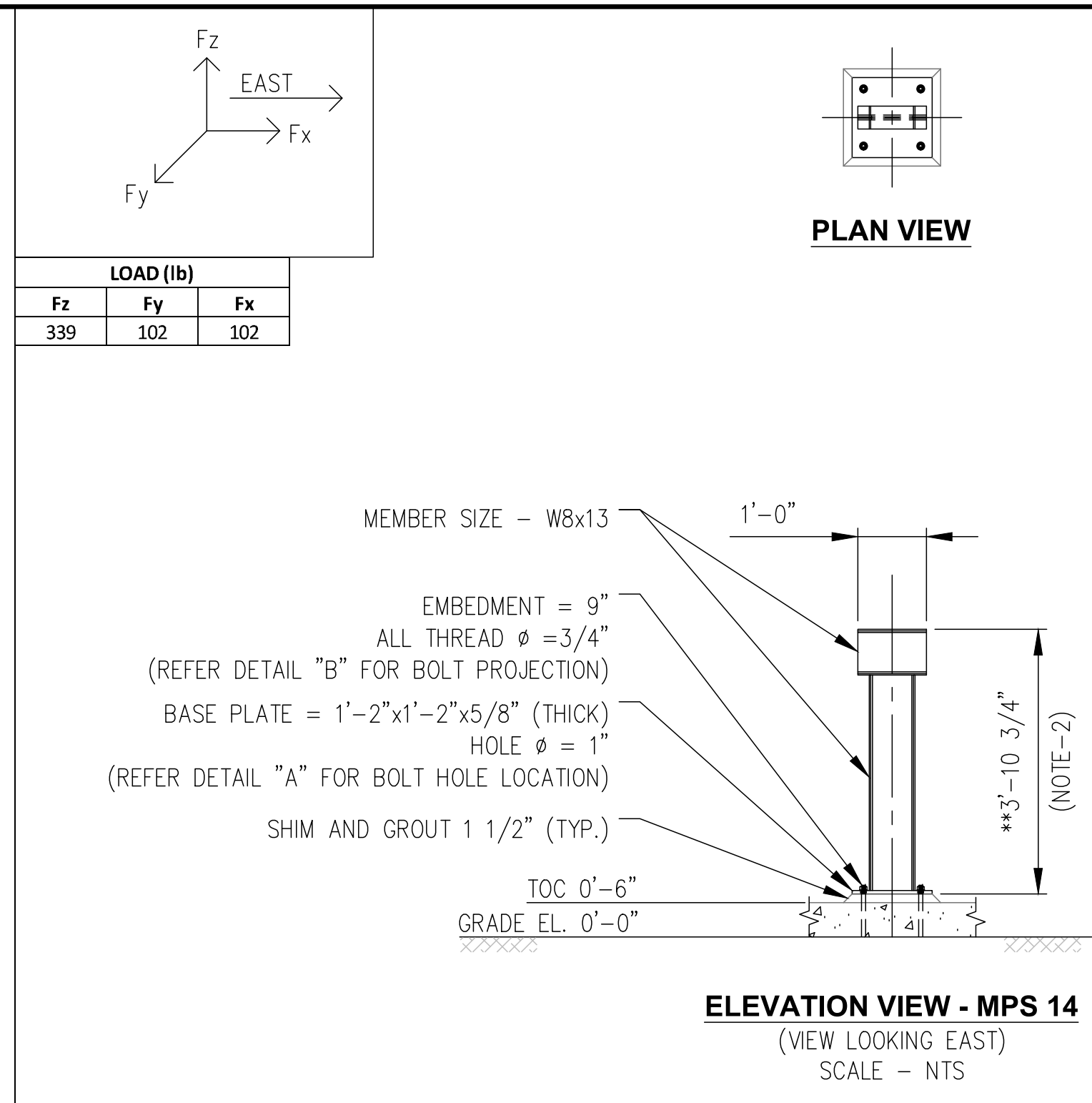
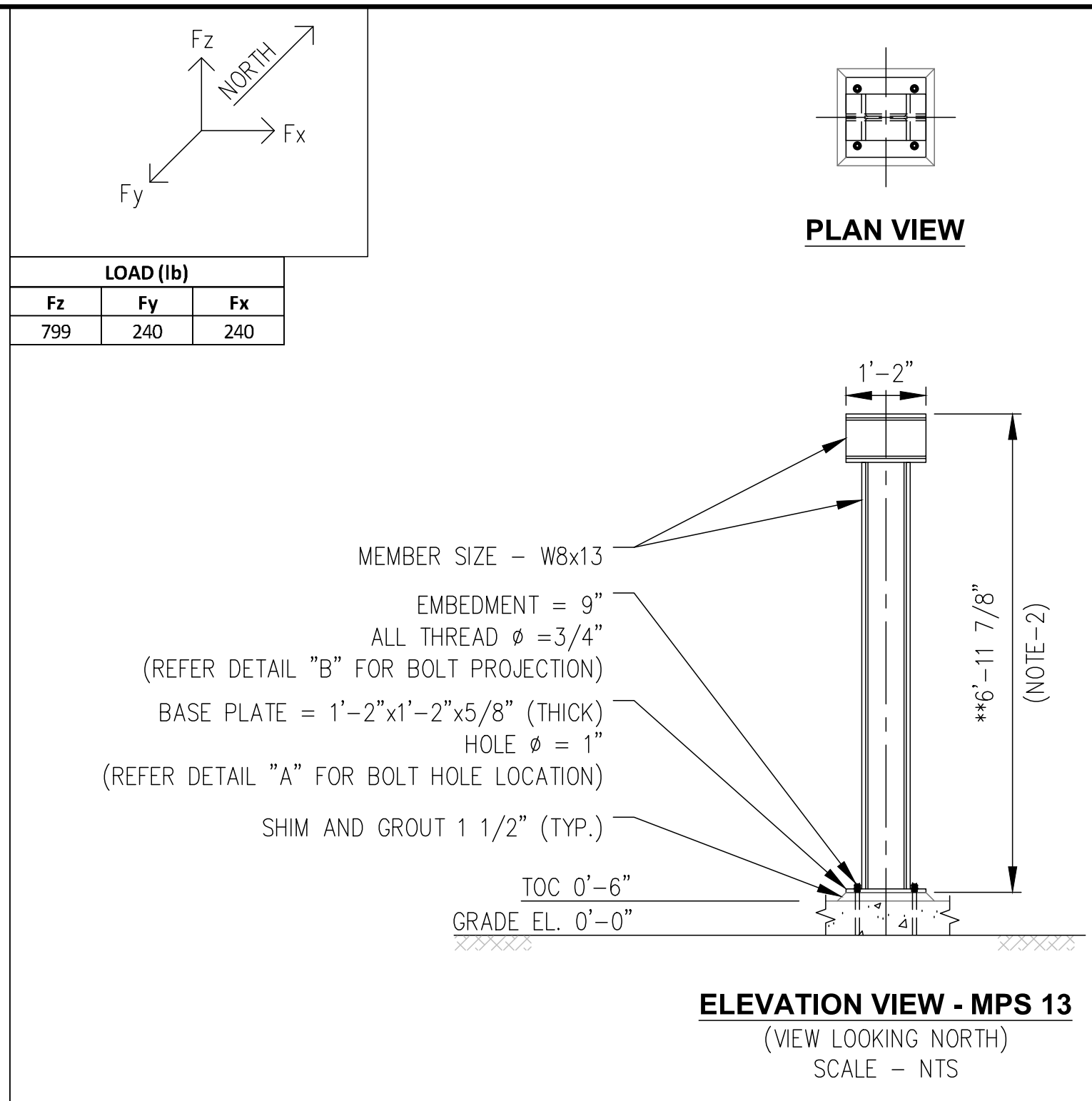
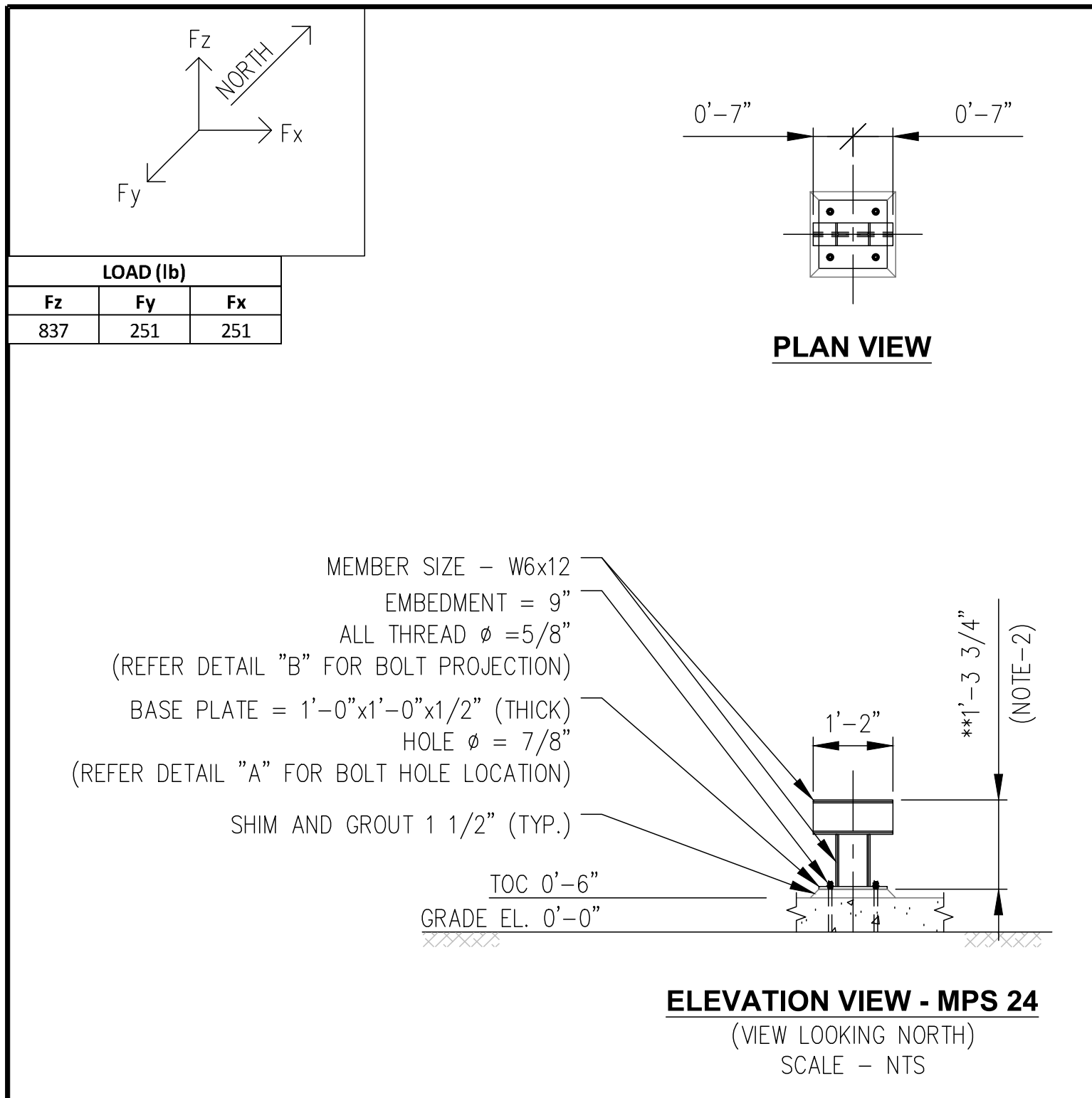
OWNER: INDIAN RIVER COUNTY FLORIDA
1325 74th AVE SW, VERO BEACH, FLORIDA 32968

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

ISSUED FOR CONSTRUCTION

MPS SECTIONS
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. **S-445B**

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

NOTE:

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

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	ANDRE GAMANIAN, P.E. FL LICENCE NO.93370 EXP. 02/28/2025
2.0	02/03/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG	
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

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'

ANDRE GAMANIAN
LICENSED PROFESSIONAL ENGINEER
No. 93370
STATE OF FLORIDA

OWNER: 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) 726-3565
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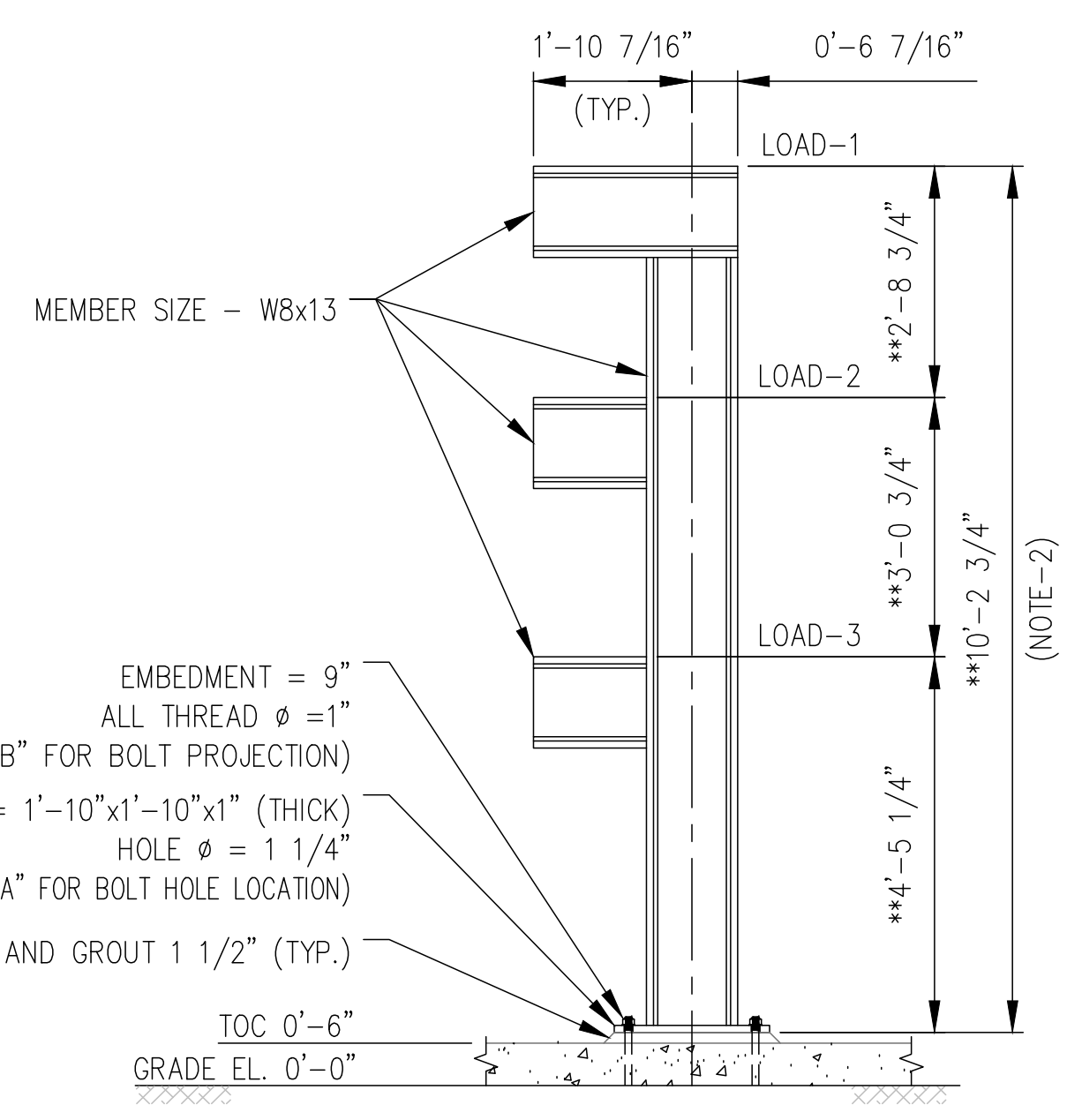
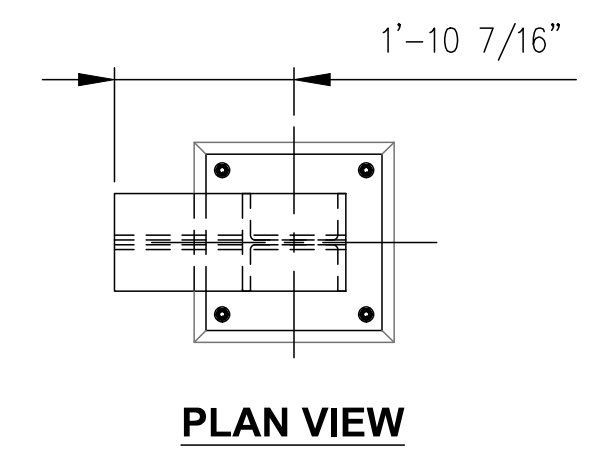
MPS SECTIONS

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **S-445C**

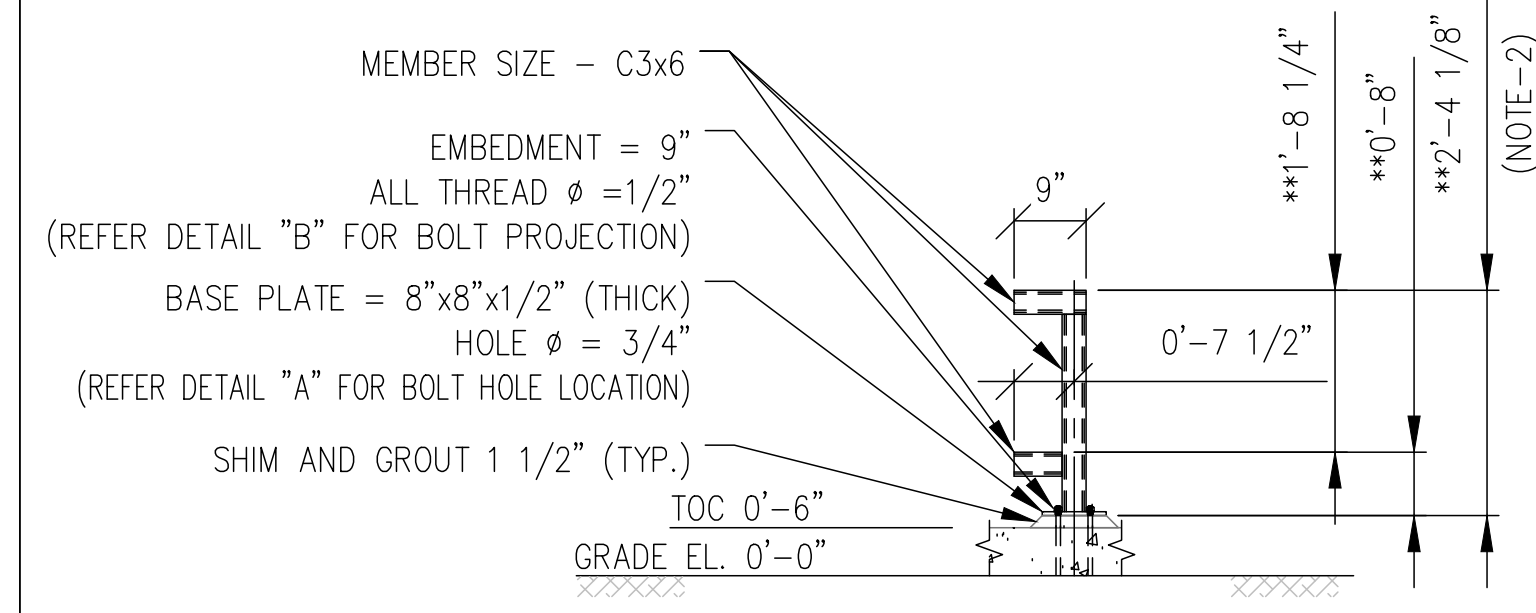
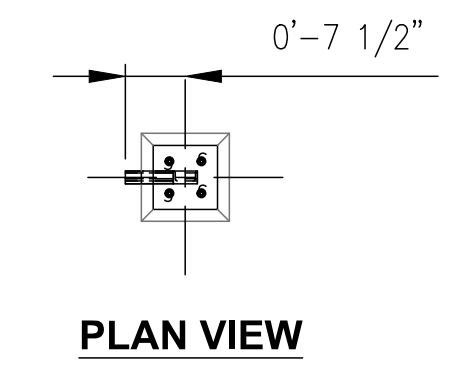
C:\Users\Mukesh\OneDrive\Documents\Engineering\Projects\Ush2126.100 - Indian River County LF\Drawings\Structural\S-445D.dwg 21-06-2023 Intel

MPS No	LOAD (lb)			
	Fz	Fy	Fx	
MPS-21	1093	328	328	LOAD-1
	545	163	163	LOAD-2
	1022	307	307	LOAD-3



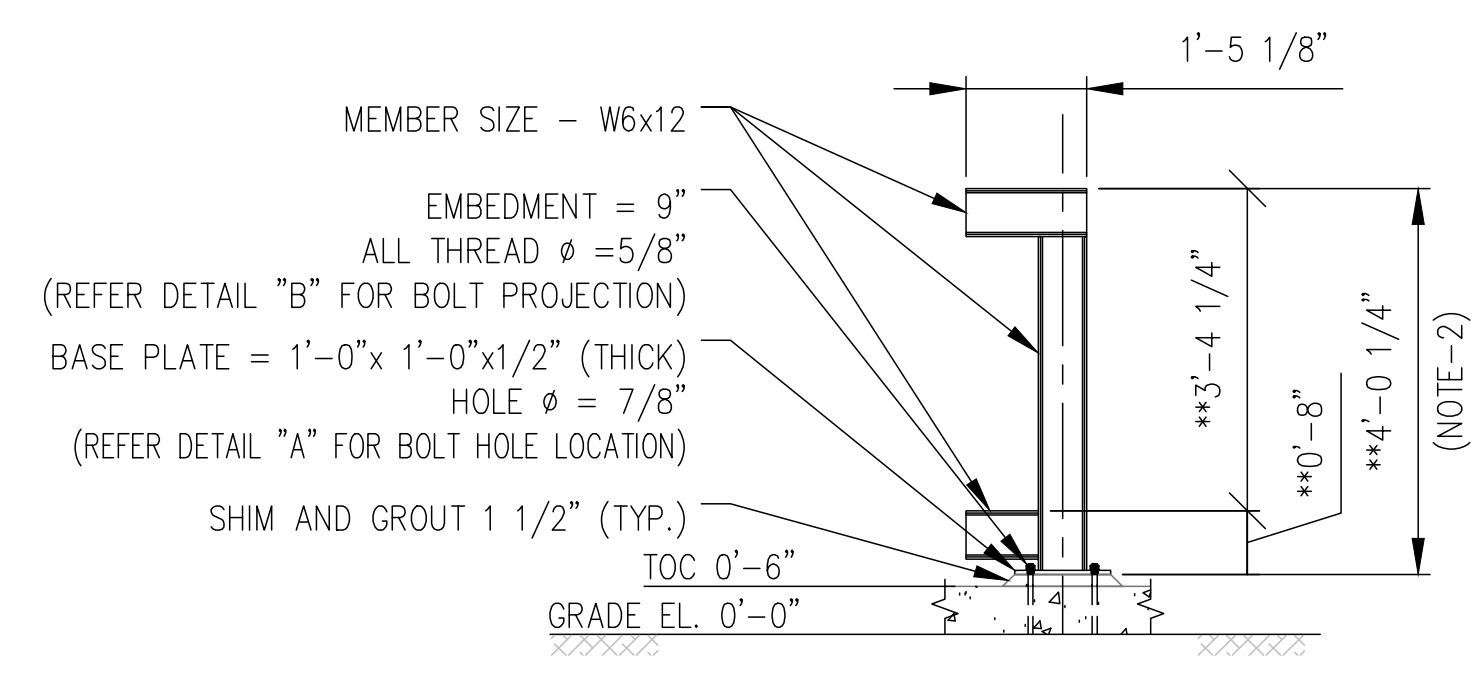
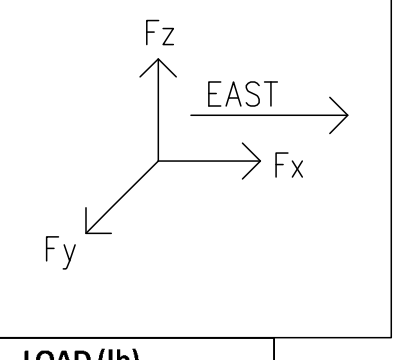
ELEVATION VIEW - MPS 21
(VIEW LOOKING EAST)
SCALE - NTS

LOAD (lb)		
Fz	Fy	Fx
72	22	22



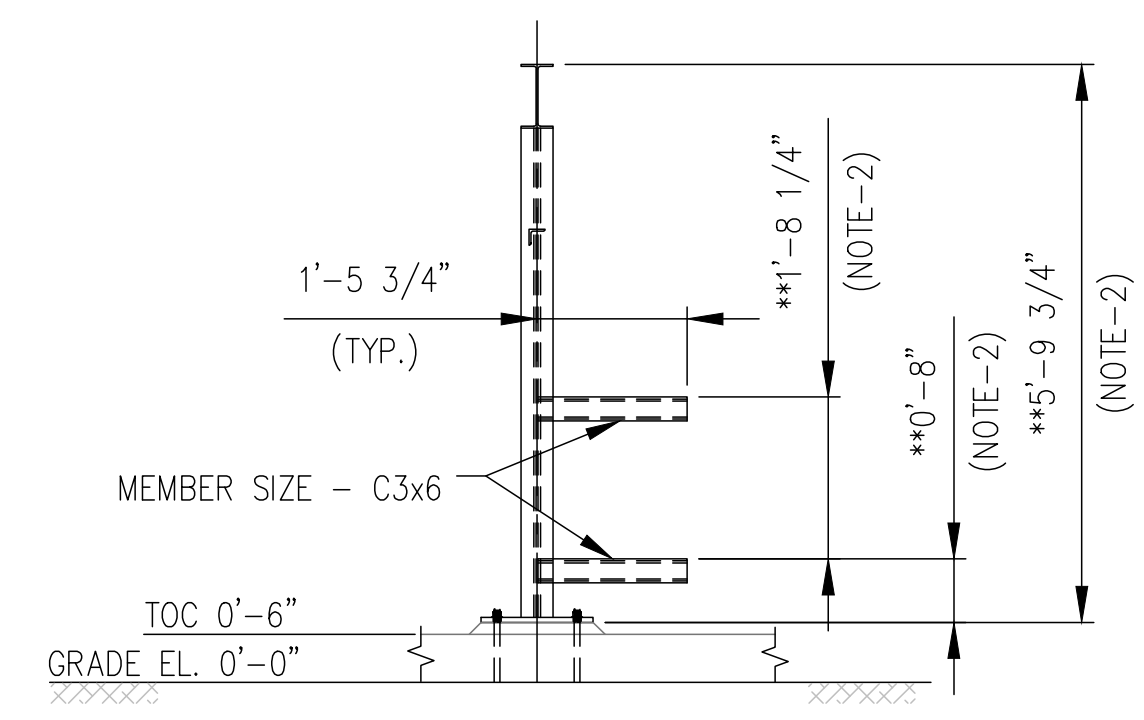
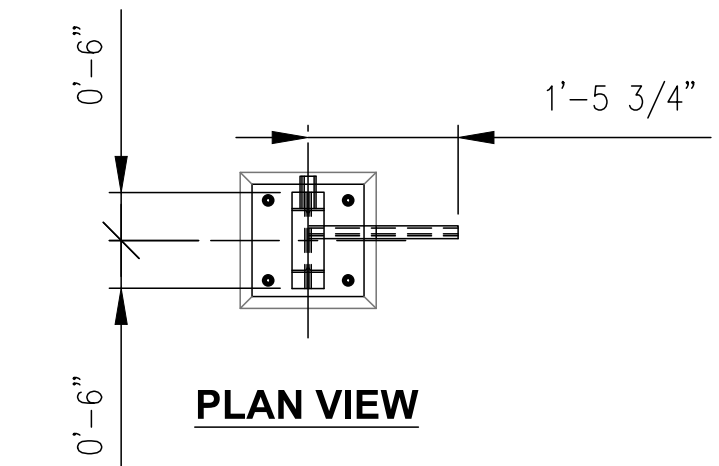
ELEVATION VIEW - MPS 23
(VIEW LOOKING NORTH)
SCALE - NTS

LOAD (lb)		
Fz	Fy	Fx
161	48	48



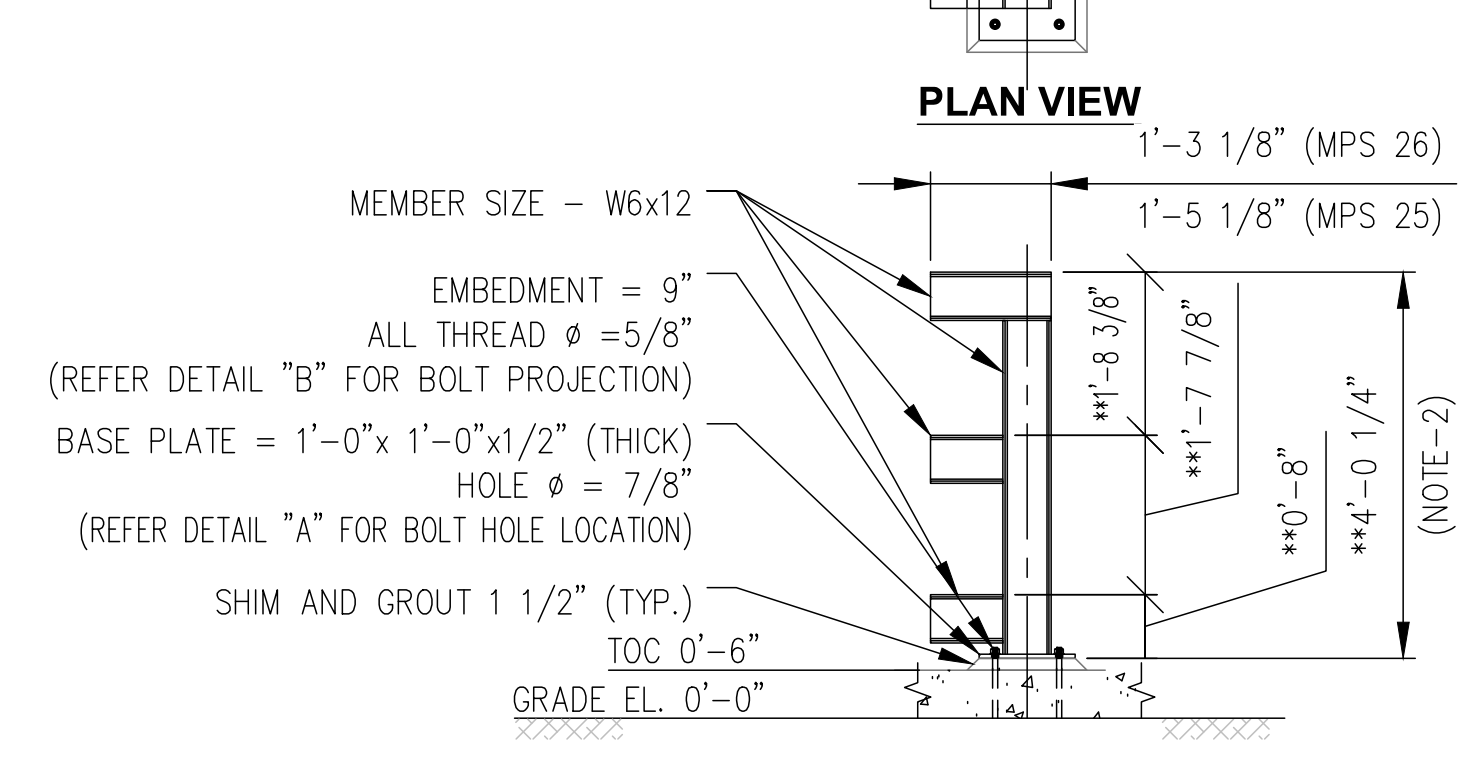
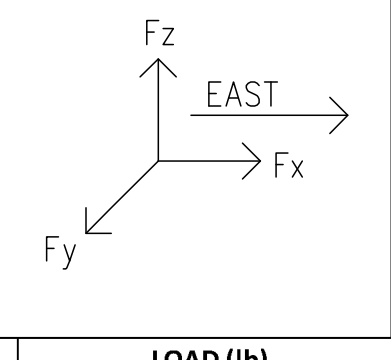
ELEVATION VIEW - MPS 27
(VIEW LOOKING EAST)
SCALE - NTS

LOAD (lb)		
Fz	Fy	Fx
316	95	95

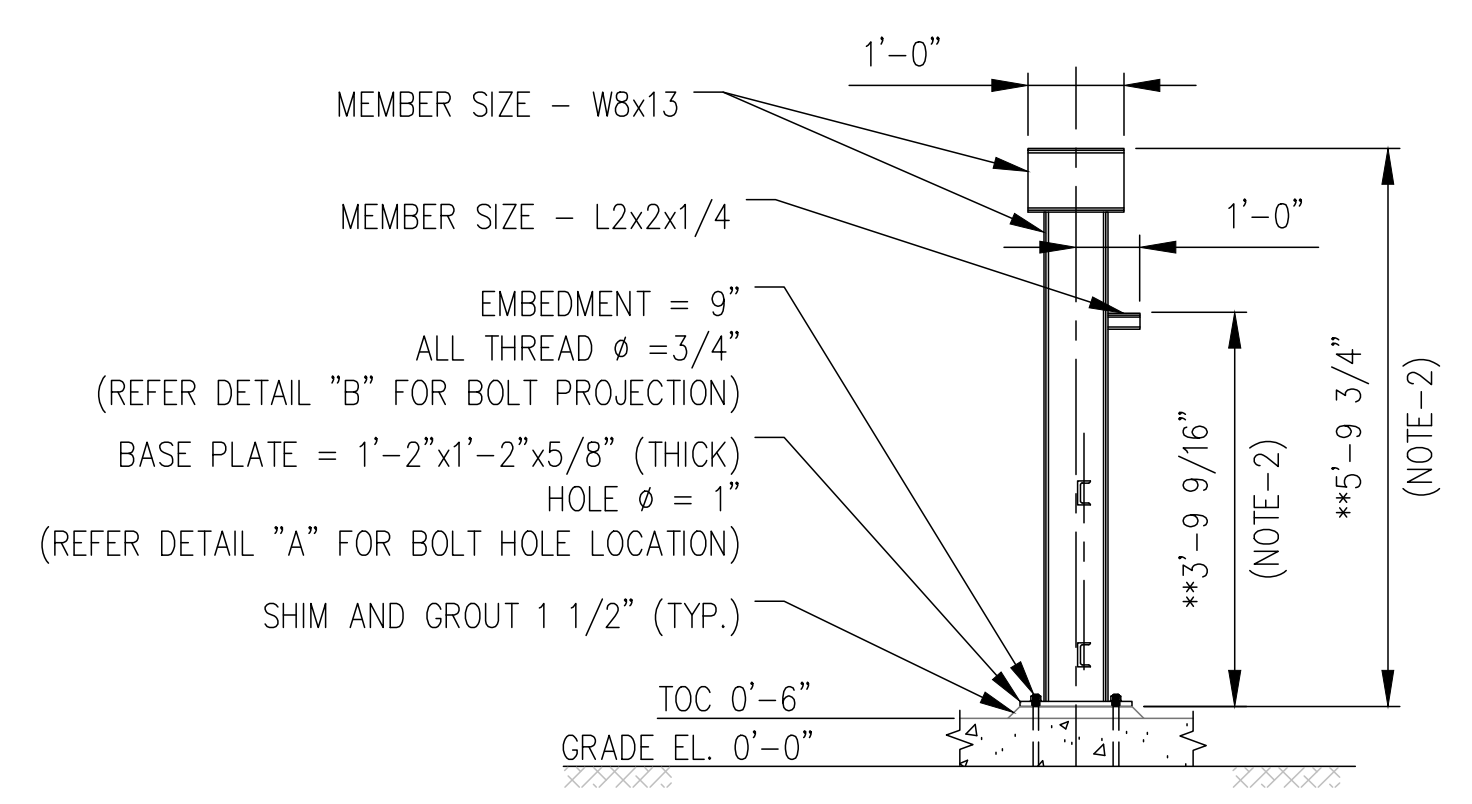


ELEVATION VIEW - MPS 15
(VIEW LOOKING NORTH)
SCALE - NTS

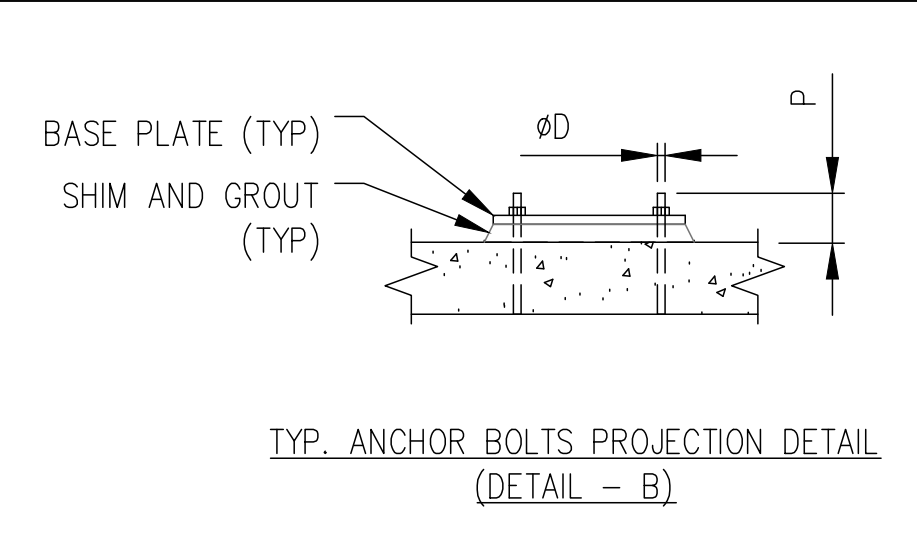
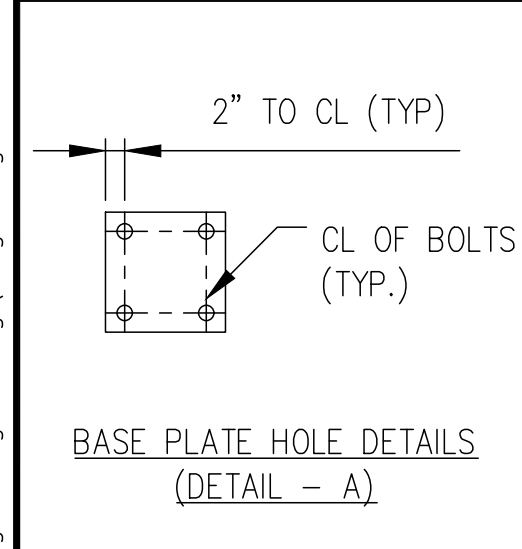
MPS No	LOAD (lb)		
	Fz	Fy	Fx
MPS-25	203	61	61
MPS-26	346	104	104



ELEVATION VIEW - MPS 25 & 26
(VIEW LOOKING EAST)
SCALE - NTS



ELEVATION VIEW - MPS 15
(VIEW LOOKING WEST)
SCALE - NTS



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

NOTE:

- FOR MPS INDEX & GENERAL NOTES REFER DRAWING S-445A.
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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	
2.0	02/03/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG	
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

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

OWNER: INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

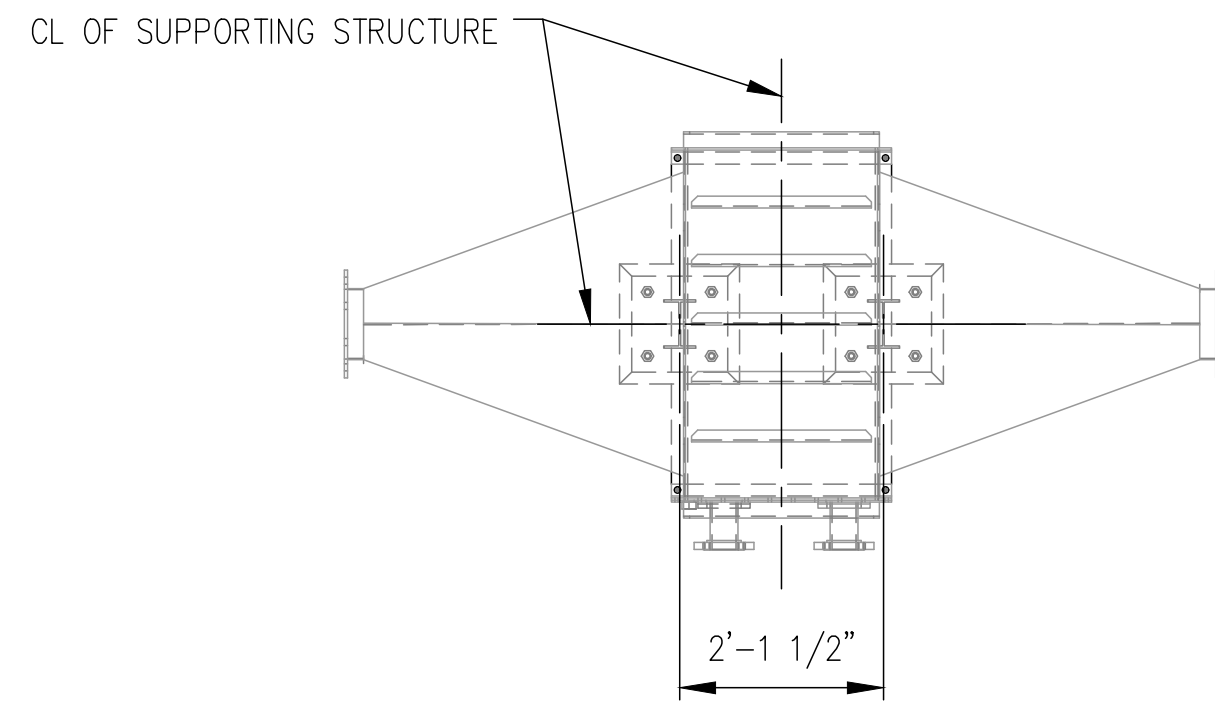
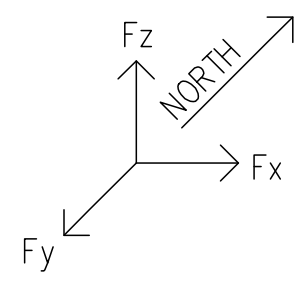
ENGINEER: **BIOGAS ENGINEERING**

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

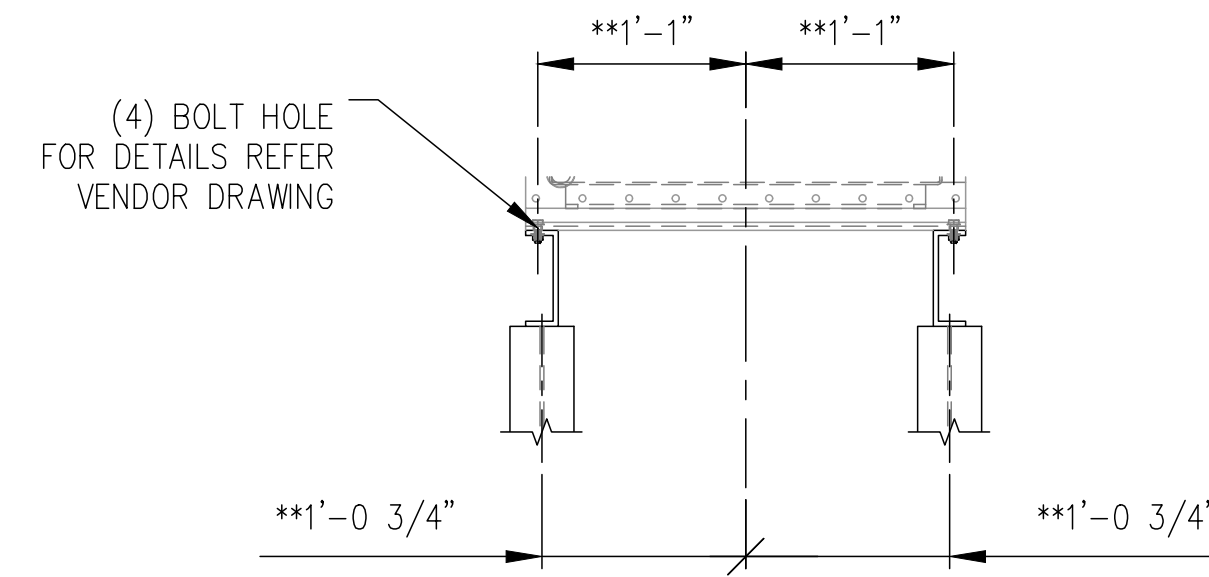
MPS SECTIONS

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

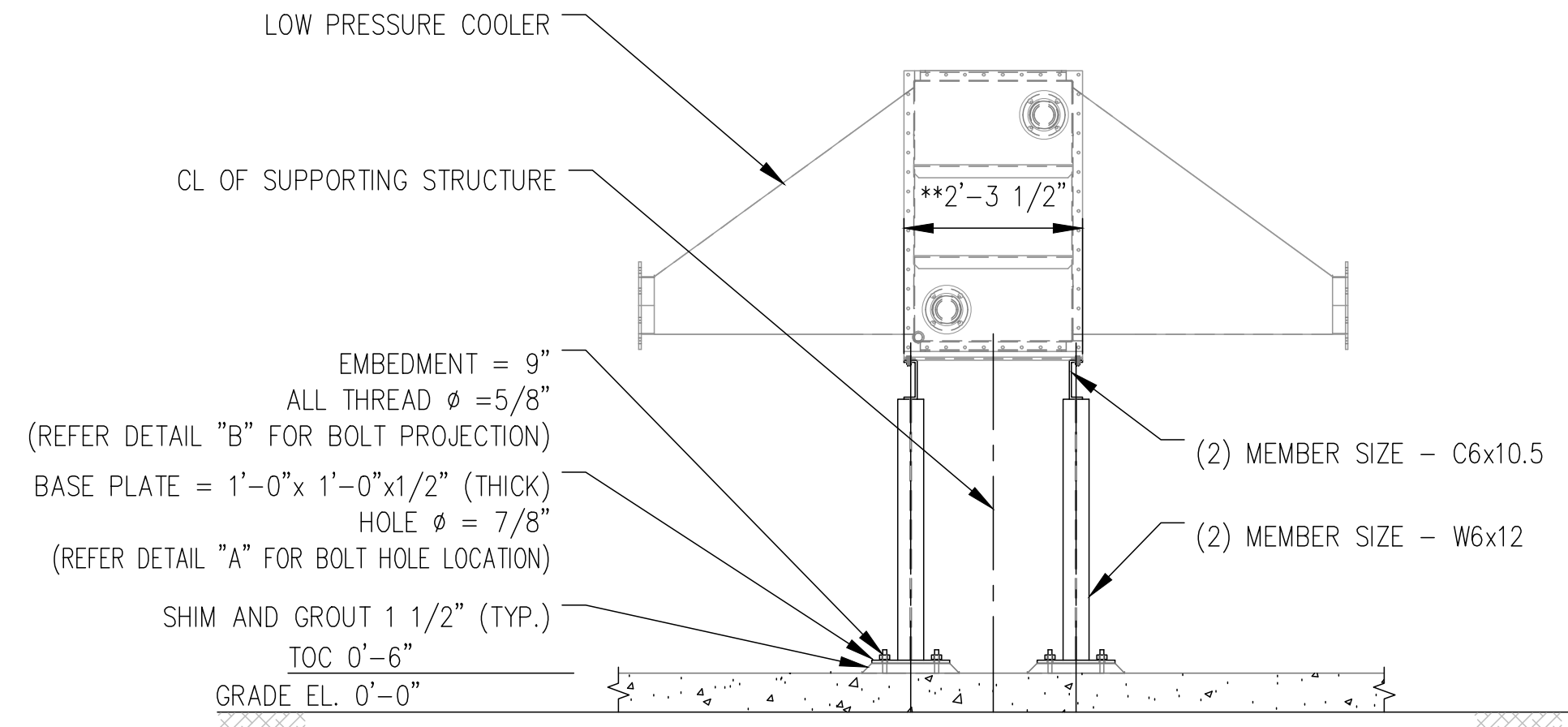
DRAWING NO. **S-445D**



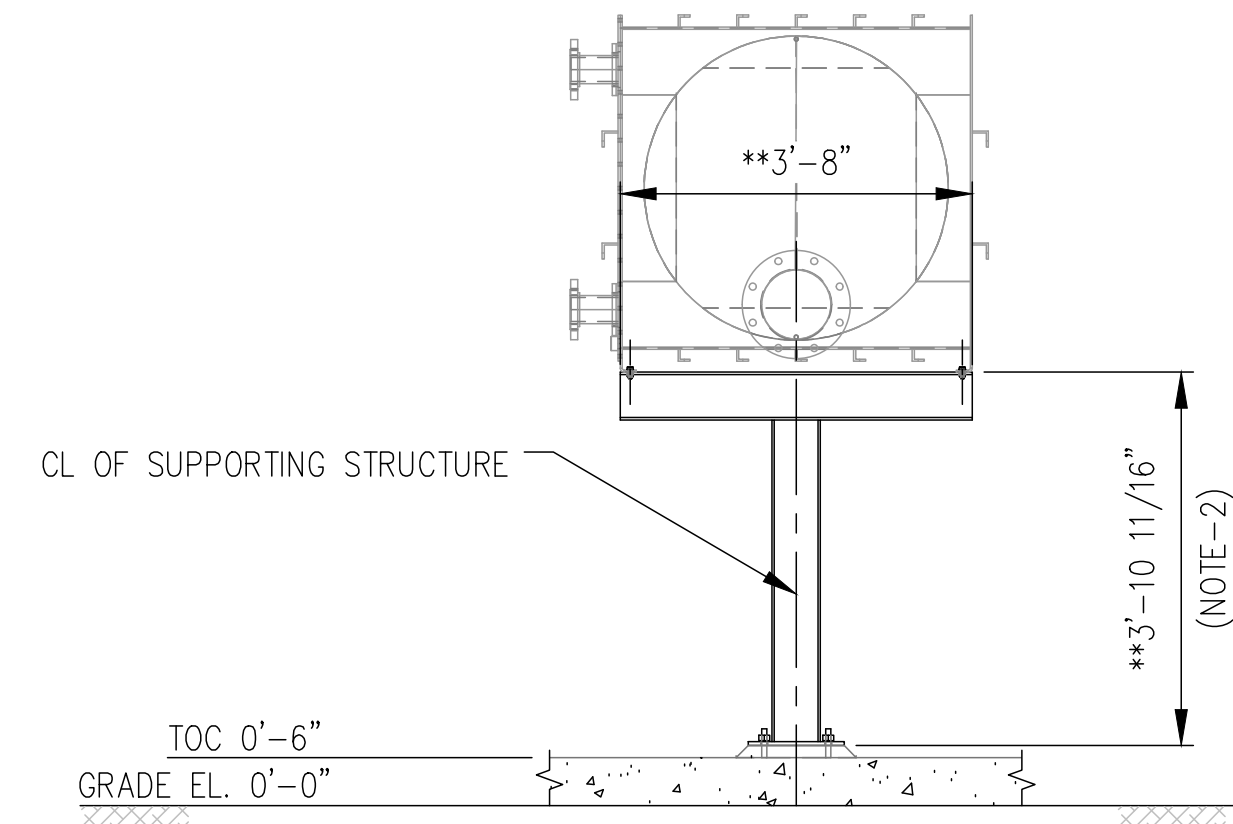
PLAN VIEW
SCALE - NTS



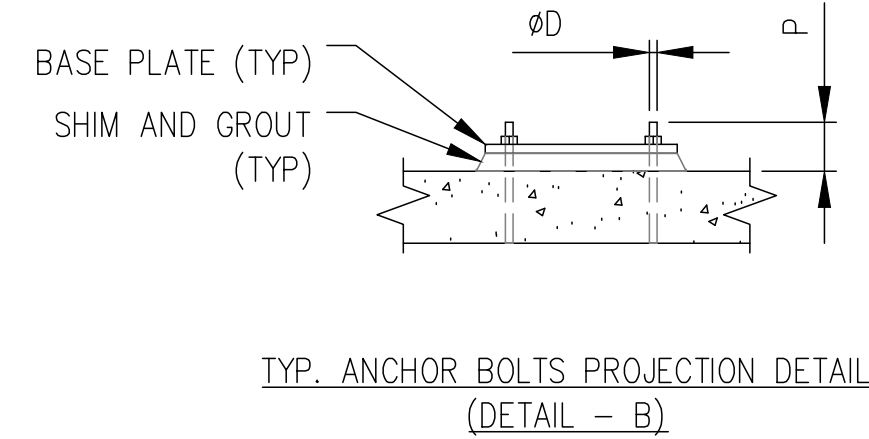
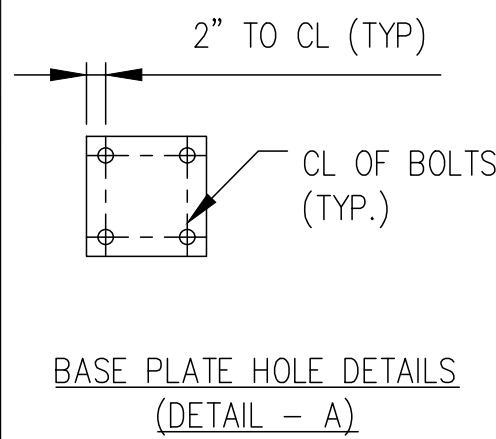
TYPICAL BOLT HOLE FIXING DETAIL
(VIEW LOOKING NORTH)
SCALE - NTS



ELEVATION VIEW
(VIEW LOOKING NORTH)
SCALE - NTS



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



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

NOTE:

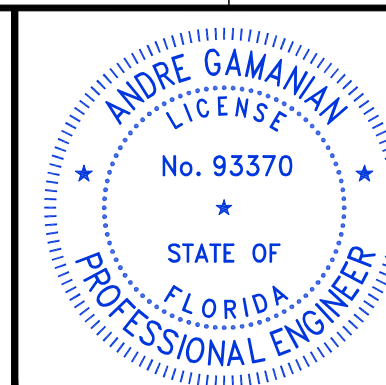
- FOR MPS INDEX & GENERAL NOTES REFER DRAWING S-445A.
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ISSUED FOR CONSTRUCTION

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	AK	TP	AG
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG

PROFESSIONAL ENGINEER

ANDRE GAMANIAN, P.E.
FL LICENCE NO. 93370
EXP. 02/28/2025



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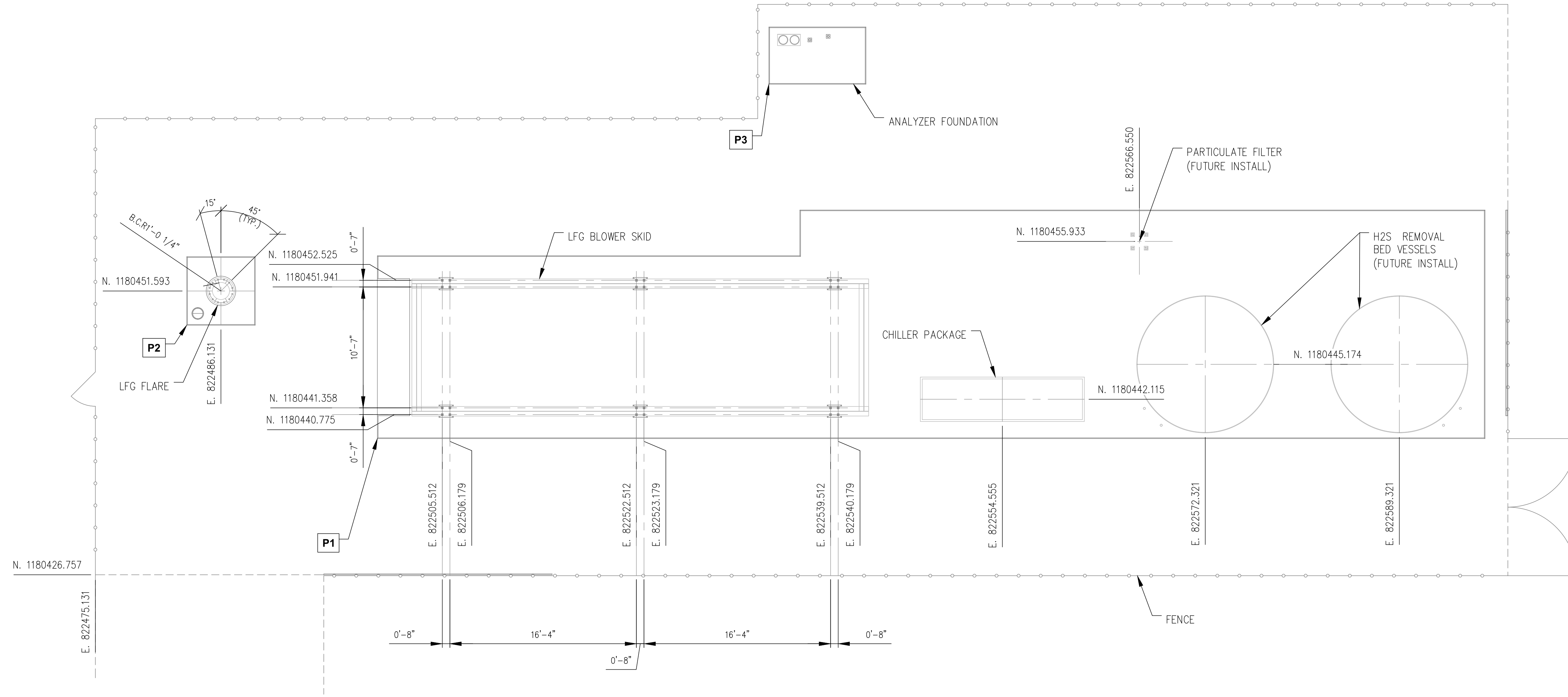
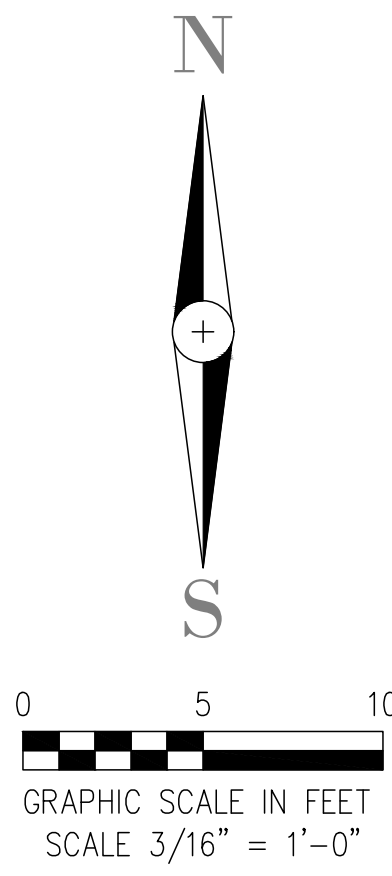
Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-07'00'

OWNER: 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) 726-3565 EMAIL: INFO@BIOGASENG.COM

MPS SECTIONS
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. **S-445E**

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GENERAL NOTES:

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

TABLE 1

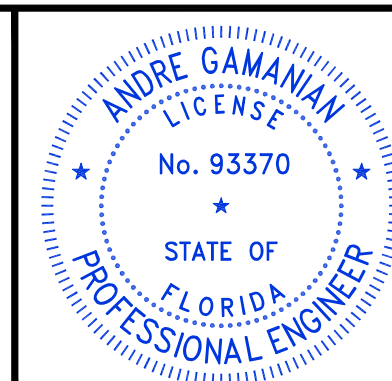
FOUNDATION CORNERS CO-ORDINATES		
TAG	NORTHING	EASTING
P1	1180438.674	822499.821
P2	1180448.593	822483.131
P3	1180469.695	822534.111

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1.0	02/03/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG
2.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG
3.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG

PROFESSIONAL ENGINEER

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FL LICENCE NO.93370
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1325 74th AVE SW, VERO BEACH, FLORIDA 32968

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

EQUIPMENT ANCHOR BOLT LOCATION PLAN

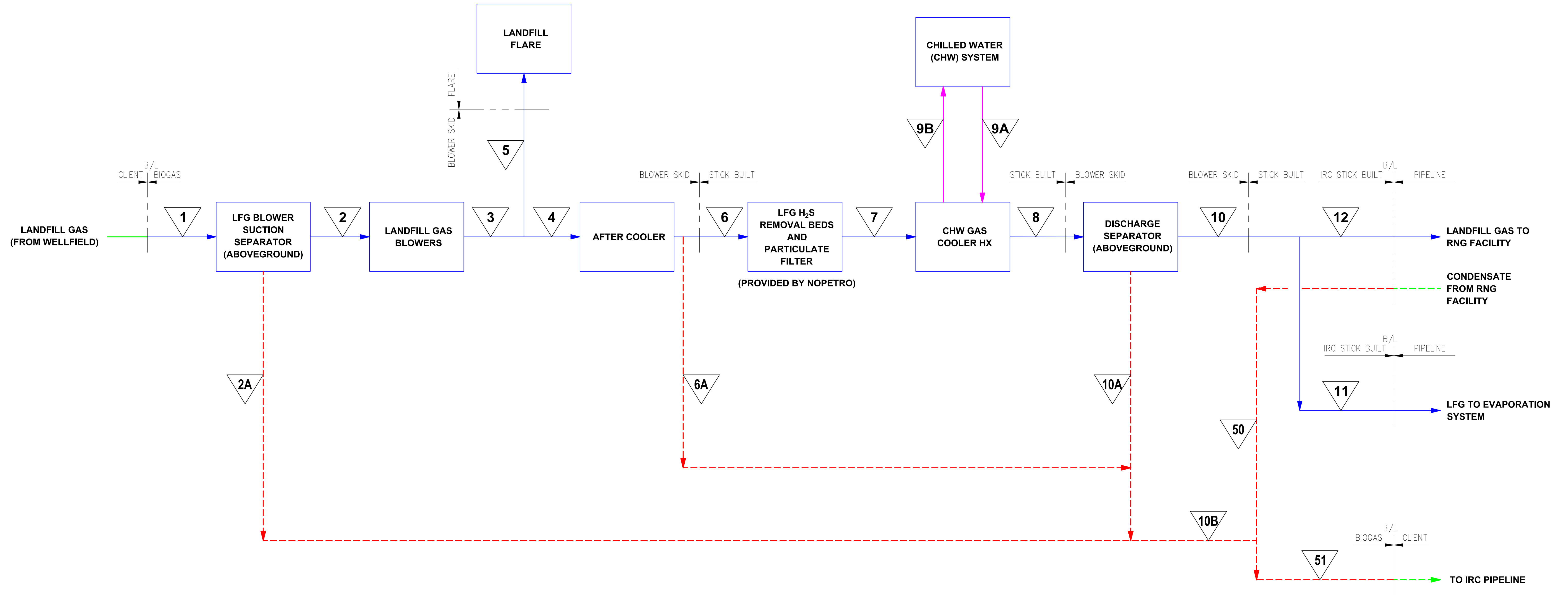
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **S-445F**

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LEGEND:

- BIOGAS ENG. DESIGN SCOPE
- CLIENT SCOPE
- CHILLED WATER LINES BGE SCOPE
- CONDENSATE BGE SCOPE



NOTE:

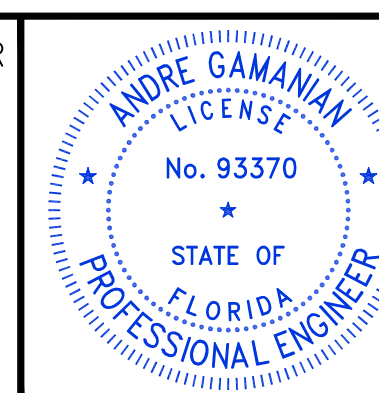
1. DELETED.
2. BLOWER SYSTEM VFD'S WILL BE ON SUCTION PRESSURE CONTROL TO LF DESIRED SET POINT. INITIAL SETTING = -60 IN. W.C.
3. BLOWER DISCHARGE PRESSURE CONTROLLED BY MODULATING VALVE TO FLARE, PV-0509 SET POINT ABOVE NORMAL PIPELINE PRESSURE. INITIAL SETTING = 8PSIG CONFIRM AT COMMISSIONING.
4. PRESSURE CONTROL VALVE ON FLARE INLET, PV-0509 , TO HAVE MINIMUM OPENING SETTING SUFFICIENT TO OPERATE FLARE. INITIAL SETTING, MIN. OPENING = 10% CONFIRM AT COMMISSIONING

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
3.0	08/05/2022	ISSUED FOR BID	AK	NST	AG
4.0	01/18/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG
5.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	AK	TP	AG
6.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG

PROFESSIONAL ENGINEER

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

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

BLOCK FLOW DIAGRAM	
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	DRAWING NO. P-445A

LFG BLOWERS SUCTION SEPARATOR (ABOVEGROUND)
V-200
 DESIGN PRESSURE : -3 TO +5 PSIG
 VESSEL (NON-ASME)
 MOC: SS
 SUPPLIED BY BGE
 TRIM LINE NO.: 0207
 SKID MOUNTED

LFG BLOWERS
BL-201A/B/C (FUTURE)
 RATED CAPACITY: 1,400 SCFM (EACH)
 SUCTION PRESS : -2.2 PSIG
 DISCHARGE PRESS: 8 PSIG
 RATED POWER : 125 HP
 POWER SUPPLY: 460V/3-PHASE/60 Hz
 SUPPLIED BY BGE
 SKID MOUNTED

H2S REMOVAL BED VESSELS
V-301A/B
 12 FT.DIA.x 16 FT.HEIGHT SEAM-SEAM
 MOC: FRP
 MEDIA LOAD: 63,000 LBS./EACH
 SUPPLIED BY NOPETRO

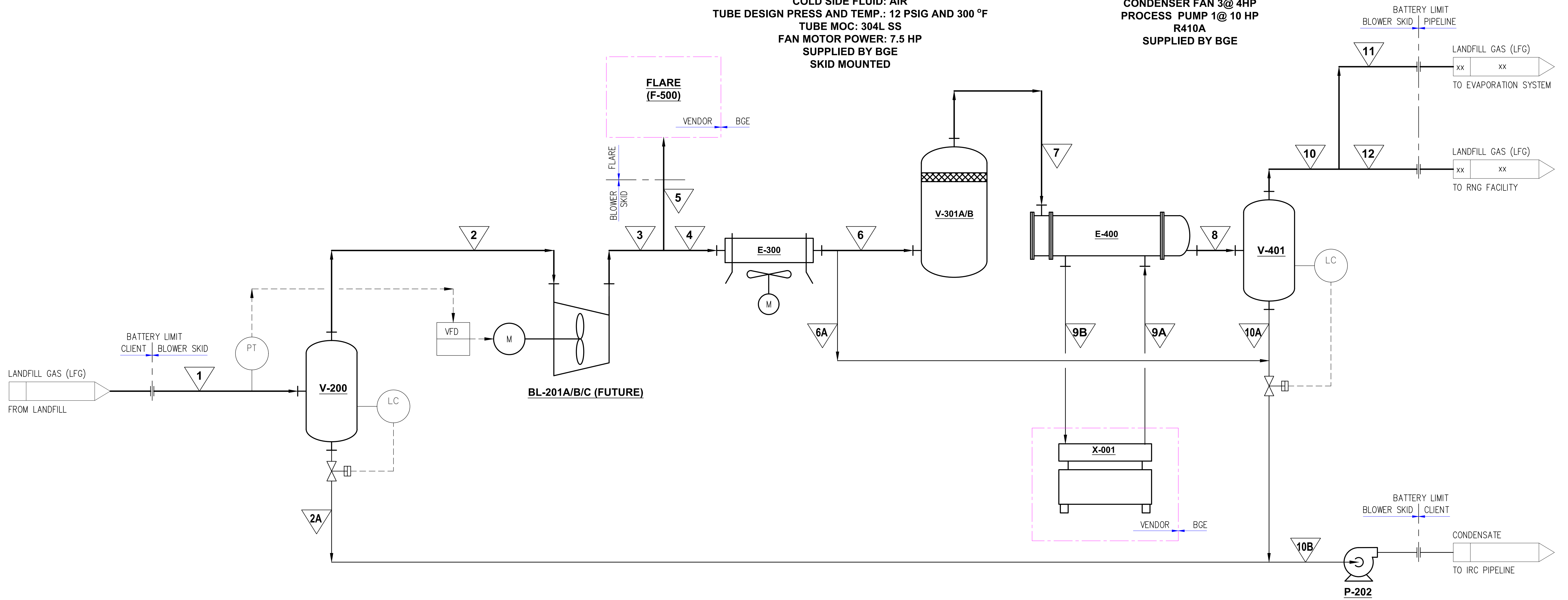
LOW PRESSURE COOLER
E-400
 CHW COOLED GAS COOLER
 MOC: 304SS
 DESIGN PRESSURE (TUBE SIDE): 100 PSIG
 DESIGN PRESSURE (SHELL SIDE): 14 PSIG
 SUPPLIED BY BGE

DISCHARGE SEPARATOR (ABOVEGROUND)
V-401
 DESIGN PRESSURE : +14 PSIG
 VESSEL (NON-ASME)
 MOC: 304L
 SUPPLIED BY BGE

LFG AFTER COOLER
E-300
 LFG FLOW RATE: 1,900 SCFM
 HOT SIDE INLET/ OUTLET TEMP: 265 °F/ 120 °F
 COLD SIDE FLUID: AIR
 TUBE DESIGN PRESS AND TEMP.: 12 PSIG AND 300 °F
 TUBE MOC: 304L SS
 FAN MOTOR POWER: 7.5 HP
 SUPPLIED BY BGE
 SKID MOUNTED

CHILLER PACKAGE
X-001
 THERMAL CHILLERS
 COMPRESSOR 2@ 30HP
 CONDENSER FAN 3@ 4HP
 PROCESS PUMP 1@ 10 HP
 R410A
 SUPPLIED BY BGE

CONDENSATE PUMP (ABOVEGROUND)
P-202
 POWER: (TBD)
 PRESSURE: (TBD)
 SUPPLIED BY BGE

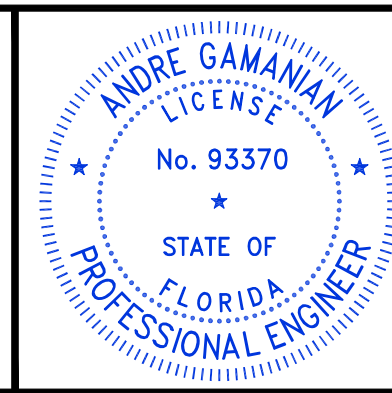


ISSUED FOR CONSTRUCTION

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REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
2.0	08/11/2022	ISSUED FOR BID	AK	NST	AG
3.0	01/18/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG
4.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	AK	TP	AG
5.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG

PROFESSIONAL ENGINEER
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 FL LICENCE NO. 93370
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 FLORIDA
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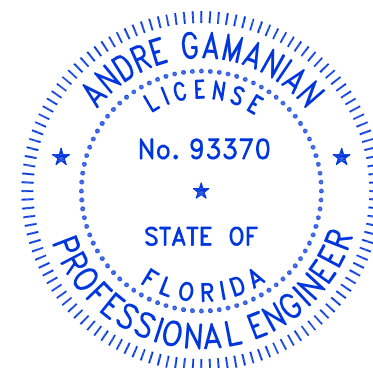
ENGINEER:
BIOGAS ENGINEERING
 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PROCESS FLOW DIAGRAM
 LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
 DRAWING NO. **P-445B**

C:\Users\MukeshThakur\Documents\Engineering\Projects\Ush2126.100 - Indian River County LF\Drawings\Process\445C (1 of 4).dwg 21-06-2023 MukeshThakur

<p>PIPE SYMBOLS</p> <p>PROCESS, MAIN PIPE</p> <p>SECONDARY PROCESS PIPE/UTILITY PIPE</p> <p>PIPE WITH HEAT TRACING</p> <p>CROSSING OF PIPE (BREAK VERTICAL)</p> <p>UNDERGROUND PIPE AG - ABOVEGROUND UG - UNDERGROUND</p> <p>SYMBOLS FOR MODIFICATION</p> <p>EXISTING PIPE</p> <p>FUTURE PIPE</p> <p>PIPE INDICATOR</p> <p>SLOPE 1:... INDICATOR, 'SLOPE'</p> <p>INDICATOR, 'FREE DRAINING'</p> <p>NO POCKETS INDICATOR, 'NO POCKETS'</p> <p>NOTE X INDICATOR, LINKED TO NOTE 1IN NOTES AREA</p> <p>INDICATOR, FLOW DIRECTION</p> <p>SPECIALITY ITEM, XX SEQUENCE NO.</p> <p>INDICATOR, TIE IN POINT YY - TIE-IN NUMBER</p> <p>PIPE MODIFIER</p> <p>HIGHER # LOWER #</p> <p>CHANGE IN PIPING CLASS / LINE NUMBER</p> <p>LINE NUMBER BREAK (BRANCH)</p> <p>LINE NUMBER BREAK (FLANGE)</p> <p>INSULATION BREAK</p> <p>MECH.ENG. INSTR.ENG.</p> <p>TUBING PIPING</p> <p>INSTRUMENT PIPING</p> <p>CHANGE IN RESPONSIBILITY</p>	<p>LINE SYMBOLS</p> <p>CONTRACTOR VENDOR</p> <p>BORDER OF PACKAGED UNIT</p> <p>END CLOSURE</p> <p>CAP</p> <p>PLUG</p> <p>BLIND FLANGE</p> <p>CAP THREADED</p> <p>DRAIN/TUNDISH</p> <p>END CONNECTIONS</p> <p>FLEXIBLE HOSE (FLANGED ENDS)</p> <p>CAMLOCK HOSE CONNECTION (FEMALE)</p> <p>CAMLOCK HOSE CONNECTION (MALE)</p> <p>QUICK DISCONNECT COUPLER SOCKET</p> <p>VALVE NUMBER</p> <p>HV-XXX NUMBER (NEXT 2 DIGITS). P&ID NO. (LAST 1 DIGITS)</p> <p>F: FLOW VALVE H: HAND OPERATED VALVE L: LEVEL VALVE P: PRESSURE VALVE</p> <p>PIPING CONNECTIONS</p> <p>REDUCER - CONCENTRIC</p> <p>REDUCER - ECCENTRIC</p> <p>FLANGE</p> <p>ORIFICE PLATE</p> <p>UNION</p> <p>SPADE CLOSED</p> <p>SPADE OPEN</p> <p>SPECTACLE BLIND CLOSED</p>	<p>PIPING CONNECTIONS CONT'D</p> <p>SPECTACLE BLIND OPEN</p> <p>REMOVABLE SPOOL</p> <p>BELLOWS/FLEXIBLE CONNECTION</p> <p>VALVES</p> <p>BALL VALVE</p> <p>GATE VALVE</p> <p>BUTTERFLY VALVE</p> <p>NEEDLE VALVE</p> <p>GLOBE VALVE</p> <p>RISING STEM GATE VALVE</p> <p>LIFT/SWING/WAFER CHECK VALVE</p> <p>STOP CHECK VALVE</p> <p>ANGLE BLOWDOWN VALVE</p> <p>PLUG VALVE</p> <p>PISTON VALVE</p> <p>NORMALLY CLOSE VALVE</p> <p>NORMALLY OPEN VALVE</p> <p>3 WAY BALL VALVE</p> <p>4 WAY VALVE</p> <p>FLOAT VALVE</p>	<p>VALVES CONT'D</p> <p>ANGLE VALVE</p> <p>BLOCK/BLEED GAUGE VALVE TWO WAY MANIFOLD VALVE</p> <p>LOCKED OPEN</p> <p>LOCKED CLOSED</p> <p>PRESSURE RELIEF OR SAFETY VALVE</p> <p>VACUUM RELIEF VALVE GENERAL SYMBOL, VALVE ACTION (TYP)</p> <p>BREATHER VALVE</p> <p>CAR SEAL OPEN</p> <p>CAR SEAL CLOSE</p> <p>HAND VALVE</p> <p>ACTUATOR (SHOWN WITH VALVE, FOR CLARITY)</p> <p>PNEUMATIC ACTUATED VALVE (BASIS SYMBOL)</p> <p>PNEUMATIC ACTUATED VALVE WITH HANDWHEEL</p> <p>MOTOR OPERATED VALVE</p> <p>BACK PRESSURE REGULATOR (SELF ACTING,INTERNAL SENSING)</p> <p>BACK PRESSURE REGULATOR (SELF ACTING,EXTERNAL SENSING)</p> <p>PRESSURE REDUCING REGULATOR (SELF ACTING,INTERNAL SENSING)</p>	<p>ACTUATOR (SHOWN WITH VALVE, FOR CLARITY) CONT'D</p> <p>PRESSURE REDUCING REGULATOR (SELF ACTING,EXTERNAL SENSING)</p> <p>DIFFERENTIAL PRESSURE REGULATOR (SELF ACTING,INTERNAL SENSING)</p> <p>DIFFERENTIAL PRESSURE REGULATOR (SELF ACTING,EXTERNAL SENSING)</p> <p>TEMPERATURE REGULATOR IN MIXING SERVICE (SELF ACTING)</p> <p>SOLENOID VALVE</p> <p>GENERIC ACTUATOR SPRING DIAPHRAGM</p> <p>SAFETY RELIEF ACTUATOR</p> <p>ON OFF VALVE</p> <p>SPRING CLOSING DRAIN VALVE</p> <p>STEAM TRAPS</p> <p>STEAM TRAP (THERMOSTATIC)</p> <p>STEAM TRAP WITH BUILT-IN STRAINER (THERMOSTATIC OR THERMODYNAMIC)</p> <p>MOISTURE TRAP</p> <p>FILTERS & STRAINERS</p> <p>Y TYPE STRAINER FLANGED</p> <p>DUPLEX TYPE STAINER</p> <p>BASKET STRAINER</p> <p>AIR FILTER REGULATOR</p> <p>SUMP</p>
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ISSUED FOR CONSTRUCTION

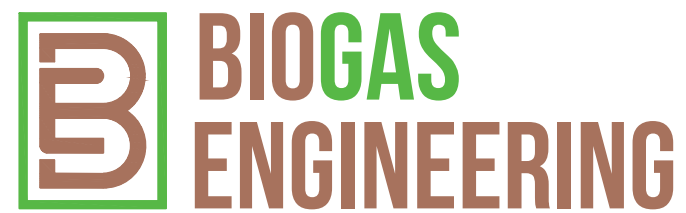
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3.0	08/05/2022	ISSUED FOR BID	AK	NST	AG	 <p>ANDRE GAMALIAN, P.E. FL LICENCE NO.93370 EXP. 02/28/2025</p>
4.0	01/18/2023	ISSUED FOR CONSTRUCTION	AK	NST	AG	
5.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	AK	NST	AG	
6.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

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

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

OWNER: 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

LEGEND SHEET
(SHEET 1 OF 4)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **P-445C**

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FILTERS & STRAINERS CONT'D		FLOW METER		PUMPS, COMPRESSORS, BLOWERS & FANS		EQUIPMENT CONT'D		EQUIPMENT CONT'D	
	'T' TYPE STRAINER		ROTAMETER		P&ID		PFD		BLOWER OR FAN
	INVERTED CARTRIDGE FILTER		VORTEX						AIR COMPRESSOR
	FILTER		CORIOLIS						UG SUMP WITH PUMP
	OIL WATER SEPARATOR		ULTRASONIC						COOLER
	AIR DRYER		MAGNETIC						COOLER & HEATER
IN LINE EQUIPMENT			POSITIVE DISPLACEMENT						AIR-BLOWN COOLER
	FLAME ARRESTOR		V-CONE						INDUCED FLOW AIR COOLER
	END OF LINE FLAME ARRESTOR		FLOW NOZZLE						HEATER
	VIEW GLASS/SLIGHT GLASS		VENTURI METER						PRESSURE VESSELS
	DIAPHRAGM/CHEMICAL SEAL		ORIFICE METER						CYLINDRICAL VESSEL WITH DISHED ENDS (HORIZONTAL OR VERTICAL)
	END OF LINE SILENCER		THERMAL FLOW METER						TANK
	FLOW CONDITIONER	EQUIPMENT							COMPRESSED GAS CYLINDER W/REGULATOR
	VENT	HEAT TRANSFER			SHELL AND TUBE EXCHANGER		REBOILER - U TUBE		PLATE EXCHANGER
	PULSATION DAMPER		AIR COOLED HEAT EXCHANGER						
	VESSEL INSULATION								
	BURSTING DISK								
	INLINE SILENCER								
	SUCTION SCREEN								
	VENT (FLANGED END)								
	DRAIN (FLANGED END)								
	EMERGENCY VENT								

PACKING COLUMN
ALL BEDS ARE SHOWN.
MINIMUM OF INTERNAL DETAIL.

TRAY COLUMN
FIRST AND LAST TRAYS ARE ALWAYS SHOWN TOGETHER OR WITH ANY OTHER TRAYS OF SIGNIFICANCE. THEY ARE NUMBERED FROM THE TOP. TRAY TYPES NOT DISTINGUISHED. MINIMUM OF INTERNAL DETAILS SHOWN.

ONLY IMPORTANT INTERNALS ARE SHOWN.

VERTICAL VESSEL
a) DEMISTER
b) VORTEX BREAKER

HORIZONTAL VESSEL
a) DEMISTER
b) VORTEX BREAKER

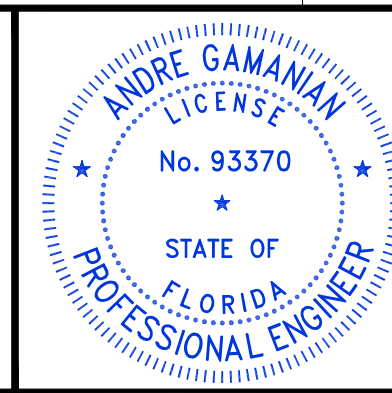
TANKS

TANK

ISSUED FOR CONSTRUCTION

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

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

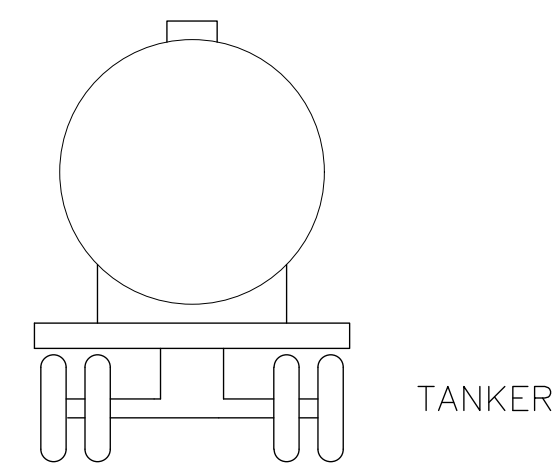

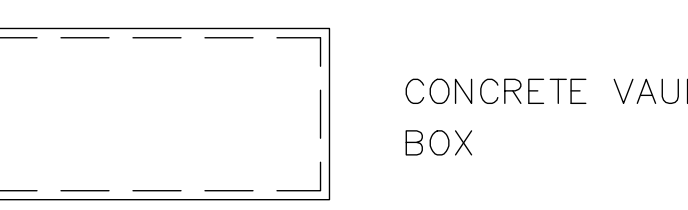
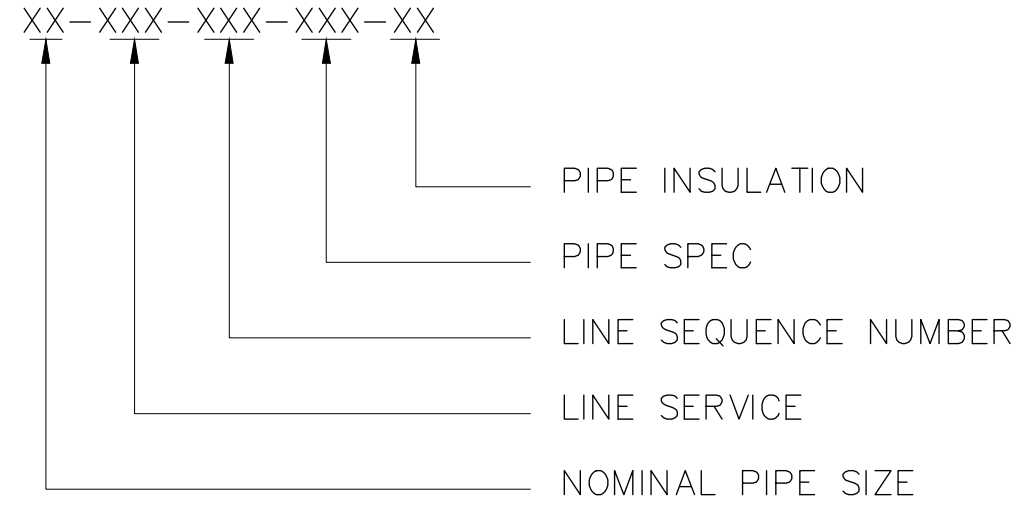
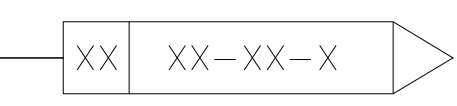
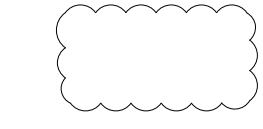

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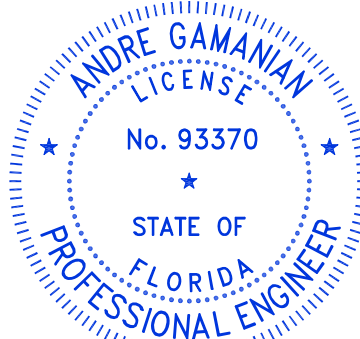
LEGEND SHEET
(SHEET 2 OF 4)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

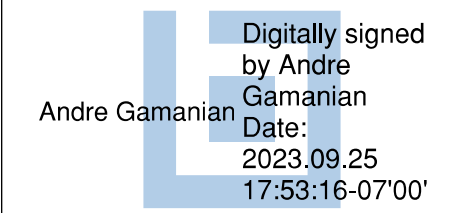
DRAWING NO. **P-445D**

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EQUIPMENT CONT'D	EQUIPMENT TYPE TABLE CONT'D	LINE NUMBERING	PIPING SPEC	GENERAL DRAFTING NOTES																																																																																																																																																																																																																																																																																																																																																																																																																																																
 TANKER  EYE WASH & SAFETY SHOWER  CONCRETE VAULT BOX	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>SYMBOL</th> <th>EQUIPMENT TYPE</th> </tr> </thead> <tbody> <tr><td>FDR</td><td>FEEDER</td></tr> <tr><td>FLA</td><td>FLAME ARRESTOR</td></tr> <tr><td>FS</td><td>FLARE STACK</td></tr> <tr><td>FU</td><td>FURNACE</td></tr> <tr><td>GEN</td><td>GENERATOR</td></tr> <tr><td>GX</td><td>GEARBOX</td></tr> <tr><td>HC</td><td>HEATING COIL</td></tr> <tr><td>HE</td><td>HEAT EXCHANGER</td></tr> <tr><td>HT</td><td>HEATER</td></tr> <tr><td>INJ</td><td>INJECTOR</td></tr> <tr><td>ME</td><td>MISCELLANEOUS EQUIPMENT</td></tr> <tr><td>MGF</td><td>MULTI GRADE FILTER</td></tr> <tr><td>MIX</td><td>MIXER</td></tr> <tr><td>MOV</td><td>MOTORIZED OPERATED VALVE</td></tr> <tr><td>P</td><td>PUMP</td></tr> <tr><td>PC</td><td>PROCESS COLUMN</td></tr> <tr><td>PDC</td><td>POWER DISTRIBUTION CENTER</td></tr> <tr><td>PM</td><td>PUMP MOTOR</td></tr> <tr><td>R</td><td>REACTOR</td></tr> <tr><td>REC</td><td>RECIEVER TANK</td></tr> <tr><td>RO</td><td>REVERSE OSMOSIS UNIT</td></tr> <tr><td>SAM</td><td>SAMPLER</td></tr> <tr><td>SC</td><td>SCRUBBER</td></tr> <tr><td>SEP</td><td>SEPARATOR</td></tr> <tr><td>SLN</td><td>SILENCER</td></tr> <tr><td>SOF</td><td>SOFTENER</td></tr> <tr><td>SI</td><td>SPECIAL ITEM</td></tr> <tr><td>SPM</td><td>SUMP</td></tr> <tr><td>SS</td><td>SAFETY SHOWER</td></tr> <tr><td>ST</td><td>STEAM TURBINE</td></tr> <tr><td>T</td><td>TURBINE</td></tr> <tr><td>TK</td><td>STORAGE TANK</td></tr> <tr><td>V</td><td>VESSEL</td></tr> <tr><td>VS</td><td>VENT STACK</td></tr> <tr><td>UF</td><td>ULTRA FILTER</td></tr> <tr><td>UV</td><td>ULTRA VIOLET EQUIPMENT</td></tr> <tr><td>VU</td><td>VENTILATING UNIT</td></tr> <tr><td>W</td><td>WEIGH SCALE</td></tr> </tbody> </table>	SYMBOL	EQUIPMENT TYPE	FDR	FEEDER	FLA	FLAME ARRESTOR	FS	FLARE STACK	FU	FURNACE	GEN	GENERATOR	GX	GEARBOX	HC	HEATING COIL	HE	HEAT EXCHANGER	HT	HEATER	INJ	INJECTOR	ME	MISCELLANEOUS EQUIPMENT	MGF	MULTI GRADE FILTER	MIX	MIXER	MOV	MOTORIZED OPERATED VALVE	P	PUMP	PC	PROCESS COLUMN	PDC	POWER DISTRIBUTION CENTER	PM	PUMP MOTOR	R	REACTOR	REC	RECIEVER TANK	RO	REVERSE OSMOSIS UNIT	SAM	SAMPLER	SC	SCRUBBER	SEP	SEPARATOR	SLN	SILENCER	SOF	SOFTENER	SI	SPECIAL ITEM	SPM	SUMP	SS	SAFETY SHOWER	ST	STEAM TURBINE	T	TURBINE	TK	STORAGE TANK	V	VESSEL	VS	VENT STACK	UF	ULTRA FILTER	UV	ULTRA VIOLET EQUIPMENT	VU	VENTILATING UNIT	W	WEIGH SCALE	<p>XX-XXX-XXX-XXX-XX</p>  <p>Example: 6"-LG-001-CS1-H</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">LINE SERVICES</th> </tr> <tr> <th>SYMBOL</th> <th>SERVICES</th> </tr> </thead> <tbody> <tr><td>AV</td><td>ATMOSPHERIC VENT</td></tr> <tr><td>BD</td><td>BLOWDOWN</td></tr> <tr><td>BG</td><td>BIOGAS</td></tr> <tr><td>CA</td><td>COMPRESSED AIR</td></tr> <tr><td>CB</td><td>CONTINUOUS BLOWDOWN</td></tr> <tr><td>C</td><td>CONDENSATE</td></tr> <tr><td>CF</td><td>CHEMICAL FEED</td></tr> <tr><td>CHWS</td><td>CHILLED WATER SUPPLY</td></tr> <tr><td>CHWR</td><td>CHILLED WATER RETURN</td></tr> <tr><td>CH</td><td>CHEMICAL</td></tr> <tr><td>CWS</td><td>COOLING WATER SUPPLY</td></tr> <tr><td>CWR</td><td>COOLING WATER RETURN</td></tr> <tr><td>DG</td><td>DIGESTER GAS</td></tr> <tr><td>EW</td><td>EFFLUENT WATER</td></tr> <tr><td>FA</td><td>FRESH AIR</td></tr> <tr><td>FG</td><td>FUEL GAS</td></tr> <tr><td>NG</td><td>NATURAL GAS</td></tr> <tr><td>LS</td><td>LOW PRESSURE STEAM</td></tr> <tr><td>IA</td><td>INSTRUMENT AIR</td></tr> <tr><td>IB</td><td>INTERMITTENT BLOWDOWN</td></tr> <tr><td>IW</td><td>INDUSTRIAL WATER</td></tr> <tr><td>LO</td><td>LUBE OIL</td></tr> <tr><td>LG</td><td>LANDFILL GAS</td></tr> <tr><td>NI</td><td>NITROGEN GAS</td></tr> <tr><td>PW</td><td>PORTABLE WATER</td></tr> <tr><td>PG</td><td>PRODUCT GAS</td></tr> <tr><td>RF</td><td>REFRIGERANT</td></tr> <tr><td>T</td><td>TRIM</td></tr> <tr><td>WG</td><td>WASTE GAS</td></tr> <tr><td>WU</td><td>UTILITY WATER</td></tr> <tr><td>WW</td><td>WASTE WATER</td></tr> </tbody> </table> <p>NOTES AND NOMENCLATURE</p> <table border="1" style="width:100%; 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border-collapse: collapse;"> <tbody> <tr><td>H</td><td>INSULATED FOR HEAT CONSERVATION</td></tr> <tr><td>C</td><td>INSULATED FOR COLD CONSERVATION</td></tr> <tr><td>P</td><td>INSULATED FOR PERSONAL PROTECTION</td></tr> <tr><td>F</td><td>INSULATED FOR FIRE PROOFING</td></tr> <tr><td>A</td><td>INSULATED FOR ACOUSTIC REDUCTION</td></tr> <tr><td>N</td><td>NONE</td></tr> <tr><td>SJ</td><td>STEAM JACKETED</td></tr> <tr><td>HT</td><td>ELECTRIC TRACE</td></tr> <tr><td>ST</td><td>STEAM TRACE</td></tr> </tbody> </table> <p>NOTE: USE OF TRACING ABBREVIATION IN THE LINE NUMBER IMPLIES INSULATION FOR HEAT CONSERVATION. (i.e: HT INDICATES ELECTRIC TRACED INSULATION FOR HEAT CONSERVATION)</p> <p>MISCELLANEOUS ABBREVIATIONS</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tbody> <tr><td>DP</td><td>DIFFERENTIAL PRESSURE</td><td>FLT</td><td>FILTER</td></tr> <tr><td>A</td><td>ACTUATOR</td><td>FV</td><td>FLOW VALVE</td></tr> <tr><td>AC</td><td>AIR TO GAS COOLER</td><td>FX</td><td>FLEXIBLE HOSE</td></tr> <tr><td>AFR</td><td>AIR FILTER/REGULATOR</td><td>GO</td><td>GEAR OPERATED</td></tr> <tr><td>AG</td><td>ABOVE GROUND</td><td>HPV</td><td>HIGH POINT VENT</td></tr> <tr><td>AR</td><td>AIR REGULATOR</td><td>SD</td><td>SHUTDOWN</td></tr> <tr><td>ASL</td><td>ATMOSPHERIC SAFE LOCATION</td><td>HRU</td><td>HEAT RECOVERY UNIT</td></tr> <tr><td>ATM</td><td>ATMOSPHERE</td><td>HT</td><td>HIGH TEMPERATURE</td></tr> <tr><td>AV</td><td>AUTOMATIC AIR VENT</td><td>HV</td><td>HAND VALVE</td></tr> <tr><td>BE</td><td>COMBUSTION SENSOR</td><td>IAS</td><td>INSTRUMENT AIR SUPPLY</td></tr> <tr><td>BD</td><td>BLOWDOWN</td><td>kW</td><td>KILOWATT</td></tr> <tr><td>BF</td><td>BLIND FLANGE</td><td>ME</td><td>MECHANICAL EQUIPMENT</td></tr> <tr><td>BG</td><td>BELOW GROUND</td><td>MW</td><td>MANWAY</td></tr> <tr><td>CD</td><td>CHEMICAL DRAIN</td><td>NTS</td><td>NOT TO SCALE</td></tr> <tr><td>CA</td><td>CORROSION ALLOWANCE</td><td>LPD</td><td>LOW POINT DRAIN</td></tr> <tr><td>SW</td><td>STORM WATER DRAIN</td><td>RA</td><td>RADIATION</td></tr> <tr><td>SC</td><td>SAMPLE CONNECT/ON</td><td>SG</td><td>SPECIFIC GRAVITY</td></tr> <tr><td>CO</td><td>CHAIN OPERATED</td><td></td><td></td></tr> <tr><td>CV</td><td>CRANKCASE VENT</td><td></td><td></td></tr> <tr><td>DE</td><td>DIELECTRIC</td><td></td><td></td></tr> <tr><td>DR</td><td>DESIGN RATIO</td><td></td><td></td></tr> <tr><td>EJ</td><td>EXPANSION JOINT</td><td></td><td></td></tr> <tr><td>F/F</td><td>FACE TO FACE</td><td></td><td></td></tr> <tr><td>(F)</td><td>VENDOR FINISHED AND PIPED</td><td></td><td></td></tr> <tr><td>(UP)</td><td></td><td></td><td></td></tr> <tr><td>FCv</td><td>FLOW CONTROL VALVE</td><td></td><td></td></tr> </tbody> </table>	CS	X		1		150# RATING	3		300# RATING	6		600# RATING	7		TUBING	9		900# RATING	AB		ACRYLONITRILE BUTADIENE STYRENE (ABS)	AH		FLEXIBLE AIR HOSE	CP		CHLORINATED POLYVINYL CHLORIDE (CPVC)	CS		CARBON STEEL	CU		COPPER	FG		FIBER GLASS	GS		GALVANIZED STEEL	HD		HIGH DENSITY POLYETHYLENE (HDPE)	PV		POLYVINYL CHLORIDE (PVC)	SS		STAINLESS STEEL	H		HOSE	DC		DOUBLE CONTAINMENT HDPE PIPE	SL		LOW PRESSURE STAINLESS STEEL	ST		SS316 STAINLESS STEEL	H	INSULATED FOR HEAT CONSERVATION	C	INSULATED FOR COLD CONSERVATION	P	INSULATED FOR PERSONAL PROTECTION	F	INSULATED FOR FIRE PROOFING	A	INSULATED FOR ACOUSTIC REDUCTION	N	NONE	SJ	STEAM JACKETED	HT	ELECTRIC TRACE	ST	STEAM TRACE	DP	DIFFERENTIAL PRESSURE	FLT	FILTER	A	ACTUATOR	FV	FLOW VALVE	AC	AIR TO GAS COOLER	FX	FLEXIBLE HOSE	AFR	AIR FILTER/REGULATOR	GO	GEAR OPERATED	AG	ABOVE GROUND	HPV	HIGH POINT VENT	AR	AIR REGULATOR	SD	SHUTDOWN	ASL	ATMOSPHERIC SAFE LOCATION	HRU	HEAT RECOVERY UNIT	ATM	ATMOSPHERE	HT	HIGH TEMPERATURE	AV	AUTOMATIC AIR VENT	HV	HAND VALVE	BE	COMBUSTION SENSOR	IAS	INSTRUMENT AIR SUPPLY	BD	BLOWDOWN	kW	KILOWATT	BF	BLIND FLANGE	ME	MECHANICAL EQUIPMENT	BG	BELOW GROUND	MW	MANWAY	CD	CHEMICAL DRAIN	NTS	NOT TO SCALE	CA	CORROSION ALLOWANCE	LPD	LOW POINT DRAIN	SW	STORM WATER DRAIN	RA	RADIATION	SC	SAMPLE CONNECT/ON	SG	SPECIFIC GRAVITY	CO	CHAIN OPERATED			CV	CRANKCASE VENT			DE	DIELECTRIC			DR	DESIGN RATIO			EJ	EXPANSION JOINT			F/F	FACE TO FACE			(F)	VENDOR FINISHED AND PIPED			(UP)				FCv	FLOW CONTROL VALVE			<p>1. CONTINUATION FLAGS</p> <p>PROCESS/UTILITY </p> <p>2. ALL PROCESS CONTINUATION FLAGS TO BE TAKEN TO EDGE OF SHEET. FLAGS TO ENTER ON THE LEFT AND LEAVE ON THE RIGHT.</p> <p>3. ALL UTILITY FLAGS TO BE LOCAL TO ITEMS SERVED AND NOT TAKEN TO THE EDGE OF SHEET UNLESS ON A UTILITY</p> <p>4. HOLD BUBBLE REPRESENTS AN ITEM AWAITING FURTHER INFORMATION.</p> <p>5. LINE NUMBER CAN GO UPTO THREE DIGITS STARTING FROM 001.</p> <p> REV CLOUD (ARC SIZE 4 mm)</p> <p> REVISION MARK</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">PIPING ABBREVIATIONS</th> </tr> <tr> <th>LETTER CODE</th> <th>INTERPRETATION</th> </tr> </thead> <tbody> <tr><td>CSO</td><td>CAR SEAL OPEN</td></tr> <tr><td>CSC</td><td>CAR SEAL CLOSE</td></tr> <tr><td>CO</td><td>CHAIN OPERATED</td></tr> <tr><td>D</td><td>DRAIN</td></tr> <tr><td>DBB</td><td>DOUBLE BLOCK & BLEED</td></tr> <tr><td>FC</td><td>FAIL CLOSE</td></tr> <tr><td>FL</td><td>FAIL LAST</td></tr> <tr><td>FO</td><td>FAIL OPEN</td></tr> <tr><td>FP</td><td>FULL PORT</td></tr> <tr><td>FSD</td><td>FLAT SIDE DOWN</td></tr> <tr><td>FST</td><td>FLAT SIDE TOP</td></tr> <tr><td>HC</td><td>HOSE CONNECTION</td></tr> <tr><td>HH</td><td>HAND HOLE</td></tr> <tr><td>HV</td><td>MANUAL OPERATED(HANDLE VALVE)</td></tr> <tr><td>LC</td><td>LOCKED CLOSED</td></tr> <tr><td>LO</td><td>LOCKED OPEN</td></tr> <tr><td>MH</td><td>MAN HOLE</td></tr> <tr><td>NC</td><td>NORMALLY CLOSED</td></tr> <tr><td>NO</td><td>NORMALLY OPEN</td></tr> <tr><td>RP</td><td>REDUCE PORT</td></tr> <tr><td>RO</td><td>RESTRICTION ORIFICE</td></tr> <tr><td>RS</td><td>REMOVABLE SPOOL</td></tr> <tr><td>RV</td><td>RELIEF VALVE</td></tr> <tr><td>SC</td><td>SAMPLE COLLECTION</td></tr> <tr><td>SGLA</td><td>SLIGHT GLASS</td></tr> <tr><td>SP</td><td>SAMPLE PORT</td></tr> <tr><td>STA</td><td>STEAM TRAP ASSEMBLY</td></tr> <tr><td>SW</td><td>SOCKET WELD</td></tr> <tr><td>TL</td><td>TANGENT LINE</td></tr> <tr><td>UC</td><td>UTILITY CONNECTION</td></tr> <tr><td>V</td><td>VENT</td></tr> <tr><td>XV</td><td>ACTUATED VALVE</td></tr> </tbody> </table> <p style="text-align: center; border: 1px solid black; padding: 5px;">ISSUED FOR CONSTRUCTION</p>	PIPING ABBREVIATIONS		LETTER CODE	INTERPRETATION	CSO	CAR SEAL OPEN	CSC	CAR SEAL CLOSE	CO	CHAIN OPERATED	D	DRAIN	DBB	DOUBLE BLOCK & BLEED	FC	FAIL CLOSE	FL	FAIL LAST	FO	FAIL OPEN	FP	FULL PORT	FSD	FLAT SIDE DOWN	FST	FLAT SIDE TOP	HC	HOSE CONNECTION	HH	HAND HOLE	HV	MANUAL OPERATED(HANDLE VALVE)	LC	LOCKED CLOSED	LO	LOCKED OPEN	MH	MAN HOLE	NC	NORMALLY CLOSED	NO	NORMALLY OPEN	RP	REDUCE PORT	RO	RESTRICTION ORIFICE	RS	REMOVABLE SPOOL	RV	RELIEF VALVE	SC	SAMPLE COLLECTION	SGLA	SLIGHT GLASS	SP	SAMPLE PORT	STA	STEAM TRAP ASSEMBLY	SW	SOCKET WELD	TL	TANGENT LINE	UC	UTILITY CONNECTION	V	VENT	XV	ACTUATED VALVE
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REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
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4.0	01/18/2023	ISSUED FOR CONSTRUCTION	AK	NST	AG	
5.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	AK	NST	AG	
6.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

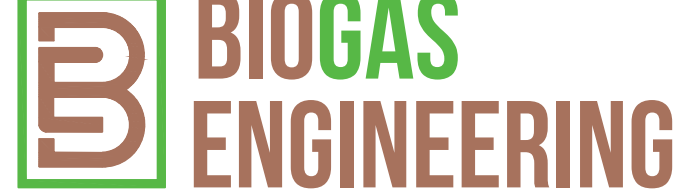
This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.



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

OWNER:  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) 726-3565
EMAIL: INFO@BIOGASENG.COM

LEGEND SHEET
(SHEET 3 OF 4)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **P-445E**

C:\Users\MukeshThakur\Documents\Engineering\Biosaseng - Documents\Engineering\Projects\Ush2126.100 - Indian River County LF\Drawings\Process\445f (4 of 4).dwg 21-06-2023 MukeshThakur

ELECTRICS BASIC SYMBOLS		INSTRUMENT SYMBOLS CONT'D		INSTRUMENT SYMBOLS CONT'D		INSTRUMENT, FUNCTION AND LOGICAL SYMBOLS			
-----	ELECTRICAL "LINK"	TEMPERATURE GAUGE WITH THERMOWELL		LEVEL TRANSMITTER HYDROSTATIC DIRECT VESSEL MOUNTED WITH DIAPHRAGM			PRIMARY LOCATION *NORMALLY ACCESSIBLE TO OPERATOR	FIELD MOUNTED	AUXILIARY LOCATION *NORMALLY ACCESSIBLE TO OPERATOR
	ELECTRIC MOTOR								
	VARIABLE SPEED DRIVE	TEMPERATURE GAUGE SURFACE MOUNTED		PRESSURE GAUGE OR TRANSMITTER /SURFACE MOUNTED		DISCRETE INSTRUMENTS			
ITEMS CONNECTED TO MOTOR CONTROL CENTER (MCC) BUT LOCATED IN INSTRUMENT CONTROL PANEL OR CONSOLE.			LEVEL TRANSMITTER /GAUGE EQUIPMENT MOUNTED				CONTROL ABBREVIATIONS	<p>AA ANALYSIS ALARM</p> <p>AE ANALYSIS SENSOR (METHANE)</p> <p>BA COMBUSTION ALARM (FIRE)</p> <p>DPI DIFFERENTIAL PRESSURE INDICATOR</p> <p>DPG DIFFERENTIAL PRESSURE GAUGE</p> <p>EI VOLTAGE INDICATOR</p> <p>ESD EMERGENCY SHUT DOWN DEVICE</p> <p>EPO EMERGENCY POWER OFF</p> <p>FI FLOW INDICATION</p> <p>FAL FLOW ALARM LOW</p> <p>FALL FLOW ALARM LOW LOW</p> <p>FAH FLOW ALARM HIGH</p> <p>FAHH FLOW ALARM HIGH HIGH</p> <p>FE FLOW ELEMENT</p> <p>FIT FLOW INDICATE TRANSMITTER</p> <p>FQI FLOW QUANTITY INDICATION (MMSCF)</p> <p>HS HAND SWITCH</p> <p>HSI HAND SWITCH INDICATION</p> <p>HOA HAND OF AUTO (ELECTRICAL SWITCH)</p> <p>HMI HUMAN MACHINE INTERFACE</p> <p>II CURRENT INDICATOR</p> <p>JI POWER INDICATION</p> <p>KQI TIME RUNNING INDICATION</p> <p>LAL LEVEL ALARM LOW</p> <p>LALL LEVEL ALARM LOW LOW</p> <p>LAH LEVEL ALARM HIGH</p> <p>LAHH LEVEL ALARM HIGH HIGH</p> <p>LSHH LEVEL SWITCH HIGH HIGH</p> <p>LSH LEVEL SWITCH HIGH</p> <p>LSL LEVEL SWITCH LOW</p> <p>LSLL LEVEL SWITCH LOW LOW</p> <p>LT LEVEL TRANSMITTER</p> <p>MCC MOTOR CONTROL CENTER</p> <p>MT MOISTURE TRANSMITTER</p> <p>NSR NETWORK SERVER RACK</p> <p>OWS OPERATOR WORK STATION</p> <p>PA PRESSURE ALARM</p> <p>PAH PRESSURE ALARM HIGH</p> <p>PAHH PRESSURE ALARM HIGH HIGH</p>	SHARED DISPLAY SHARED CONTROL
	MOTOR RUNNING LIGHT WITH RUNNING STOP (OPTIONAL) INDICATION ON MAIN PANEL	LEVEL GAUGE DP DIRECT VESSEL MOUNTED			CONTROL ABBREVIATIONS CONT'D	<p>PALL PRESSURE ALARM LOW LOW</p> <p>PAL PRESSURE ALARM LOW</p> <p>PB PRESSURE BUTTON</p> <p>PC PRESS CONTROL</p> <p>PCV PRESSURE CONTROL VALVE</p> <p>PSA PRESSURE SWIG ADSORPTION</p> <p>PSV PRESSURE SAFETY VALVE</p> <p>PRR PRESSURE REDUCING REGULATOR</p> <p>PRV PRESSURE RELIEF VALVE</p> <p>PI PRESSURE INDICATION</p> <p>PIH PRESSURE INDICATE HIGH</p> <p>PIL PRESSURE INDICATE LOW</p> <p>PDT PRESSURE DIFFERENTIAL TRANSMITTER</p> <p>POR POINT OF RECEIVE</p> <p>SV SOLENOID VALVE</p> <p>TAL TEMPERATURE ALARM LOW</p> <p>TALL TEMPERATURE ALARM LOW LOW</p> <p>TAH TEMPERATURE ALARM HIGH</p> <p>TAHH TEMPERATURE ALARM HIGH HIGH</p> <p>TC TEMPERATURE CONTROL</p> <p>TCV TEMPERATURE CONTROL VALVE</p> <p>TE TEMPERATURE ELEMENT</p> <p>TEI TEMPERATURE INDICATION</p> <p>TIC TEMPERATURE INDICATING CONTROLLER</p> <p>TT TEMPERATURE TRANSMITTER</p> <p>VFD VARIABLE FREQUENCY DRIVE</p> <p>VSHH HIGH HIGH VIBRATION SWITCH</p> <p>UA REMOTE ALARM</p> <p>UY REMOTE SHUTDWN</p>			COMPUTER FUNCTION
	ILLUMINATED LOCAL HAND SWITCH		DIFFERENTIAL PRESSURE TRANSMITTER/GAUGE				<p>CONTROL ABBREVIATIONS CONT'D</p> <p>X PLC OUTPUT</p> <p>XSC SETPOINT</p> <p>XC CONTROL OUTPUT (CONTACT CLOSED)</p> <p>XO CONTROL OUTPUT (CONTACT OPEN)</p> <p>YA EVENT ALARM</p> <p>YI EVENT INDICATION</p> <p>YAO EVENT OPEN</p> <p>YAC EVENT CLOSED</p> <p>YAF LOCAL STOP</p> <p>YAL LOCAL ALARM</p> <p>YL EVENT INDICATOR LIGHT</p> <p>ZAO LIMIT SWITCH ALARM OPEN</p> <p>ZAC LIMIT SWITCH ALARM CLOSE</p> <p>ZIO LIMIT SWITCH INDICATE OPEN</p> <p>ZIC LIMIT SWITCH INDICATE CLOSE</p> <p>ZSC LIMIT SWITCH CLOSE</p> <p>ZSO LIMIT SWITCH OPEN</p>	PROGRAMMABLE LOGIC CONTROL	
	HAND SWITCH WITH START/STOP ACTION			<p>CONTROL ABBREVIATIONS CONT'D</p> <p>UST PNL UNDERGROUND STORAGE TANK PANEL</p> <p>MSA PLC METER SET ASSEMBLY PLC (GAS CO.)</p> <p>CHW PLC CHILLED WATER SYSTEM PANEL</p> <p>BLR PLC BLOWER (FUTURE) PLC</p> <p>AL PLC AIR LIQUIDE CO2 SEPARATION PLC</p>					
INSTRUMENT SIGNAL LINES									
-----	INSTRUMENT CONNECT TO PROCESS								
- - - -	ELECTRICAL SIGNAL (HARDWIRED)								
---\$---	RADIOACTIVE								
---o---	INTERLINK SIGNAL								
---#---	PNEUMATIC SIGNAL								
---x---	CAPILLARY TUBING								
--- ---	HYDRAULIC SINGLE LINES								
---o---	MECHANICAL LINK								
---w---	FIBER OPTICAL CABLE								
---g---	GUIDED ELECTROMAGNETIC SIGNAL								
---o---	WIRELESS INSTRUMENTATION SIGNAL								
INSTRUMENT SYMBOLS									
ANALYZER		LEVEL TRANSMITTER HYDROSTATIC DIRECT VESSEL MOUNTED							
TEMPERATURE TRANSMITTER WITH THERMOWELL									
TEMPERATURE TRANSMITTER SURFACE MOUNTED									

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REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
3.0	08/05/2022	ISSUED FOR BID	AK	NST	AG	<p>ANDRE GAMANIAN, P.E. FL LICENCE NO.93370 EXP. 02/28/2025</p>
4.0	01/18/2023	ISSUED FOR CONSTRUCTION	AK	NST	AG	
5.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	AK	NST	AG	
6.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

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

OWNER: INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW, VERO BEACH, FLORIDA 32968

ENGINEER:

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

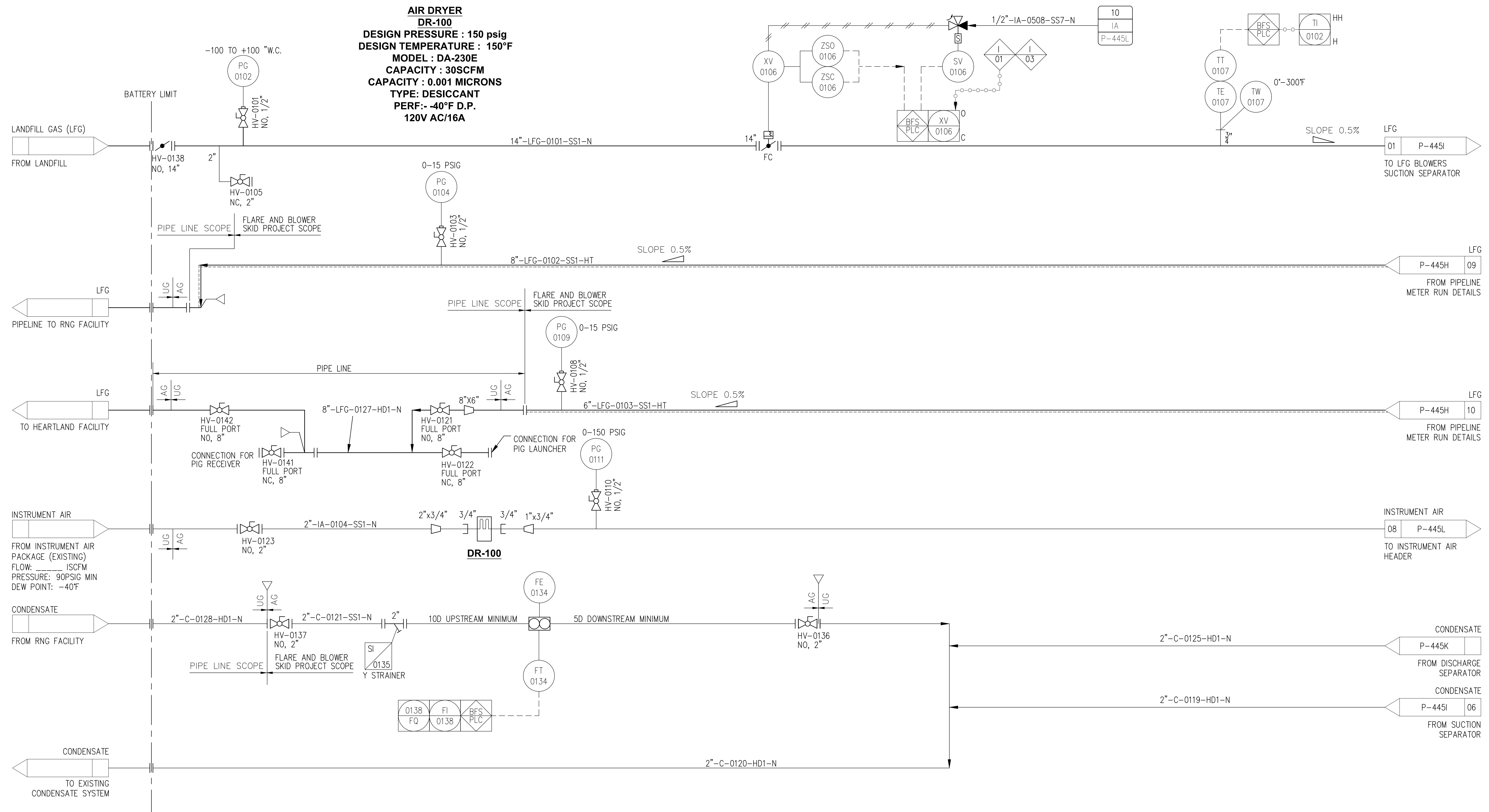
LEGEND SHEET (SHEET 4 OF 4)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **P-445F**

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AIR DRYER
DR-100
DESIGN PRESSURE : 150 psig
DESIGN TEMPERATURE : 150°F
MODEL : DA-230E
CAPACITY : 30SCFM
CAPACITY : 0.001 MICRONS
TYPE: DESICCANT
PERF:- -40°F D.P.
120V AC/16A

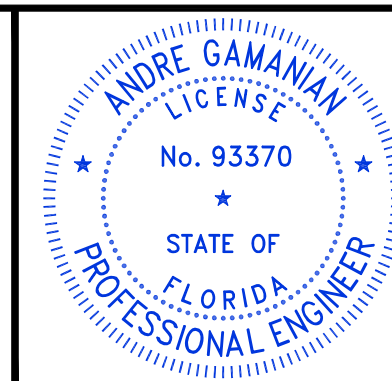


NOTE:
 1. ALL ITEMS SHOWN ON THIS SHEET ARE STICK BUILT.

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REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
3.0	08/24/2022	ISSUED FOR BID	AK	NST	AG
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6.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG

PROFESSIONAL ENGINEER
 ANDRE GAMANIAN, P.E.
 FL LICENCE NO.93370
 EXP. 02/28/2025



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 VERO BEACH, FLORIDA 32968

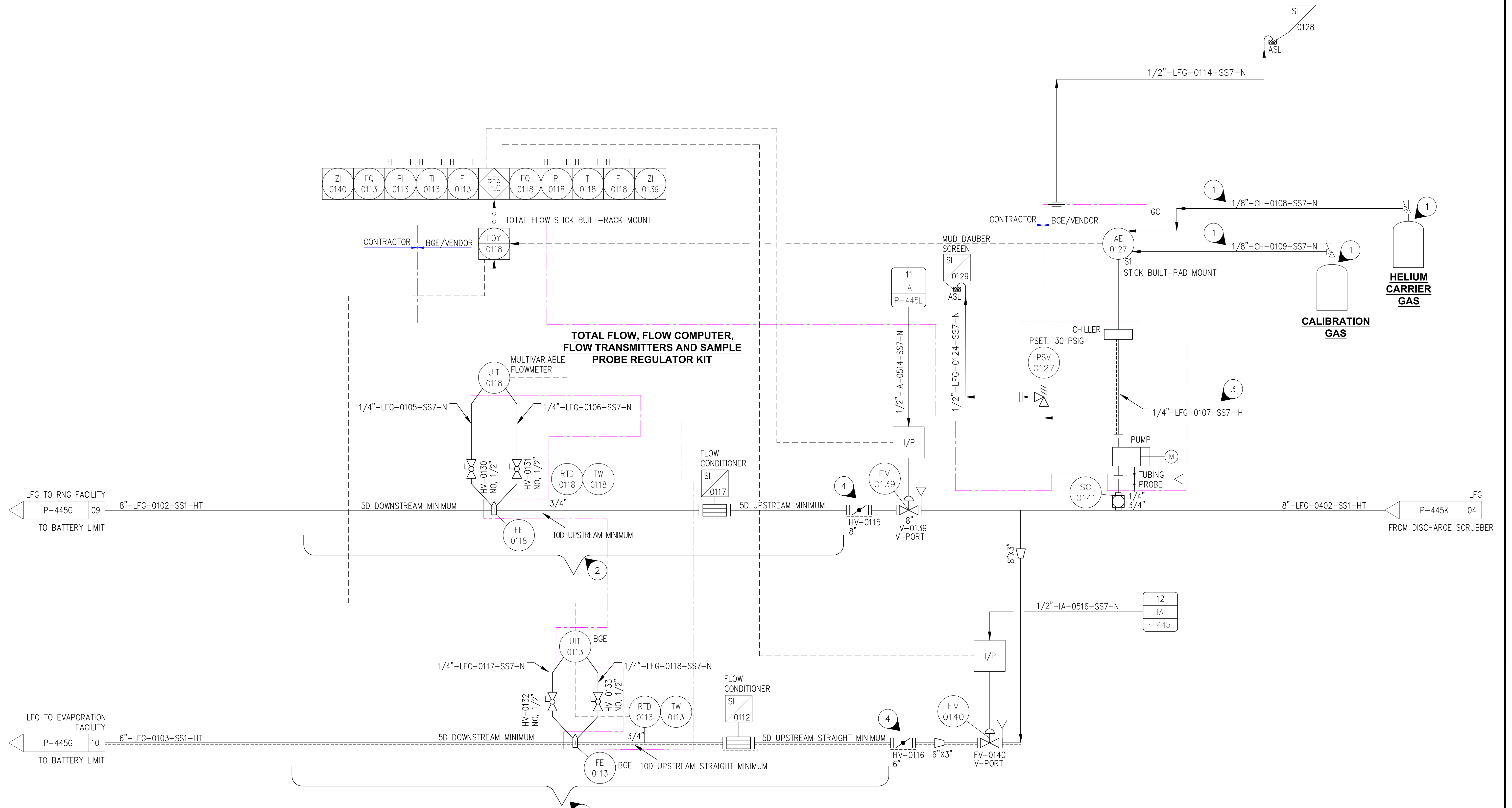
ENGINEER: **BIOGAS ENGINEERING**
 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING AND INSTRUMENTATION DIAGRAM
BATTERY LIMIT

DRAWING NO.
P-445G

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

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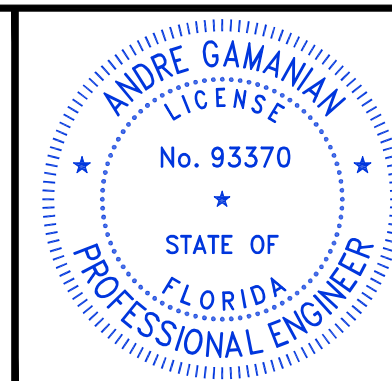


- NOTE:**
1. GAS CYLINDERS, REGULATORS AND TUBING TO FIELD INSTRUMENTS ARE CUSTOMER'S SCOPE OF SUPPLY AND INSTALLATION.
 2. USE SEAMLESS PIPE AS INDICATED.
 3. SULPHUR INERT TUBING SHALL BE USED, O' BRIEN EQUIVALENT.
 4. OPERATION PROCEDURE:
 ONLY FLARE OPERATIONS: HV-0501 (PID P-445L) OPEN. HV-0115 AND HV-0116 CLOSED.
 ONLY RNG FACILITY OPERATIONS: HV-0501 (PID P-445L) CLOSED. HV-0115 OPEN AND HV-0116 CLOSED.
 ONLY EVAPORATOR FACILITY OPERATIONS: HV-0501 (PID P-445L) CLOSED. HV-0116 OPEN AND HV-0115 CLOSED.
 ALL OPERATING: HV-0501 (PID P-445L) OPEN. HV-0115 AND HV-0116 OPEN.
 5. ALL ITEMS SHOWN ON THIS SHEET ARE STICK BUILT.

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2.0	08/24/2022	ISSUED FOR BID	AK	NST	AG
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**PIPING AND INSTRUMENTATION DIAGRAM
 METER RUN DETAILS**

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

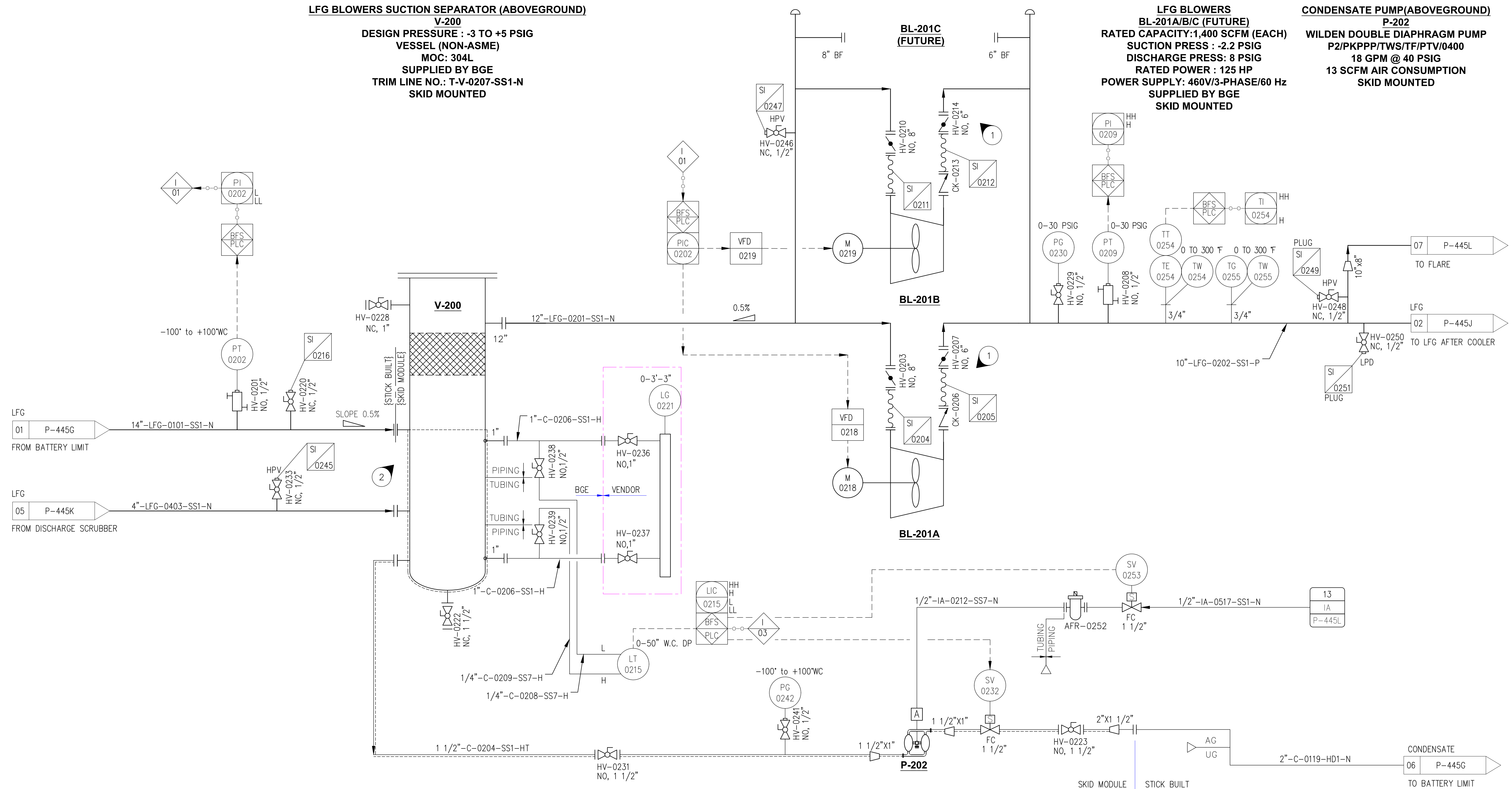
DRAWING NO. **P-445H**

LFG BLOWERS SUCTION SEPARATOR (ABOVEGROUND)

V-200
 DESIGN PRESSURE : -3 TO +5 PSIG
 VESSEL (NON-ASME)
 MOC: 304L
 SUPPLIED BY BGE
 TRIM LINE NO.: T-V-0207-SS1-N
 SKID MOUNTED

LFG BLOWERS
BL-201A/B/C (FUTURE)
 RATED CAPACITY: 1,400 SCFM (EACH)
 SUCTION PRESS : -2.2 PSIG
 DISCHARGE PRESS: 8 PSIG
 RATED POWER : 125 HP
 POWER SUPPLY: 460V/3-PHASE/60 Hz
 SUPPLIED BY BGE
 SKID MOUNTED

CONDENSATE PUMP (ABOVEGROUND)
P-202
 WILDEN DOUBLE DIAPHRAGM PUMP
 P2/PKPPP/TWS/TF/PTV/0400
 18 GPM @ 40 PSIG
 13 SCFM AIR CONSUMPTION
 SKID MOUNTED



NOTE:

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

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3.0	08/24/2022	ISSUED FOR BID	AK	NST	AG
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 2321 E. 28TH STREET, SUITE 400
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 EMAIL: INFO@BIOGASENG.COM

PIPING AND INSTRUMENTATION DIAGRAM
SUCTION SEPARATOR & BLOWER SYSTEM

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

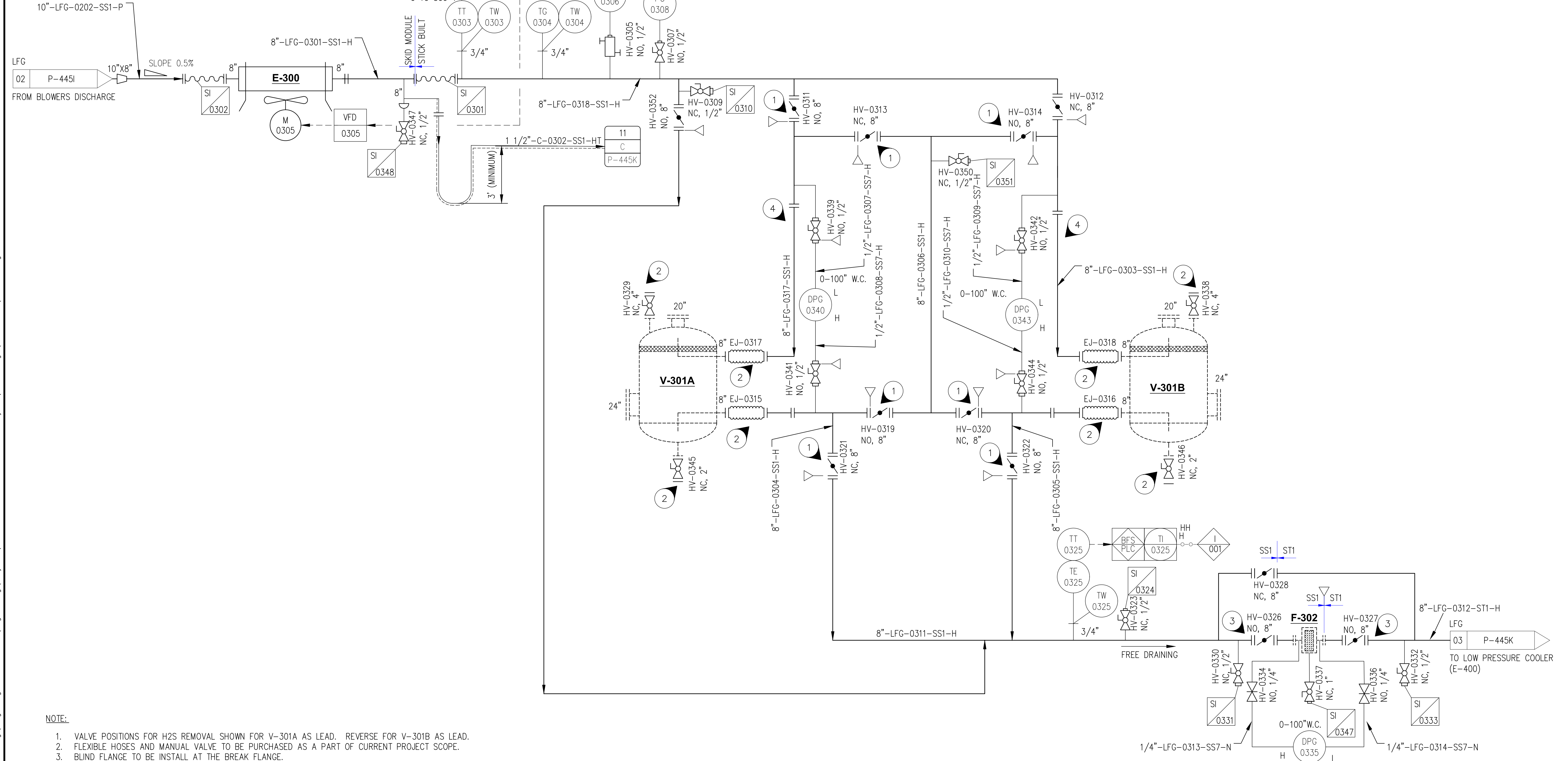
DRAWING NO.
P-445I

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LFG BLOWERS AFTER COOLER
E-300
 LFG FLOW RATE: 1,900 SCFM
 HOT SIDE INLET/ OUTLET TEMP: 265 °F/ 120 °F
 COLD SIDE FLUID: AIR
 TUBE DESIGN PRESS AND TEMP.: 12 PSIG AND 300 °F
 TUBE MOC: 304L SS
 FAN MOTOR POWER: 7.5 HP
 SUPPLIED BY BGE
 SKID MOUNTED

H2S REMOVAL BED VESSELS
V-301A/B
 12 FT.DIA.x 16 FT.HEIGHT SEAM-SEAM
 MOC: FRP
 MEDIA LOAD: 63,000 LBS./EACH
 SUPPLIED BY NOPETRO
 TRIM LINE NO. : T-V-0315-SS1-H

PARTICULATE FILTER
F-302
 VENDOR: SHWANDRA PRODUCTS INC.
 MODEL: P22-0206
 CAPACITY: 5 MICRON PARTICULATE
 DESIGN PRESSURE: 15psig
 SUPPLIED BY NOPETRO
 TRIM LINE NO. : T-V-0316-SS1-H



- NOTE:**
1. VALVE POSITIONS FOR H2S REMOVAL SHOWN FOR V-301A AS LEAD. REVERSE FOR V-301B AS LEAD.
 2. FLEXIBLE HOSES AND MANUAL VALVE TO BE PURCHASED AS A PART OF CURRENT PROJECT SCOPE.
 3. BLIND FLANGE TO BE INSTALL AT THE BREAK FLANGE.
 4. PIPE SPOOL TO BE FABRICATE AS A PART OF CURRENT PROJECT SCOPE AND INSTALL ALONG WITH H2S REMOVAL BED VESSELS.

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REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
3.0	08/24/2022	ISSUED FOR BID	AK	NST	AG	HEATHER P. CAVANAGH, P.E. FL LICENCE NO.54607 EXP. 02/28/2025
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 VERO BEACH, FLORIDA 32968

ENGINEER:

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

PIPING AND INSTRUMENTATION DIAGRAM
 LFG AFTER COOLER & H2S REMOVAL VESSELS
 LANDFILL GAS BLOWER SKID
 & FLARE REPLACEMENT
 DRAWING NO.
P-445J

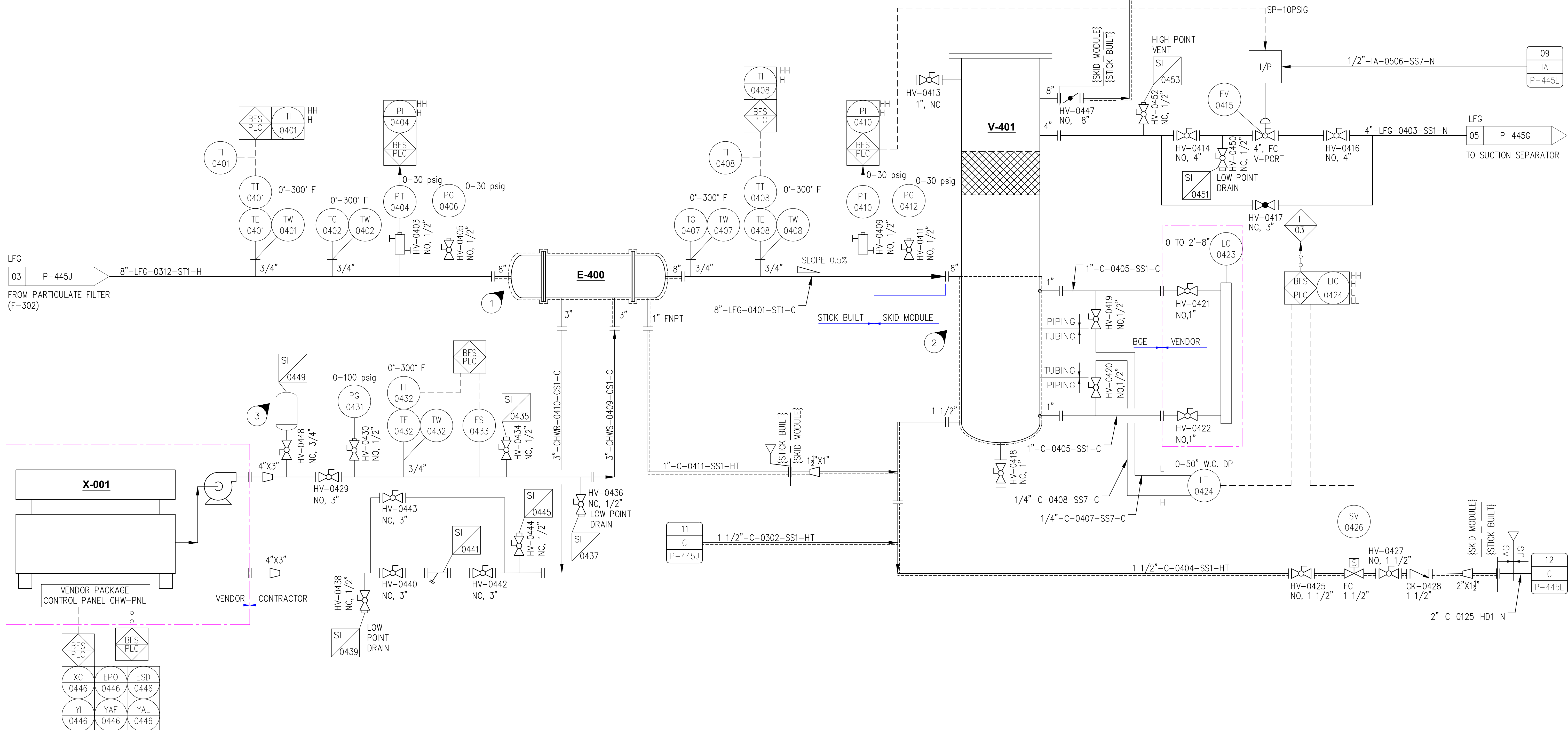
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CHILLER PACKAGE

X-001
THERMAL CARE
COMPRESSOR 2@ 30HP
CONDENSER FAN 3@ 4HP
PROCESS PUMP 1@ 10 HP
R410A
SUPPLIED BY BGE

LOW PRESSURE COOLER
E-400
CHW COOLED GAS COOLER
MOC:304SS
DESIGN PRESSURE (TUBE SIDE): 100 PSIG
DESIGN PRESSURE (SHELL SIDE): 14 PSIG
SUPPLIED BY BGE

DISCHARGE SEPARATOR (ABOVEGROUND)
V-401
DESIGN PRESSURE : -5 TO 15 PSIG
VESSEL (NON-ASME)
MOC:304L
SUPPLIED BY BGE
TRIM LINE NO. : T-V-0406-SS1-N
SKID MOUNTED

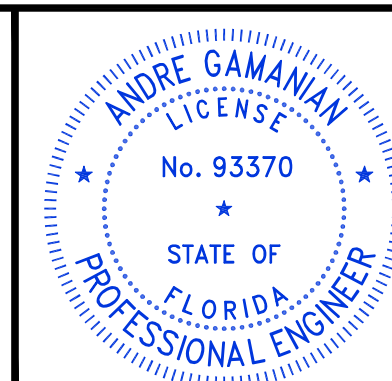


- NOTE:**
1. INSULATE COOLER WITH SAME SPEC. INSULATION & CLADDING AS CHW PIPES.
 2. HEAT TRACE AND INSULATE SEPARATOR TO FROM BOTTOM OF INLET PIPE DOWN.
 3. SHIPPED LOOSE ITEM SUPPLIED BY THERMAL CARE.

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PROFESSIONAL ENGINEER
ANDRE GAMANIAN, P.E.
 FL LICENCE NO.93370
 EXP. 02/28/2025



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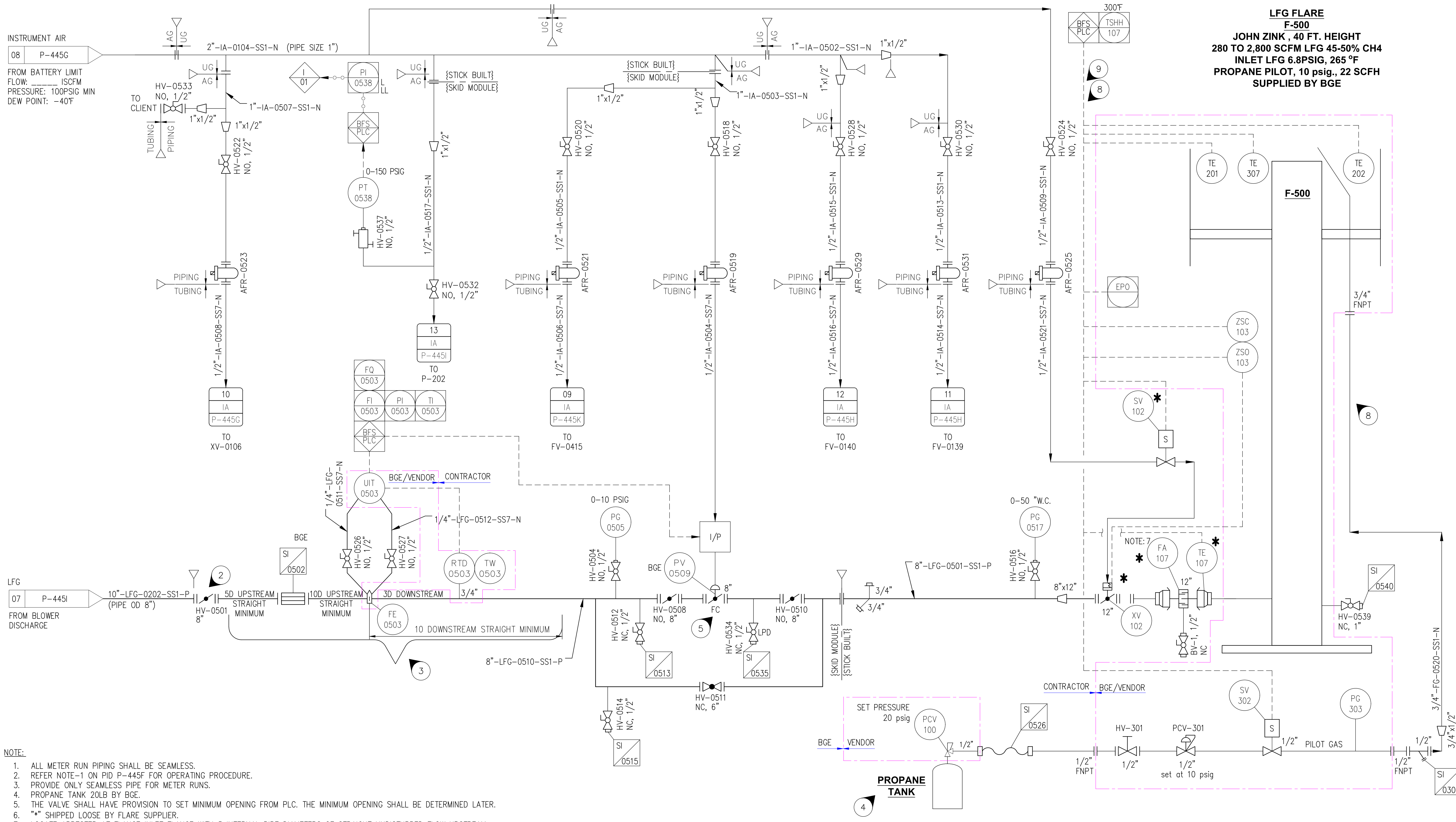
OWNER:
INDIAN RIVER COUNTY FLORIDA
 1325 74th AVE SW,
 VERO BEACH, FLORIDA 32968

ENGINEER:
BIOGAS ENGINEERING
 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
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PIPING AND INSTRUMENTATION DIAGRAM
LOW PRESSURE COOLER, DISCHARGE SCRUBBER & CHILLED WATER SYSTEM
 LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. P-445K

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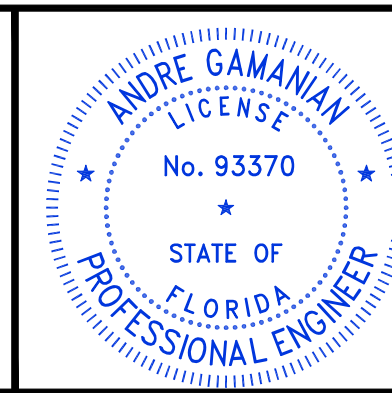


- NOTE:**
1. ALL METER RUN PIPING SHALL BE SEAMLESS.
 2. REFER NOTE-1 ON PID P-445F FOR OPERATING PROCEDURE.
 3. PROVIDE ONLY SEAMLESS PIPE FOR METER RUNS.
 4. PROPANE TANK 20LB BY BGE.
 5. THE VALVE SHALL HAVE PROVISION TO SET MINIMUM OPENING FROM PLC. THE MINIMUM OPENING SHALL BE DETERMINED LATER.
 6. ** SHIPPED LOOSE BY FLARE SUPPLIER.
 7. LOCATE ARRESTER AT FLANGE INLET FLANGE WITH 5 INTERNAL PIPE DIAMETERS OF STRAIGHT UNDISTURBED FLOW UPSTREAM.
 8. INSTALL PILOT GAS RISER AND CONDUIT CONNECTION ON THE STACK WHEN STACK IS IN HORIZONTAL POSITION ON THE GROUND.
 9. CONNECT RIGID CONDUIT TO THE THERMOCOUPLE. NO FLEXIBLE CONDUIT.

ISSUED FOR CONSTRUCTION

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3.0	08/24/2022	ISSUED FOR BID	AK	NST	AG
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 ANDRE GAMANIAN, P.E.
 FL LICENCE NO.93370
 EXP. 02/28/2025



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 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
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**PIPING AND INSTRUMENTATION DIAGRAM
 FLARE & INSTRUMENT AIR SYSTEM**

LANDFILL GAS BLOWER SKID
 & FLARE REPLACEMENT

DRAWING NO.
P-445L

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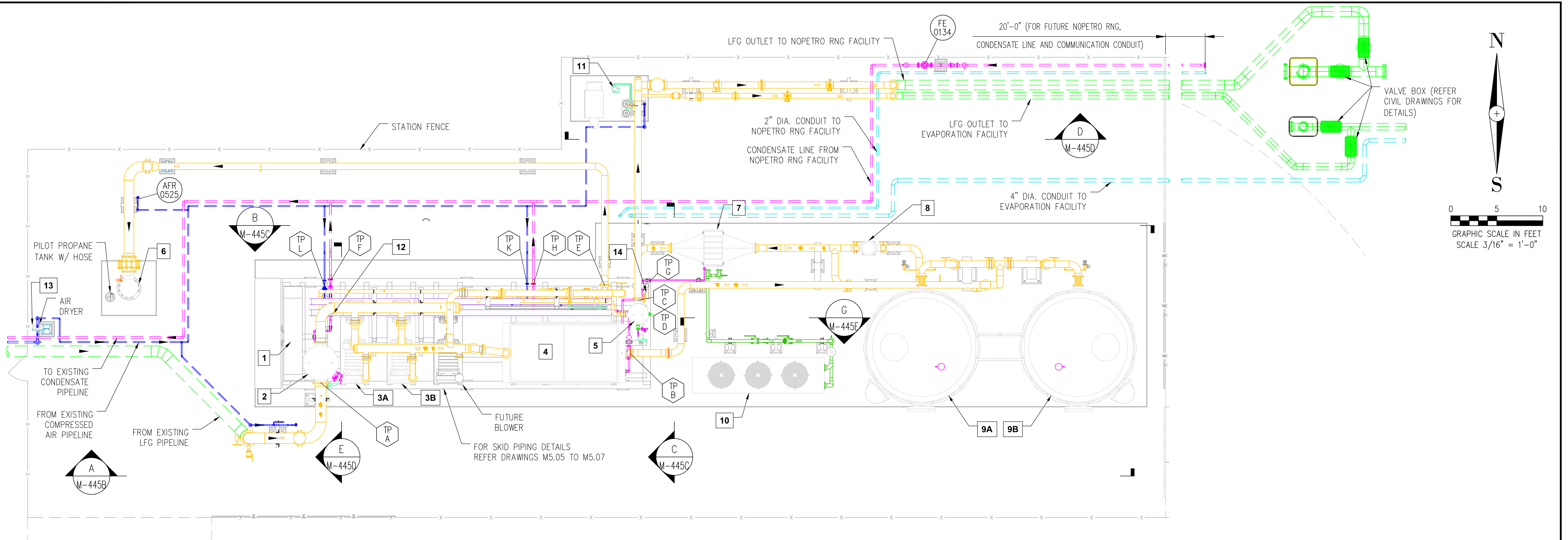


TABLE 1:-
EQUIPMENT LIST

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)

TIE-IN NUMBER	SERVICE	LINE SIZE	FLANGE FACE	FLANGE RATING
TP-A	SUCTION SEPARATOR (LFG INLET)	14"	RF	150
TP-B	LFG AFTER COOLER (OUTLET)	8"	RF	150
TP-C	DISCHARGE SEPARATOR (INLET)	8"	RF	150
TP-D	DISCHARGE SEPARATOR (OUTLET)	8"	RF	150
TP-E	TO FLARE	8"	RF	150
TP-F	SUCTION SEPARATOR CONDENSATE (OUTLET)	1 1/2"	RF	150
TP-G	LOW PRESSURE COOLER CONDENSATE (INLET)	1"	RF	150
TP-H	DISCHARGE SEPARATOR CONDENSATE (OUTLET)	1 1/2"	RF	150
TP-K	COMPRESSED AIR (INLET)	1"	RF	150
TP-L	COMPRESSED AIR (INLET)	1"	RF	150

LEGEND

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

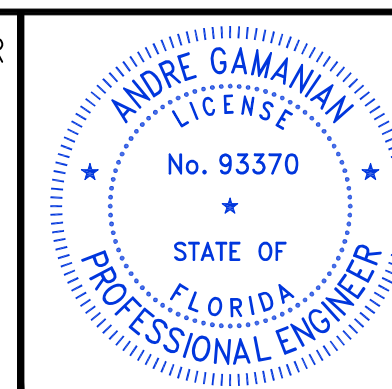
NOTES:

- 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.

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
2.0	08/24/2022	ISSUED FOR BID	AK	TP	AG
3.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG
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PROFESSIONAL ENGINEER
ANDRE GAMANIAN, P.E.
FL LICENCE NO.93370
EXP. 02/28/2025

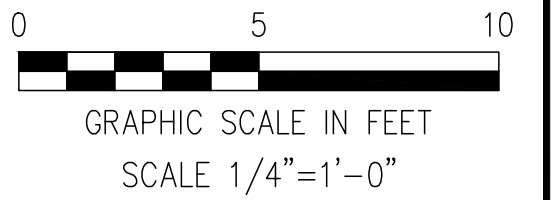


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Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16 -07'00'

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

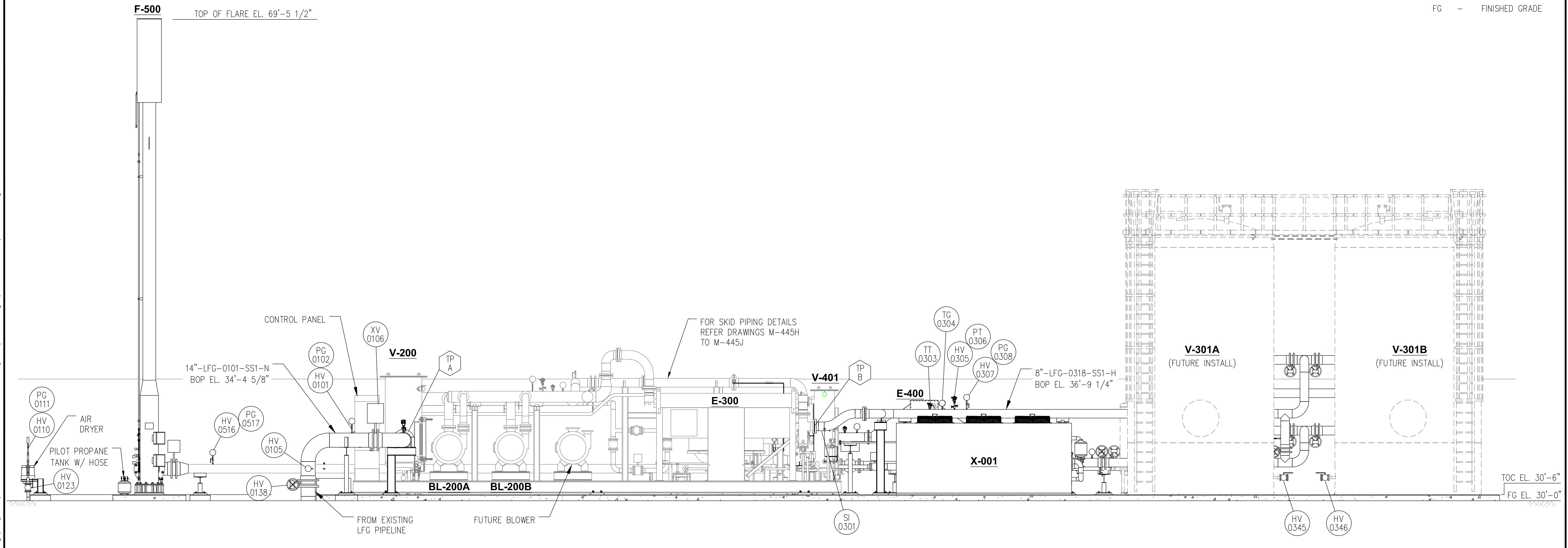
ENGINEER: **BIOGAS ENGINEERING**
2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM

OVERALL PIPING LAYOUT
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. **M-445A**



LEGEND

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



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

NOTES:

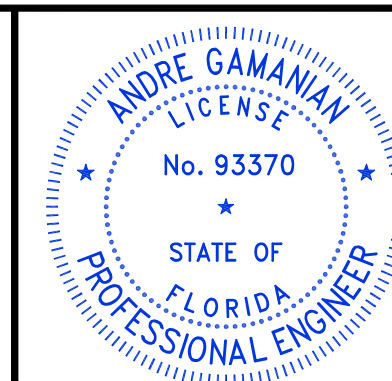
1. FOR P&ID REFER DRAWING P-445G TO P-445L.
2. ALL PIPING AND ITS FITTING IN THE PROJECT SHALL BE SS 304. EXCEPT BETWEEN THE PARTICULATE FILTER (F-302) AND DISCHARGE SEPARATOR (V-401) WHICH WILL BE SS 316.
3. REFER VALVE/SP-ITEM LIST & INSTRUMENT LIST DRAWING M-445S TO M-445AE (13 SHEETS) FOR THE SCOPE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

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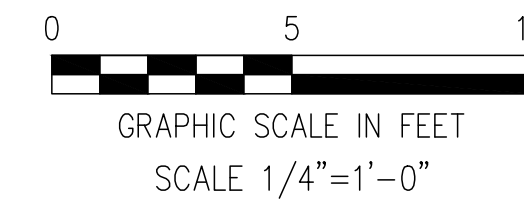
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SIGNAL HILL, CA 90755, Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING LAYOUT SECTIONS & DETAILS

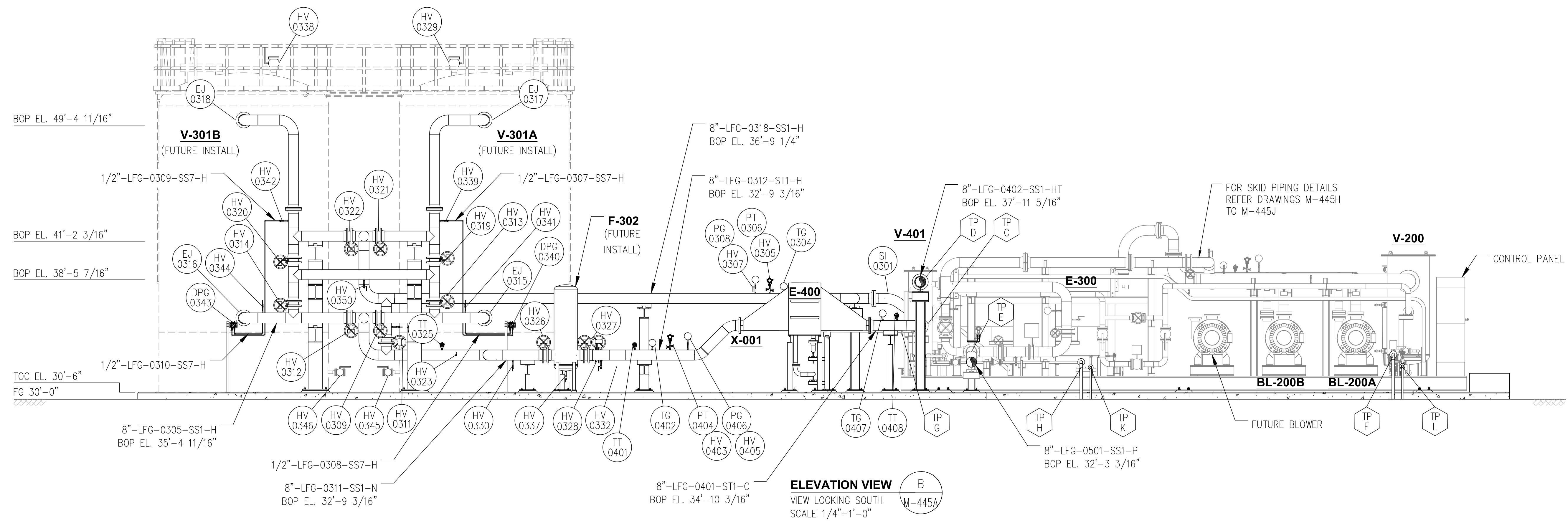
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. M-445B

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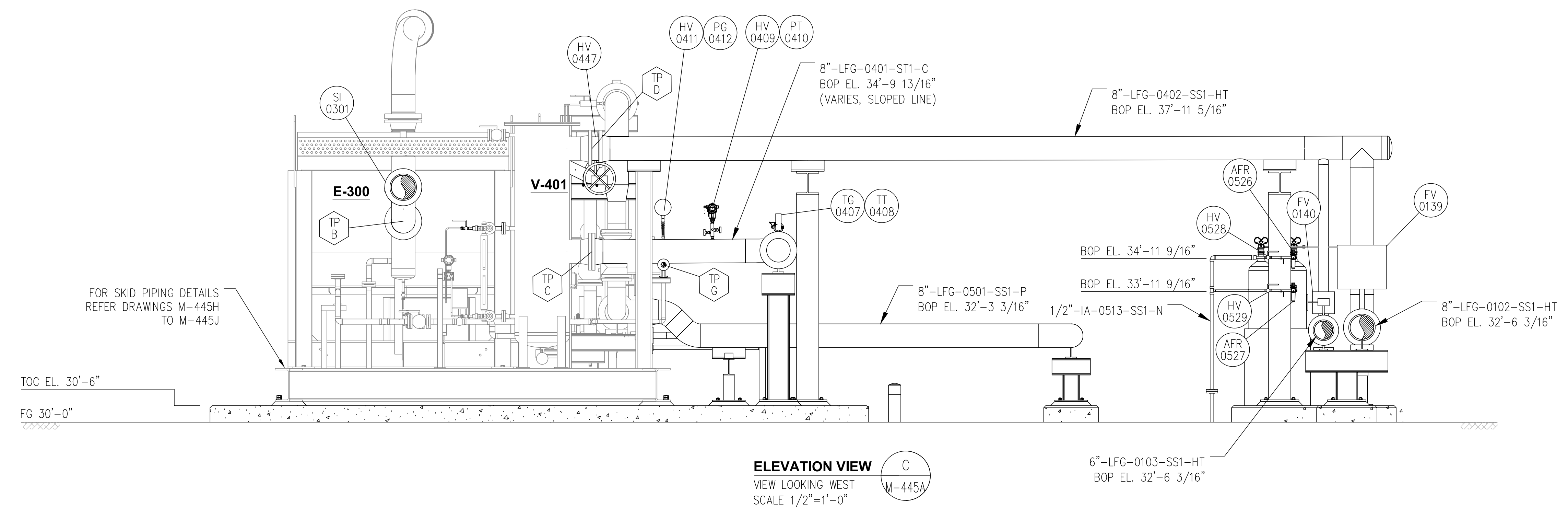
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LEGEND
 TOC - TOP OF CONCRETE
 BOP - BOTTOM OF PIPE
 TOS - TOP OF STEEL
 FG - FINISHED GRADE



ELEVATION VIEW B
 VIEW LOOKING SOUTH
 SCALE 1/4"=1'-0"



ELEVATION VIEW C
 VIEW LOOKING WEST
 SCALE 1/2"=1'-0"

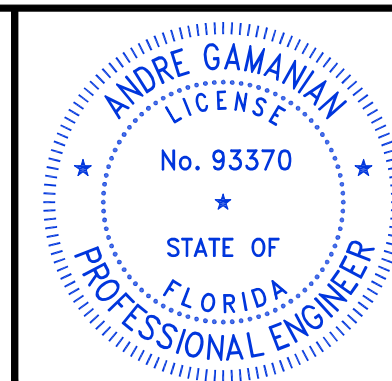
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 FL LICENCE NO. 93370
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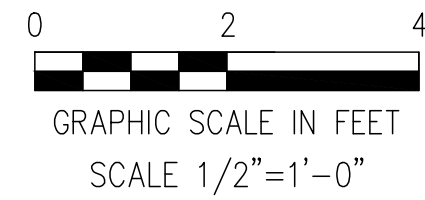
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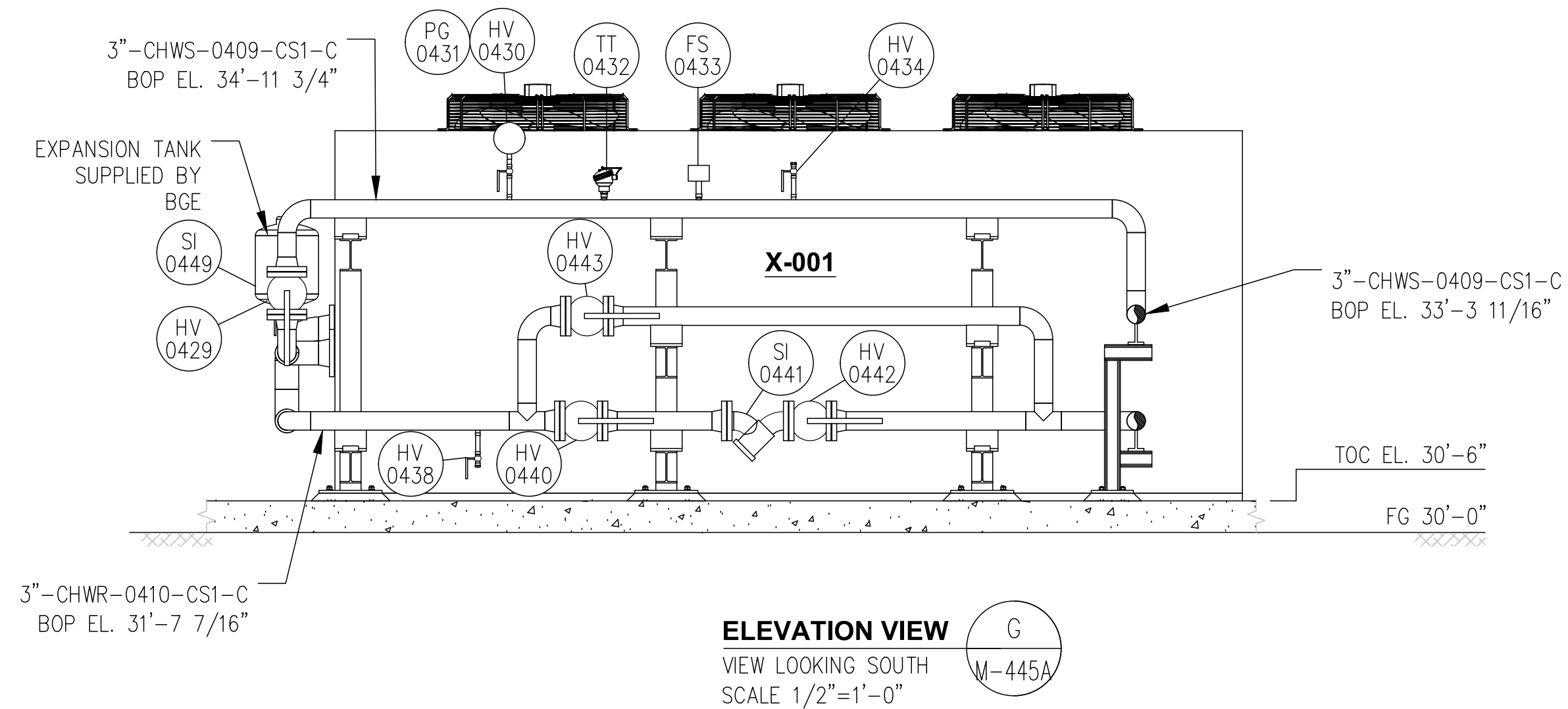
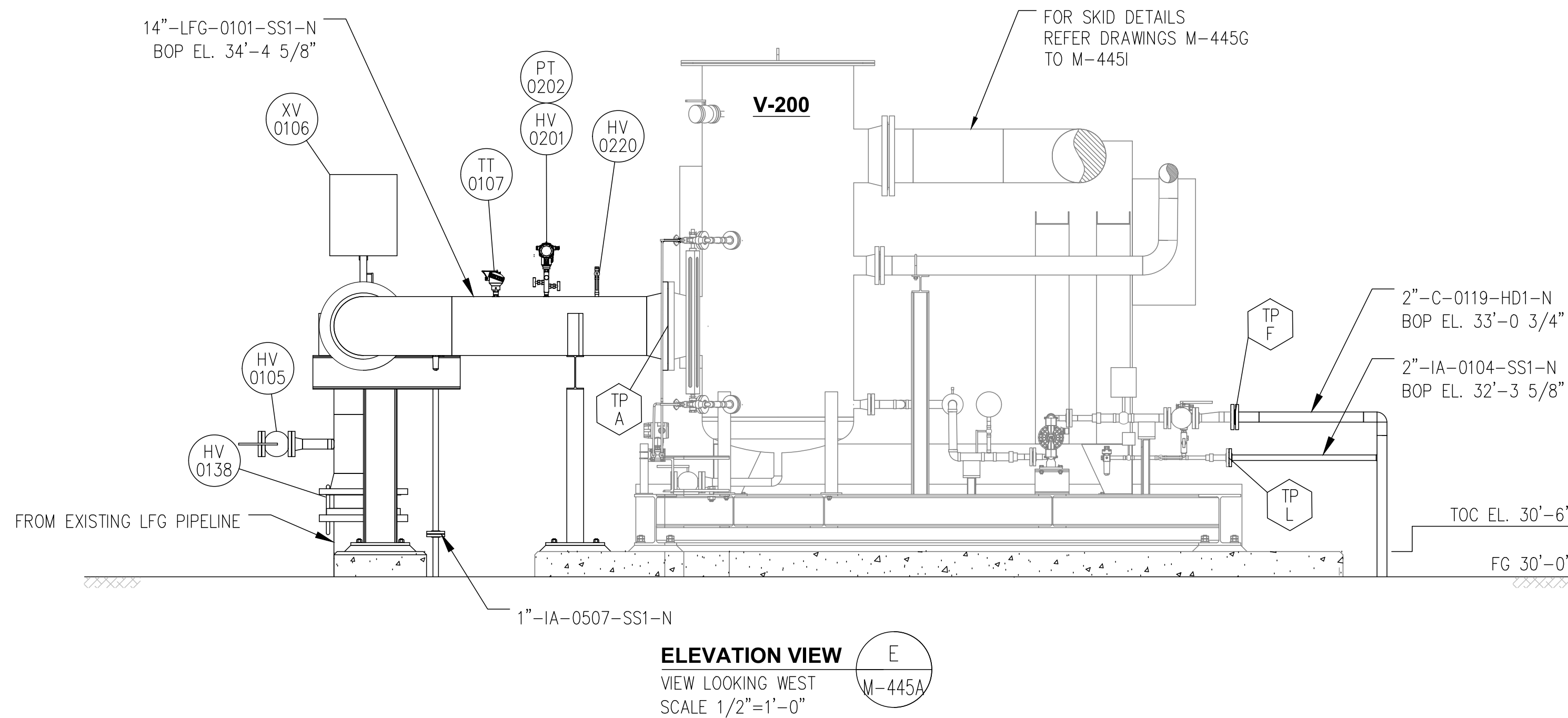
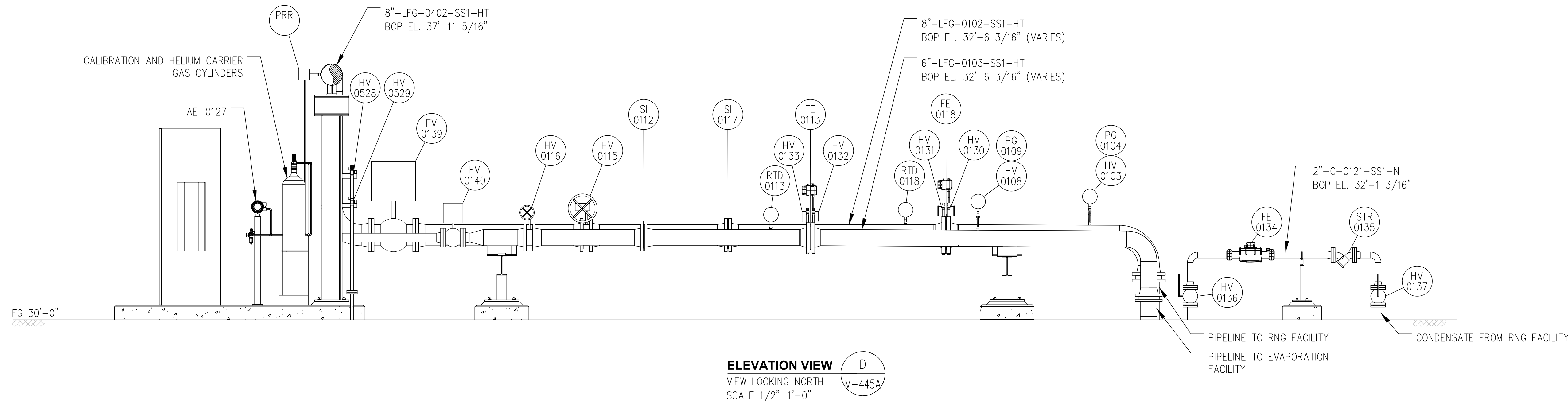
ENGINEER:
BIOGAS ENGINEERING
 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING LAYOUT SECTIONS & DETAILS
 LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. M-445C

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LEGEND
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 TOS - TOP OF STEEL
 FG - FINISHED GRADE



NOTES:

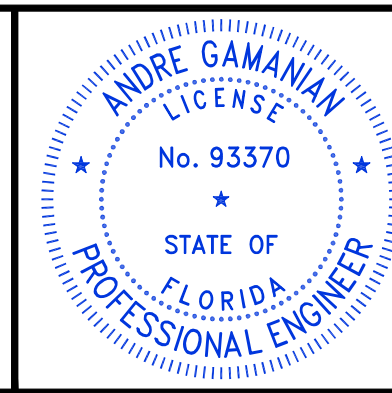
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PROFESSIONAL ENGINEER

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 EXP. 02/28/2025



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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 LAYOUT SECTIONS & DETAILS
 LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
 DRAWING NO. **M-445D**

MECHANICAL, FABRICATION AND CONSTRUCTION NOTES:

1. REFERENCE DOCUMENTS

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.
 - i. 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

3. 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.

4. GENERAL NOTES

- 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.
- d. 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.
- f. 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.
- j. 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.
- l. 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.
- j. 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.
- l. 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

- 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.
 - i. 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:

	COLOR SCHEME
i. FIRE QUENCHING FLUIDS: -WHITE ON RED	WHITE ON RED
ii. TOXIC & CORROSIVE FLUID: - BLACK ON ORANGE	BLACK ON ORANGE
iii. FLAMMABLE & OXIDIZING FLUIDS: - BLACK ON YELLOW	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 CORROSION INHIBITOR, 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

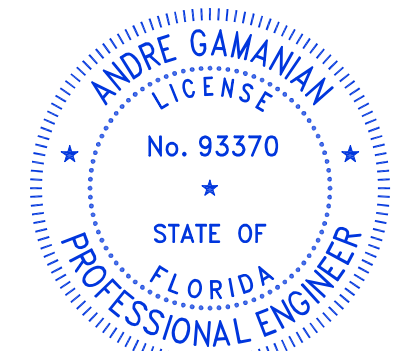
ALL INSULATED PIPE AND EQUIPMENT SHALL HAVE INSULATION AND JACKETING INSTALLED IN WATERPROOF MANNER.

- 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
- d. 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.

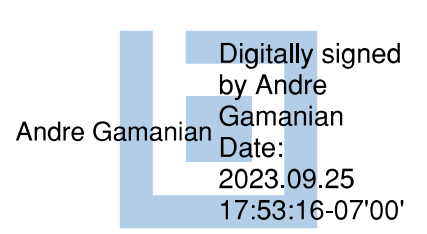
NOTES CONT ON SHEET-2

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1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

ENGINEER:  **BIOGAS ENGINEERING**

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MECHANICAL, FABRICATION AND CONSTRUCTION NOTES (SHEET 1 OF 3)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. M-445E

MECHANICAL, FABRICATION AND CONSTRUCTION NOTES CONT:

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.

Types of Contamination	Cleaning Methods
Dirt, Metal Chips, and Filings	A-1, A-2, B
Oil, Paint, Grease Wax, Varnish	B
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.
 - iii. 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.

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 testing is to be used, 100% of mechanical joints shall be examined.
 (2) Includes any additional examination or testing required by engineering.
 (3) Category D Systems require welds to be random visually examined.
 (4) When brazed joints are used, 5% in-process examination is performed.
 (5) Socket welds require 5% visual examination of final weld.
 Note: Vol = Volumetric weld examination such as a radiograph or ultrasonic.
 Rad = Radiography

b. TESTING

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

Fluid Service/ Piping Type	Type of Test				
	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

(1) May be substituted for the hydrostatic or pneumatic leak tests provided:
 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]

TEST NUMBER:	PROJECT NO.:	PAGE 1 OF
PROJECT NAME:		
TEST INFORMATION		
SYSTEM DESCRIPTION:		
DESCRIPTION OF TEST BOUNDARIES: (Attach Sketch Showing Boundaries as Required. P&ID Recommended)		
DESIGN TEMPERATURE:	DESIGN PRESSURE:	
TEST METHOD: • HYDROSTATIC • PNEUMATIC:		
TEST FLUID:	APPLICABLE CODE:	
TEST REQUIREMENTS		
REQUIRED TEST PRESSURE:	TEST FLUID TEMPERATURE:	
REQUIRED TEST DURATION:	AMBIENT TEMPERATURE:	
GAUGE PRESSURE CALCULATION		
ELEVATION DIFFERENCE BETWEEN GAUGE AND HIGH POINT:		
X CONVERSION FACTOR:		
PLUS REQUIRED TEST PRESSURE:		
EQUALS REQUIRED GAUGE PRESSURE:		
TEST RESULTS		
TEST DATE:	START TIME:	• AM • PM
	FINISH TIME:	• AM • PM
ACTUAL GAUGE PRESSURE:		
TEST EQUIPMENT		
TYPE:	RANGE:	CAL. DATE:
		CAL. DUE:
REMARKS:		
TEST ACCEPTANCE		
CODE EXAMINER:	DATE:	
CODE INSPECTOR:	DATE:	

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

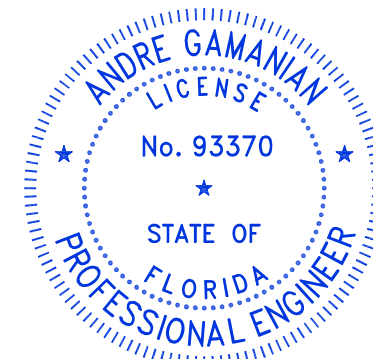
12. APPROVALS AND INSPECTIONS

- 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

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

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'

OWNER:



INDIAN RIVER COUNTY
FLORIDA

1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

ENGINEER:



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

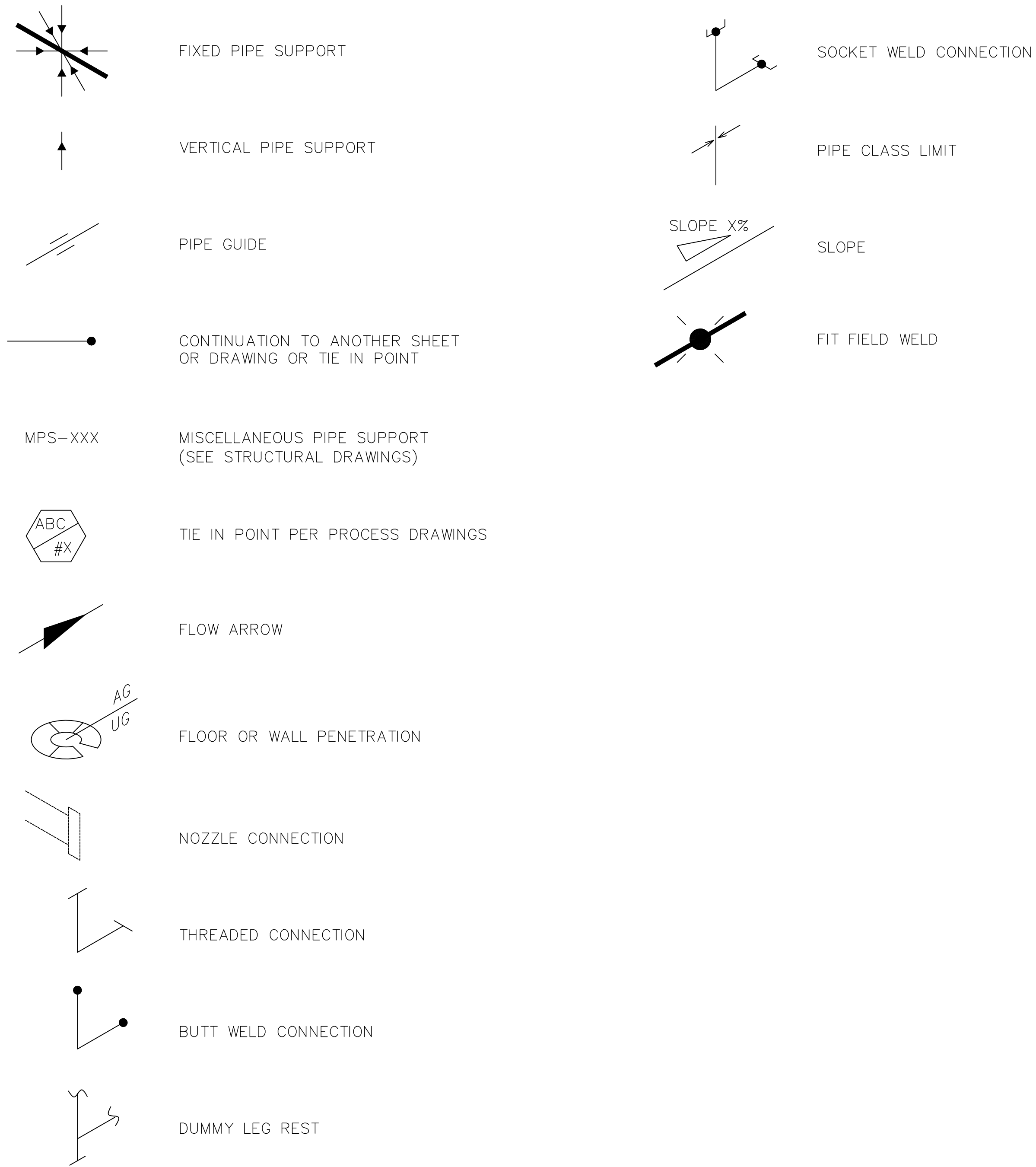
MECHANICAL, FABRICATION AND CONSTRUCTION NOTES (SHEET 2 OF 3)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO.

M-445F

ISOMETRIC SYMBOLS LEGEND:



MECHANICAL ISOMETRIC GENERAL NOTES:

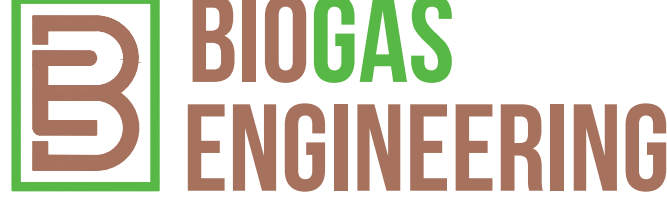
1. GENERAL NOTES:
 - a. CONTRACTOR TO MAKE PROVISIONS FOR VARIATIONS IN FIELD DIMENSIONS AND FIT UP.
 - b. WORK THIS DRAWING WITH PROCESS, MECHANICAL, CIVIL, STRUCTURAL, VENDOR DRAWINGS AND OTHER CONTRACT DOCUMENTS.
 - c. CONFIRM WITH PIPING MATERIAL SPECIFICATIONS (PMS) AND OTHER CONTRACT DOCUMENTS 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.

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REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
1.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	TW	HEATHER P. CAVANAGH, P.E. FL LICENCE NO.54607 EXP. 02/28/2025
2.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	
3.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

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FLORIDA
1325 74th AVE SW,
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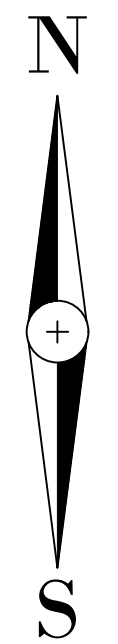
ENGINEER:  **BIOGAS ENGINEERING**
2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
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MECHANICAL ISOMETRIC GENERAL NOTES AND LEGEND (SHEET 3 OF 3)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO.
M-445G

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GRAPHIC SCALE IN FEET
SCALE 1/2" = 1'-0"

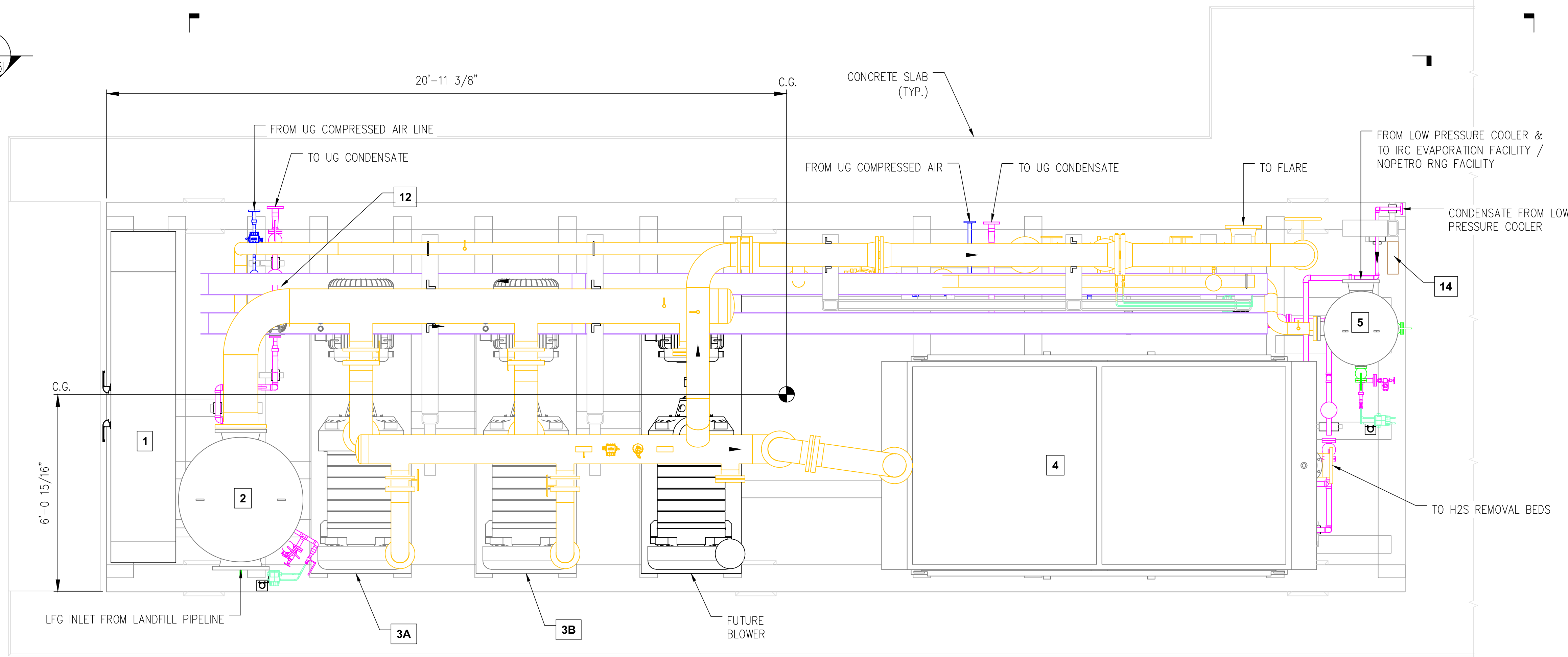
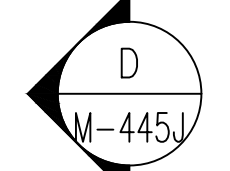
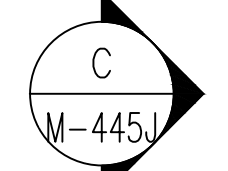
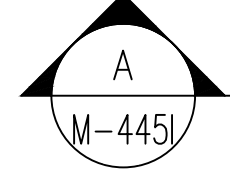
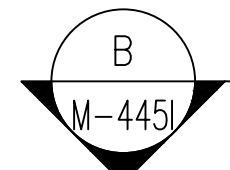


TABLE 1:-
EQUIPMENT LIST

ID	TAG	DESCRIPTION
1	--	BOP PANEL
2	V-200	LFG BLOWERS SUCTION SEPARATOR
3A/3B	BL-201A/BL-201B	LFG BLOWERS
4	E-300	LFG BLOWERS AFTER COOLER
5	V-401	DISCHARGE SEPARATOR
12	P-202	CONDENSATE DISCHARGE PUMP
14	JB-500	JUNCTION BOX

LEGEND

- LANDFILL GAS (LFG)
- CONDENSATE (C)
- INSTRUMENT AIR
- SS TUBING
- CABLE TRAY

NOTES:

1. 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.
3. THIS DRAWING IS FOR INFORMATION PURPOSES ONLY.

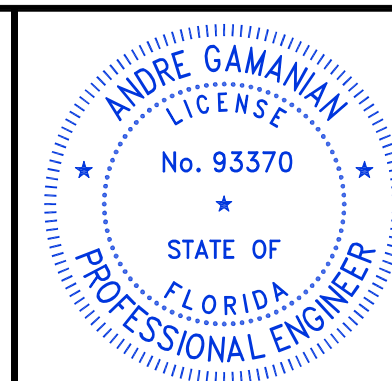
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1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG
2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG

PROFESSIONAL ENGINEER

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

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

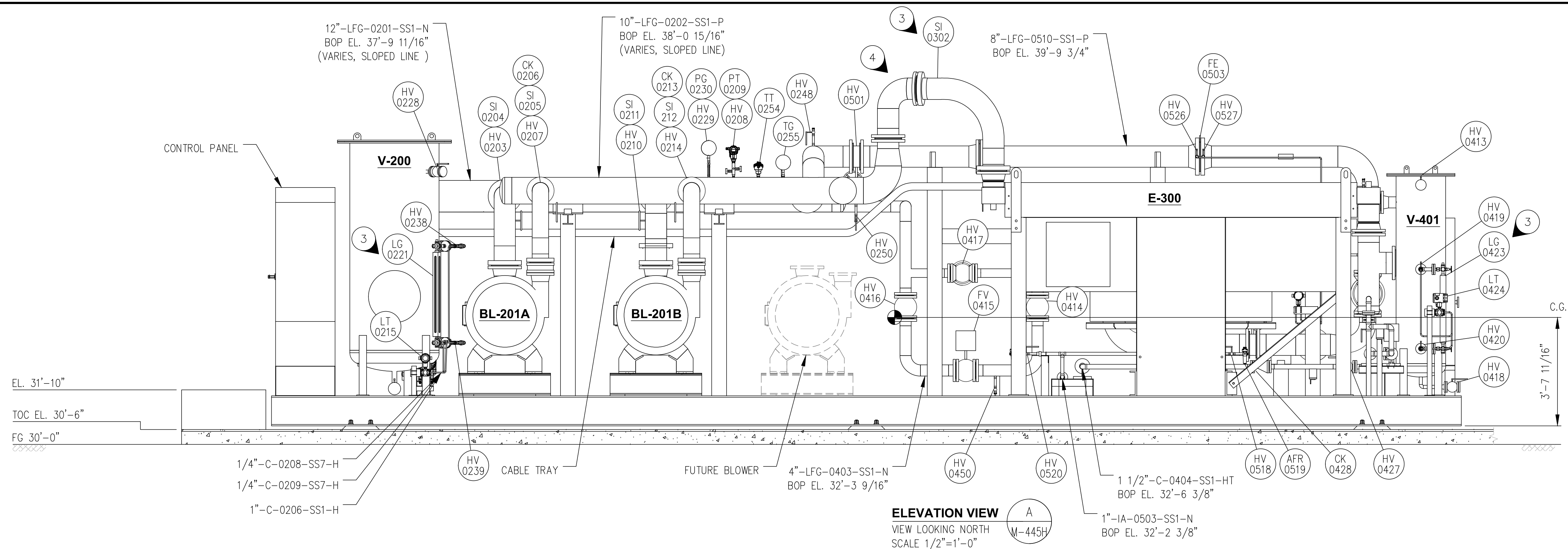
ENGINEER: **BIOGAS ENGINEERING**
2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM

BLOWER SKID PIPING LAYOUT

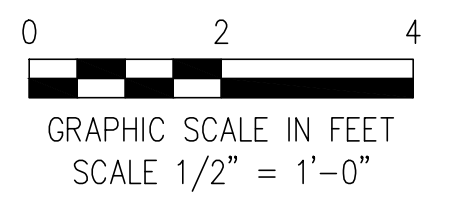
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO.
M-445H

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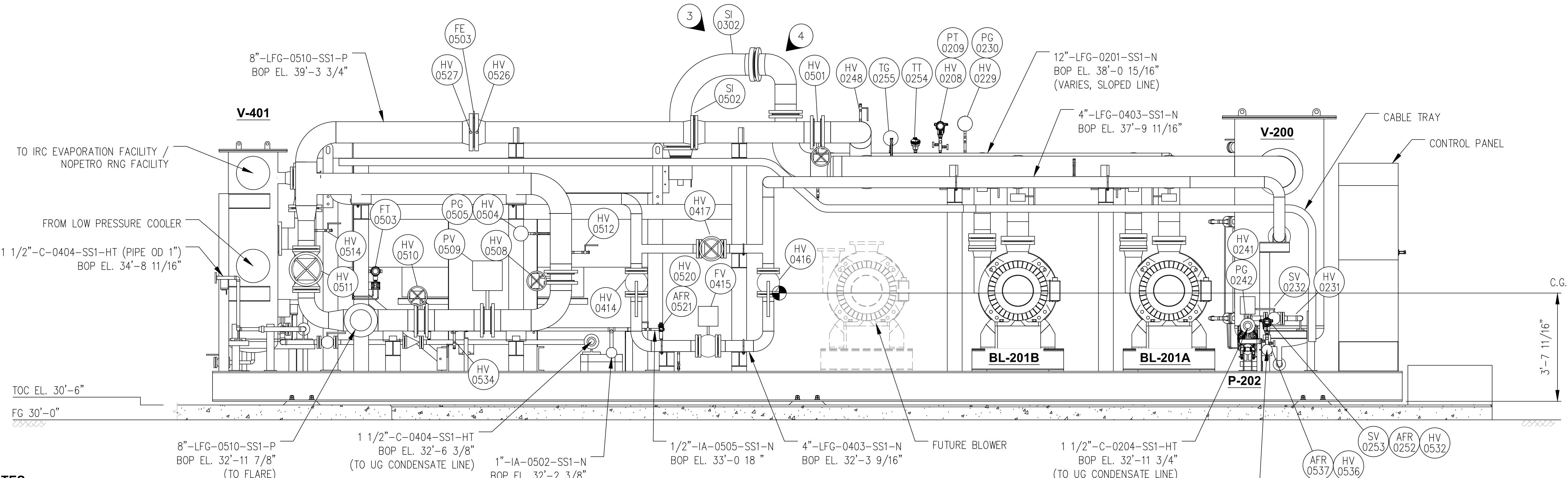


ELEVATION VIEW A
VIEW LOOKING NORTH
SCALE 1/2"=1'-0"
M-445H



LEGEND

TOC - TOP OF CONCRETE
BOP - BOTTOM OF PIPE
COG - CENTER OF GRAVITY
FG - FINISHED GRADE



ELEVATION VIEW B
VIEW LOOKING SOUTH
SCALE 1/2"=1'-0"
M-445H

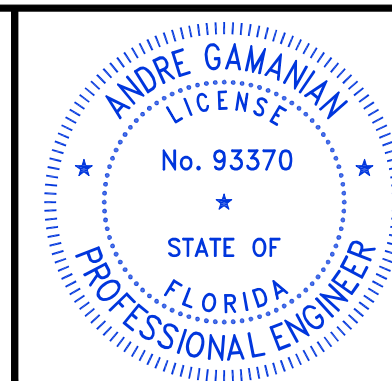
- NOTES:**
- FOR P&ID REFER DRAWING P-445G TO P-445M.
 - ALL PIPING AND ITS FITTING IN THE PROJECT SHALL BE SS 304. EXCEPT BETWEEN THE PARTICULATE FILTER (F-302) AND DISCHARGE SEPARATOR (V-401) WHICH WILL BE SS 316.
 - LG-0221, LG-0423 & HOSE TAG SI-0302 TO BE SHIPPED LOOSE WITH SKID & SAME TO BE INSTALLED 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.
 - 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

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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)	MT	TP	AG

PROFESSIONAL ENGINEER
ANDRE GAMANIAN, P.E.
FL LICENCE NO. 93370
EXP. 02/28/2025

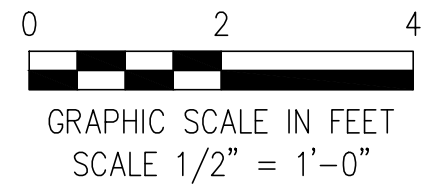


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Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-0700'

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

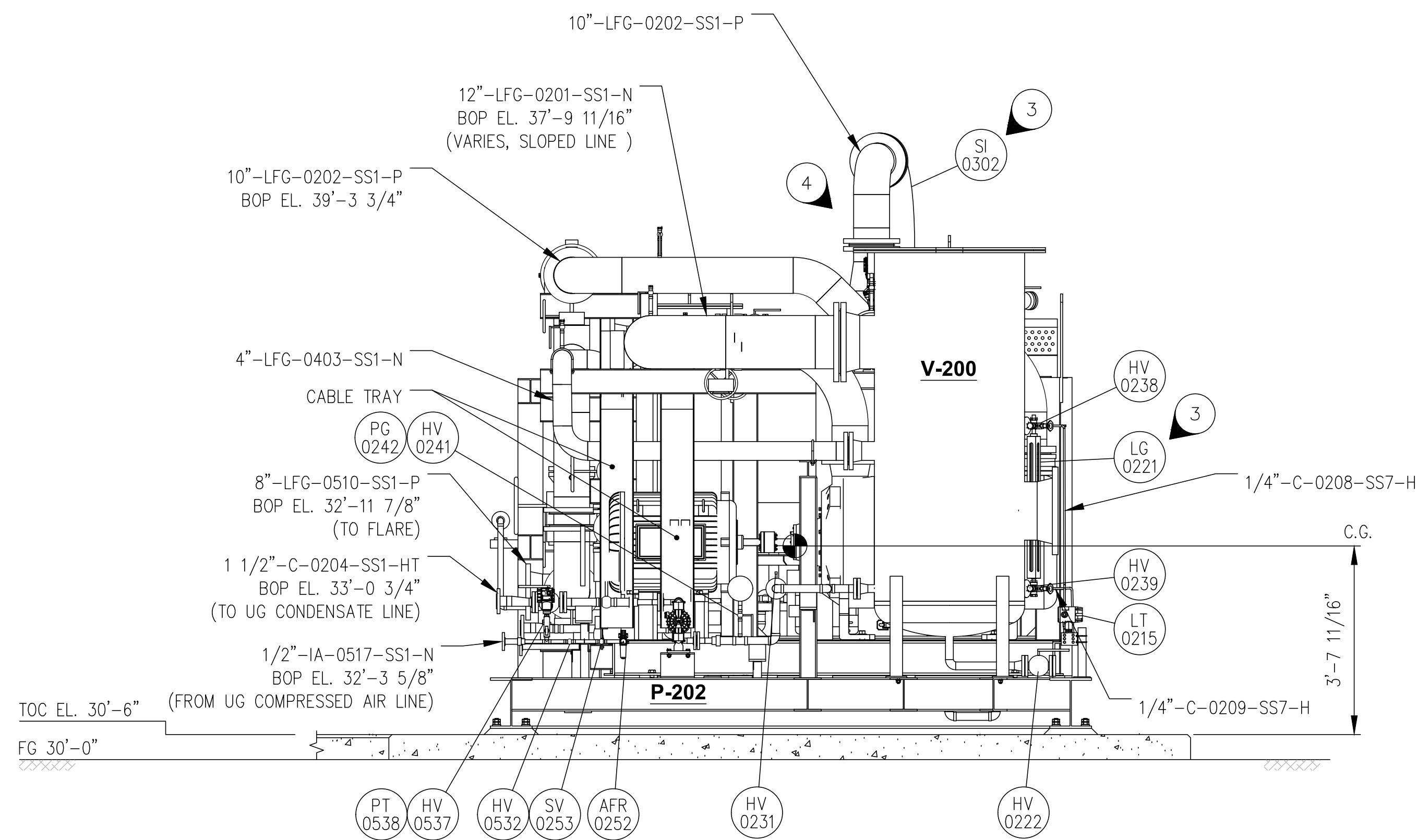
ENGINEER:
BIOGAS ENGINEERING
2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM

BLOWER SKID SECTIONS & DETAILS
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. **M-445I**

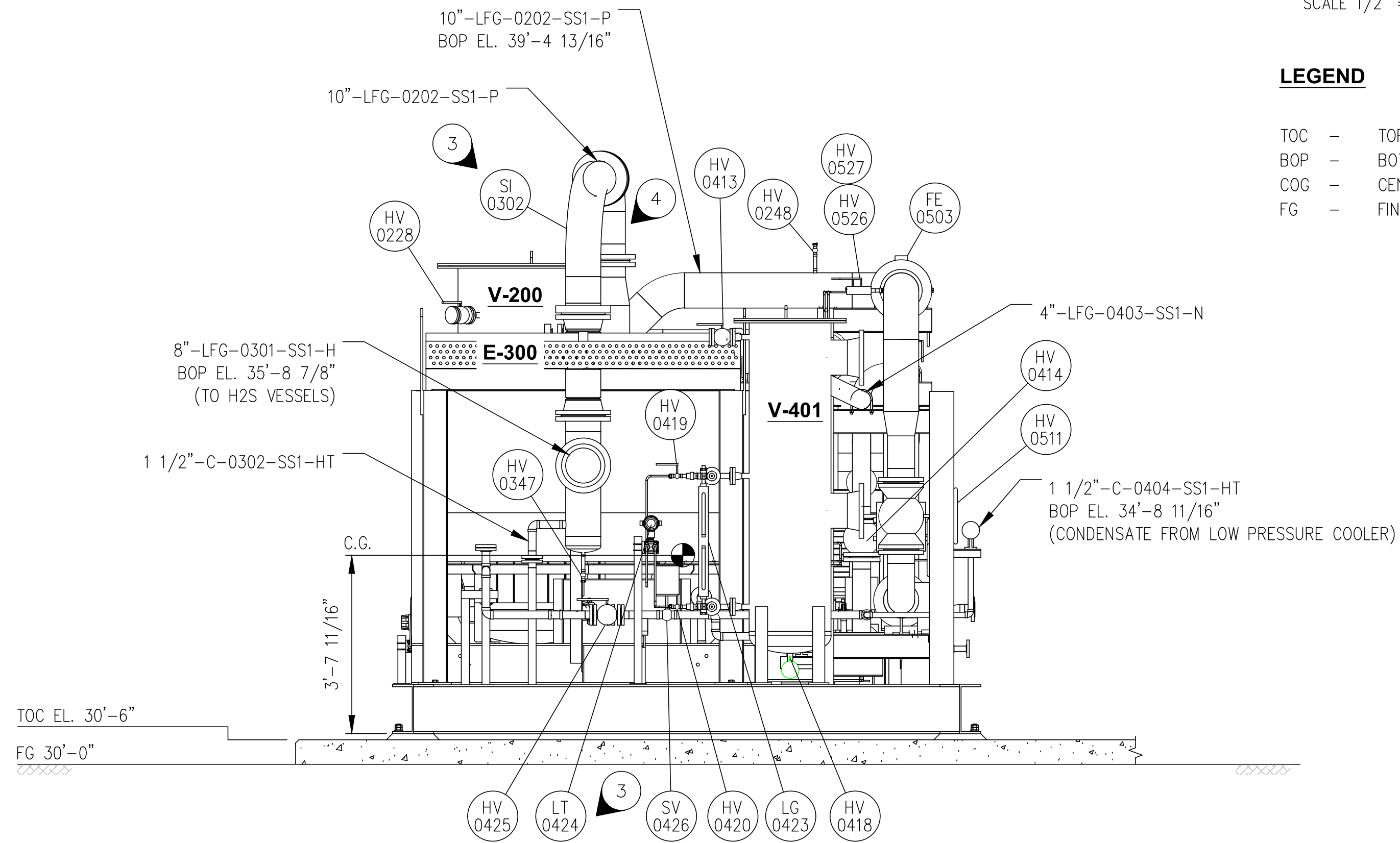


LEGEND

- TOC - TOP OF CONCRETE
- BOP - BOTTOM OF PIPE
- COG - CENTER OF GRAVITY
- FG - FINISHED GRADE



ELEVATION VIEW C
VIEW LOOKING EAST
SCALE 1/2"=1'-0"



ELEVATION VIEW D
VIEW LOOKING WEST
SCALE 1/2"=1'-0"

NOTES:

1. 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.
3. LG-0221, LG-0423 & HOSE TAG SI-0302 TO BE SHIPPED LOOSE WITH SKID & SAME TO BE INSTALLED ON SITE BY CONTRACTOR.
4. 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 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	
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

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

Digitally signed by Andre Gamalian
Date: 2023.09.25 17:53:16 -0700

OWNER: 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

BLOWER SKID SECTIONS & DETAILS

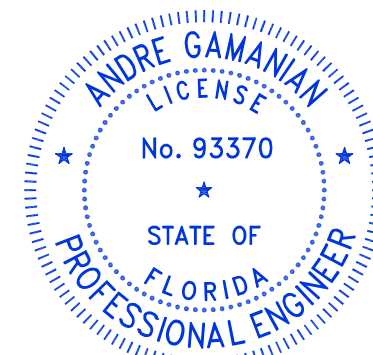
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **M-445J**

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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
1	CS1	Chilled Water Supply & Return	CHWS/CHWR	+47 /+54	58	150#	CS (ERW)	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			
		Hot water Supply & Return	HWS/HWR	40-55	58			MOC of Hot water piping shall be Carbon Steel (ERW) pipes with Rock wool insulation and with Aluminium sheet cladding Note: Max. continuous 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 Steel (ERW)	MOC shall be GI Pipe for the lines running on Piperack and CPVC for lines within the Water Treatment plant. SS 304 ERW (SS1) for clean room Area.
		Raw water	RW	Amb.	58			
		Nitrogen (Gas)	N	Amb.	2			*MOC of Nitrogen in clean room shall be SS 316 ERW (SS5)
5	CP1	Potable Water	WP	Amb.	58	150#	CPVC	
6	SS1	Jacket Pipe for Liquid Nitrogen	JLN	-	-	150#	Stainless Steel ERW	
		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)
		Liquid Nitrogen	LN	-99.4	58			Jacketed pipe shall be of SS 304 ERW (SS1) with vacuum insulation. Perfite insulation
		Breathing Air	BA	Amb.	-			
		Digester Gas	DG	248	25			
		Lube Oil	LO	40	3.1			
7	SS3	Digester Gas	DG	248	206	300#	Stainless Steel ERW	
		Lube Oil	LO	248	206			*MOC of compressed air line shall be SS316L tubing (SS4) after 0.2 micron filter wherever applicable (SS6).
8	SS7	Lab Gas	GAS	Amb	145	150#	SS 316L TUBE	*For lab gases. *Compression tubing/fittings equivalent to Swagelok/parker.
		Compressed Air	CA	Amb	116			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
9	HD1	Leachate	LH	Amb	145	150#	High Density Polyethylene	
		Water	CA	Amb	116			
		Digester Gas	DG	70	5			
10	HD2	Leachate	LH	Amb	145	150#	High Density Polyethylene	
		Water	CA	Amb	116			
		Natural Gas	NG	Amb				
		Waste Gas	WG	Amb				
		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 (SS 304) after 0.2 micron filter wherever applicable (SS6).
		Digester Gas	DG	248	25			
		Lube Oil	LO	40	3.1			

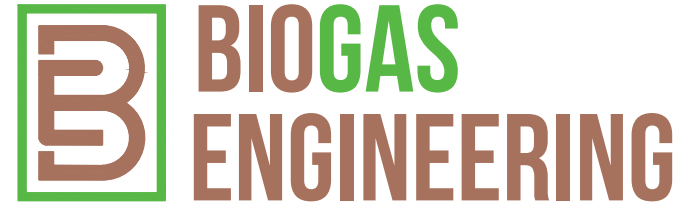
ISSUED FOR CONSTRUCTION

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

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

Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-0700'

OWNER:  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) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING MATERIAL SPECIFICATION (SHEET 1 OF 5)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **M-445K**

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Piping Material Specifications																
MATERIAL: CARBON STEEL (ERW)			SPEC: CS1						Class: 150#							
Services: Chilled Water, Product Gas(BioMethane)																
Design Pressure (psig)	285	260	230	215	NA	NA	NA	Calculation Reference:								
Design Temperature (F)	100	200	300	350	NA	NA	NA	Code of Reference: B31.3 - 2008								
Minimum Temperature (F)	-20	-20	-20	-20	NA	NA	NA	Material: Carbon Steel								
Minimum Test Pressure (psig)	430	390	345	323	NA	NA	NA	Pressure Rating: Class 150								
Maximum Test Pressure (psig)	820															
Max Corrosion Allowance:	0.0625"															
Nominal Pipe Size (in)	1/2	3/4	1	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20
Nominal Pipe Size (NB)	15	20	25	40	50	65	80	100	150	200	250	300	350	400	450	500
Schedule Table	ASME 36.10															
PIPE	THK.	SCH 80 PE						SCH 40 BE								
	TYPE	ERW(NOTE 9)														
	STANDARD	A53						A53								
FLANGES	MATERIAL	A53 GR B						A53 GR B								
	TYPE	SW RAISED FACE, Serrated						WELDNECK RAISED FACE, Serrated								
	CLASS	150#														
BLINDS	MATERIAL	ASTM A 105														
	DIM STD	ASME B 16.5														
	CLASS	150#, RF, Serrated														
FITTINGS	MATERIAL	ASTM A 105														
	DIM STD	ASME B 16.5														
	CLASS	ASME B 16.5														
FULL/HALF COUPLINGS	TYPE	Threaded/Socket Weld, Smts.						BW, Seamless			BW, Welded					
	CLASS	3000#						SCH 40 BE								
	STANDARD	ASME B16.11						ASME B16.9								
BOLTING	MATERIAL	ASTM A105						ASTM A234 Gr WPB								
	TYPE	Socket Weld														
	CLASS	3000#														
GASKETS	STANDARD	ASME B16.11						ASTM A234 Gr WPB								
	MATERIAL	ASTM A105														
	CLASS	3000#														
BALL	TYPE	Regular bore, NPT, Lockable Operator (NOTE 4,5,8,10)			Regular bore, RF, Flanged Ends, (As per ASME B 16.5) Manual Lever Lockable Operator (NOTE 4)											
	CLASS	150#														
	MATERIAL	Body- ASTM A 105 or ASTM A216-WCB, Ball- SS 304 or 316 Seat- PTFE or RTFE or TFM														
GLOBE/GATE	TYPE	SW (NOTE 5,8) (NOTE 4 is only applicable for gate valve)			RF, Flanged end, Serrated (as per ASME B 16.5)(NOTE 5) (NOTE 4 is only applicable for gate valve)											
	CLASS	150#														
	MATERIAL	ASTM A105N, TRIM 13% CR, HARD FACED SEAT			ASTM A216 WCB, Trim-13% CR, HARD FACED SEAT											
CHECK	TYPE	LIFT TYPE (Spring) RF ASME B 16.5			Wafer (Dual Disc Spring Loaded), RF, Serrated as per ASME B 16.5											
	CLASS	150#														
	MATERIAL	Body: ASTM A 105, Disc & Trim-SS 316, Spring: SS316			Body: ASTM A 216 WCB, Disc & Trim-SS 316, Spring: SS316											
BUTTERFLY	TYPE	LUG TYPE														
	CLASS	150#														
	MATERIAL	BODY-ASTM A216 WCB, SPINDLE & DISC-SS 304 or 316, BODY SEAT: SS304 or 316														

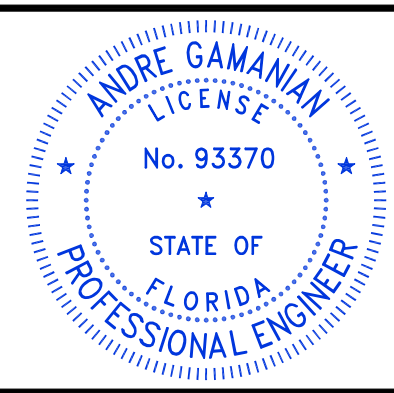
Piping Material Specifications																	
MATERIAL: CARBON STEEL (ERW)			SPEC: CS3						Class: 300#								
Services: Product Gas(BioMethane)																	
Design Pressure (psig)	740	675	655	645	NA	NA	NA	Calculation Reference:									
Design Temperature (F)	100	200	300	350	NA	NA	NA	Code of Reference: B31.3 - 2008									
Minimum Temperature (F)	-20	-20	-20	-20	NA	NA	NA	Material: Carbon Steel									
Minimum Test Pressure (psig)	1110	1015	985	968	NA	NA	NA	Pressure Rating: Class 300									
Maximum Test Pressure (psig)	1320																
Max Corrosion Allowance:	0.0625"																
Nominal Pipe Size (in)	1/2	3/4	1	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20	
Nominal Pipe Size (NB)	15	20	25	40	50	65	80	100	150	200	250	300	350	400	450	500	
Schedule Table	ASME 36.10																
PIPE	THK.	SCH 80 PE						SCH 80 BE			SCH STD BE			SCH 40 BE			
	TYPE	ERW(NOTE 10)															
	STANDARD	A53						A53									
FLANGES	MATERIAL	A53 GR B						A53 GR B									
	TYPE	SW RAISED FACE, Serrated						WELDNECK RAISED FACE, Serrated									
	CLASS	300#															
BLINDS	MATERIAL	ASTM A 105															
	DIM STD	ASME B 16.5															
	CLASS	300#, RF, Serrated															
FITTINGS	MATERIAL	ASTM A 105															
	DIM STD	ASME B 16.5															
	CLASS	ASME B 16.5															
FULL/HALF COUPLINGS	TYPE	Threaded/Socket Weld, Smts.						BW, Seamless			BW, Welded						
	CLASS	3000#						SCH 80 BE			SCH STD BE			SCH 40 BE			
	STANDARD	ASME B16.11						ASME B16.9									
BOLTING	MATERIAL	ASTM A105						ASTM A234 Gr WPB									
	TYPE	Socket Weld															
	CLASS	3000#															
BALL	TYPE	Regular bore, NPT, Lockable Operator (NOTE 4,5,9,11)			Regular bore, RF, Flanged Ends, (As per ASME B 16.5) Manual Lever Lockable Operator (NOTE 4)												
	CLASS	300#															
	MATERIAL	Body: ASTM A 105 or ASTM A216-WCB, Ball- SS 304 or 316 Seat- TFM(NOTE 6)															
GLOBE/GATE	TYPE	SW (NOTE 5,9) (NOTE 4 is only applicable for gate valve)			RF, Flanged end, Serrated (as per ASME B 16.5)(NOTE 5) (NOTE 4 is only applicable for gate valve)												
	CLASS	300#															
	MATERIAL	ASTM A105N, TRIM 13% CR, HARD FACED SEAT			ASTM A216 WCB, Trim-13% CR, HARD FACED SEAT												
CHECK	TYPE	LIFT TYPE (Spring) RF ASME B 16.5			Wafer (Dual Disc Spring Loaded), RF, Serrated as per ASME B 16.5												
	CLASS	300#															
	MATERIAL	Body: ASTM A 105, Disc & Trim-SS 316, Spring: SS316			Body: ASTM A 216 WCB, Disc & Trim-SS 316, Spring: SS316												
BUTTERFLY	TYPE	LUG TYPE															
	CLASS	300#															
	MATERIAL	BODY-ASTM A216 WCB, SPINDLE & DISC-SS 304 or 316, BODY SEAT: SS304 or 316															

Piping Material Specifications																
MATERIAL: CARBON STEEL (ERW)			SPEC: CS6						Class: 600#							
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	Code of Reference: B31.3 - 2008								
Minimum Temperature (F)	-20	-20	-20	-20	-20	-20	NA	Material: Carbon Steel								
Minimum Test Pressure (psig)	2025	1975	1905	1905	1900	1900	NA	Pressure Rating: Class 600								
Maximum Test Pressure (psig)	2625															
Max Corrosion Allowance:	0.0625"															
Nominal Pipe Size (in)	1/2	3/4	1	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20
Nominal Pipe Size (NB)	15	20	25	40	50	65	80	100	150	200	250	300	350	400	450	500
Schedule Table	ASME 36.10															
PIPE	THK.	SCH 160 PE						SCH 160 PE								
	TYPE	SEAMLESS ERW(NOTE 8)														
	STANDARD	A53														
FLANGES	MATERIAL	A53 GR B						A53 GR B								
	TYPE	SW RAISED FACE, Serrated						WELDNECK RAISED FACE, Serrated								
	CLASS	600#														
BLINDS	MATERIAL	ASTM A 105														
	DIM STD	ASME B 16.5														
	CLASS	600#, RF, Serrated														
FITTINGS	MATERIAL	ASTM A 105														
	DIM STD	ASME B 16.5														
	CLASS	ASME B 16.5														
FULL/HALF COUPLINGS	TYPE	Threaded/Socket Weld, Smts.						BW, Seamless			BW, Welded					
	CLASS	6000#						Sch. 160			Sch. 160					
	STANDARD	ASME B16.11						ASME B16.9								
BOLTING	MATERIAL	ASTM A105						ASTM A234 Gr WPB								
	TYPE	Socket Weld														
	CLASS	6000#														
BALL	TYPE	Regular bore, NPT, Lockable Operator (NOTE 4,5,9,11)			Regular bore, RF, Flanged Ends, (As per ASME B 16.5) Manual Lever Lockable Operator (NOTE 4)											
	CLASS	300#														
	MATERIAL	Body: ASTM A 105 or ASTM A216-WCB, Ball- SS 304 or 316 Seat- TFM(NOTE 6)														
GLOBE/GATE	TYPE	SW (NOTE 5,9) (NOTE 4 is only applicable for gate valve)			RF, Flanged end, Serrated (as per ASME B 16.5)(NOTE 5) (NOTE 4 is only applicable for gate valve)											
	CLASS	600#														
	MATERIAL	ASTM A105N, TRIM 13% CR, HARD FACED SEAT			ASTM A216 WCB, Trim-13% CR, HARD FACED SEAT											
CHECK	TYPE	LIFT TYPE (Spring) RF ASME B 16.5			Wafer (Dual Disc Spring Loaded), RF, Serrated as per ASME B 16.5											
	CLASS	600#														
	MATERIAL	Body: ASTM A 105, Disc & Trim-SS 316, Spring: SS316			Body: ASTM A 216 WCB, Disc & Trim-SS 316, Spring: SS316											
BUTTERFLY	TYPE	LUG TYPE														
	CLASS	600#														
	MATERIAL	BODY-ASTM A216 WCB, SPINDLE & DISC-SS 304 or 316, BODY SEAT: SS304 or 316														

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	
4	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

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

OWNER: 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING MATERIAL SPECIFICATION
(SHEET 2 OF 5)

DRAWING NO. **M-445L**

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

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Piping Material Specifications											
MATERIAL : CARBON STEEL (GLV.)			SPEC: GS1						Class: 150#		
Services: Potable water											
Design Pressure (psig)	232	232	NA	NA	NA	NA	NA	NA	Calculation Reference:		
Design Temperature (F)	149	149	NA	NA	NA	NA	NA	NA	Code of Reference:		B31.3 - 2008
Minimum Temperature (F)	-20	-20	NA	NA	NA	NA	NA	NA	Material:		Galvanized Carbon steel
Minimum Test Pressure (psig)	348	348	NA	NA	NA	NA	NA	NA	Pressure Rating:		Class 150
Maximum Test Pressure (psig)	375						External Pressure Rating:			15 psi	
Max Corrosion Allowance:	0										
Nominal Pipe Size (in)	1/4	3/4	1	1 1/2	2	2 1/2	3	4	6		
Nominal Pipe Size (NB)	15	20	25	40	50	65	80	100	150		
Schedule Table	ASME 36.10										
PIPE	THK	SCH 10									
	TYPE	ERW, Screw ed, NPT(M)					ERW, Screw ed, NPT(M)				
STANDARD	A53 (Galvanized)										
	MATERIAL	A53 GRB									
FLANGES	TYPE	Screw ed, NPT(F), Serrated, RF									
	CLASS	150#									
LINES	MATERIAL	ASTM A 105 (Glv.)									
	DIM STD	ASME B16.5									
BLUNDS	CLASS	150#, RF, Serrated									
	MATERIAL	ASTM A 105 (Glv.)									
DIM STD	ASME B16.5										
	TYPE	Sm's, Screw ed, NPT(F)									
FITTINGS	CLASS	2000#									
	STANDARD	ASME B16.11									
MATERIAL	ASTM A105 (Glv.)										
	TYPE	Screw ed, NPT(F)									
FULL/HALF COUPLINGS	CLASS	2000#									
	STANDARD	ASME B16.11									
MATERIAL	ASTM A105 (Glv.)										
	BOLTING	Bolts ASTM A 193 Gr B7, Hex nuts ASTM A194 Gr 2H PTFE coated									
Hex Headed Bolt and Nut PTFE coated, ASME 18.2.2											
GASKETS	Asbestos free (Armid Fibres bonded w ith Nitrile Butyl Rubber), 3 mm Thk. ASME B 16.21.										
BALL	TYPE	2 Piece Brass Ball Valve-Lead Free, Threaded Type, NPT (F)			Regular bore, 2-Piece, RF, Flanged Ends (As per ASME B 16.5) (NOTE 3)						
	CLASS	Manufacturer's (Nbc Valve or Equal)			150#						
MATERIAL	Body: Forged LZK Copper Alloy			Ball: Stainless Steel or Chrome Plated Brass, Seat: PTFE							
	Body: ASTM A216-WCB, Ball: SS 304, Seat: PTFE										
GLOBE/GATE	TYPE	Lead Free Bronze Valve, Threaded Type, NPT (F)			RF, Flanged end, Serrated						
	CLASS	Manufacturer's (Nbc Valve or Equal)			150#						
MATERIAL	Body: Bronze ASTM B584 Alloy C87850, Seat & Trim: Bronze ASTM B584 Alloy C87850 (In Globe)			ASTM A216 WCB, Trim-13% CR, HARD FACED SEAT							
	Lead Free Check Valve, Swing type, NPT(F),			Swing type, RF, Flanged End, as per ASME B16.5							
CHECK	CLASS	Manufacturer's (Nbc Valve Or Equal)			150#						
	MATERIAL	Body: ASTM B584 Alloy C87850, Trim: ASTM B584 Alloy C87850, Spring: AISI 410, Disc: 316SS, Disc: PTFE			Body: ASTM A216 WCB, Trim: 13% Cr., Spring: AISI 410, Disc: A1045						
BUTTERFLY	TYPE	WAFER									
	CLASS	150# (Nbc Valve or Equal)									
MATERIAL	Body: ASTM A536, Disc: Alum Brz. ASTM B148 Alloy 955 & Spindle: Stainless Steel ASTM A582 Type 416, Body Liner Material - EPDM Rubber										

- NOTES:**
- Butterfly Valve 8" and above Gear Operated
 - No Asbestos or its ingredient to be used in any part of valve / gasket
 - Extended stem ball valve shall be used for Chilled water services.
 - Use full bore for pressure relief system
 - Higher rating flange to be used to match the counter flange requirement only
 - For sizes 6" and smaller butterfly valve to be used as on-off valve only when specified in the P&ID
- TESTING:**
- Hydrotest pressure = 1.5 X Design pressure
 - Pneumatic Test Pressure= 1.1 X Design Pressure

Piping Material Specifications												
MATERIAL: CHLORINATED POLYVINYL CHLORIDE			SPEC: CP1						Class: 150#			
Services: Potable Water												
Design Pressure (psig)	150	136.5	123	97.5	75	60	43.5	Calculation Reference:				
Design Temperature (F)	73	90	100	120	140	160	170	Code of Reference:		NA		
Minimum Temperature (F)	32	32	32	32	32	32	32	Material:				C-PVC
Minimum Test Pressure (psig)	150	150	150	150	112.5	90	65.3	Pressure Rating:		Class 150		
Maximum Test Pressure (psig)	150						External Pressure Rating:			15 psi		
Max Corrosion Allowance:	0											
Nominal Pipe Size (in)	1/4	3/4	1	1 1/2	2	2 1/2	3	4				
Nominal Pipe Size (NB)	15	20	25	40	50	65	80	100				
THK	FN16											
TYPE	Plain End											
STANDARD	Metric, EN ISO 15493, Series S4, SDR 9											
	Metric, EN ISO 15493, Series S6.3, SDR 13.6											
MATERIAL	PVC-C, Georg Fischer or ow ner approved equal.											
	LINES	TYPE	Socket									
CLASS		ASME B16.5, #150, Flat Face										
MATERIAL	PVC-C, Georg Fischer or ow ner approved equal											
	DIM STD	Metric, EN ISO 15493										
BLUNDS	CLASS	ASME B16.5, #150, Flat Face										
	MATERIAL	PVC-C, Georg Fischer or ow ner approved equal										
DIM STD	Metric, EN ISO 15493											
	TYPE	Socket										
FITTINGS	CLASS	Schedule 80										
	STANDARD	Metric, EN ISO 15493 / ISO 727-1										
MATERIAL	PVC-C, Georg Fischer or ow ner approved equal.											
	TYPE	Socket										
CLASS	Schedule 80											
	STANDARD	Metric, EN ISO 15493 / ISO 727-1										
MATERIAL	PVC-C, Georg Fischer or ow ner approved equal.											
	Solvent Cemented											
BOLTING	Bolt : ASTM A-193 Gr B7 PTFE coated Nut : ASTM A194 Gr 2H PTFE coated, ASME 18.2.2											
GASKETS	3mm thick. ASME B16.5 Class 150 FF. Rated: 1189 psig @ 500 °F, Nylon PTFE, Factory cut and punched. Garlock No. 3540											
CLEANER AND CEMENT	As furnished by fittings manufacturer. Alternatives: (ow ner approved) Cement: Henkel, Tangit, Cleaner: Tangit											
BALL	TYPE	EN ISO 16135, True double-union, Socket, Lockable handle. Stem extension if insulated.										
	CLASS	150#										
MATERIAL	Georg Fischer type 546 or ow ner approved equal. PVC-C Valve body and ball, PTFE seal, Viton O-Ring											
	TYPE	EN ISO 16137, Ball check type, True double union, Socket										
CLASS	150#											
	MATERIAL	Georg Fischer type 562 or ow ner approved equal. PVC-C Valve body and ball, Viton (FPM) seal. Stainless Steel spring.										
TYPE	EN ISO 16136, Wafer type, Double eccentric disc, Lockable lever handle (5 increments c/w six teeth engagement betw een ratchet and index plate)											
	CLASS	150#										
MATERIAL	Georg Fischer type 567 or ow ner approved equal. PVC-C Valve body and ball, Viton (FPM) seal.											

- NOTES:**
- PVC-C pipe is supplied in OD metric sizes
 - Use fittings for all branch connections
 - Components must comply w ith Pressure Equipment Directive 97/23/EC w here applicable.
 - Bolts and nuts shall be marked w ith manufacturer's identification and grade. Provide material certificates in accordance w ith EN 10204:2004 Type 2.2.
 - Installing piping in cold environments may affect the solvent cement joints and w ill require special considerations. Where piping items or environmental conditions are below 4°C (40°F) consult the manufacturer.
 - Special considerations must be given to accommodate PVC-C piping thermal expansion. Consult manufacturer's recommended practices.
 - Support piping in accordance w ith the manufacturer's instructions.
 - Consult manufacturer's literature for solvent cement cure times. Allow necessary cure time prior to pressurizing system.
 - Anti-seize compound to be used. Chesterton "725-Nickel" or ow ner approved equivalent.
 - Flat washers shall be used under bolt heads and nuts per ASME B31.3 Para A 335.2.5.
 - Maximum operating pressure/temperature ratings are for pipe, fittings, flanges and valves and are limited by the valves.
 - Utilize welded, solder, brazed, solvent cement, and heat fusion joints for piping systems located above Classified and Controlled Unclassified areas. No grooved, threaded, or mechanical joints are allowed
 - Uninsulated PVC-C piping systems, installed outdoors, shall be painted w ith an approved UV protective coating
 - Higher rating flange to be used to match the counter flange requirement only
 - Nuts and bolts to be marked w ith manufacturer's identification and grade.
 - Flanges shall only be used w hen indicated on drawings or for equipment connections

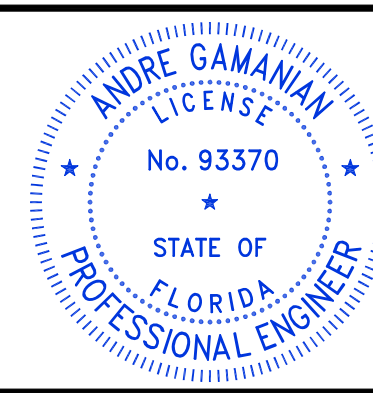
Piping Material Specifications															
MATERIAL: POLYETHYLENE			SPEC: HD1						Class: 150#						
Services: Water, Digester Gas															
Design Pressure (psig)	100	80	NA	NA	NA	NA	NA	Calculation Reference:							
Design Temperature (F)	73	73	NA	NA	NA	NA	NA	Code of Reference:		NA					
Minimum Temperature (F)	0	0	NA	NA	NA	NA	NA	Material:				HDPE			
Minimum Test Pressure (psig)	150	120	NA	NA	NA	NA	NA	Pressure Rating:		100 Psi					
Maximum Test Pressure (psig)							External Pressure Rating:			15 psi					
Max Corrosion Allowance:															
Nominal Pipe Size (in)	3/4	1	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20
Nominal Pipe Size (NB)	20	25	40	50	65	80	100	150	200	250	300	350	400	450	500
Schedule Table	HDPE IRON PIPE SIZE (IPS) PE3408														
PIPE	THK	SDR 17													
	TYPE	Plain End													
STANDARD	ASTM D3035														
	MATERIAL	ASTM D3035, PE3408													
LINES	TYPE	Back up Flange													
	CLASS	#150, Flat Face													
MATERIAL	ASTM A105														
	DIM STD	ASME B16.5,													
BLUNDS	CLASS	#150, Flat Face													
	MATERIAL	ASTM D3035, PE3408													
DIM STD	ASME B16.5,														
	TYPE	Butt Fusion Fitting													
FITTINGS	CLASS	SDR 17													
	STANDARD	ASTM D3261													
MATERIAL	ASTM D1248 P34 (PE3408)														
	TYPE	Butt Fusion Fitting													
CLASS	SDR 17														
	STANDARD	ASTM D3261													
MATERIAL	ASTM D1248 P34 (PE3408)														
	BOLTING	Bot : ASTM A-307 Gr A ASME 18.2.1 Nut : ASTM A563 Gr B, ASME 18.2.2													
GASKETS	Neoprene														
BALL	TYPE	Regular bore, 2-Piece, FF, Flanged Ends (As per ASME B 16.5) (NOTE 3)													
	CLASS	150#													
MATERIAL	Body: ASTM A105			Ball: SS 304, Seat: PTFE											
	Body: ASTM A216-WCB, Ball: SS 304, Seat: PTFE														
GLOBE/GATE	TYPE	FF, Flanged end, Serrated (NOTE 3 is only applicable for gate valve)													
	CLASS	150#													
MATERIAL	ASTM A105N, TRIM 13% CR, HARD FACED			ASTM A216 WCB, Trim-13% CR, HARD FACED SEAT											
	TYPE	LIFT TYPE (Spring) FF ASME B 16.5E			Flanged (Sw ing type), FF, ASME B 16.5										
CLASS	150#														
	MATERIAL	Body: ASTM A105, Trim 13% Cr., Spring: AISI 410, Disc: A1045			Body: ASTM A 216 WCB, Seat & Trim 13% Cr., Spring: AISI 410, Disc: A1045										
TYPE	WAFER														
	CLASS	150#													
MATERIAL	BODY-ASTM A216 WCB, SPINDLE & DISC-SS 304, BODY SEAT: SS304														

- NOTES:**
- Butterfly Valve 8" and above Gear Operated,
 - No Asbestos or It's ingredient to be used in gasket or in any parts of valve.
 - Use full bore for pressure relief system.
 - Higher rating flange to be used to match the counter flange requirement only
 - For sizes 6" and smaller butterfly valve to be used as on-off valve only w hen specified in the P&ID
- TESTING:**
- Hydrotest pressure = 1.5 X Design pressure
 - Pneumatic Test Pressure= 1.1 X Design Pressure

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	
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

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

OWNER: 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING MATERIAL SPECIFICATION
(SHEET 3 OF 5)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **M-445M**

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Piping Material Specifications																
MATERIAL: SS 304 (ERW)				SPEC: SS1				Class: 150#								
Services: Compressed Air, Digester Gas, Lube Oil																
Design Pressure (psig)	230	195	175	170	NA	NA	NA	Calculation Reference:								
Design Temperature (F)	100	200	300	350	NA	NA	NA	Code of Reference: B31.3 - 2008								
Minimum Temperature (F)	-425	-425	-425	-425	NA	NA	NA	Material: Stainless Steel								
Minimum Test Pressure (psig)	345	265	265	255	NA	NA	NA	Pressure Rating: Class 150								
Maximum Test Pressure (psig)	440 for NPS ≤ 6, 360 for NPS > 6							External Pressure Rating: 15 psi								
Max Corrosion Allowance:	0.0625"															
Nominal Pipe Size (in)	½	¾	1	1½	2	2½	3	4	6	8	10	12	14	16	18	20
Nominal Pipe Size (NB)	15	20	25	40	50	65	80	100	150	200	250	300	350	400	450	500
Schedule Table	ASME 36.19															
PIPE	THK Sch 80S, BE				Sch 40S, BE				Sch 10S, BE							
TYPE	ERW(NOTE 8)															
STANDARD	ASME A312															
MATERIAL	ASTM A312 Gr TP 304															
FLANGES	TYPE SW RAISED FACE, Serrated				WELDNECK RAISED FACE, Serrated											
LINES	CLASS 150#															
MATERIAL	ASTM A 182 Gr F304															
DIM STD	ASME B 16.5															
BLINDS	CLASS 150#, RF, Serrated															
MATERIAL	ASTM A 182 Gr F304															
DIM STD	ASME B 16.5															
FITTINGS	TYPE Socket Weld, Smls.				BW, SMLS				BW, Welded							
CLASS	3000#				Sch 80S				Sch 40S, BE				Sch 10S, BE			
STANDARD	ASME B16.9															
MATERIAL	ASTM A 182 Gr F304				ASTM A 403 Gr WP 304											
FULL/HALF COUPLINGS	TYPE															
CLASS																
STANDARD																
MATERIAL																
BOLTING	Bolts ASTM A-193 Gr B8, Hex nuts ASTM A194 Gr 8, ASME B 18.2.2															
GASKETS	SGASKET, 1/8" THK, 316 SS CORE, GRAPHITE FACED, CLASS 150, RF, ASME B16.20															
BALL	TYPE Regular bore, NPT, Lockable Operator (NOTE 4,5,7)				Regular bore, RF, Flanged Ends, (As per ASME B 16.5) Manual Lever Lockable Operator (NOTE 4,5)											
CLASS	150#															
MATERIAL	Body- ASTM A182 Gr F304 or ASTM A351 Gr. CF8, Ball- SS 304 or 316 Seat- PTFE or RTFE or TFM															
GLOBE/GATE	TYPE SW (NOTE 5,7) (NOTE 4 is only applicable for gate valve)				RF, Flanged end, Serrated (as per ASME B 16.5) (NOTE 5) (NOTE 4 is only applicable for gate valve)											
CLASS	150#															
MATERIAL	Body- ASTM A182 Gr F304 or ASTM A351 Gr. CF8, Disc- SS 316, Seat- PTFE or RTFE or TFM															
CHECK	TYPE LIFT TYPE (Spring) RF, Flanged, ASME B 16.5				Wafer (Dual Disc Spring Loaded), RF, Serrated as per ASME B 16.5											
CLASS	150#															
MATERIAL	ASTM A351 Gr. CF8, Disc & Trim SS 316, Spring SS 316															
BUTTERFLY	TYPE				WAFER				LUG TYPE							
CLASS	150#															
MATERIAL	BODY-ASTM A351 CF8M, SPINDLE & DISC-SS 304 or 316, BODY SEAT: SS304 or 316															
NOTES:																
1. Butterfly Valve 8" and above Gear Operated																
2. No Asbestos or its Ingredient 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, NPT(F) end connection, for instrument, vents and drains.																
6. Higher rating flange to be used to match the counter flange requirement only																
7. Use flanged valve when specifically mentioned in the P&ID																
8. Use seamless pipe when specifically mentioned in the P&ID and/or in isometric drawings																
TESTING:																
1. DPMP - 10% of Weld joint																
2. Radiography - As decided by the site-incharge																
3. Hydrotest pressure = 1.5 X Design pressure																

Piping Material Specifications																
MATERIAL: SS 304 (ERW)				SPEC: SS3				Class: 300#								
Services: Digester Gas, Lube Oil																
Design Pressure (psig)	600	505	455	440	NA	NA	NA	Calculation Reference:								
Design Temperature (F)	100	200	300	350	NA	NA	NA	Code of Reference: B31.3 - 2008								
Minimum Temperature (F)	-425	-425	-425	-425	NA	NA	NA	Material: Stainless Steel								
Minimum Test Pressure (psig)	900	760	680	660	NA	NA	NA	Pressure Rating: Class 300								
Maximum Test Pressure (psig)	440 for NPS ≤ 6, 360 for NPS > 6							External Pressure Rating: 15 psi								
Max Corrosion Allowance:	0.0625"															
Nominal Pipe Size (in)	½	¾	1	1½	2	2½	3	4	6	8	10	12	14	16	18	20
Nominal Pipe Size (NB)	15	20	25	40	50	65	80	100	150	200	250	300	350	400	450	500
Schedule Table	ASME 36.19															
PIPE	THK Sch 80S, BE				Sch 40S, BE				Sch 10S, BE							
TYPE	ERW(NOTE 9)															
STANDARD	ASME A312															
MATERIAL	ASTM A312 Gr TP 304															
FLANGES	TYPE SW RAISED FACE, Serrated				WELDNECK RAISED FACE, Serrated											
LINES	CLASS 300#															
MATERIAL	ASTM A 182 Gr F304															
DIM STD	ASME B 16.5															
BLINDS	CLASS 300#, RF, Serrated															
MATERIAL	ASTM A 182 Gr F304															
DIM STD	ASME B 16.5															
FITTINGS	TYPE Socket Weld, Smls.				BW, SMLS				BW, Welded							
CLASS	3000#				Sch 80S				Sch 40S, BE				Sch 10S, BE			
STANDARD	ASME B16.9															
MATERIAL	ASTM A 182 Gr F304				ASTM A 403 Gr WP 304											
FULL/HALF COUPLINGS	TYPE															
CLASS																
STANDARD																
MATERIAL																
BOLTING	Bolts ASTM A-193 Gr B8, Hex nuts ASTM A194 Gr 8, ASME B 18.2.2															
GASKETS	SGASKET, 1/8" THK, 316 SS CORE, GRAPHITE FACED, CLASS 300, RF, ASME B16.20															
BALL	TYPE Regular bore, NPT, Lockable Operator (NOTE 4,5,8)				Regular bore, RF, Flanged Ends, (As per ASME B 16.5) Manual Lever Lockable Operator (NOTE 4,5)											
CLASS	300#															
MATERIAL	Body- ASTM A182 Gr F304 or ASTM A351 Gr. CF8, Ball- SS 304 or 316 Seat- TFM (NOTE 6)															
GLOBE/GATE	TYPE SW (NOTE 5,8) (NOTE 4 is only applicable for gate valve)				RF, Flanged end Serrated (as per ASME B 16.5) (NOTE 5) (NOTE 4 is only applicable for gate valve)											
CLASS	300#															
MATERIAL	Body- ASTM A182 Gr F304 or ASTM A351 Gr. CF8, Disc- SS 316, Seat & Trim- SS 316															
CHECK	TYPE LIFT TYPE (Spring) RF, Flanged, ASME B 16.5				Wafer (Dual Disc Spring Loaded), RF, Serrated as per ASME B 16.5											
CLASS	300#															
MATERIAL	ASTM A351 Gr. CF8, Disc & Trim-SS 316, Spring SS316															
BUTTERFLY	TYPE				Wafer				lug							
CLASS	300#															
MATERIAL	BODY-ASTM A351 CF8M, SPINDLE & DISC-SS 304 or 316, BODY SEAT: SS304 or 316															
NOTES:																
1. Butterfly Valve 8" and above Gear Operated																
2. No Asbestos or its Ingredient 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, NPT(F) end connection, for instrument, vents and drains.																
6. RTFE or PTFE seat can be used, provided piping design temperature and pressure is within seat material's pressure/temperature rating.																
7. Higher rating flange to be used to match the counter flange requirement only																
8. Use flanged valve when specifically mentioned in the P&ID																
9. Use seamless pipe when specifically mentioned in the P&ID and/or in isometric drawings																
TESTING:																
1. DPMP - 10% of Weld joint																
2. Radiography - As decided by the site-incharge																
3. Hydrotest pressure = 1.5 X Design pressure																

Piping Material Specifications																				
MATERIAL: SS 316L TUBE				SPEC: SS7				Class: 150#												
SERVICE: Product Gas (BioMethane), Compressed Air, Digester Gas																				
Design Pressure (psig)	2000	2000	1890	1675	1555	1425	930	Calculation Reference:												
Design Temperature (F)	100	300	400	600	800	900	1000	Code of Reference: B31.3 - 2008												
Minimum Temperature (F)	-425	-425	-425	-425	-425	-425	-425	Material: Stainless Steel												
Minimum Test Pressure (psig)	3000	3000	3055	3110	3140	3025	2080	Pressure Rating: 2000 PSI												
Maximum Test Pressure (psig)	3330							External Pressure Rating: 15 psi												
Max Corrosion Allowance:	.01"																			
Tube OD Size (in)	1/8	¼	3/8	½	¾	1														
Tube OD Size (mm)	6	8	10	12.7	19.05	25.4														
Schedule Table	NA																			
PIPE	THK MM 0.035				0.065				0.083				0.109				0.12			
TYPE	Seamless, Plain ends																			
STANDARD	ASTM A269/SA213																			
MATERIAL	SS 316L, Hardness 80 HRB, Cold draw n, Outside matt finish Bright Annealed																			
UNION	TYPE Double ferrule compression type with back ferrule (Compression fittings) Hardness 80 HRB																			
CLASS	NA																			
MATERIAL	Sw agelok																			
DIM STD	SS 316L																			
TRICLOVER	TYPE																			
CLASS																				
MATERIAL																				
DIM STD																				
FITTINGS	TYPE Double ferrule compression type with back ferrule (Compression fittings) Hardness 80 HRB																			
CLASS	NA																			
THK/END	Suitable for sw aging																			
MATERIAL	SS 316L																			
FULL/HALF COUPLINGS	TYPE																			
CLASS																				
STANDARD																				
MATERIAL																				
GASKETS	4mm O-Ring PTFE (Food grade) to comply with CFR 21.177.2600 / USP Class VI																			
SEAL RING	Silicon (FOOD GRADE)																			
VALVES	NEEDLE				BALL				CHECK											
TYPE	2-way Type				2500#, NPT (Female) with back ferrule ends.				2-way Type				Lift Type							
CLASS	2500#, NPT (Female) with back ferrule ends.				2500#, NPT (Female) with back ferrule ends.				2500#, NPT (Female) with back ferrule ends.				2500#, NPT (Female) with back ferrule ends.							
MATERIAL	SS 316L				SS 316L				SS 316L				SS 316L							
TYPE	2-way Type				2500#, NPT (Female) with back ferrule ends.				Lift Type											
CLASS	2500#, NPT (Female) with back ferrule ends.				2500#, NPT (Female) with back ferrule ends.				2500#, NPT (Female) with back ferrule ends.				2500#, NPT (Female) with back ferrule ends.							
MATERIAL	SS 316L				SS 316L				SS 316L				SS 316L							
NOTE:																				
1. No Asbestos or It's ingredient to be used in gasket or in any parts of valve.																				
2. Fittings/ Valves shall be as per Sw agelok/Equivalent Gas Tubing Standard.																				
3. Valves must be bubble tight leak tested.																				
4. The Pipe, fitting and valve must be Cleaned for Oxygen Service.																				
Reference may be taken from Compressed gas association's Pamphlet G-4-1/ ASTM G93 Level C for Oxygen Service. Thread sealing compound must be suitable for oxygen services. Piping and components of oxygen service shall be cleaned, Degreased, Dried and capped. All components used for this system must be 5.Pneumatic Test Pressure= 1.1 X Design Pressure																				

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	
4	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

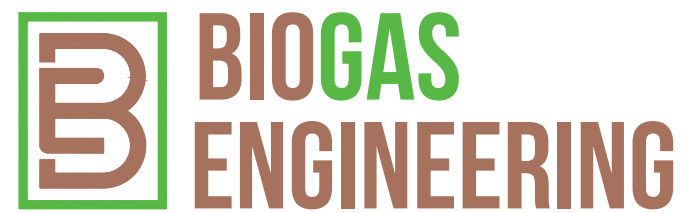
ANDRE GAMANIAN, P.E.
FL LICENCE NO.93370
EXP. 02/28/2025



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

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

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

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

PIPING MATERIAL SPECIFICATION
(SHEET 4 OF 5)

DRAWING NO. **M-445N**

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

C:\Users\Mukesh.Thakur\Biosgas Engineering\Biosgaseng - Documents\Engineering\Projects\Ush2126.100 - Indian River County LF\Drawings\M-Mechanical\M-445K to M-445O.dwg 21-06-2023 Mukesh Thakur

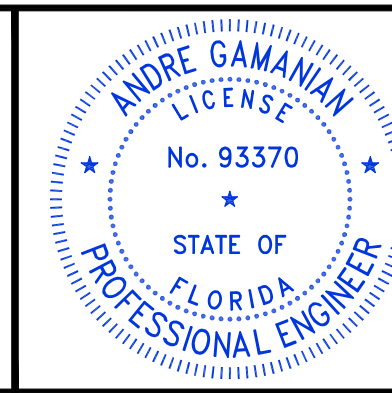
Piping Material Specifications														
MATERIAL: POLYETHYLENE			SPEC: HD2						Class: 150#					
Services: Water, Leachate, Digester Gas														
Design Pressure (psig)	200	193	160	128	110	NA	Calculation Reference:							
Design Temperature (F)	73	73	73	73	73	NA	Code of Reference:				NA			
Minimum Temperature (F)	0	0	0	0	0	NA	Material:				HDPE			
Minimum Test Pressure (psig)	300	289.5	240	192	165	NA	Pressure Rating:				200 Psi			
Maximum Test Pressure (psig)							External Pressure Rating:				15 psi			
Max Corrosion Allowance:														
Nominal Pipe Size (in)														
Nominal Pipe Size (NB)														
Schedule Table														
HDPE IRON PIPE SIZE (IPS) PE3408														
PIPE	THK	SDR 7												
	TYPE	Plain End												
STANDARD	ASTM D3035													
	MATERIAL													
FLANGES	LINES	TYPE	Back up Flange											
		CLASS	#150, Flat Face											
	MATERIAL	ASTMA105												
		DIM STD												
BLINDS	CLASS	#150, Flat Face												
	MATERIAL	ASTM D3035, PE3408												
DIM STD	ASME B16.5,													
	FITTINGS													
TYPE	Butt Fusion Fitting													
	CLASS	SDR 7												
STANDARD	ASTM D3261													
MATERIAL	ASTM D1248 P34 (PE3408)													
CAP COUPLING	TYPE	Butt Fusion Fitting												
	CLASS	SDR 7												
STANDARD	ASTM D3261													
MATERIAL	ASTM D1248 P34 (PE3408)													
BOLTING														
Bolt : ASTM A-307 Gr A ASME 18.2.1 Nut : ASTM A563 Gr B, ASME 18.2.2														
GASKETS														
Neoprene														
BALL	TYPE	Regular bore, 2-Piece, FF, Flanged Ends (As per ASME B 16.5)(NOTE 3)												
	CLASS	150#												
	MATERIAL	Body: ASTM A105 Ball: SS 304, Seat: PTFE	Body: ASTM A216-WCB, Ball: SS 304, Seat: PTFE											
GLOBE/GATE	TYPE	FF, Flanged end, Serrated (NOTE 3 is only applicable for gate valve)												
	CLASS	150#												
	MATERIAL	ASTMA105N TRIM 13% CR, HARD FACED	ASTMA216 WCB, Trim: 13% CR, HARD FACED SEAT											
CHECK	TYPE	LIFT TYPE (Spring) FF ASME B 16.5E	Flanged (Swing type), FF, ASME B 16.5											
	CLASS	150#												
	MATERIAL	Body: ASTM A105, Trim 13% Cr., Spring: AISI 410, Disc: A1045	Body: ASTM A 216 WCB, Seat & Trim 13% Cr., Spring: AISI 410, Disc: A1045											
BUTTERFLY	TYPE	WAFER												
	CLASS	150#												
	MATERIAL	BODY-ASTM A216 WCB, SPINDLE & DISC-SS 304, BODY SEAT: SS304												
NOTES:														
1. Butterfly Valve 8" and above Gear Operated.														
2. No Asbestos or its ingredient to be used in gasket or in any parts of valve.														
3. Use full bore for pressure relief system.														
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														
TESTING:														
1. Hydrotest pressure = 1.5 X Design pressure														
2. Pneumatic Test Pressure= 1.1 X Design Pressure														

Piping Material Specifications															
MATERIAL: SS 316 (ERW)			SPEC: ST1						Class: 150#						
Services: Compressed Air, Digester Gas, Lube Oil															
Design Pressure (psig)	230	195	175	170	NA	NA	NA	Calculation Reference:							
Design Temperature (F)	100	200	300	350	NA	NA	NA	Code of Reference:				B31.3 - 2008			
Minimum Temperature (F)	-425	-425	-425	-425	NA	NA	NA	Material:				Stainless Steel			
Minimum Test Pressure (psig)	345	295	265	255	NA	NA	NA	Pressure Rating:				Class 150			
Maximum Test Pressure (psig)	440 for NPS ≤ 6, 360 for NPS > 6						External Pressure Rating:				15 psi				
Max Corrosion Allowance:															
0.0025"															
Nominal Pipe Size (in)															
Nominal Pipe Size (NB)															
Schedule Table															
ASME 36.19															
PIPE	THK	Sch 80S, PE			Sch 40S, BE			Sch 10S, BE							
	TYPE	SEAMLESS													
STANDARD	ERW(NOTE 8)														
	ASME B 36.19														
MATERIAL	ASTM A312 Gr TP 316														
	FLANGES														
LINES	TYPE	SW RAISED FACE, Serrated			WELD NECK RAISED FACE_OR_SLIP ON RAISE FACE_OR_LAP FLANGE WITH CS RING, Serrated										
	CLASS	150#													
MATERIAL	ASTM A 182 Gr F316														
	DIM STD														
BLINDS	CLASS	150#, RF, Serrated													
	MATERIAL	ASTM A 182 Gr F316													
DIM STD	ASME B 16.5														
	FITTINGS														
TYPE	Socket Weld, SMLS (NOTE 11)			BW, SMLS			BW, Welded								
CLASS	3000#	SCH 80S			Sch 40S			Sch 10S, BE							
STANDARD	ASME B16.11			ASME B16.9			ASME B16.9								
MATERIAL	ASTM A 182 Gr F316			ASTM A 403 Gr WP316											
FULL/HALF COUPLINGS	TYPE	socket Weld (Note 11)													
	CLASS	3000#													
STANDARD	ASME B16.11														
MATERIAL	ASTM A 182 Gr F304														
BOLTING															
Bolts ASTM A-193 Gr B8, Hex nuts ASTM A194 Gr 8, ASME B 18.2.2															
GASKETS															
SS GASKET, 1/8" THK, 316 SS CORE & OUTER RING, GRAPHITE FACED, CLASS 150, RF, ASME B16.20															
BALL	TYPE	Regular bore, NPT, Lockable Operator (NOTE 4,5,7)	Regular bore, RF, Flanged Ends, (As per ASME B 16.5) Manual Lever Lockable Operator (NOTE 4,5)												
	CLASS	150#													
	MATERIAL	Body- ASTM A182 Gr F316 or ASTM A351 Gr. CF8, Ball- SS 316 or 316 Seat- PTFE or RTFE or TFM													
GLOBE/GATE	TYPE	SW (NOTE 5,7) (NOTE 4 is only applicable for gate valve)	RF, Flanged end, Serrated (as per ASME B 16.5)(NOTE 5) (NOTE 4 is only applicable for gate valve)												
	CLASS	150#													
	MATERIAL	Body- ASTM A182 Gr F316 or ASTM A351 Gr. CF8, Disc- SS 316, Seat- PTFE or RTFE or TFM													
CHECK	TYPE	LIFT TYPE (Spring) RF, Flanged, ASME B 16.5	Wafer (Dual Disc spring Loaded), RF, Serrated as per ASME B 16.5												
	CLASS	150#													
	MATERIAL	ASTMA351 Gr. CF8, Disc & Trim SS 316, Spring SS 316													
BUTTERFLY	TYPE	LUG TYPE (NOTE 9)													
	CLASS	150#													
	MATERIAL	BODY-ASTM A351 CF8M, SPINDLE & DISC-SS 316 or 316, BODY SEAT: SS316 or 316													
NOTES:															
1. Butterfly Valve shall be Gear Operated															
2. No Asbestos or its ingredient 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, NPT(F) end connection, for Instrument, vents and drains.															
6. Higher rating flange to be used to match the counter flange requirement only															
7. Use flanged valve when specifically mentioned in the P&ID															
8. Use seamless pipe when specifically mentioned in the P&ID and/or in isometric drawings															
9. Use wafer type in Indian Projects Only.															
10. Threading on pipe or nipple is only allowed on 1 1/2" and smaller pipe															
11. For shop fabrication use butt weld fitting for 1" and 1 1/2" pipe size.															
TESTING:															
1. DPIMP - 10% of Weld joint															
2. Radiography - As decided by the site-in-charge															
3. Hydrotest pressure = 1.5 X Design pressure															

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	
4	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

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

OWNER: 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING MATERIAL SPECIFICATION
(SHEET 5 OF 5)

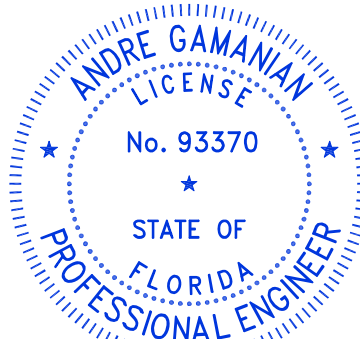
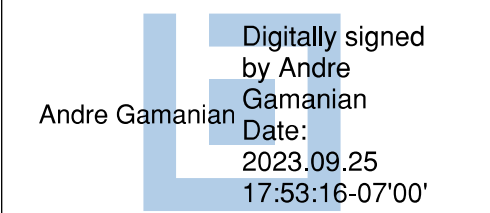

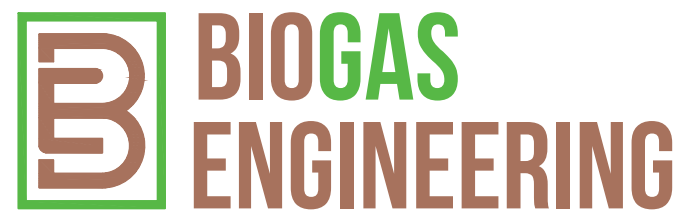

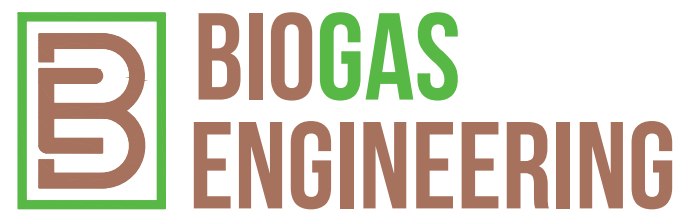
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **M-4450**

Biogas Engineering		IFC			IRC			LANDFILL GAS BLOWER SKID AND FLARE REPLACEMENT																			
REV NO	Sequence no	LINE NO	FROM	TO	FLUID	COMMODITY DESCRIPTION	P&ID NO	PHASE	NOMINAL DIAMETER	PIPING CLASS	OPERATING CONDITION		DESIGN CONDITIONS				PIPE SYSTEM DETAILS				PWHT	PRESS. TEST		HEAT TRACE LENGTH, FT	NOTES	REMARKS	
											APP. WOR. PRESS.	WOR. TEMP.	PRESS.		RATING	TRACING	INSULATION		TYPE	MIN PRESSURE							
													MIN	MAX			MIN	MAX				THICK					
psig	°F	psig	psig	°F	°F	inch	psig																				
1.0	0101	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	-	10	24	150	STAINLESS STEEL	150	NA	N	NA	NA	H	15		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0102	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	-	14	24	150	STAINLESS STEEL	150	ETR	HT	1	NA	H	21	58	STICK BUILT (CONTRACTOR SCOPE)	
1.0	0103	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	-	14	24	150	STAINLESS STEEL	150	ETR	HT	1	NA	H	21	38	STICK BUILT (CONTRACTOR SCOPE)	
1.0	0104	2"-IA-0104-SS1-N	BATTERY LIMIT INSTRUMENT SUPPLY	TO DISTRIBUTION HEADER	IA	INSTRUMENT AIR	P-445G	V	2"	SS1	90	40	-	100	24	100	STAINLESS STEEL	150	NA	N	NA	NA	H	150		STICK BUILT (CONTRACTOR SCOPE)	
2.0	0105	1/4"-LFG-0105-SS7-N	8"-LFG-0102-SS1-HT	FE-0118	LFG	PROCESS GAS	P-445H	V	1/4"	SS7	5	40	-	14	24	150	SS TUBING	150	NA	N	NA	NA	H	21		STICK BUILT (CONTRACTOR SCOPE)	
2.0	0106	1/4"-LFG-0106-SS7-N	8"-LFG-0102-SS1-HT	FE-0118	LFG	PROCESS GAS	P-445H	V	1/4"	SS7	5	40	-	14	24	150	SS TUBING	150	NA	N	NA	NA	H	21		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0107	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	-	14	24	150	SS TUBING	150	NA	N	NA	NA	H	21		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0108	1/4"-CH-0108-SS7-N	HELIUM CARRIER GAS CYL	AE-0127	CH	HELIUM GAS	P-445H	V	1/4"	SS7	265	95	-	300	24	150	SS TUBING	150	NA	N	NA	NA	H	450		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0109	1/4"-CH-0109-SS7-N	CALIBRATION GAS CYL	AE-0127	CH	CALIBRATION GAS	P-445H	V	1/4"	SS7	65	70	-	125	24	150	SS TUBING	150	NA	N	NA	NA	H	187.5		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0110	1/4"-LFG-0110-SS7-N	AE-0127	1/2"-LFG-0114-SS7-N	LFG	PROCESS GAS	P-445H	V	1/4"	SS7	5	40	-	14	24	150	SS TUBING	150	NA	N	NA	NA	NA	NA		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0111	1/4"-LFG-0111-SS7-N	AE-0127	1/2"-LFG-0114-SS7-N	LFG	PROCESS GAS	P-445H	V	1/4"	SS7	5	40	-	14	24	150	SS TUBING	150	NA	N	NA	NA	NA	NA		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0112	1/4"-LFG-0112-SS7-N	AE-0127	1/2"-LFG-0114-SS7-N	LFG	PROCESS GAS	P-445H	V	1/4"	SS7	5	40	-	14	24	150	SS TUBING	150	NA	N	NA	NA	NA	NA		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0113	1/4"-LFG-0113-SS7-N	AE-0127	1/2"-LFG-0114-SS7-N	LFG	PROCESS GAS	P-445H	V	1/4"	SS7	5	40	-	14	24	150	SS TUBING	150	NA	N	NA	NA	NA	NA		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0114	1/2"-LFG-0114-SS7-N	AE-0127	VENT	LFG	PROCESS GAS	P-445H	V	1/2"	SS7	5	40	-	14	24	150	SS TUBING	150	NA	N	NA	NA	NA	NA		STICK BUILT (CONTRACTOR SCOPE)	
2.0	0115	12"-LFG-0115-SS1-N	8"-LFG-0102-SS1-HT	BATTERY LIMIT PIPELINE-RNG FACILITY	LFG	PROCESS GAS	P-445G	V	12"	SS1	5	40	-	14	24	150	STAINLESS STEEL	150	NA	N	NA	NA	H	15	6	HEAT TRACE ABOVEGROUND PORTIO	NA
2.0	0116	8"-LFG-0116-SS1-N	6"-LFG-0103-SS1-HT	BATTERY LIMIT PIPELINE-EVAP FACILITY	LFG	PROCESS GAS	P-445G	V	8"	SS1	5	40	-	14	24	150	STAINLESS STEEL	150	NA	N	NA	NA	H	15	6	HEAT TRACE ABOVEGROUND PORTIO	NA
2.0	0117	1/4"-LFG-0117-SS7-N	6"-LFG-0103-SS1-HT	FE-0113	LFG	PROCESS GAS	P-445H	V	1/4"	SS7	5	40	-	14	24	150	SS TUBING	150	NA	N	NA	NA	H	21		STICK BUILT (CONTRACTOR SCOPE)	
2.0	0118	1/4"-LFG-0118-SS7-N	6"-LFG-0103-SS1-HT	FE-0113	LFG	PROCESS GAS	P-445H	V	1/4"	SS7	5	40	-	14	24	150	SS TUBING	150	NA	N	NA	NA	H	21		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0119	2"-C-0119-HD1-N	1 1/2"-C-0204-SS1-HT	2"-C-0120-HD1-N	C	CONDENSATE	P-445G	L	2"	HD1	15	60	-	15	24	150	HDPE	150	NA	N	NA	NA	H	15		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0120	2"-C-0120-HD1-N	2"-C-0121-SS1-N	BATTERY LIMIT CONDENSATE PIPELINE	C	CONDENSATE	P-445G	L	2"	HD1	15	60	-	15	24	150	HDPE	150	NA	N	NA	NA	H	15		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0121	2"-C-0121-SS1-N	BATTERY LIMIT CONDENSATE PIPELINE FROM RNG	2"-C-0120-HD1-N	C	CONDENSATE	P-445G	L	2"	SS1	15	60	-	15	24	150	STAINLESS STEEL	150	NA	N	NA	NA	H	15		STICK BUILT (CONTRACTOR SCOPE)	
2.0	0122	1/4"-C-0122-SS7-N	2"-C-0121-SS1-N	FE-0134	C	CONDENSATE	P-445G	L	1/4"	SS7	15	60	-	15	24	150	SS TUBING	150	NA	N	NA	NA	H	15		NA	
2.0	0123	1/4"-C-0123-SS7-N	2"-C-0121-SS1-N	FE-0134	C	CONDENSATE	P-445G	L	1/4"	SS7	15	60	-	15	24	150	SS TUBING	150	NA	N	NA	NA	H	15		NA	
1.0	0124	XX-LFG-0124-SS7-N	PSV-01XX	VENT	LFG	PROCESS GAS	P-445H	V	XX	SS7	5	40	-	14	24	150	SS TUBING	150	NA	N	NA	NA	NA	NA		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0125	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	-	15	24	150	HDPE	150	NA	N	NA	NA	H	15		STICK BUILT (CONTRACTOR SCOPE)	
2.0	0126	8"-LFG-0126-SS1-N	8"-LFG-0127-HD1-N	TQ-EVAP FACILITY	LFG	PROCESS GAS	P-445G	V	8"	SS1	5	40	-	14	24	150	STAINLESS STEEL	150	NA	N	NA	NA	H	15		NA	
1.0	0127	8"-LFG-0127-HD1-N	6"-LFG-0103-SS1-HT	BATTERY LIMIT	LFG	PROCESS GAS	P-445G	V	8"	HD1	5	40	-	14	24	150	HDPE	150	NA	N	NA	NA	H	15		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0201	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	-	10	24	150	STAINLESS STEEL	150	NA	P	1	NA	H	15		SKID MODULE (BGE SCOPE)	
1.0	0202	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	-	14	24	300	STAINLESS STEEL	150	NA	N	NA	NA	H	21		SKID MODULE (BGE SCOPE)	
1.0	0204	1 1/2"-C-0204-SS1-HT	P-202 (CONDENSATE PUMP)	2"-C-0119-HD1-N	C	CONDENSATE	P-445I	L	1 1/2"	SS1	15	120	-	15	24	150	STAINLESS STEEL	150	ETR	HT	1	NA	H	22.5	10	SKID MODULE (BGE SCOPE)	
1.0	0206	1"-C-0206-SS1-H	V-200(LFG BLOWERS SUCTION SEPARATOR)	LG-0221	C	CONDENSATE	P-445I	L	1"	SS1	15	120	-	15	24	150	STAINLESS STEEL	150	NA	H	1	NA	H	22.5		SKID MODULE (BGE SCOPE)	
1.0	0207	TRIM-V-0207-SS1-N	V-200(LFG BLOWERS SUCTION SEPARATOR)	TRIM	V	CONDENSATE	P-445I	L	TRIM	SS1	15	120	-	15	24	150	STAINLESS STEEL	150	NA	N	NA	NA	H	22.5		SKID MODULE (BGE SCOPE)	
1.0	0208	1/4"-C-0208-SS7-H	1"-C-0206-SS1-N	LT-0215	C	CONDENSATE	P-445I	L	1/4"	SS7	15	120	-	15	24	150	SS TUBING	150	NA	H	1	NA	H	22.5		SKID MODULE (BGE SCOPE)	
1.0	0209	1/4"-C-0209-SS7-H	1"-C-0206-SS1-N	LT-0215	C	CONDENSATE	P-445I	L	1/4"	SS7	15	120	-	15	24	150	SS TUBING	150	NA	H	1	NA	H	22.5		SKID MODULE (BGE SCOPE)	
1.0	0212	1/2"-IA-0212-SS7-N	1"-IA-0517-SS1-N	P-202 (CONDENSATE PUMP)	IA	INSTRUMENT AIR	P-445I	V	1/2"	SS7	90	40	-	100	24	100	SS TUBING	150	NA	N	NA	NA	H	150		SKID MODULE (BGE SCOPE)	

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.

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER	 <p>This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.</p> 	OWNER:	 <p>INDIAN RIVER COUNTY FLORIDA</p> <p>1325 74th AVE SW, VERO BEACH, FLORIDA 32968</p>	ENGINEER:	 <p>2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM</p>	LINE LIST (SHEET 1 OF 3)		DRAWING NO. M-445P
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	 <p>INDIAN RIVER COUNTY FLORIDA</p> <p>1325 74th AVE SW, VERO BEACH, FLORIDA 32968</p>		 <p>2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM</p>		LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT				
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)	MT	TP	AG									

C:\Users\Mukesh\My Documents\Engineering\Projects\Ush2126.100 - Indian River County LFG - Drawings\M-Mechanical\M-445P to M-445R.dwg 21-06-2023 MRKarthik

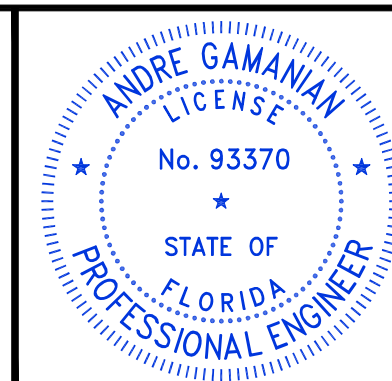
Biogas Engineering		IFC			IRC			LANDFILL GAS BLOWER SKID AND FLARE REPLACEMENT																			
REV NO	Sequence no	LINE NO	FROM	TO	FLUID	COMMODITY DESCRIPTION	P&ID NO	PHASE	NOMINAL DIAMETER	PIPING CLASS	OPERATING CONDITION		DESIGN CONDITIONS				PIPE SYSTEM DETAILS				PWHT	PRESS. TEST		HEAT TRACE LENGTH, FT	NOTES	REMARKS	
											APP. WOR. PRESS.	WOR. TEMP.	PRESS.		TEMP.		MATERIAL	RATING	TRACING	INSULATION		TYPE	MIN PRESSURE				
													MIN	MAX	MIN	MAX				TYPE							THICK
											psig	°F	psig	psig	°F	°F				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	H	1	NA	H	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	C	CONDENSATE	P-445J	L	1 1/2"	SS1	7	120	-	14	24	150	STAINLESS STEEL	150	ETR	HT	1	NA	H	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	H	1	NA	H	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	H	1	NA	H	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	H	1	NA	H	21		STICK BUILT (CONTRACTOR SCOPE)	
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	H	1	NA	H	21		STICK BUILT (CONTRACTOR SCOPE)	
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	H	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	H	1	NA	H	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	H	1	NA	H	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	H	1	NA	H	187.5		STICK BUILT (CONTRACTOR SCOPE)	
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	H	1	NA	H	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	H	1	NA	H	21		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0313	1/4"-LFG-0313-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)	
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)	
2.0.0	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	H	1	NA	H	21		STICK BUILT (CONTRACTOR SCOPE)	
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	H	1	NA	H	21		STICK BUILT (CONTRACTOR SCOPE)	
2.0	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	H	1	NA	H	21		STICK BUILT (CONTRACTOR SCOPE)	
2.0	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	H	1	NA	H	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	150	NA	C	1	NA	H	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	H	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	H	21		SKID MODULE (BGE SCOPE)	
1.0	0404	1 1/2"-C-0404-SS1-HT	V-401(DISCHARGE SEPARATOR)	2"-C-0125-HD1-N	C	CONDENSATE	P-445K	L	1 1/2"	SS1	5	120	-	14	24	150	STAINLESS STEEL	150	ETR	HT	1	NA	H	21	26	SKID MODULE (BGE SCOPE)	
1.0	0405	1"-C-0405-SS1-C	V-401(DISCHARGE SEPARATOR)	LG-0423	C	CONDENSATE	P-445K	L	1"	SS1	5	120	-	14	24	150	STAINLESS STEEL	150	NA	C	1	NA	H	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	H	21		SKID MODULE (BGE SCOPE)	
1.0	0407	1/4"-C-0407-SS7-C	V-401(DISCHARGE SEPARATOR)	LT-0424	C	CONDENSATE	P-445K	L	1/4"	SS7	5	120	-	14	24	150	SS TUBING	150	NA	C	1	NA	H	21		SKID MODULE (BGE SCOPE)	
1.0	0408	1/4"-C-0408-SS7-C	V-401(DISCHARGE SEPARATOR)	LT-0424	C	CONDENSATE	P-445K	L	1/4"	SS7	5	120	-	14	24	150	SS TUBING	150	NA	C	1	NA	H	21		SKID MODULE (BGE SCOPE)	
1.0	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	C	1	NA	H	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	C	1	NA	H	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	C	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)	

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.

ISSUED FOR CONSTRUCTION

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)	MT	TP	AG

PROFESSIONAL ENGINEER
 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 Gamanian
 Date: 2023.09.25 17:53:16-07'00'

OWNER: 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) 726-3565
 EMAIL: INFO@BIOGASENG.COM

LINE LIST
 (SHEET 2 OF 3)
 LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
 DRAWING NO. **M-445Q**

C:\Users\Mukesh\My Documents\Engineering\Projects\Ush2126.100 - Indian River County LF\Drawings\M-Mechanical\M-445P to M-445R.dwg 21-06-2023 MRKarthik

Biogas Engineering		IFC		IRC		LANDFILL GAS BLOWER SKID AND FLARE REPLACEMENT																					
REV NO	Sequence no	LINE NO	FROM	TO	FLUID	COMMODITY DESCRIPTION	P&ID NO	PHASE	NOMINAL DIAMETER	PIPING CLASS	OPERATING CONDITION		DESIGN CONDITIONS				PIPE SYSTEM DETAILS				PWHT	PRESS. TEST		HEAT TRACE LENGTH, FT	NOTES	REMARKS	
											APP. WOR. PRESS.	WOR. TEMP.	PRESS.		TEMP.		MATERIAL	RATING	TRACING	INSULATION		TYPE	MIN PRESSURE				
													MIN	MAX	MIN	MAX				THICK							psig
psig	°F	psig	psig	°F	°F		inch																				
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	H	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	H	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	H	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	H	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	H	150		STICK BUILT (CONTRACTOR SCOPE)	
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	H	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	H	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	P	1	NA	H	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	H	21		SKID MODULE (BGE SCOPE)	
1.0	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	H	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	H	150		STICK BUILT (CONTRACTOR SCOPE)	
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	H	150		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0515	1/2"-IA-0515-SS1-N	1"-IA-0502-SS1-N	1/2"-IA-0516-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		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0516	1/2"-IA-0516-SS7-N	1/2"-IA-0515-SS1-N	FV-0140	IA	INSTRUMENT AIR	P-445L	V	1/2"	SS7	90	40	-	100	24	100	SS TUBING	150	NA	N	NA	NA	H	150		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0517	1/2"-IA-0517-SS1-N	2"-IA-0104-SS1-N	P-202 (CONDENSATE PUMP)	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)	
2.0	0518	1"-IA-0518-SS1-N	2"-IA-0104-SS1-N	1/2"-IA-0519-SS7-N	IA	INSTRUMENT AIR	P-445L	V	1"	SS1	90	40	-	100	24	100	STAINLESS STEEL	150	NA	N	NA	NA	H	150		NA	
2.0	0519	1/2"-IA-0519-SS7-N	1"-IA-0518-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	H	150		NA	
1.0	0520	3/4"-FG-0520-SS1-N	PILOT GAS PANEL	FS-001	FG	PILOT GAS	P-445L	V	3/4"	SS1	15	40	-	25	24	80	STAINLESS STEEL	150	NA	N	NA	NA	H	37.5		STICK BUILT (CONTRACTOR SCOPE)	
1.0	0521	1/2"-IA-0521-SS7-N	1/2"-IA-0509-SS1-N	XV-0103	IA	INSTRUMENT AIR	P-445L	V	1/2"	SS7	90	40	-	100	24	100	SS TUBING	150	NA	N	NA	NA	H	150		STICK BUILT (CONTRACTOR SCOPE)	

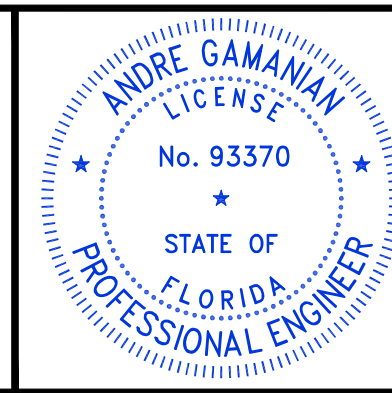
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NOTE:-
 IN THE REMARK COLUMN,
 IF IT IS MENTIONED "SKID MODULE", IT IS BGE SCOPE OF SUPPLY.
 AND IF IT IS MENTIONED "STICK BUILT", IT IS CONTRACTOR SCOPE OF SUPPLY.

ISSUED FOR CONSTRUCTION

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4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG

PROFESSIONAL ENGINEER
 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 Gamanian
 Date: 2023.09.25 17:53:16-07'00'

OWNER: 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) 726-3565
 EMAIL: INFO@BIOGASENG.COM

LINE LIST
 (SHEET 3 OF 3)
 LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
 DRAWING NO. **M-445R**

Biogas Engineering Manual Valve List

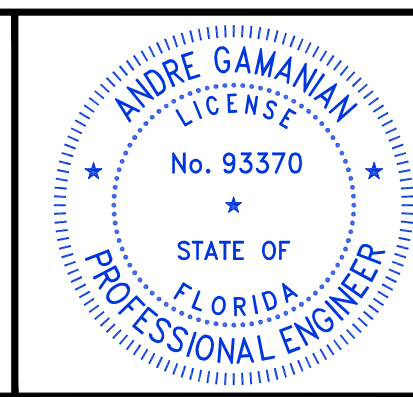
Skid Module_Supply																									
SERVICE FLUID DATA & INSTRUMENT REQUIREMENT																		TO BE FILLED BY SUPPLIER				NOT TO BE FILLED BY SUPPLIER			
No.	PID sheet	P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Class rating	Design Pressure psig	Design Temp F, Min.	Design Temp F, Max.	Fluid Service	Fluid Composition	Material	End Connection	Description	Manufacturer	Model Number	Supplier	Remark	Comments	Scope of Supply	Status	Isometric Number
1	P-455L	AFR-0519	Skid Module	Air Filter Regulator	Piping Item	PV-509	1"-IA-0503-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	NUMATICS	8653APBM4FA00GN	Coyle Supply			BGE		1"-IA-0503-SS1-N-1
2	P-455L	AFR-0521	Skid Module	Air Filter Regulator	Piping Item	FV-0415	1/2"-IA-0505-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	NUMATICS	8653APBM4FA00GN	Coyle Supply			BGE		1/2"-IA-0505-SS1-N-1
3	P-455I	CK-0233	Skid Module	Check-valve	Piping Valve	SUCTION SCRUBBER DRAIN LINE	1-1/2"-C-0204-SS1-HT	1-1/2"	150	25	24	150	CONDENSATE	CH4-50%, CO2-21.75% N212%-O2-2.5%, H2S-.10%	SS Body ASTM A351-	Flanged	CHECK VALVE, LIFT TYPE, CLASS 150, RF	GM Valves		Process Valves(India)			BGE		NA
4	P-455I	AFR-0252	Skid Module	Air Filter Regulator	Piping Item	P-202 INSTRUMENT LINE	1/2"-IA-0517-SS1-N	1/2"	150	15	24	150	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		1/2"-IA-0517-SS1-N-1
5	P-455I	HV-0231	Skid Module	Ball Valve	Piping Valve	SUCTION SCRUBBER DRAIN LINE	1 1/2"-C-0204-SS1-HT	1 1/2"	150	25	24	150	CONDENSATE	H2O 100% with traces of H2S	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF	GM Valves	Regular Bore GM406-CF8	Process Valves(India)			BGE		1 1/2"-C-0204-SS1-HT-1
6	P-455I	HV-0223	Skid Module	Ball Valve	Piping Valve	SUCTION SCRUBBER DRAIN LINE	1 1/2"-C-0204-SS1-HT	1 1/2"	150	25	24	150	CONDENSATE	H2O 100% with traces of H2S	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF	GM Valves	Regular Bore GM406-CF8	Process Valves(India)			BGE		1 1/2"-C-0204-SS1-HT-2
7	P-455I	HV-0241	Skid Module	Ball Valve	Piping Valve	SUCTION SCRUBBER DRAIN LINE	1 1/2"-C-0204-SS1-HT	1 1/2"	150	25	24	150	CONDENSATE	H2O 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	Full Bore GM406-CF8	Process Valves(India)			BGE		1 1/2"-C-0204-SS1-HT-1
8	P-455I	HV-0222	Skid Module	Ball Valve	Piping Valve	SUCTION SCRUBBER V-200	Vessel Trim V-200	1 1/2"	150	25	24	150	CONDENSATE	H2O 100% with traces of H2S	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF	GM Valves	Regular Bore GM406-CF8	Process Valves(India)			BGE		1 1/2"-T-0207-SS1-H-1
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	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	GM Valves	Regular Bore GM406-CF8	Process Valves(India)			BGE		1"-T-0207-SS1-N-1
10	P-455I	HV-0229	Skid Module	Ball 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%	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	Full Bore GM450-CF8	Process Valves(India)			BGE		10"-LFG-0202-SS1-P-2
11	P-455I	HV-0238	Skid Module	Ball Valve	Piping Valve	SUCTION SCRUBBER LEVEL TRANSMITTER	1"-C-0206-SS1-H	1/2"	150	25	24	150	CONDENSATE	H2O 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	Full Bore GM450-CF8	Process Valves(India)			BGE		1"-C-0206-SS1-H-2
12	P-455I	HV-0239	Skid Module	Ball Valve	Piping Valve	SUCTION SCRUBBER LEVEL TRANSMITTER	1"-C-0206-SS1-H	1/2"	150	25	24	150	CONDENSATE	H2O 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	Full Bore GM450-CF8	Process Valves(India)			BGE		1"-C-0206-SS1-H-1
13	P-455J	HV-0347	Skid Module	Ball Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0301-SS1-H	1/2"	150	25	24	150	CONDENSATE	H2O 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	Full Bore GM450-CF8	Process Valves(India)			BGE		8"-LFG-0301-SS1-H-1
14	P-455K	HV-0413	Skid Module	Ball Valve	Piping Valve	DISCHARGE SCRUBBER V-401	V-401 TRIM	1"	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,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF	GM Valves	Regular Bore GM406-CF8	Process Valves(India)			BGE		1"-T-0406-SS1-H-1
15	P-455K	HV-0418	Skid Module	Ball Valve	Piping Valve	DISCHARGE SCRUBBER V-401	V-401 TRIM	1"	150	25	24	150	CONDENSATE	H2O 100% with traces of H2S	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF	GM Valves	Regular Bore GM406-CF8	Process Valves(India)			BGE		1"-T-0406-SS1-H-2
16	P-455K	HV-0425	Skid Module	Ball Valve	Piping Valve	DISCHARGE SCRUBBER DRAIN LINE	1 1/2"-C-0404-SS1-HT	1 1/2"	150	25	24	150	CONDENSATE	H2O 100% with traces of H2S	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF	GM Valves	Regular Bore GM406-CF8	Process Valves(India)			BGE		1 1/2"-C-0404-SS1-HT-2
17	P-455K	HV-0427	Skid Module	Ball Valve	Piping Valve	DISCHARGE SCRUBBER DRAIN LINE	1 1/2"-C-0404-SS1-HT	1 1/2"	150	25	24	150	CONDENSATE	H2O 100% with traces of H2S	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF	GM Valves	Regular Bore GM406-CF8	Process Valves(India)			BGE		1 1/2"-C-0404-SS1-HT-4
18	P-455K	HV-0419	Skid Module	Ball Valve	Piping Valve	DISCHARGE SCRUBBER LEVEL TRANSMITTER	1"-C-0405-SS1-C	1/2"	150	25	24	150	CONDENSATE	H2O 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	Full Bore GM450-CF8	Process Valves(India)			BGE		1"-C-0405-SS1-C-2

- NOTES:**
- IF LIST IS "SKID MODULE_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
 - IF LIST IS "STICK BUILT_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

ISSUED FOR CONSTRUCTION

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)	MT	TP	AG

PROFESSIONAL ENGINEER
 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 Gamanian
 Date: 2023.09.25 17:53:16-07'00'

OWNER: 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) 726-3565
 EMAIL: INFO@BIOGASENG.COM

VALVE LIST (SKID MODULE)
 (SHEET 1 OF 13)
 LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. M-445S

C:\Users\MukeshThakur\Documents\Engineering\Biogaseng - Documents\Engineering\Projects\USH2126.100 - Indian River County LF\Drawings\M-Mechanical\M-445S to M-445AE.dwg 21-06-2023 MukeshThakur

Biogas Engineering Manual Valve List

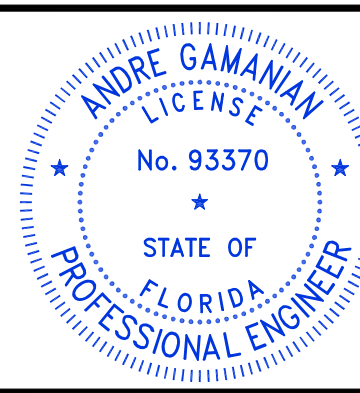

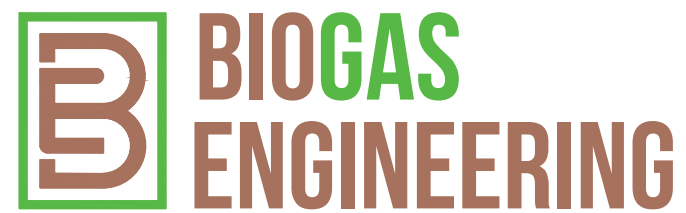
Skid Module_Supply

SERVICE FLUID DATA & INSTRUMENT REQUIREMENT																		TO BE FILLED BY SUPPLIER				NOT TO BE FILLED BY SUPPLIER			
No.	PID sheet	P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Class rating	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
19	P-455K	HV-0420	Skid Module	Ball Valve	Piping Valve	DISCHARGE SCRUBBER LEVEL TRANSMITTER	1"-C-0405-SS1-C	1/2"	150	25	24	150	CONDENSATE	H2O 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	Full Bore GM450-CF8	Process Valves(India)			BGE		1"-C-0405-SS1-C-1
20	P-455K	HV-0414	Skid Module	Ball Valve	Piping Valve	DISCHARGE SCRUBBER RECYCLE LINE	4"-LFG-0403-SS1-N	4"	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,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF	GM Valves	Regular Bore GM406-CF8	Process Valves(India)			BGE		4"-LFG-0403-SS1-N-2
21	P-455K	HV-0416	Skid Module	Ball Valve	Piping Valve	DISCHARGE SCRUBBER RECYCLE LINE	4"-LFG-0403-SS1-N	4"	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,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF	GM Valves	Regular Bore GM406-CF8	Process Valves(India)			BGE		4"-LFG-0403-SS1-N-3
22	P-455L	HV-0504	Skid Module	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	GM Valves	Full Bore GM450-CF8	Process Valves(India)			BGE		8"-LFG-0510-SS1-P-4
23	P-455L	HV-0512	Skid Module	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	GM Valves	Full Bore GM450-CF8	Process Valves(India)			BGE		8"-LFG-0510-SS1-P-4
24	P-455L	HV-0514	Skid Module	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	GM Valves	Full Bore GM450-CF8	Process Valves(India)			BGE		8"-LFG-0510-SS1-P-3
25	P-455L	HV-0518	Skid Module	Ball Valve	Piping Valve	PV-509	1"-IA-0503-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, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	GM Valves	Full Bore GM450-CF8	Process Valves(India)			BGE		1"-IA-0503-SS1-N-1
26	P-455L	HV-0520	Skid Module	Ball Valve	Piping Valve	FV-0415	1/2"-IA-0505-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, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	GM Valves	Full Bore GM450-CF8	Process Valves(India)			BGE		1/2"-IA-0505-SS1-N-1
27	P-455L	HV-0526	Skid Module	Ball Valve	Piping Valve	FE-0503	8"-LFG-0510-SS1-P-2	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	GM Valves	Full Bore GM450-CF8	Process Valves(India)			BGE		8"-LFG-0510-SS1-P-2
28	P-455L	HV-0527	Skid Module	Ball Valve	Piping Valve	FE-0503	8"-LFG-0510-SS1-P-3	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	GM Valves	Full Bore GM450-CF8	Process Valves(India)			BGE		8"-LFG-0510-SS1-P-3
29	P-455L	HV-0534	Skid Module	Ball Valve	Piping Valve	FLARE INLET LINE	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	GM Valves	Full Bore GM450-CF8	Process Valves(India)			BGE		8"-LFG-0510-SS1-P-5
30	P-455I	HV-0233	Skid Module	Ball Valve	Piping Valve	SUCTION SCRUBBER INLET	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 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	Full Bore GM450-CF8	Process Valves(India)			BGE		4"-LFG-0403-SS1-N-1
31	P-455I	HV-0246	Skid Module	Ball Valve	Piping Valve	SUCTION SCRUBBER INLET	12"-LFG-0201-SS1-N	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	GM Valves	Full Bore GM450-CF8	Process Valves(India)			BGE		12"-LFG-0201-SS1-N-2
32	P-455I	HV-0248	Skid Module	Ball Valve	Piping Valve	SUCTION SCRUBBER INLET	10"-LFG-0202-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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	GM Valves	Full Bore GM450-CF8	Process Valves(India)			BGE		10"-LFG-0202-SS1-P-5
33	P-455I	HV-0250	Skid Module	Ball Valve	Piping Valve	SUCTION SCRUBBER INLET	10"-LFG-0202-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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	GM Valves	Full Bore GM450-CF8	Process Valves(India)			BGE		10"-LFG-0202-SS1-P-2
34	P-455K	HV-0452	Skid Module	Ball Valve	Piping Valve	SUCTION SCRUBBER INLET	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 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	Full Bore GM450-CF8	Process Valves(India)			BGE		4"-LFG-0403-SS1-N-2
35	P-455K	HV-0450	Skid Module	Ball Valve	Piping Valve	SUCTION SCRUBBER INLET	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 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	Full Bore GM450-CF8	Process Valves(India)			BGE		4"-LFG-0403-SS1-N-4
36	P-455L	HV-0532	Skid Module	Ball Valve	Piping Valve	FLARE INLET LINE	1/2"-IA-0517-SS1-N	1/2"	150	15	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, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR	GM Valves	Full Bore GM450-CF8	Process Valves(India)			BGE		1/2"-IA-0517-SS1-N-1

NOTES:

- IF LIST IS "SKID MODULE_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
- IF LIST IS "STICK_BUILT_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER	 <p>This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.</p> <p>Digitally signed by Andre Gamanian Date: 2023.09.25 17:53:16-07'00'</p>	OWNER:	 <p>INDIAN RIVER COUNTY FLORIDA</p> <p>1325 74th AVE SW, VERO BEACH, FLORIDA 32968</p>	ENGINEER:	 <p>2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM</p>	VALVE LIST (SKID MODULE)		DRAWING NO. M-445T
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG							(SHEET 2 OF 13)		
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. FL LICENCE NO.93370 EXP. 02/28/2025								
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG									

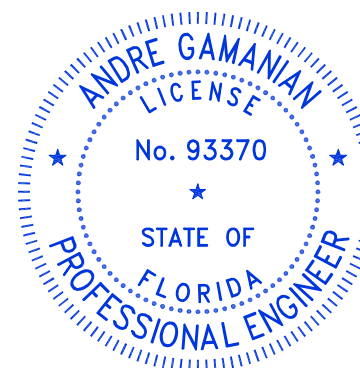
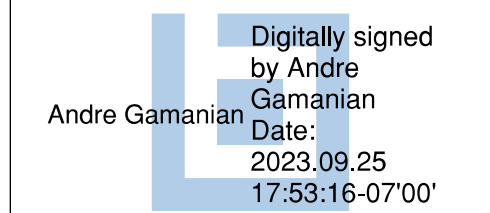


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Biogas Engineering Manual Valve List

SERVICE FLUID DATA & INSTRUMENT REQUIREMENT																								TO BE FILLED BY SUPPLIER				NOT TO BE FILLED BY SUPPLIER			
No.	PID sheet	P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Class rating	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						
37	P-455I	HV-0207	Skid Module	Butterfly Valve	Piping Valve	BLOWER DISCHARGE PIPING	10"-LFG-0202-SS1-P	6"	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	LUG TYPE	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF	GM Valves	Pending	Process Valves(India)			BGE		10"-LFG-0202-SS1-P-4						
38	P-455I	HV-0214	Skid Module	Butterfly Valve	Piping Valve	BLOWER DISCHARGE PIPING	10"-LFG-0202-SS1-P	6"	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	LUG TYPE	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF	GM Valves	Pending	Process Valves(India)			BGE		10"-LFG-0202-SS1-P-3						
39	P-455L	HV-0506	Skid Module	Needle 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	NPT (F)	MULTI-PORT BLOCK & BLEED VALVE, CLASS 6000, SOFT SEAT, PTFE PACKING, BLEED PORT							BGE		NA					
40	P-455I	HV-0203	Skid Module	Butterfly Valve	Piping Valve	BLOWER SUCTION PIPING	12"-LFG-0201-SS1-N	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	LUG TYPE	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF	GM Valves	Pending	Process Valves(India)			BGE		12"-LFG-0201-SS1-N-2						
41	P-455I	HV-0210	Skid Module	Butterfly Valve	Piping Valve	BLOWER SUCTION PIPING	12"-LFG-0201-SS1-N	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	LUG TYPE	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF	GM Valves	Pending	Process Valves(India)			BGE		12"-LFG-0201-SS1-N-2						
42	P-455L	HV-0501	Skid Module	Butterfly Valve	Piping Valve	FLARE INLET LINE	8"-LFG-0510-SS1-P	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	LUG TYPE	BUTTERFLY VALVE, GEAR OPERATED HAND WHEEL, CLASS 150, RF WITH 14 FT. CHAIN-	GM Valves	Pending	Process Valves(India)			BGE		8"-LFG-0510-SS1-P-1						
43	P-455L	HV-0508	Skid Module	Butterfly Valve	Piping Valve	FLARE INLET LINE	8"-LFG-0510-SS1-P	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	LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF	GM Valves	Pending	Process Valves(India)			BGE		8"-LFG-0510-SS1-P-5						
44	P-455L	HV-0510	Skid Module	Butterfly Valve	Piping Valve	FLARE INLET LINE	8"-LFG-0510-SS1-P	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	LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF	GM Valves	Pending	Process Valves(India)			BGE		8"-LFG-0510-SS1-P-5						
45	P-455I	CK-0206	Skid Module	Check valve	Piping Valve	BLOWER DISCHARGE PIPING	10"-LFG-0202-SS1-P	6"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351	WAFER TYPE	DUAL DISC SPING LOADED CHECK VALVE, WAFER TYPE, CLASS 150, RF	GM Valves	Pending	Process Valves(India)			BGE		10"-LFG-0202-SS1-P-4						
46	P-455I	CK-0213	Skid Module	Check valve	Piping Valve	BLOWER DISCHARGE PIPING	10"-LFG-0202-SS1-P	6"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351	WAFER TYPE	DUAL DISC SPING LOADED CHECK VALVE, WAFER TYPE, CLASS 150, RF	GM Valves	Pending	Process Valves(India)			BGE		10"-LFG-0202-SS1-P-3						
47	P-455K	CK-0428	Skid Module	Check valve	Piping Valve	DISCHARGE SCRUBBER DRAIN LINE	1 1/2"-C-0404-SS1-HT	1 1/2"	150	25	24	150	CONDENSATE	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS Body ASTM A351	Flanged	CHECK VALVE, LIFT TYPE, CLASS 150, RF	GM Valves	Regular Bore GM406-CF8	Process Valves(India)			BGE		1 1/2"-C-0404-SS1-HT-4						
48	P-455I	SI-0205	Skid Module	FLEXIBLE HOSE	Speciality Item	BLOWER DISCHARGE PIPING	10"-LFG-0202-SS1-P	6"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	TBD (VENDOR TO SPECIFY)	Flanged	3'-10" LONG FLEXIBLE HOSE WITH 150# FLANGED END	METALFLEX	PF31-321	Coyle Supply	FIXED WELDNECK FLANGE ONE END, SPINNING FLANGE W/ SCH 10 STUBEND OTHER END.			BGE		10"-LFG-0202-SS1-P-4					
49	P-455I	SI-0212	Skid Module	FLEXIBLE HOSE	Speciality Item	BLOWER DISCHARGE PIPING	10"-LFG-0202-SS1-P	6"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	TBD (VENDOR TO SPECIFY)	Flanged	3'-10" LONG FLEXIBLE HOSE WITH 150# FLANGED END	METALFLEX	PF31-321	Coyle Supply	FIXED WELDNECK FLANGE ONE END, SPINNING FLANGE W/ SCH 10 STUBEND OTHER END.			BGE		10"-LFG-0202-SS1-P-3					
50	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	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	TBD (VENDOR TO SPECIFY)	Flanged	4' LONG FLEXIBLE HOSE WITH 150# FLANGED END	METALFLEX	PF31-321	Coyle Supply	FIXED WELDNECK FLANGE ONE END, SPINNING FLANGE W/ SCH 10 STUBEND OTHER END.			BGE		12"-LFG-0201-SS1-N-2					
51	P-455I	SI-0211	Skid Module	FLEXIBLE HOSE	Speciality Item	BLOWER SUCTION PIPING	12"-LFG-0201-SS1-N	8"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	TBD (VENDOR TO SPECIFY)	Flanged	4' LONG FLEXIBLE HOSE WITH 150# FLANGED END	METALFLEX	PF31-321	Coyle Supply	FIXED WELDNECK FLANGE ONE END, SPINNING FLANGE W/ SCH 10 STUBEND OTHER END.			BGE		12"-LFG-0201-SS1-N-2					
52	P-455J	SI-0302	Skid Module	FLEXIBLE HOSE	Speciality Item	AFTER COOLER INLET	10"-LFG-0202-SS1-P	8"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	TBD (VENDOR TO SPECIFY)	Flanged	4'-8" LONG FLEXIBLE HOSE WITH 150# FLANGED END	METALFLEX	PF31-321	Coyle Supply	FIXED WELDNECK FLANGE ONE END, SPINNING FLANGE W/ SCH 10 STUBEND OTHER END.			BGE		10"-LFG-0202-SS1-P-1					
53	P-455L	SI-0502	Skid Module	Flow conditioner	Speciality Item	RNG LFG FLOW METER	8"-LFG-0510-SS1-P	8"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	WAFER TYPE	8" SCH 40 316 S/S FLOW CONDITIONER	CANADA PIPELINE	50E	Coyle Supply			BGE		8"-LFG-0510-SS1-P-1						
54	P-455K	HV-0417	Skid Module	Globe valve	Piping Valve	DISCHARGE SCRUBBER RECYCLE LINE	4"-LFG-0403-SS1-N	3"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	Body- ASTM A351 Gr. CF8. Disc- SS 316.S	Flanged	GLOBE VALVE, CLASS 150, RF	GM Valves	Pending	Process Valves(India)			BGE		4"-LFG-0403-SS1-N-2						
55	P-455L	HV-0511	Skid Module	Globe valve	Piping Valve	FLARE INLET LINE	8"-LFG-0510-SS1-P	6"	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	Flanged	GLOBE VALVE, CLASS 150, RF	GM Valves	Pending	Process Valves(India)			BGE		8"-LFG-0510-SS1-P-6						

- NOTES:**
- IF LIST IS "SKID MODULE_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
 - IF LIST IS "STICK_BUILT_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER		This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023. 	OWNER:  INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW, VERO BEACH, FLORIDA 32968	ENGINEER:  2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM	VALVE LIST (SKID MODULE) (SHEET 3 OF 13)		DRAWING NO. M-445U
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)	MT	TP	AG	ANDRE GAMANIAN, P.E. FL LICENCE NO.93370 EXP. 02/28/2025							

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Biogas Engineering

Manual Valve List

Skid Module_Supply

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SERVICE FLUID DATA & INSTRUMENT REQUIREMENT														TO BE FILLED BY SUPPLIER				NOT TO BE FILLED BY SUPPLIER							
No.	PID sheet	P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Class rating	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)	MULTIPOINT 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	H2O 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	FLARE INLET LINE	8"-LFG-0510-SS1-P	1/2"	150	25	24	150	CONDENSATE	H2O 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	FLARE INLET LINE	8"-LFG-0510-SS1-P	1/2"	150	25	24	150	CONDENSATE	H2O 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	FLARE INLET LINE	8"-LFG-0510-SS1-P	1/2"	150	25	24	150	CONDENSATE	H2O 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 INLET	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	Piping Item	SUCTION SCRUBBER INLET	12"-LFG-0201-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		12"-LFG-0201-SS1-N-2
63	P-455I	SI-0249	Skid Module	SS PLUG	Piping Item	SUCTION SCRUBBER INLET	10"-LFG-0202-SS1-P	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		10"-LFG-0202-SS1-P-5
64	P-455I	SI-0251	Skid Module	SS PLUG	Piping Item	SUCTION SCRUBBER INLET	10"-LFG-0202-SS1-P	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		10"-LFG-0202-SS1-P-2
65	P-455K	SI-0453	Skid Module	SS PLUG	Piping Item	SUCTION SCRUBBER INLET	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-2
66	P-455K	SI-0451	Skid Module	SS PLUG	Piping Item	SUCTION SCRUBBER INLET	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-4
67	P-455L	HV-0536	Skid Module	Ball Valve	Piping Valve	P-202 INSTRUMENT LINE	1"-IA-0518-SS1-N	1/2"	150	15	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(India)			BGE		NA
68	P-455I	AFR-0537	Skid Module	Air Filter-Regulator	Piping Item	P-202 INSTRUMENT LINE	1"-IA-0518-SS1-N	1/2"	150	15	24	150	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
69	P-455L	HV-0537	Skid Module	Needle Valve	Piping Valve	INSTRUMENT AIR TO P-202	1/2"-IA-0517-SS1-N	1/2"	150	15	24	150	Instrument Air	DRY ATM GAS COMPOSITION		NPT (M)	MULTIPOINT BLOCK & BLEED VALVE, CLASS 6000, SOFT SEAT, PTFE PACKING, BLEED PORT			Coyle Supply			BGE		1/2"-IA-0517-SS1-N-1

NOTES:

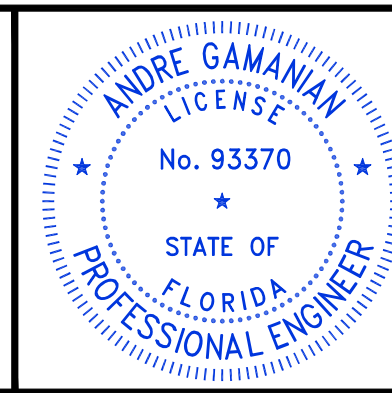
- IF LIST IS "SKID MODULE_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
- IF LIST IS "STICK_BUILT_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

ISSUED FOR CONSTRUCTION

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)	MT	TP	AG

PROFESSIONAL ENGINEER

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 Gamanian
Date: 2023.09.25 17:53:16-0700'

OWNER: 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

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

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. M-445V

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Biogas Engineering Manual Valve List																									
Stick Built_Supply																									
SERVICE FLUID DATA & INSTRUMENT REQUIREMENT															TO BE FILLED BY SUPPLIER				NOT TO BE FILLED BY SUPPLIER						
No.	PID sheet	P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Class rating	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
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	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-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	LANDFILL 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						IRC		14"-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	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	LUG TYPE	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF						IRC		14"-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"	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	LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF					Deleted	IRC		N/A
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	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-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	12"	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,	Flanged	BALL VALVE, FULL PORT, CLASS 150, RF WITH GEAR OPERATOR				Full Port & With Gear operator	Deleted	IRC		N/A
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	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		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	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		6"-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	Instrument Air	DRY ATM GAS COMPOSITION	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF						IRC		2"-IA-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	Instrument Air	DRY ATM GAS COMPOSITION	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		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	CONDENSATE	H2O 100% with traces of H2S	SS Body ASTM A351 Gr. CF8, Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF						IRC		2"-C-0121-SS1-N-1
13	P-455G	HV-0135	STICK BUILT	Ball Valve	Piping Valve	RNG CONDENSATE FLOW METER	2"-C-0121-SS1-N	1/2"	150	25	24	150	CONDENSATE	H2O 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						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	CONDENSATE	H2O 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						IRC		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	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-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	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-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	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		6"-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	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		6"-LFG-0103-SS1-HT-2
19	P-455H	SI-0117	STICK BUILT	FLOW CONDITIONER	Speciality Item	RNG LFG FLOW METER	8"-LFG-0102-SS1-HT	8"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75%, N212% O2 2.5%, H2S .10%	SS 316	WAFER TYPE	8" SCH 40 316 S/S FLOW CONDITIONER						IRC		8-LFG-0102-SS1-HT-2
20	P-455H	HV-0115	STICK BUILT	Butterfly Valve	Piping Valve	RNG LFG FLOW METER	8"-LFG-0102-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: SS 316	LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF						IRC		8"-LFG-0102-SS1-HT-1

NOTES:

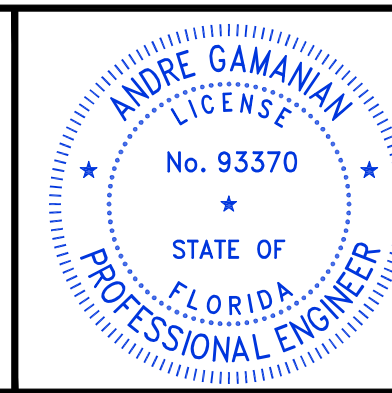
- IF LIST IS "SKID MODULE_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
- IF LIST IS "STICK BUILT_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

ISSUED FOR CONSTRUCTION

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)	MT	TP	AG

PROFESSIONAL ENGINEER

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

OWNER: 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

VALVE LIST (STICK BUILT)
(SHEET 5 OF 13)
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. M-445W

Biogas Engineering

Manual Valve List

Stick Built_Supply

SERVICE FLUID DATA & INSTRUMENT REQUIREMENT																	TO BE FILLED BY SUPPLIER				NOT TO BE FILLED BY SUPPLIER				
No.	PID sheet	P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Class rating	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
21	P-455H	SI-0112	STICK BUILT	FLOW CONDITIONER	Speciality Item	EVAP LFG FLOW METER	6"-LFG-0103-SS1-HT	6"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	SS 316	WAFER TYPE	6" SCH 40 316 S/S FLOW CONDITIONER						IRC		6-LFG-0103-SS1-HT-1
22	P-455H	HV-0116	STICK BUILT	Butterfly Valve	Piping Valve	EVAP LFG	6"-LFG-0103-SS1-HT	6"	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	LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF						IRC		6"-LFG-0103-SS1-HT-1
23	P-455I	HV-0201	STICK BUILT	Needle Valve	Piping Valve	SUCTION SCRUBBER INLET	14"-LFG-0101-SS1-N	1/2"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	316 S/S	NPT (F)	MULTIPOINT BLOCK & BLEED VALVE, CLASS 6000, SOFT SEAT, PTFE PACKING, BLEED PORT						IRC		14"-LFG-0101-SS1-N-1
24	P-455I	HV-0220	STICK BUILT	Ball Valve	Piping Valve	SUCTION SCRUBBER INLET	14"-LFG-0101-SS1-N	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC		14"-LFG-0101-SS1-N-1
25	P-455I	SI-0216	STICK BUILT	SS PLUG	Piping Item	SUCTION SCRUBBER INLET	14"-LFG-0101-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						IRC		14"-LFG-0101-SS1-N-1
26	P-455J	HV-0347	STICK BUILT	Ball Valve	Piping Valve	AFTER COOLER-OUTLET	8"-LFG-0301-SS1-H	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC		N/A
27	P-455J	SI-0348	STICK BUILT	SS PLUG	Piping Item	AFTER COOLER-OUTLET	8"-LFG-0301-SS1-H	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						IRC		N/A
28	P-455J	HV-0349	STICK BUILT	Ball Valve	Piping Valve	AFTER COOLER-OUTLET	8"-LFG-0301-SS1-H	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC		N/A
29	P-455J	SI-0350	STICK BUILT	SS PLUG	Piping Item	AFTER COOLER-OUTLET	8"-LFG-0301-SS1-H	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						IRC		N/A
30	P-455J	HV-0309	STICK BUILT	Ball Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0318-SS1-H	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC		8"-LFG-0318-SS1-H-3
31	P-455J	SI-0310	STICK BUILT	SS PLUG	Piping Item	AFTER COOLER OUTLET	8"-LFG-0318-SS1-H	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						IRC		8"-LFG-0318-SS1-H-3
32	P-455J	HV-0305	STICK BUILT	Needle Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0318-SS1-H	1/2"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	316 S/S	NPT (F)	MULTIPOINT BLOCK & BLEED VALVE, CLASS 6000, SOFT SEAT, PTFE PACKING, BLEED PORT						IRC		8"-LFG-0318-SS1-H-2
33	P-455J	HV-0307	STICK BUILT	Ball Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0318-SS1-H	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC		8"-LFG-0318-SS1-H-2
34	P-455J	HV-0311	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	LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF						IRC		8"-LFG-0318-SS1-H-3
35	P-455J	HV-0312	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	LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF						IRC		8"-LFG-0318-SS1-H-3
36	P-455J	HV-0313	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0306-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	LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF						IRC		8"-LFG-0306-SS1-H-1

NOTES:

- IF LIST IS "SKID MODULE_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
- IF LIST IS "STICK BUILT_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

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	
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)	MT	TP	AG	

ANDRE GAMANIAN
No. 93370
STATE OF FLORIDA
PROFESSIONAL ENGINEER

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'

OWNER: 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

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

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **M-445X**

c:\Users\MukeshThakur\Documents\Engineering\Projects\Ush2126.100 - Indian River County LF\Drawings\M-Mechanical\M-445X to M-445AE.dwg 21-06-2023 MukeshThakur

Biogas Engineering Manual Valve List

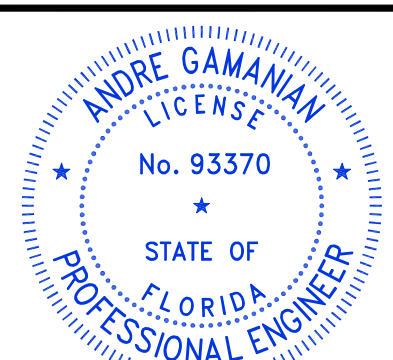
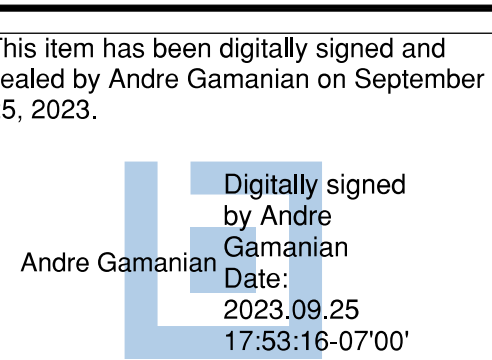

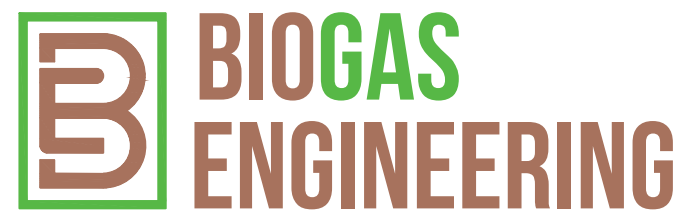
Stick Built_Supply

SERVICE FLUID DATA & INSTRUMENT REQUIREMENT																	TO BE FILLED BY SUPPLIER				NOT TO BE FILLED BY SUPPLIER				
No.	PID sheet	P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Class rating	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
37	P-455J	HV-0314	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0306-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	LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF						IRC		8"-LFG-0306-SS1-H-1
38	P-455J	HV-0319	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0306-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	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-0306-SS1-H-1
39	P-455J	HV-0320	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0306-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	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-0306-SS1-H-1
40	P-455J	HV-0321	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0304-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	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-0304-SS1-H-1
41	P-455J	HV-0322	STICK BUILT	Butterfly Valve	Piping Valve	H2S VESSEL LEAD-LAG VALVES	8"-LFG-0305-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	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
42	P-455J	HV-0326	STICK BUILT	Butterfly Valve	Piping Valve	F-302 INLET	8"-LFG-0311-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	LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF						IRC		8"-LFG-0311-SS1-H-1
42	P-455J	HV-0328	STICK BUILT	Butterfly Valve	Piping Valve	F-302 INLET	8"-LFG-0311-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	LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF						IRC		8"-LFG-0311-SS1-H-2
43	P-455J	HV-0327	STICK BUILT	Butterfly Valve	Piping Valve	F-302 INLET	8"-LFG-0312-ST1-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	LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF						IRC		8"-LFG-0312-ST1-H-1
44	P-455J	HV-0328	Skid Module	Globe valve	Piping Valve	FLARE INLET LINE	8"-LFG-0312-SS1-H	6"	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	Flanged	GLOBE VALVE, CLASS 150, RF						IRC		N/A
45	P-455J	HV-0339	STICK BUILT	Ball Valve	Piping Valve	DPG-0340	8"-LFG-0317-SS1-H	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC		8"-LFG-0317-SS1-H-2
46	P-455J	HV-0341	STICK BUILT	Ball Valve	Piping Valve	DPG-0340	8"-LFG-0304-SS1-H	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC		8"-LFG-0304-SS1-H-1
47	P-455J	HV-0342	STICK BUILT	Ball Valve	Piping Valve	DPG-343	8"-LFG-0303-SS1-H	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC		8"-LFG-0303-SS1-H-1
48	P-455J	HV-0344	STICK BUILT	Ball Valve	Piping Valve	DPG-343	8"-LFG-0305-SS1-H	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						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"	150	15	24	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- Returnable	IRC		8"-LFG-0304-SS1-H-1
50	P-455J	EJ-0316	STICK BUILT	Expansion Bellows	Speciality Item	H2S VESSEL	8"-LFG-0305-SS1-H	8"	150	15	24	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- Returnable	IRC		8"-LFG-0305-SS1-H-1
51	P-455J	EJ-0317	STICK BUILT	Expansion Bellows	Speciality Item	H2S VESSEL	8"-LFG-0317-SS1-H	8"	150	15	24	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- Returnable	IRC		8"-LFG-0317-SS1-H-1
52	P-455J	EJ-0318	STICK BUILT	Expansion Bellows	Speciality Item	H2S VESSEL	8"-LFG-0303-SS1-H	8"	150	15	24	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- Returnable	IRC		8"-LFG-0303-SS1-H-2
53	P-455J	HV-0329	STICK BUILT	Ball Valve	Piping Valve	H2S VESSEL	V-301A TRIM	4"	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,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF						IRC		4"-T-0315-SS1-H-1
54	P-455J	HV-0338	STICK BUILT	Ball Valve	Piping Valve	H2S VESSEL	V-301B TRIM	4"	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,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF						IRC		4"-T-0315-SS1-H-2

NOTES:

- IF LIST IS "SKID MODULE_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
- IF LIST IS "STICK BUILT_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER	 <p>This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.</p> 	OWNER:	 <p>INDIAN RIVER COUNTY FLORIDA</p> <p>1325 74th AVE SW, VERO BEACH, FLORIDA 32968</p>	ENGINEER:	 <p>2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM</p>	VALVE LIST (STICK BUILT)		DRAWING NO.
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	INDIAN RIVER COUNTY FLORIDA		SHEET 7 OF 13						
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)	MT	TP	AG	ANDRE GAMANIAN, P.E. FL LICENCE NO.93370 EXP. 02/28/2025			LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT		M-445Y			

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Biogas Engineering

Manual Valve List

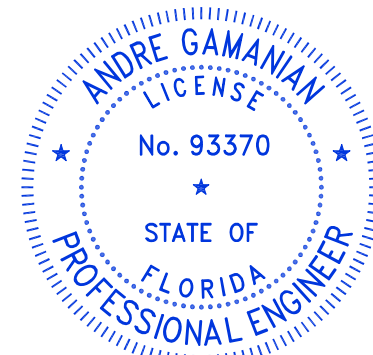
Stick Built_Supply

SERVICE FLUID DATA & INSTRUMENT REQUIREMENT																	TO BE FILLED BY SUPPLIER				NOT TO BE FILLED BY SUPPLIER				
No.	PID sheet	P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Class rating	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
55	P-455J	HV-0345	STICK BUILT	Ball Valve	Piping Valve	H2S VESSEL	V-301A TRIM	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,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF						IRC		2"-T-0315-SS1-H-1
56	P-455J	HV-0346	STICK BUILT	Ball Valve	Piping Valve	H2S VESSEL	V-301B TRIM	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,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF						IRC		2"-T-0315-SS1 H-2
57	P-455J	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 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-0306-SS1-H-1
58	P-455J	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 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-0306-SS1-H-1
59	P-455J	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 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-0311-SS1-H-2
60	P-455J	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 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-0311-SS1-H-2
61	P-455J	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 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-0311-SS1-H-1
62	P-455J	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 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-0311-SS1-H-1
63	P-455J	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 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-0312-ST1-H-1
64	P-455J	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 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-0312-ST1-H-1
65	P-455J	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 GAS	CH4 50%, CO2 21.75%, N212% O2 2.5%, H2S .10%	316 S/S	NPT (F)	SS BODY SOFT SEAT, PTFE PACKING,						IRC		NA
66	P-455J	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 GAS	CH4 50%, CO2 21.75%, N212% O2 2.5%, H2S .10%	316 S/S	NPT (F)	SS BODY SOFT SEAT, PTFE PACKING,						IRC		NA
67	P-455J	HV-0337	STICK BUILT	Ball Valve	Piping Valve	H2S VESSEL LEAD LAG PIPING	F-302 TRIM	1"	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC		NA
68	P-455J	SI-0347	STICK BUILT	SS PLUG	Piping Item	H2S VESSEL LEAD LAG PIPING	F-302 TRIM	1"	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						IRC		8"-LFG-0301-SS1-H-1

NOTES:

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- IF LIST IS "STICK BUILT_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

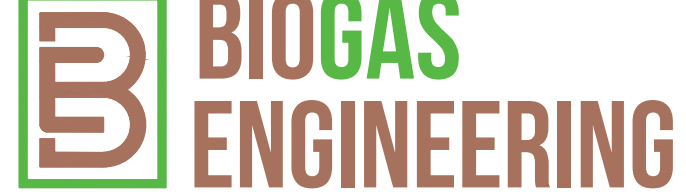
ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	 <p>ANDRE GAMANIAN, P.E. FL LICENCE NO.93370 EXP. 02/28/2025</p>
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)	MT	TP	AG	

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'

OWNER:  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) 726-3565
EMAIL: INFO@BIOGASENG.COM

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

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **M-445Z**

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Biogas Engineering

Manual Valve List

Stick Built_Supply

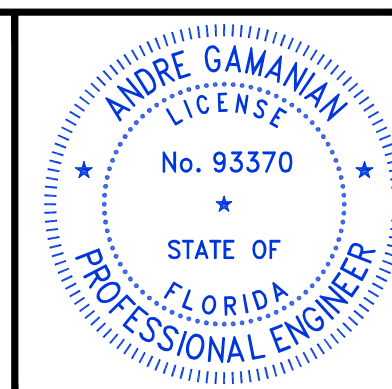
SERVICE FLUID DATA & INSTRUMENT REQUIREMENT															TO BE FILLED BY SUPPLIER				NOT TO BE FILLED BY SUPPLIER						
No.	PID sheet	P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Class rating	Design Pressure psig	Design Temp F, Min.	Design Temp F, Max	Fluid Service	Fluid Composition	Material	End Connection	Description	Manufacturer	Model Number	Supplier	Remark	Comments	Scope of Supply	Status	Isometric Number
69	P-455K	HV-0403	STICK BUILT	Needle Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0312-ST1-H	1/2"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	316 S/S	NPT (F)	MULTIPOINT BLOCK & BLEED VALVE, CLASS 6000, SOFT SEAT, PTFE PACKING, BLEED PORT						IRC		8"-LFG-0312-ST1-H-2
70	P-455K	HV-0405	STICK BUILT	Ball Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0312-ST1-H	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC		8"-LFG-0312-ST1-H-2
71	P-455K	HV-0409	STICK BUILT	Needle Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0401-ST1-C	1/2"	150	15	24	150	LANDFILL GAS	CH4 50%, CO2 21.75% N212% O2 2.5%, H2S .10%	316 S/S	NPT (F)	MULTIPOINT BLOCK & BLEED VALVE, CLASS 6000, SOFT SEAT, PTFE PACKING, BLEED PORT						IRC		8"-LFG-0401-ST1-C-2
72	P-455K	HV-0411	STICK BUILT	Ball Valve	Piping Valve	AFTER COOLER OUTLET	8"-LFG-0401-ST1-C	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,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						IRC		8"-LFG-0401-ST1-C-2
73	P-455K	HV-0434	STICK BUILT	Ball Valve	Piping Valve	CHILLER SUPPLY LINE	3"-CHWS-0409-CS1-C	1/2"	150	150	8	150	CHILLER WATER	35% PEG/Water	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		3"-CHWS-0409-CS1-C-2
74	P-455K	SI-0435	STICK BUILT	SS PLUG	Piping Item	CHILLER SUPPLY LINE	3"-CHWS-0409-CS1-C	1/2"	150	150	8	150	CHILLER WATER	35% PEG/Water	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG						IRC		3"-CHWS-0409-CS1-C-2
75	P-455K	HV-0430	STICK BUILT	Ball Valve	Piping Valve	CHILLER SUPPLY LINE	3"-CHWS-0409-CS1-C	1/2"	150	150	8	150	CHILLER WATER	35% PEG/Water	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		3"-CHWS-0409-CS1-C-2
76	P-455K	HV-0436	STICK BUILT	Ball Valve	Piping Valve	CHILLER SUPPLY LINE	3"-CHWS-0409-CS1-C	1/2"	150	150	8	150	CHILLER WATER	35% PEG/Water	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		3"-CHWS-0409-CS1-C-3
77	P-455K	SI-0437	STICK BUILT	SS PLUG	Piping Item	CHILLER SUPPLY LINE	3"-CHWS-0409-CS1-C	1/2"	150	150	8	150	CHILLER WATER	35% PEG/Water	SS 316	NPT (M)	1/2" SS NPT VALVE PLUG						IRC		3"-CHWS-0409-CS1-C-3
78	P-455K	HV-0429	STICK BUILT	Ball Valve	Piping Valve	CHILLER RETURN LINE	3"-CHWS-0409-CS1-C	3"	150	150	8	150	CHILLER WATER	35% PEG/Water	CS Body Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF						IRC		3"-CHWS-0409-CS1-C-1
79	P-455K	HV-0440	STICK BUILT	Ball Valve	Piping Valve	CHILLER RETURN LINE	3"-CHWR-0410-CS1-C	3"	150	150	8	150	CHILLER WATER	35% PEG/Water	CS Body Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF						IRC		3"-CHWR-0410-CS1-C-3
80	P-455K	HV-0442	STICK BUILT	Ball Valve	Piping Valve	CHILLER RETURN LINE	3"-CHWR-0410-CS1-C	3"	150	150	8	150	CHILLER WATER	35% PEG/Water	CS Body Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF						IRC		3"-CHWR-0410-CS1-C-3
81	P-455K	HV-0443	STICK BUILT	Ball Valve	Piping Valve	CHILLER RETURN LINE	3"-CHWR-0410-CS1-C	3"	150	150	8	150	CHILLER WATER	35% PEG/Water	CS Body Ball-SS 316, Seat - RTFE,	Flanged	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF						IRC		3"-CHWR-0410-CS1-C-4
82	P-455K	HV-0438	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	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		3"-CHWR-0410-CS1-C-4
83	P-455K	SI-0439	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	NPT (M)	1/2" SS NPT VALVE PLUG						IRC		3"-CHWR-0410-CS1-C-4

NOTES:

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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	
2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	
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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 17:53:16-0700'

OWNER: 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) 726-3565 EMAIL: INFO@BIOGASENG.COM

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

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **M-445AA**

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Biogas Engineering

Manual Valve List

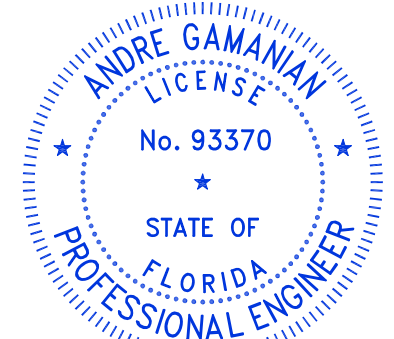
Stick Built_Supply

SERVICE FLUID DATA & INSTRUMENT REQUIREMENT																TO BE FILLED BY SUPPLIER				NOT TO BE FILLED BY SUPPLIER					
No.	PID sheet	P&ID Tag #	Scope	Item	Category	Location	Line	Item Size	Class rating	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
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)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR						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		NA
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	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		NA
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		NA
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. CF8, Ball-SS 316, Seat - RTFE,	NPT (F)	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE 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, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE 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	1/2"	150	25	24	150	CONDENSATE	H2O 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						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	H2O 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		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	LUG TYPE	BUTTERFLY VALVE, CLASS 150, RF						IRC		8"-LFG-0318-SS1-H-3

NOTES:

- IF LIST IS "SKID MODULE_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
- IF LIST IS "STICK BUILT_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

ISSUED FOR CONSTRUCTION

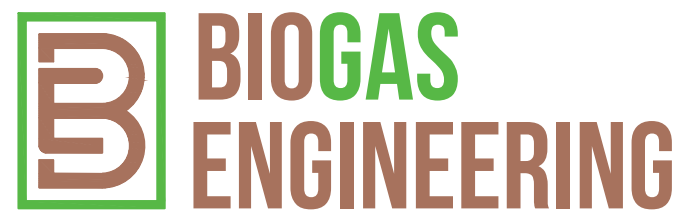
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	PROFESSIONAL ENGINEER
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG	 <p>ANDRE GAMANIAN, P.E. FL LICENCE NO.93370 EXP. 02/28/2025</p>
2.0	02/03/2023	ISSUED FOR CONSTRUCTION	SS	TP	AG	
3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG	
4.0	06/21/2023	ISSUED FOR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

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'

OWNER:  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) 726-3565
EMAIL: INFO@BIOGASENG.COM

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

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **M-445AC**

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Biogas Engineering Instrument List																												
Skid Module_Supply																												
No.	PID sheet	P&ID Tag #	Scope	Item	Instrument Location	Category	Line	Item Size	Class rating	Design Pressure psig	Design Temp F, Min.	Design Temp F, Max.	Fluid Service	Fluid Composition	Range	End Connection	Description	POWER SUPPLY	Feedback SIGNAL	TO BE FILLED BY SUPPLIER				NOT TO BE FILLED BY SUPPLIER				
																				Manufacturer	Model Number	Supplier	Remark	Comments	Scope of Supply	Status	Isometric Number	
1	P-4451	IG-0771	SKID MODULE	Level Gauge	@ V-700	GAUGES	1"-C-0206-SS1-H	1"	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%	1"-3"	RF FLANGED	Sight Glass with 1" ANSI 150 Flanged Stainless Steel Gauge Valves	N/A	N/A	JOHN C ERNST	81910F-09-00-ATH-150-150-5N	COYLE			BGE		1"-C-0206-SS1-H-1	
2	P-4451	LT-0215	SKID MODULE	Level Transmitter	@ V-200	TRANSMITTER	1/2"-LFG-0208-SS7-H/ 1/2"-LFG-0208-SS7-H	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-0206-SS1-H-2	
3	P-4451	PG-0242	SKID MODULE	Pressure Gauge	Suction Scrubber Drain	GAUGES	1 1/2"-C-0204-SS1-HT	1 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-PC4051A2P72-LD-D-T	COYLE		We need CSI-PC4051A2P75-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 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-PR4051A2P16-LD-D-T	COYLE			BGE		10"-LFG-0202-SS1-P-2	
5	P-4451	PT-0209	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	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	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	ABB	266DSH	COYLE	Provide RTD with Thermowell		BGE		1"-C-0405-SS1-C-1 & 1"-C-0405-SS1-C-2	
8	P-445L	PG-0505	SKID MODULE	Pressure Gauge	Blower Discharge	GAUGES	8"-LFG-0510-SS1-P	1 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-PR4051A2P15-LD-D-T	COYLE			BGE		8"-LFG-0510-SS1-P-4	
9	P-445L	PT-0507	SKID MODULE	Pressure Transmitter	UPSTREAM OF BLOWER INLET SCRUBBER	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%	0-10PSIG	MNPT	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A							BGE		NA
10	P-445L	FT-0503	SKID MODULE	Multivariable Flow Meter Element & Transmitter	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	
11	P-445L	TT/TW-0254	SKID MODULE	RTD	UPSTREAM 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	IN/A					BGE		10"-LFG-0202-SS1-P-2	
12	P-445L	TG/TW-0255	SKID MODULE	Temperature Gauge	UPSTREAM 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	IN/A					BGE		10"-LFG-0202-SS1-P-2	
13	P-445L	PT-0538	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	ABB	266HSH	COYLE			BGE		1/2"-IA-0517-SS1-N-1	

- Notes:
1. All transmitter shall generate 4-20 mA signal.
2. All the items shall be designed 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

Biogas Engineering Actuated Valve List																															
Skid Module_Supply																															
No.	PID sheet	P&ID Tag #	Scope	Item	XV Location	Line No	Item Size	Class rating	Design Pressure psig	Design Temp F, Min.	Design Temp F, Max.	Fluid Service	Fluid Composition	Actuation	Seal Class	Failure Position	Inline Element	Instrument Air Requirement	Power Supply	Feedback SIGNAL	End Connection	Description	TO BE FILLED BY SUPPLIER				NOT TO BE FILLED BY SUPPLIER				
																							Manufacturer	Model Number	Supplier	Cost	Remark	Comments	Scope of Supply	Status	Isometric Number
1	P-4451	SV-0232	SKID MODULE	On/Off Valve	Suction Scrubber Drain	1 1/2"-C-0204-SS1-HT	1 1/2"	150	40 PSIG	24	150	CONDENSATE	WATER	Electrical	Class 2	Fail Closed	Ball Valve	NA	24DC	Form C Contacts (Open, Close)	FNPT	Stainless Steel Solenoid Valve, Threaded, Norm Closed, 24Vdc Explosion Proof.	TRIAC	22-TX-150/3RF8-FB	Coyle	\$957.25	Full Port SS THREADED Ball Valve, Non-Firesafe		BGE		1 1/2"-C-0204-SS1-HT-2
2	P-445K	SV-0426	SKID MODULE	On/Off Valve	Discharge Scrubber Drain	1 1/2"-C-0404-SS1-HT	1 1/2"	150	15	24	150	CONDENSATE	WATER	Electrical	Class 2	Fail Closed	Ball Valve	NA	24DC	Form C Contacts (Open, Close)	FNPT	Stainless Steel Solenoid Valve, Threaded, Norm Closed, 24Vdc Explosion Proof.	MAGNATROL	PLF35K45BC-HDTH-24VDC-VISUAL INDICATOR	Coyle	\$2,286.50	Solenoid Valve. Non-Firesafe		BGE		1 1/2"-C-0404-SS1-HT-3
3	P-445K	FV-0415	SKID MODULE	Flow Control Valve	Discharge Scrubber Recycle	4"-LFG-0403-SS1-N	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%	Instrument Air	CLASS 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
4	P-445L	PV-0606	SKID MODULE	Pressure Control Valve	LFG Line to Flare	8"-LFG-0610-SS1-P	8"	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%	Instrument Air	CLASS 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, hold open, fail closed. Assembled with solenoid, exhaust speed control mufflers, position indication/limit switches.	TRIAC	P1F-L1-0800-F6C-XAG - 3R850SR	Coyle	\$7,924.50	SS ANSI 150 LUG, FIRESAFE DESIGN, G2TFE/ 316L METAL SEAT		BGE		8"-LFG-0610-SS1-P-5
5	P-445L	SV-0253	SKID MODULE	On/Off Valve	Instrument Air Line to P-202	1/2"-IA-0517-SS1-N	1/2"	150	150	24	150	INSTRUMENT AIR	AIR	Electrical	Class 2	Fail Closed	Ball Valve	NA	24DC	Form C Contacts (Open, Close)	FNPT	Stainless Steel Solenoid Valve, Threaded, Norm Closed, 24Vdc Explosion Proof.	MAGNATROL	PLF41K36C-HDTG-24VDC-PLF41K36G	Coyle	\$2,770.20	Solenoid Valve. Non-Firesafe		BGE		1/2"-IA-0517-SS1-N-1

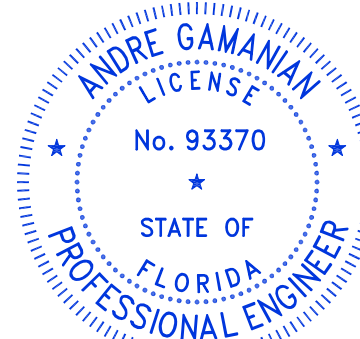
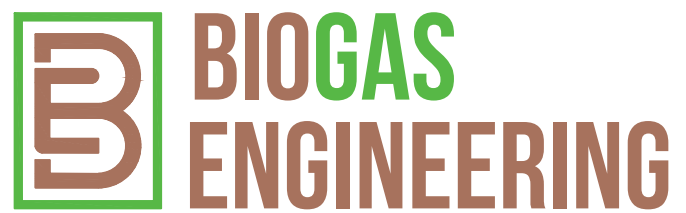
- Notes:
1. All the items shall be designed for class I Div 2 electrical area classification.
2. Instrument air supply: Maximum 100 psig, Normal : 80 psig Minimum: 65 psig
3. Position indication is not required for valves with Electro-pneumatic positioner
4. All items except SS tags are quantity of one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

Biogas Engineering Actuated Valve List																														
Stick Built_Supply																														
No.	PID sheet	P&ID Tag #	Scope	Item	XV Location	Line No	Item Size	Class rating	Design Pressure psig	Design Temp F, Min.	Design Temp F, Max.	Fluid Service	Fluid Composition	Actuation	Seal Class	Failure Position	Inline Element	Instrument Air Requirement	Power Supply	Feedback SIGNAL	End Connection	Description	TO BE FILLED BY SUPPLIER				NOT TO BE FILLED BY SUPPLIER			
																							Manufacturer	Model Number	Supplier	Remark	Comments	Scope of Supply	Status	Isometric Number
1	P-445G	XV-0106	Stick Built	On/Off Valve	LFG INLET @ B/L	14"-LFG-0101-SS1-N	14"	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%	Instrument Air	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	
2	P-445H	FV-0139	Stick Built	Flow Control Valve	LFG INLET @ B/L	8"-LFG-0102-SS1-N	8"	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%	Instrument Air	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
3	P-445H	FV-0140	Stick Built	Flow Control Valve	LFG INLET @ B/L	6"-LFG-0103-SS1-N	3"	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%	Instrument Air	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-F1-0800-SXX-3R1000SR FAIL CLOSED	Coyle			BGE		6"-LFG-0103-SS1-HT-1

- Notes:
1. All the items shall be designed for class I Div 2 electrical area classification.
2. Instrument air supply: Maximum 100 psig, Normal : 80 psig Minimum: 65 psig
3. Position indication is not required for valves with Electro-pneumatic positioner
4. All items except SS tags are quantity of one each.
5. 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.

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	 <p>This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.</p> <p>Digitally signed by Andre Gamanian Date: 2023.09.25 17:53:16-07'00'</p>
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)	MT	TP	AG	
						<p>OWNER: INDIAN RIVER COUNTY FLORIDA</p> <p>1325 74th AVE SW, VERO BEACH, FLORIDA 32968</p>
						<p>ENGINEER:  BIOGAS ENGINEERING</p> <p>2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM</p>
						<p>INSTRUMENT LIST (SKID MODULE) & ACTUATED VALVE LIST (SKID MODULE/STICK BUILT) (SHEET 12 OF 13)</p> <p>LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT</p> <p>DRAWING NO. M-445AD</p>

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Biogas Engineering																										
Instrument List																										
Stick Built_Supply																										
No.	PID sheet	P&ID Tag #	Scope	Item	Instrument Location	Category	Line	Item Size	Class rating	Design Pressure psi	Design Temp F, Min.	Design Temp F, Max.	Fluid Service	Fluid Composition	Range	End Connection	Description	POWER SUPPLY	Feedback SIGNAL	TO BE FILLED BY SUPPLIER			NOT TO BE FILLED BY SUPPLIER			
																				Manufacturer	Model Number	Supplier	Remark	Comments	Scope of Supply	Status
1	P-445G	PG-0102	Stick Built	Pressure Gauge	LFG INLET @ B/L	GAUGES	14"-LFG-0101-SS1-N	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	4" DIAL PRESSURE GAUGE, SS BODY, INTERNALS, BOTTOM MNT	N/A	N/A	REOTEMP				IRC	14"-LFG-0101-SS1-N-2	
2	P-445G	TT/TW-0107	Stick Built	RTD	LFG INLET @ B/L	RTD/Thermowell	14"-LFG-0101-SS1-N	3/4"	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 to 300°F	MNPT	100 ohm RTD Sensor / 4" Spring Loaded Stem/Aluminum Screw Connection head	24DC	4-20 mA	TREXICE		Provide RTD with Thermowell	IRC	14"-LFG-0101-SS1-N-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	Nutting 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	Multivariable 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	Multivariable 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	ABB		TRI-PACIFIC		BGE	8"-LFG-0102-SS1-HT-3	
9	P-445H	TT/TW-0124	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%	0 to 300°F	MNPT	100 ohm RTD Sensor / 4" Spring Loaded Stem/Aluminum Screw Connection head	24DC	4-20 mA	TREXICE		Confirm the measurement range	IRC	NA		
10	P-445H	AE-127	Stick Built	TotalFlow Landfills Gas RTU 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	ABB		TRI-PACIFIC	Include 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	ABB				IRC	14"-LFG-0101-SS1-N-1	
12	P-445I	TT/TW-0303	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	TREXICE				IRC	8"-LFG-0318-SS1-H-2	
13	P-445I	TG/TW-0304	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	
14	P-445I	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	
15	P-445I	PG-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	
16	P-445I	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	IN/A				IRC	8"-LFG-0304-SS1-H-1	
17	P-445I	DPG-0343	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	IN/A				IRC	8"-LFG-0303-SS1-H-1	
18	P-445I	DPG-0335	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	IN/A				IRC	NA	
19	P-445I	TT/TW-0325	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	TREXICE				IRC	8"-LFG-0311-SS1-H-2	
20	P-445K	TI/TT/TW-0401	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	TREXICE				IRC	8"-LFG-0312-ST1-H-2	
21	P-445K	TG/TW-0402	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	
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	ABB				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-0408	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	TREXICE				IRC	8"-LFG-0401-ST1-C-1	
25	P-445K	TG/TW-0407	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	ABB				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	
28	P-445K	TT/TW-0432	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	TREXICE				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-0508	Stick Built	Multivariable Flow Meter Element & Transmitter	LFG OUTLET TO EVAP FACILITY @ B/L	TRANSMITTER	8"-LFG-0501-SS1-P	3/4"	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	IN/A		Confirm the measurement range & Only Rosemount make to be considered			IRC	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:
- All transmitter shall generate 4-20 mA signal.
 - All the items shall be designed for class 1 Div 2 electrical area classification.
 - All items except SS tags are quantity of one each.
 - All items shall be tagged with SS tags

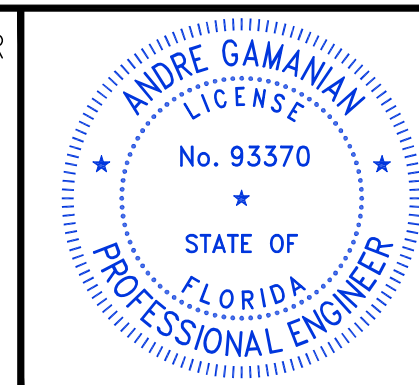
NOTES:

- IF LIST IS "SKID MODULE_SUPPLY", IT DOES NOT NEED TO BE PROCURED NOR INSTALLED BY CONTRACTOR.
- IF LIST IS "STICK BUILT_SUPPLY", IT DOES NEED TO BE PROCURED AND INSTALLED BY CONTRACTOR.

ISSUED FOR CONSTRUCTION

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)	MT	TP	AG

PROFESSIONAL ENGINEER
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 Gamanian
Date: 2023.09.25 17:53:16-07'00'

OWNER: 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

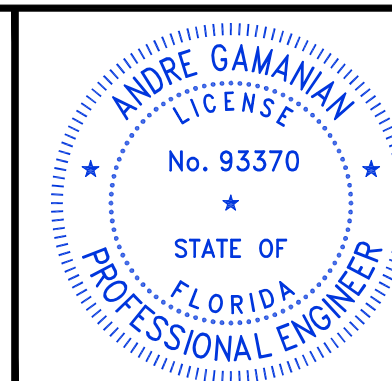
INSTRUMENT LIST (STICK BUILT)
(SHEET 13 OF 13)
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. M-445AE

C:\Users\MukeshThakur\Documents\Engineering\Biogaseng - Documents\Engineering\Projects\Ush2126.100 - Indian River County LF\Drawings\M-Mechanical\M-445AF to M-445AL.dwg 21-06-2023 Mukesh Thakur

PIPING SUPPORT STANDARD - SUPPORT INDEX					
S.NO.	TYPE	DESCRIPTION	DRAWING NO.	REVISION	DATE
1	US1	U-BOLT FOR BARE PIPE SIZE 1/2" THRU 16"	M-445AG	3.0	05/30/2023
2	SS1	PIPE SHOE FOR INSULATED PIPE SIZE 1/2" TO 6"	M-445AG	3.0	05/30/2023
3	SS2	PIPE SHOE FOR INSULATED PIPE SIZE 8" TO 16"	M-445AG	3.0	05/30/2023
4	SS3	PIPE SHOE FOR INSULATED PIPE SIZE 18" TO 24"	M-445AH	3.0	05/30/2023
5	SS4	PIPE SADDLE FOR SLOPE LINE FOR PIPE SIZE 10" THRU 24"	M-445AH	3.0	05/30/2023
6	GS1	GUIDE SUPPORT FOR BARE PIPE-SIZE 1/2" TO 12"	M-445AI	3.0	05/30/2023
7	GS2	GUIDE SUPPORT FOR BARE PIPE-SIZE 14" TO 24"	M-445AI	3.0	05/30/2023
8	PS6	PICK UP SUPPORTS	M-445AJ	3.0	05/30/2023
9	AS1	LINE STOP FOR UNINSULATED PIPE ON STEEL / CONCRETE STRUCTURE	M-445AJ	3.0	05/30/2023
10	AS2	LINE STOP FOR UNINSULATED PIPE ON STEEL / CONCRETE STRUCTURE	M-445AJ	3.0	05/30/2023
11	LS2	ADJUSTABLE LOW SUPPORT WITH 4 BOLTS FOR PIPE SIZE 2" THRU 16"	M-445AK	3.0	05/30/2023
12	LS3	LOW SUPPORT SLIDING FOR BARE AND INSULATED PIPE - SIZE 2" THRU 16"	M-445AK	3.0	05/30/2023
13	DS1	DUMMY PIPE SUPPORT FOR INSULATED PIPE SIZE 2" THRU 16"	M-445AK	3.0	05/30/2023
14	HS1	PIPE HANGER SUPPORT FOR BARE/INSULATED PIPE SIZE 1/2' THRU 12"	M-445AL	3.0	05/30/2023

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	ANDRE GAMANIAN, P.E. FL LICENCE NO.93370 EXP. 02/28/2025
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)	MT	TP	AG	



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'

OWNER:  INDIAN RIVER COUNTY FLORIDA

1325 74th AVE SW,
 VERO BEACH, FLORIDA 32968

ENGINEER:  **BIOGAS ENGINEERING**

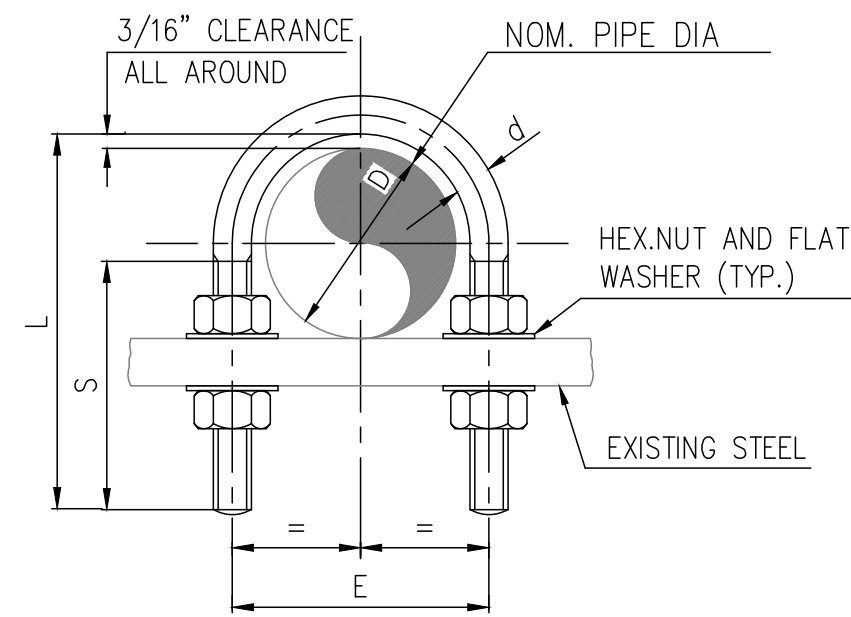
2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING SUPPORT STANDARD SUPPORT INDEX (SHEET 1 OF 7)

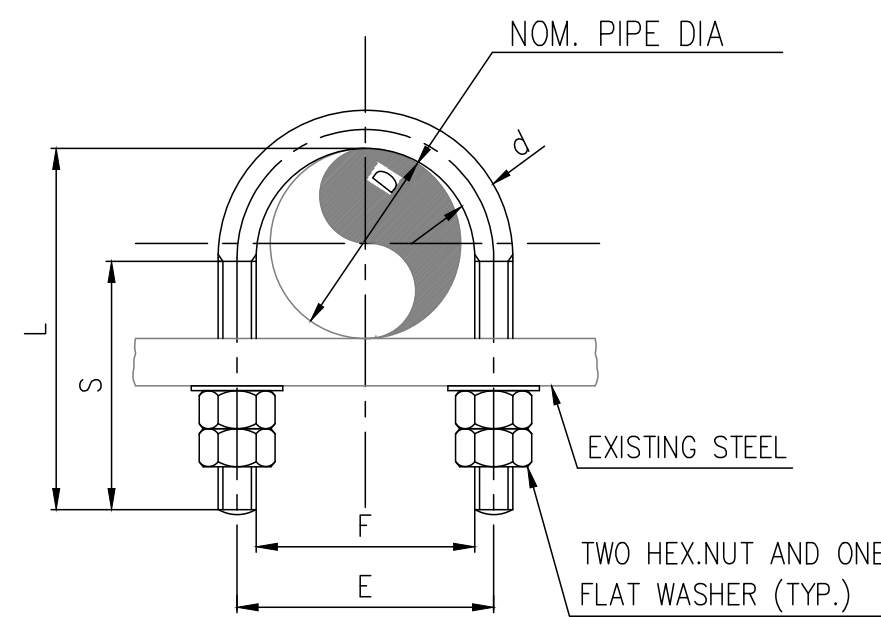
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **M-445AF**

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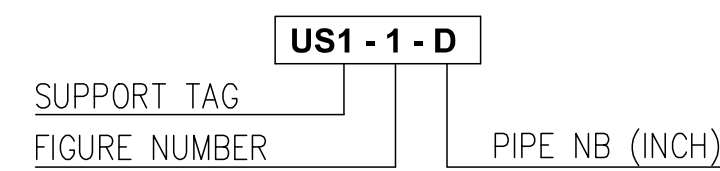


GUIDE
(1/2" TO 16")
FIGURE-1



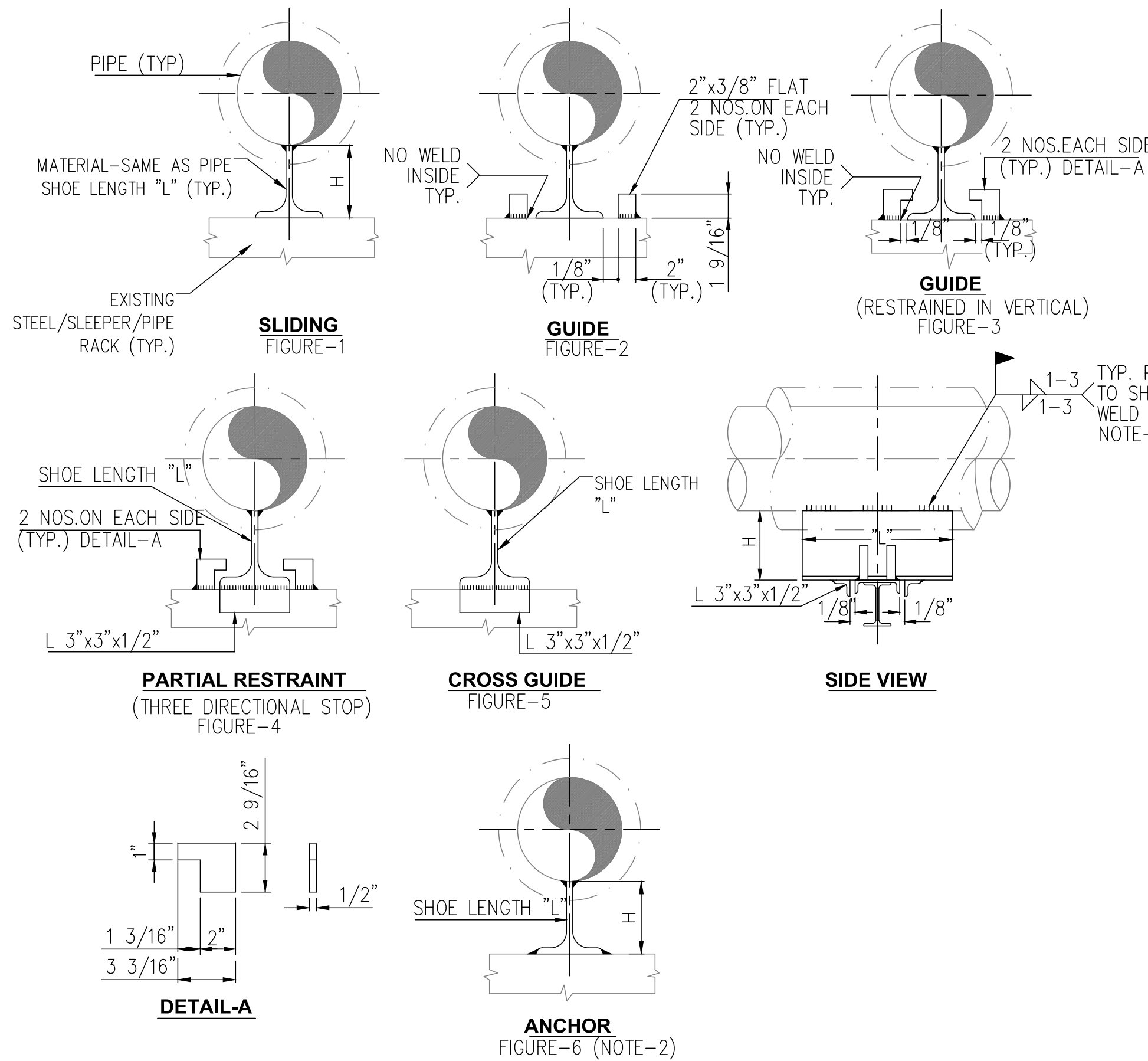
FIXED
(1/2" TO 16")
FIGURE-2

D	O.D.	'U' CLAMP					
		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

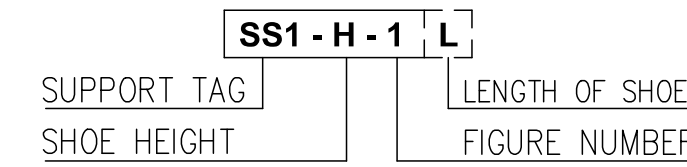


- NOTES:-**
- ALL DIMENSIONS ARE IN INCH.
 - U-CLAMPS SHALL BE HOT DIP GALVANIZED, UNLESS NOTED OTHERWISE.

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

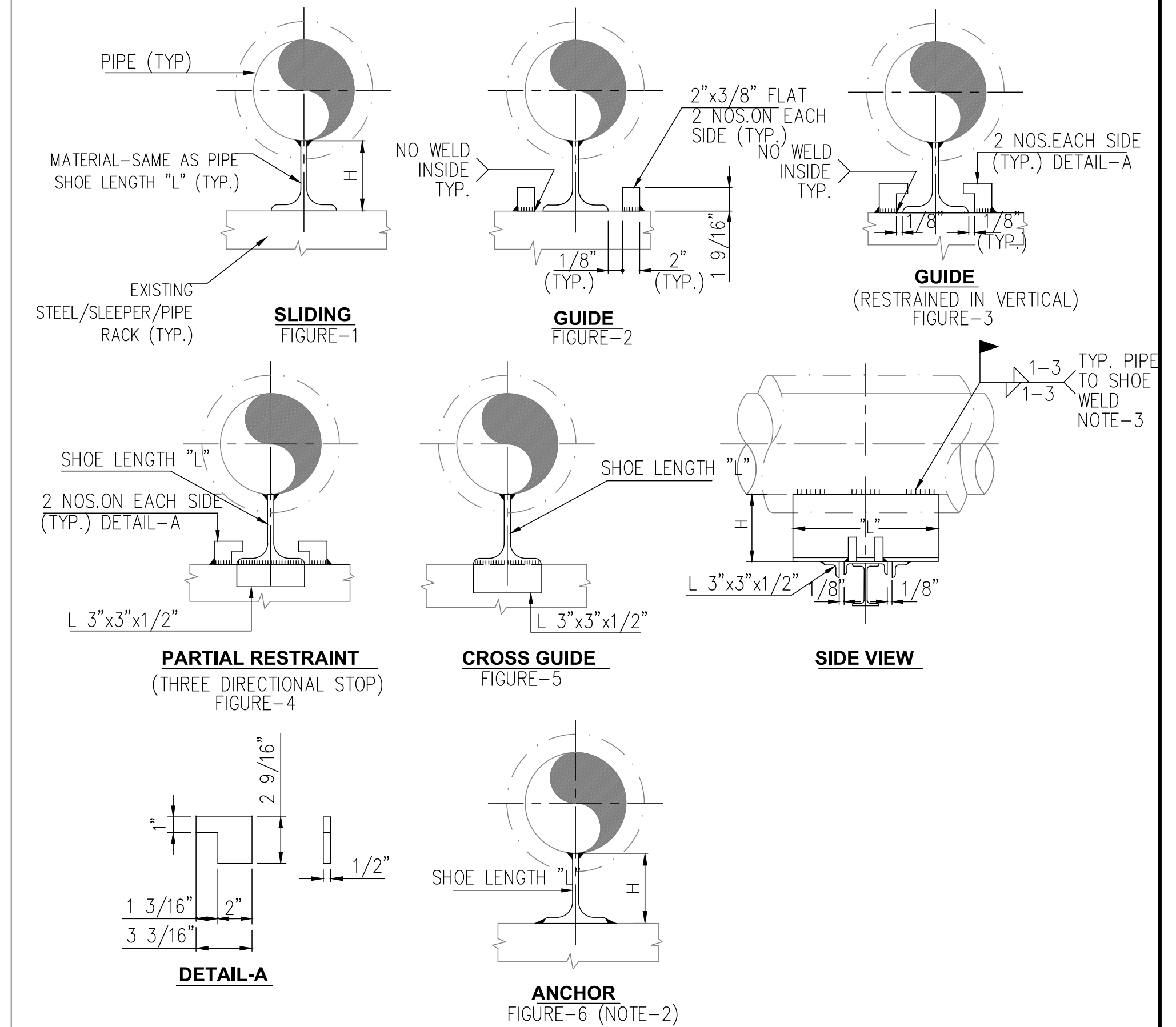


INSULATION THICKNESS	H	CUT FROM S SHAPE
UP TO 3"	1"to4"	S 8x18.4 / ST4X9.2

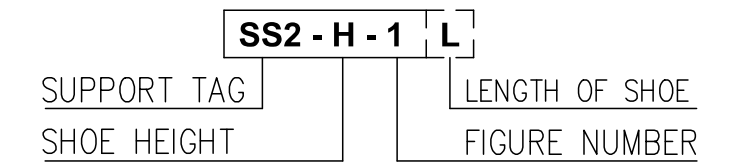


- NOTES:-**
- ALL DIMENSIONS ARE IN INCH
 - FOR ANCHOR SUPPORT, SHOE DETAIL WILL BE THE SAME AS FIG.1 THE SHOE TO BE FULL WELDED TO THE EXISTING STRUCTURE BY INSERTING SUITABLE PLATE THICKNESS INCREASING THE SHOE HEIGHT.
 - ALL WELDS CONTINUOUS EXCEPT PIPE TO SHOE WHICH ARE STAGGERED STITCH WELDS 1 -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

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



INSULATION THICKNESS	H	CUT FROM S SHAPE
UP TO 3"	1"to4"	S 8x18.4 / ST4X9.2



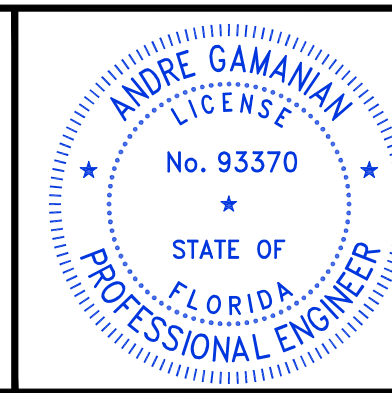
- NOTES:-**
- ALL DIMENSIONS ARE IN INCH
 - FOR ANCHOR SUPPORT, SHOE DETAIL WILL BE THE SAME AS FIG.1 THE SHOE TO BE FULL WELDED TO THE EXISTING STRUCTURE BY INSERTING SUITABLE PLATE THICKNESS INCREASING THE SHOE HEIGHT.
 - ALL WELDS CONTINUOUS EXCEPT PIPE TO SHOE WHICH ARE STAGGERED STITCH WELDS 1 -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

PIPING SUPPORT STANDARD - SS2
PIPE SHOE FOR INSULATED PIPE SIZE
8" TO 16"

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	
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)	MT	TP	AG	

ANDRE GAMANIAN, P.E.
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EXP. 02/28/2025



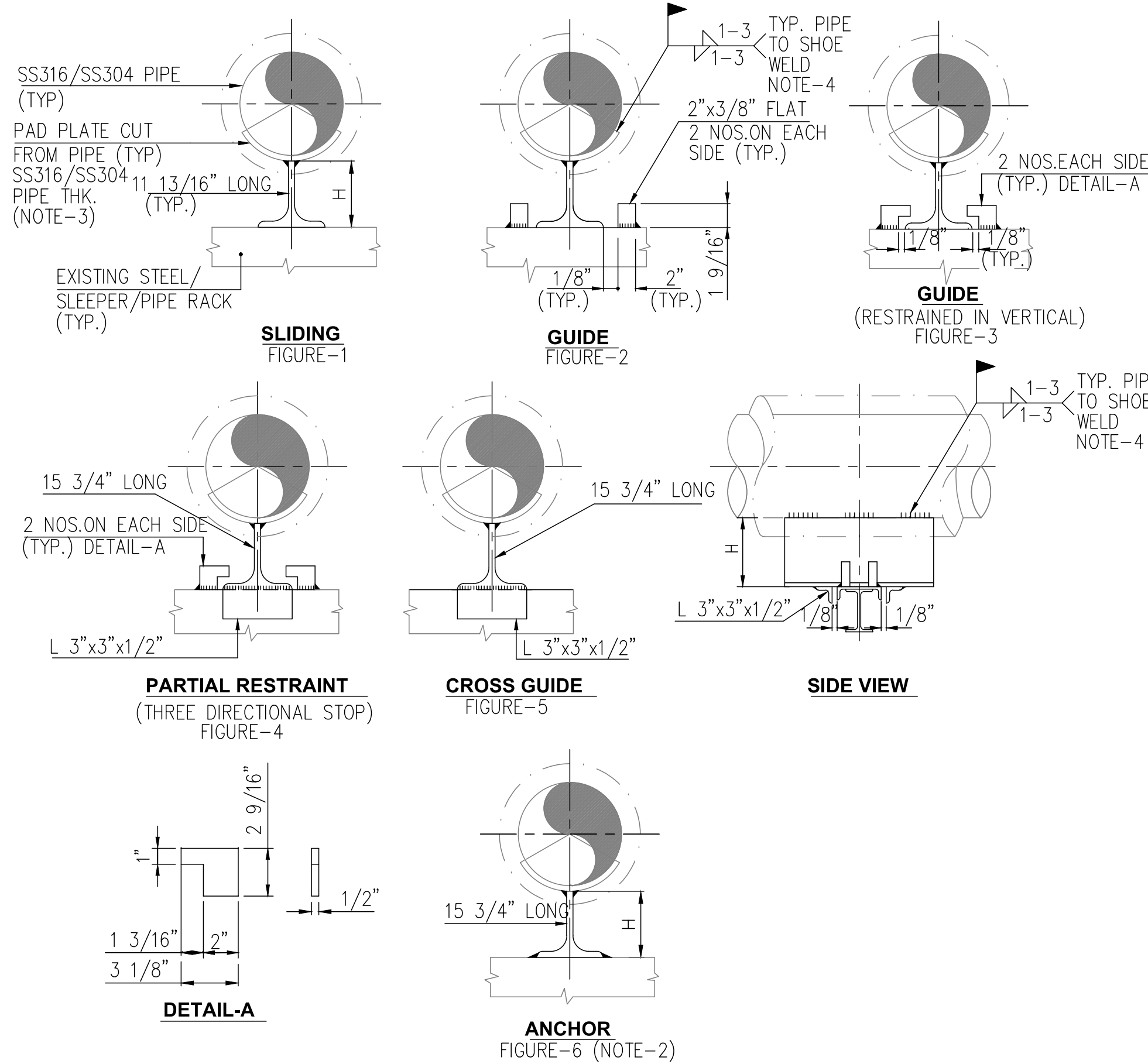
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1325 74th AVE SW, VERO BEACH, FLORIDA 32968

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

PIPING SUPPORT STANDARD
(SHEET 2 OF 7)
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. M-445AG

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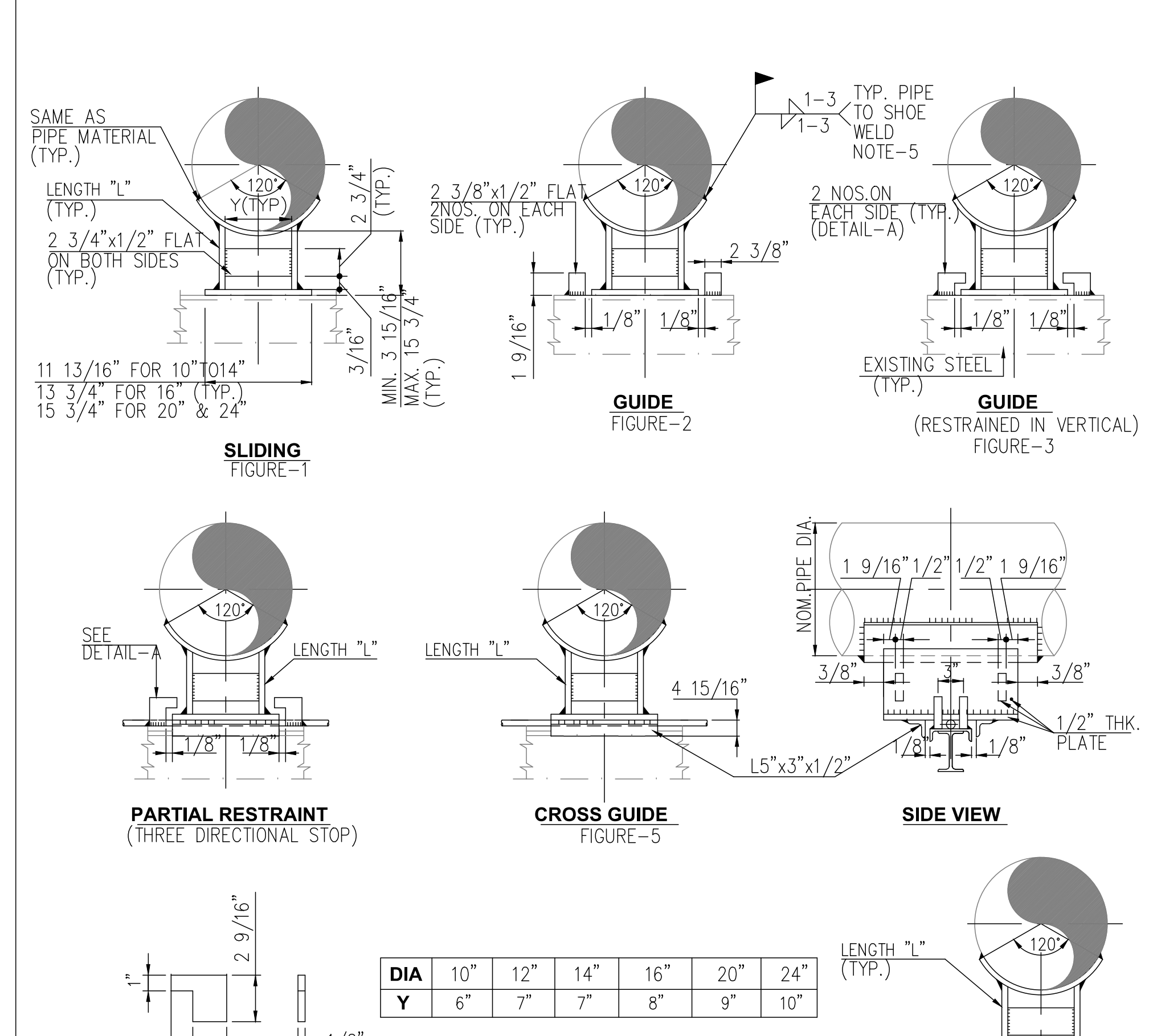


INSULATION THICKNESS	H	CUT FROM S SHAPE
UP TO 3"	4"	S 12X31.8

SS3 - H - 1 L	
SUPPORT TAG	LENGTH
SHOE HEIGHT	FIGURE NUMBER

- NOTES:-**
1. ALL DIMENSIONS ARE IN INCH
 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. ROD SHALL BE PROVIDED IF SHOWN IN PIPING GA DRAWINGS
 4. ALL WELDS CONTINUOUS EXCEPT PIPE TO SHOE WHICH ARE STAGGERED STITCH WELDS 1 - 3, FILLET THICKNESS PER AWS D1.1 TABLE.

**PIPING SUPPORT STANDARD - SS3
PIPE SHOE FOR INSULATED PIPE SIZE
18" TO 24"**



DIA	10"	12"	14"	16"	20"	24"
Y	6"	7"	7"	8"	9"	10"

SS4 - H - 2 - D L	
SUPPORT TAG	SUPPORT LENGTH
SHOE HEIGHT	PIPE NB (INCH)
FIGURE NUMBER	

- NOTES:-**
1. ALL DIMENSIONS ARE IN INCH
 2. PAD PLATE / PROTECTION SHIELD TO BE CUT FROM LINE PIPE
 3. USE 1/2" THICK CARBON STEEL PLATE FOR SADDLE FABRICATION
 4. FOR ANCHOR SUPPORT, SADDLE DETAIL WILL BE THE SAME AS FIG.1 SADDLE & THE SADDLE TO BE FULL WELDED TO THE EXISTING STRUCTURE / SLEEPER & PIPE BY INSERTING SUITABLE PLATE THICKNESS EQUAL TO THE ROD DIA OR BY REMOVING THE ROD & INCREASING THE SADDLE HEIGHT
 5. ALL WELDS CONTINUOUS EXCEPT PIPE TO SHOE WHICH ARE STAGGERED STITCH WELDS 1 - 3, FILLET THICKNESS PER AWS D1.1 TABLE.

**PIPING SUPPORT STANDARD - SS4
PIPE SADDLE FOR SLOPE LINE FOR PIPE
SIZE 10" THRU 24"**

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	
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)	MT	TP	AG	

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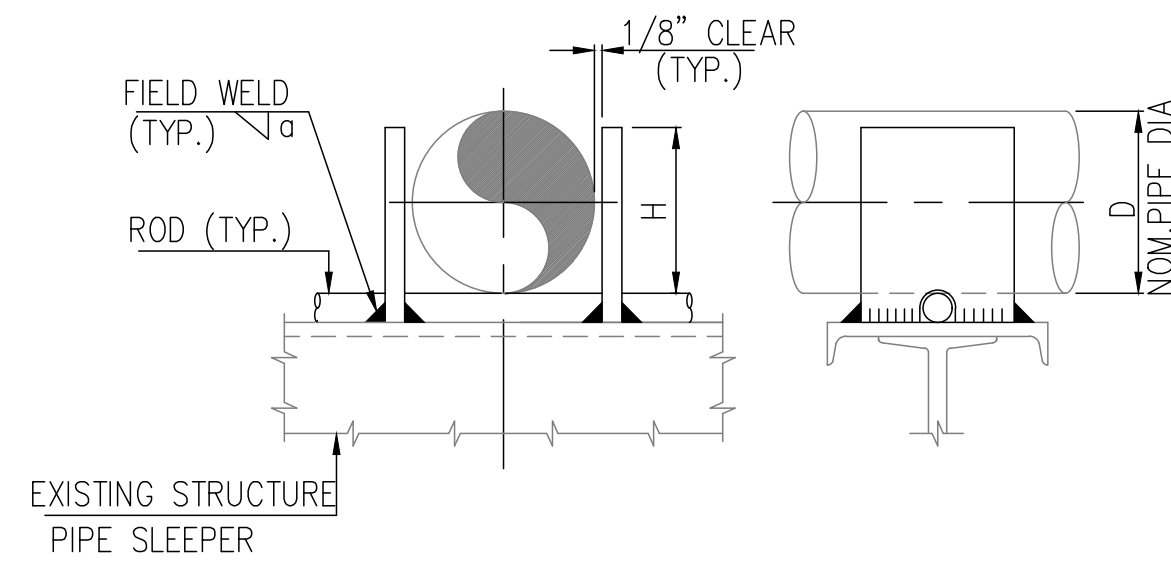
ENGINEER:
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING SUPPORT STANDARD
(SHEET 3 OF 7)

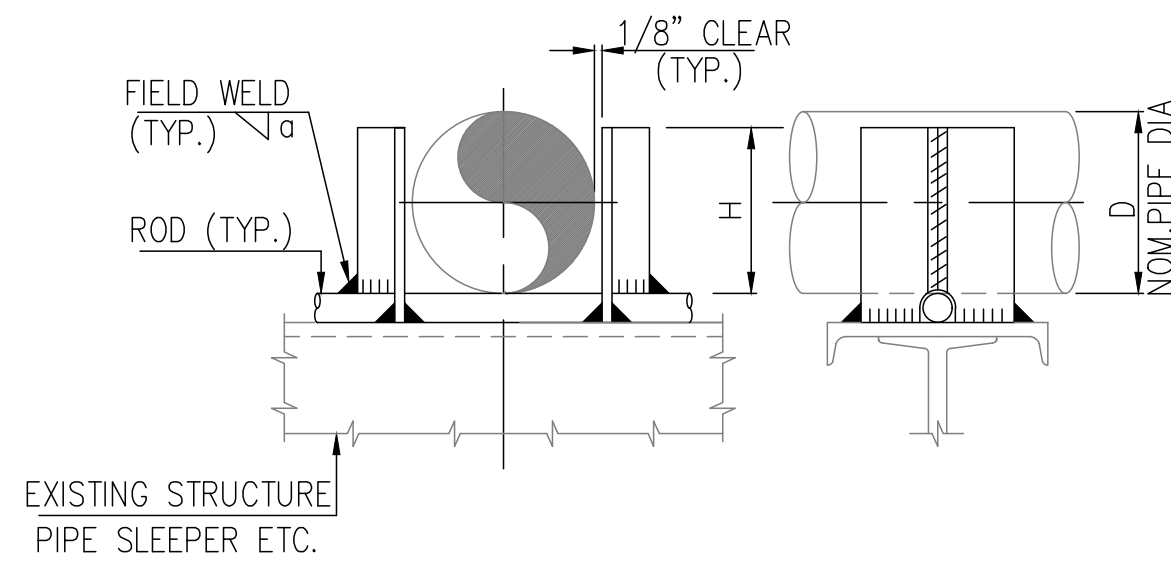
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **M-445AH**

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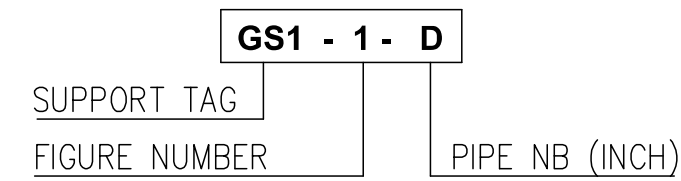


FOR SIZES UPTO 4"
FIGURE-1



FOR SIZES 6" UPTO 12"
FIGURE-2

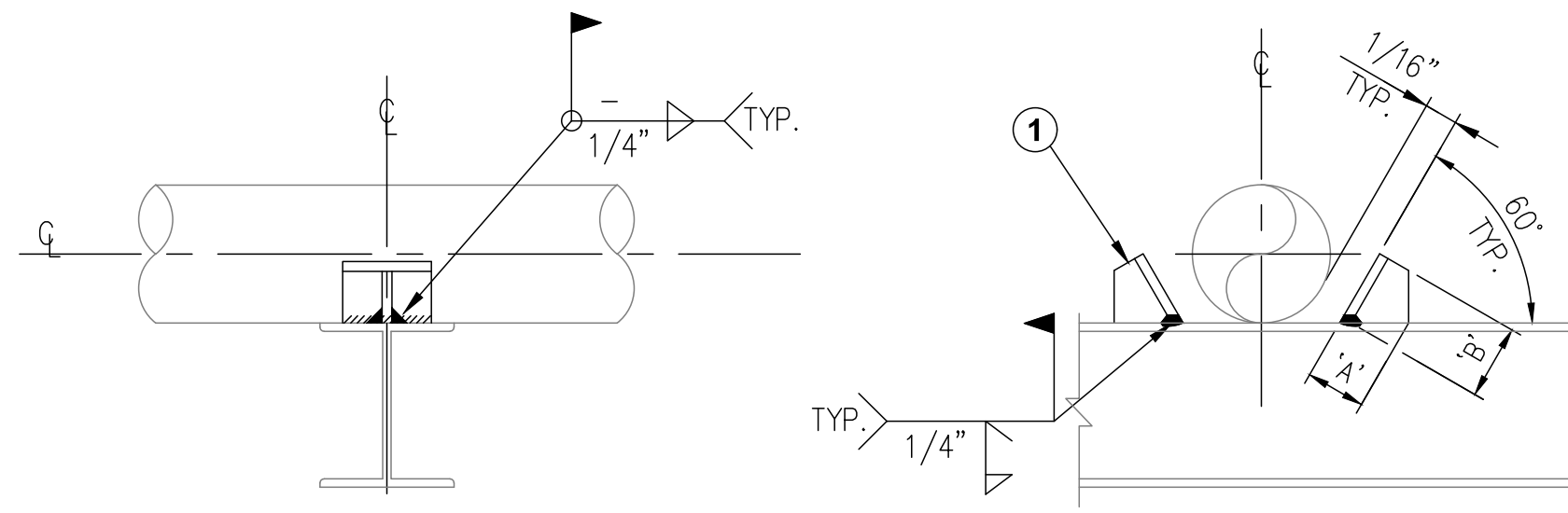
D	H	a	GUIDE SIZE
2" & SMALLER	1 9/16	1/4	FLAT 3 1/8 x 5/16 (NOTE 3)
3" TO 4"	2 3/4	1/4	FLAT 3 x 5/8 (NOTE 3)
6" TO 8"	5 1/8	1/4	2 NOS. L 2 x 2 x 1/4
10" TO 12"	9 1/16	3/8	2 NOS. L 3 x 3 x 1/2



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.

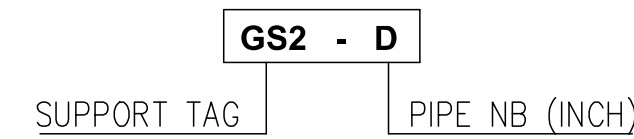
**PIPING SUPPORT STANDARD - GS1
GUIDE SUPPORT FOR BARE PIPE
1/2" TO 12"**



MARK NO. 1 TO 2

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		
DESCRIPTION	ITEM	QTY
WB X 28	1	1
(MARK NO.1-2)		



NOTES:-

1. ALL DIMENSIONS ARE IN INCH.

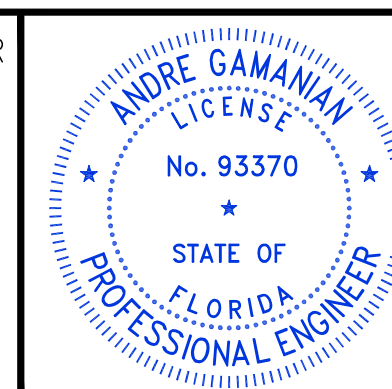
**PIPING SUPPORT STANDARD - GS2
GUIDE SUPPORT FOR BARE PIPE
14" TO 24"**

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG
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3.0	05/30/2023	ISSUED FOR CONSTRUCTION (REVISED)	SS	TP	AG
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PROFESSIONAL ENGINEER

ANDRE GAMANIAN, P.E.
FL LICENCE NO.93370
EXP. 02/28/2025



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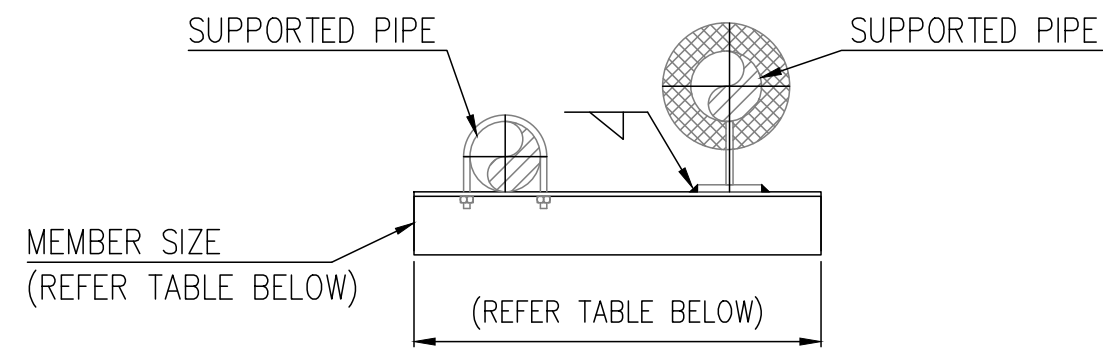
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FLORIDA
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VERO BEACH, FLORIDA 32968

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EMAIL: INFO@BIOGASENG.COM

PIPING SUPPORT STANDARD
(SHEET 4 OF 7)

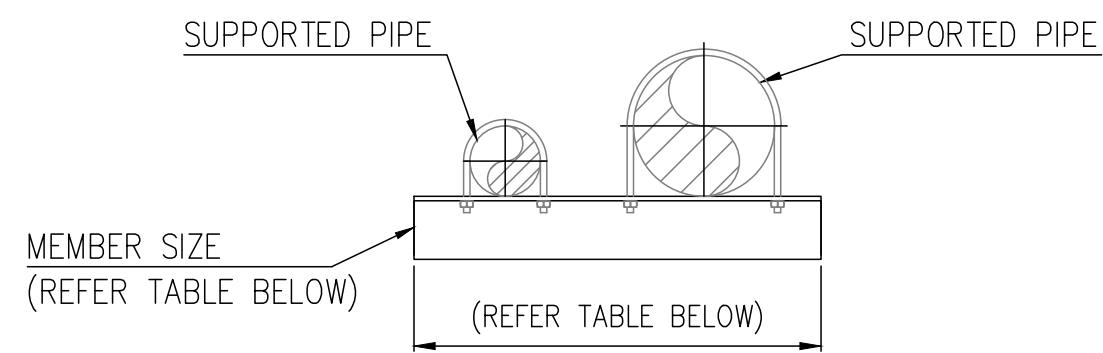
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. M-445AI

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ELEVATION

CONFIGURATION TO BE FOLLOWED FOR INSULATED SUPPORTING PIPE



ELEVATION

CONFIGURATION TO BE FOLLOWED FOR NON-INSULATED SUPPORTING PIPE

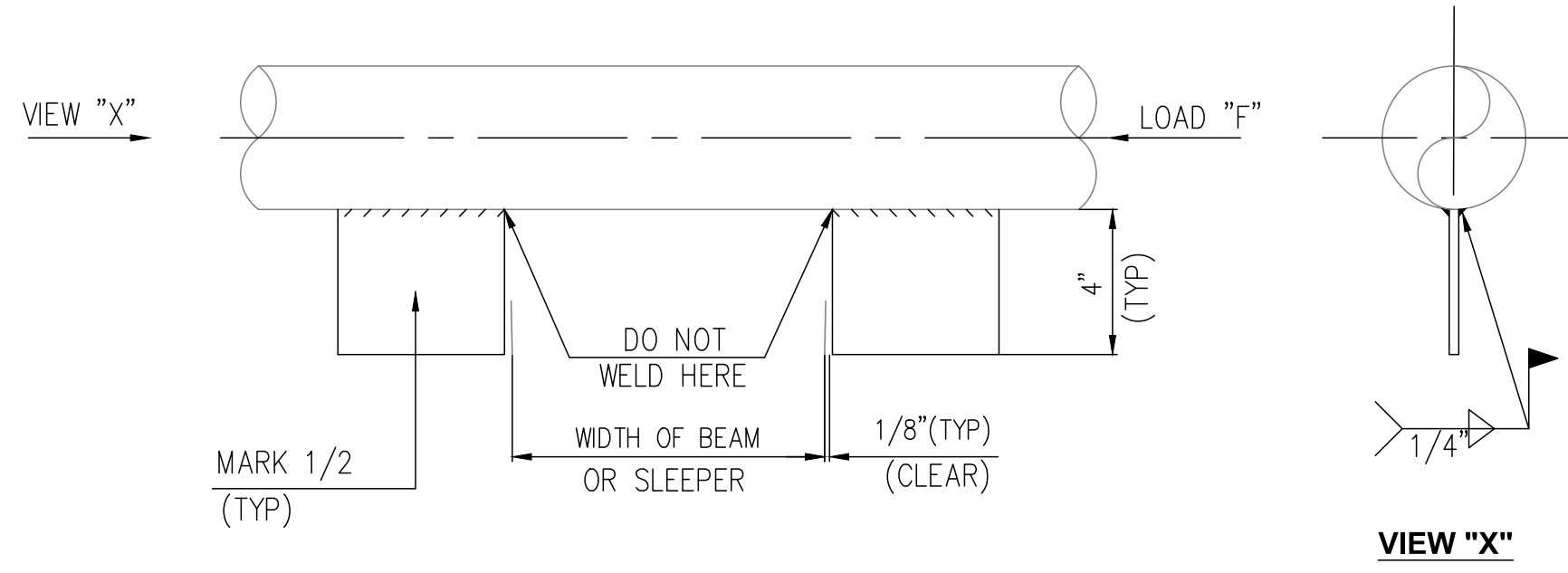
MEMBER SIZE	SUPPORTED PIPE SIZE	SUPPORTING PIPE SIZE	MAX. LENGTH
L2x2x1/4	1/2" - 1"	2" - 4"	24"
L3x3x1/4	1/2" - 3"	6" - 10"	36"
L4x4x1/4	1/2" - 6"	12" - 16"	48"

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**



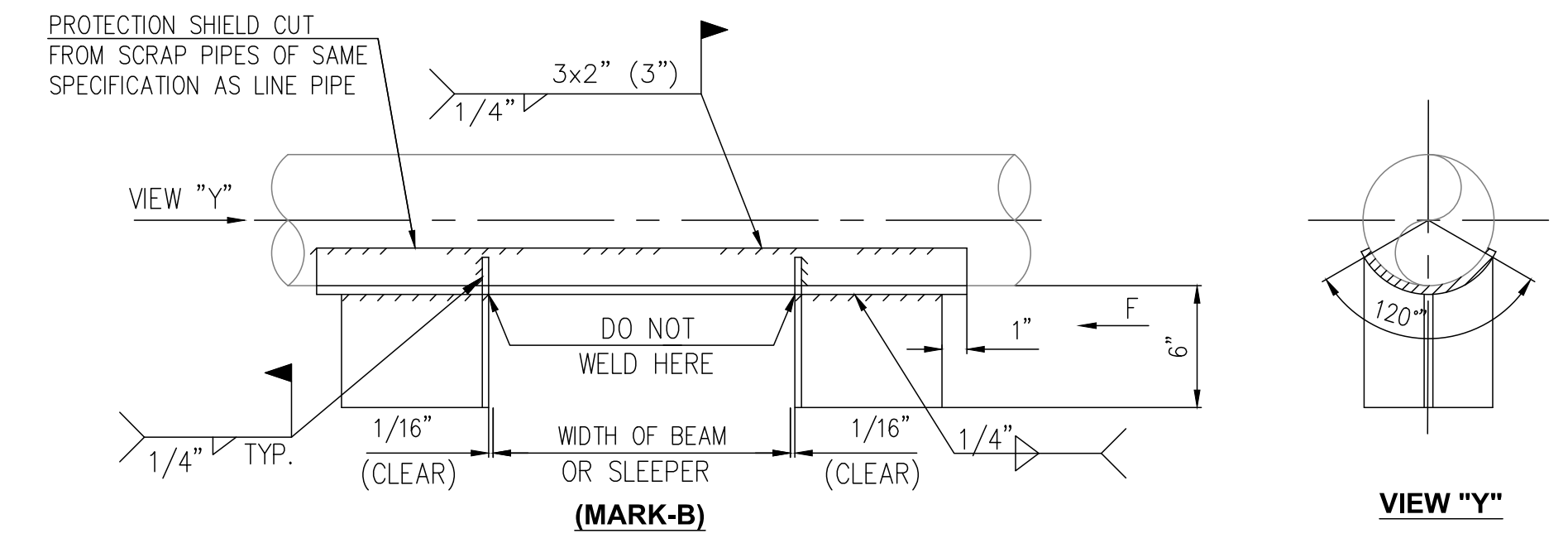
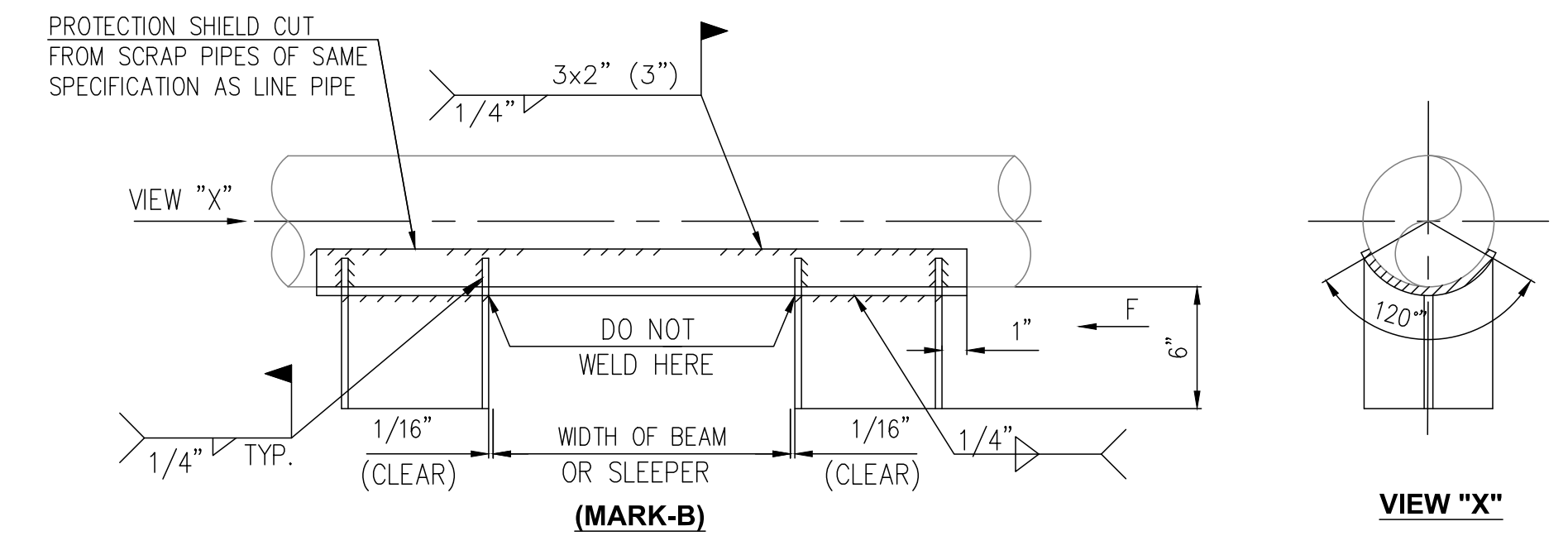
LINE SIZE	MARK - 1		MARK - 2		QTY.
	MAX LOAD 'F' (LBS)	PLATE SIZE	MAX LOAD 'F' (LBS)	PLATE SIZE	
1"	55116	6x4x3/8 THK.	27558	3x4x3/8 THK.	2
1 1/2"	55116	6x4x3/8 THK.	27558	3x4x3/8 THK.	2
2"	55116	6x4x3/8 THK.	27558	3x4x3/8 THK.	2
3"	74957	6x4x3/8 THK.	37478	3x4x3/8 THK.	2

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

NOTES:

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)
A	1/2 W8 X 13	9700
B	W8 X 13	19400

AS2 - A - D
SUPPORT TAG MARK NO. PIPE SIZE

NOTES:

1. ALL DIMENSIONS ARE IN INCH.

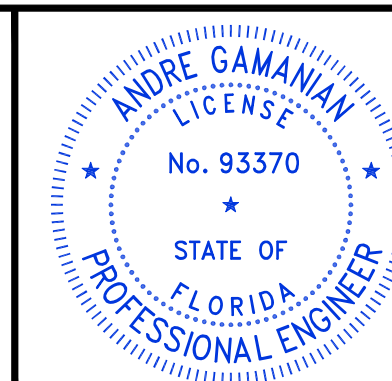
**PIPING SUPPORT STANDARD - AS2
LINE STOP FOR UNINSULATED PIPE ON STEEL/CONCRETE STRUCTURES**

ISSUED FOR CONSTRUCTION

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
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PROFESSIONAL ENGINEER

ANDRE GAMANIAN, P.E.
FL LICENCE NO.93370
EXP. 02/28/2025



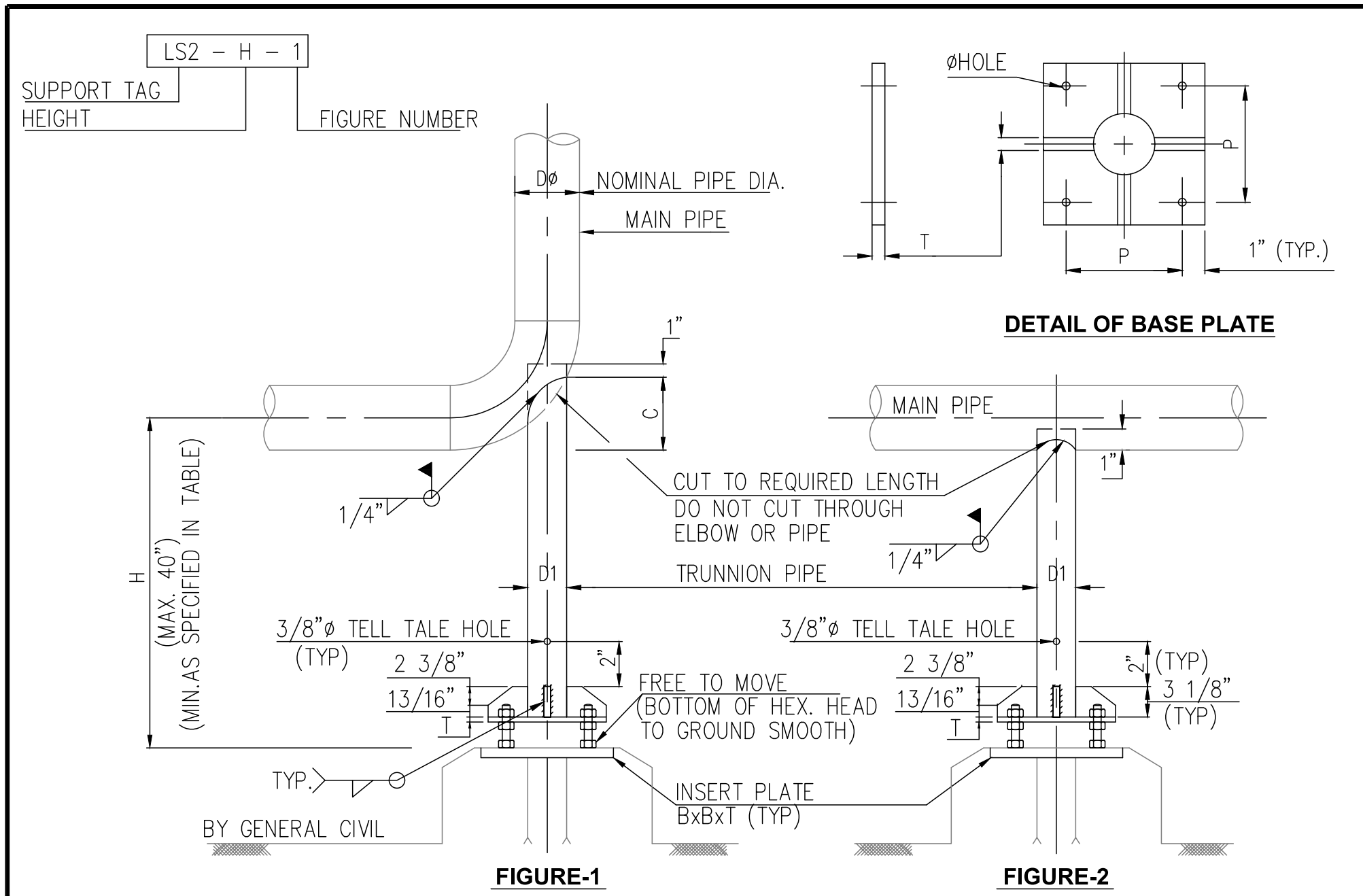
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1325 74th AVE SW,
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ENGINEER:
 BIOGAS ENGINEERING
2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING SUPPORT STANDARD
(SHEET 5 OF 7)
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. **M-445AJ**

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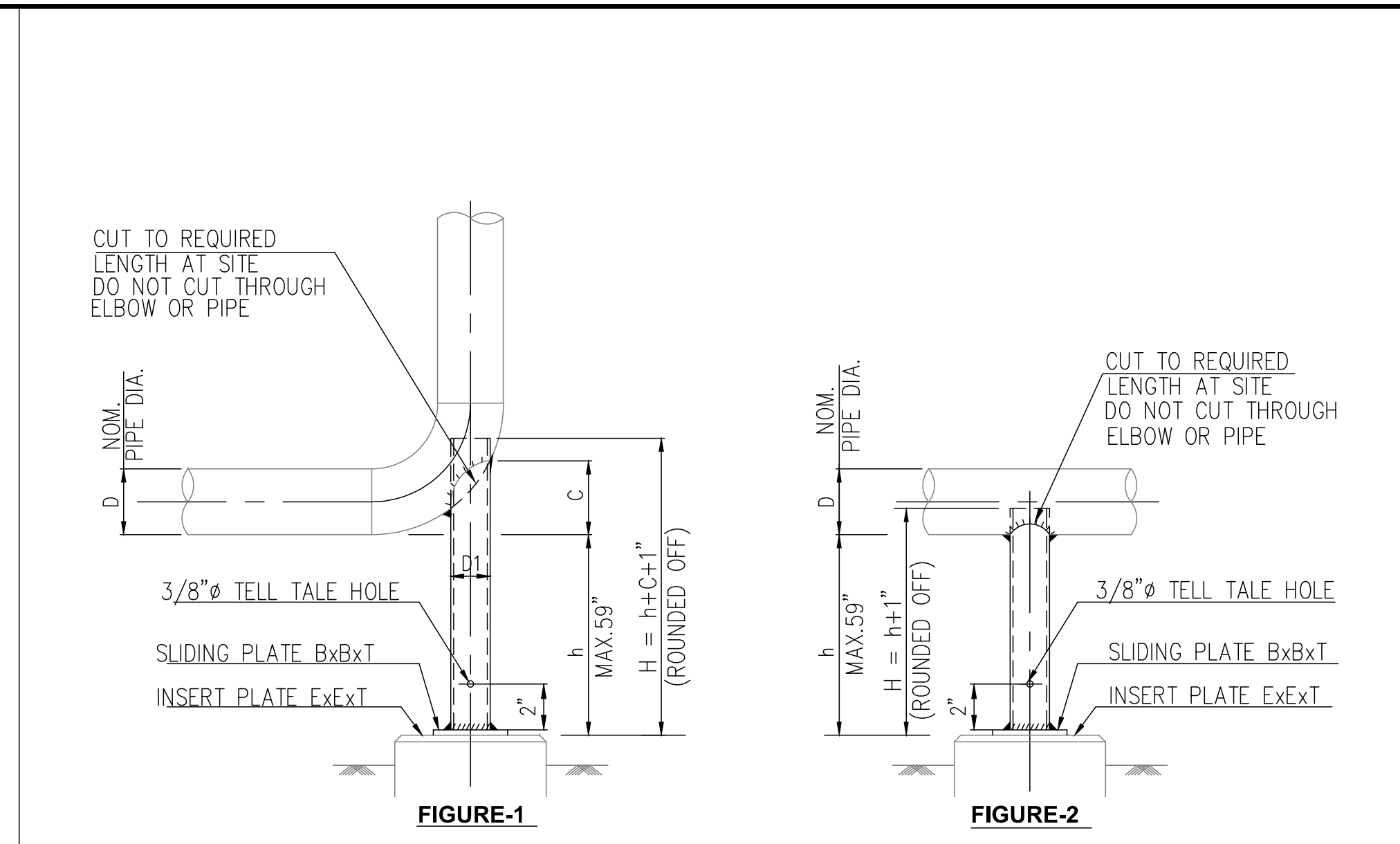
INSTALLATION PROCEDURE :-

- 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)	B	T	C	HEX. BOLT FULLY THREADED WITH TWO NUTS	H (MIN.)	P	Ø
1.	2"	2" SCH.40	10"	3/8"	2 3/4"	Ø1/2" x 4" LONG	7 7/8"	4	9/16"
	3"				4 1/2"		8 7/16"		
2.	4"	3" SCH.40	12"	3/8"	5 3/8"	Ø3/4" x 6" LONG	9 13/16"	6	7/8"
	6"				6 7/8"		11"		
3.	8"	4" SCH.40	14"	1/2"	8"	Ø7/8" x 6 7/8" LONG	11 13/16"	6	7/8"
	10"				10 5/16"		13 3/16"		
4.	12"	6" SCH.40	16"	1/2"	11 5/16"	Ø1" x 6 7/8" LONG	14 3/16"	7	1"
	14"				15 1/16"		15 3/16"		
	16"				16 7/16"		16 1/8"	9	1 1/16"

- NOTES:-**
- ALL DIMENSIONS ARE IN INCH.
 - 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
 - IN CASE, SIZE AND/OR SCH. OF TRUNNION PIPE, (D1) LISTED IN THE TABLE IS NOT AVAILABLE, USE NEXT HIGHER SIZE AND/OR NEAREST EQUIVALENT THICKNESS AVAILABLE.
 - IN CASE H IS MORE THAN 40", RAISE HEIGHT OF CONCRETE PEDESTAL ACCORDINGLY.
 - 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

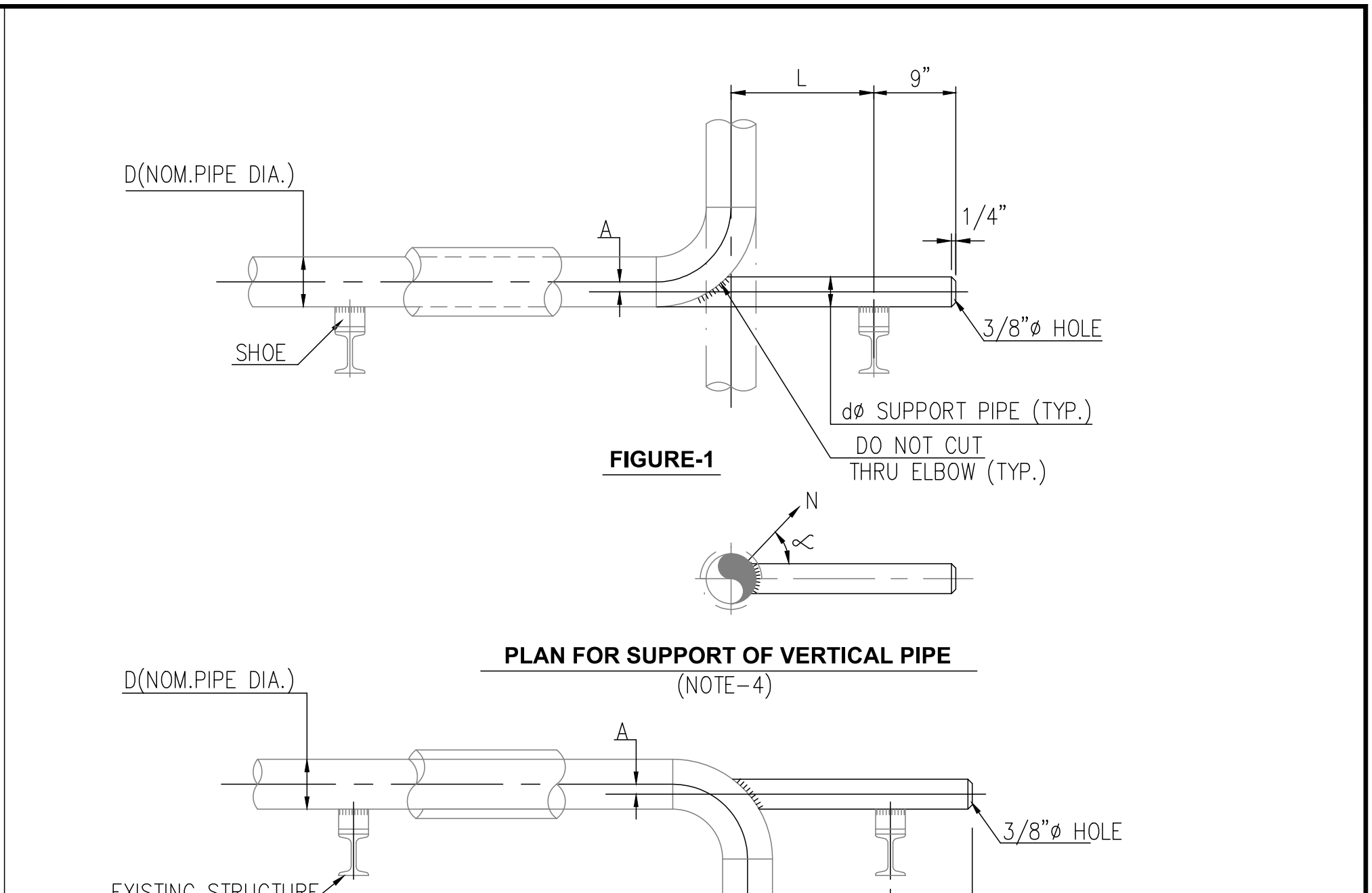
**PIPING SUPPORT STANDARD - LS2
ADJUSTABLE LOW SUPPORT WITH 4 BOLTS
FOR PIPE SIZE 2" THRU 16"**



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

- NOTES:-**
- ALL DIMENSIONS ARE IN INCH.
 - IN CASE SIZE AND/OR SCHEDULE OF SUPPORT PIPE (D1) LISTED IN THE TABLE IS NOT AVAILABLE, USE NEXT HIGHER SIZE AND/OR NEAREST EQUIVALENT THICKNESS AVAILABLE.
 - 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"**



FOR L, 60" OR LESS

D	d	A
2"	2" SCH 40	--
3"	2" SCH 40	9/16"
4"	3" SCH 40	1/2"
6"	3" SCH 40	1 9/16"
8"	4" SCH 40	2 1/16"
10"	6" SCH 40	2 1/16"
12"	6" SCH 40	3 1/16"
14"	8" SCH 40	2 11/16"
16"	8" SCH 40	3 11/16"

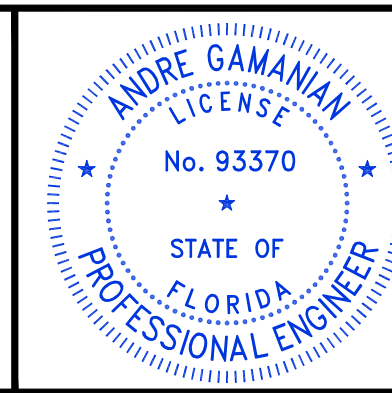
- NOTES:-**
- ALL DIMENSIONS ARE IN INCH.
 - MATERIAL OF SUPPORT PIPE SHALL BE THE SAME AS THE MAIN PIPE SPECIFICATION FOR C.S PIPES. FOR SS PIPES, SS PAD PLATES SHALL BE WELDED ON TO THE PIPES AND THE DUMMY PIPE SHALL BE OF CS.
 - IN CASE, SIZE AND/OR SCHEDULE OF SUPPORT PIPE (d) LISTED IN THE TABLE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

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	
4.0	06/21/2023	ISSUED FOR CONSTRUCTION (REVISED)	MT	TP	AG	

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



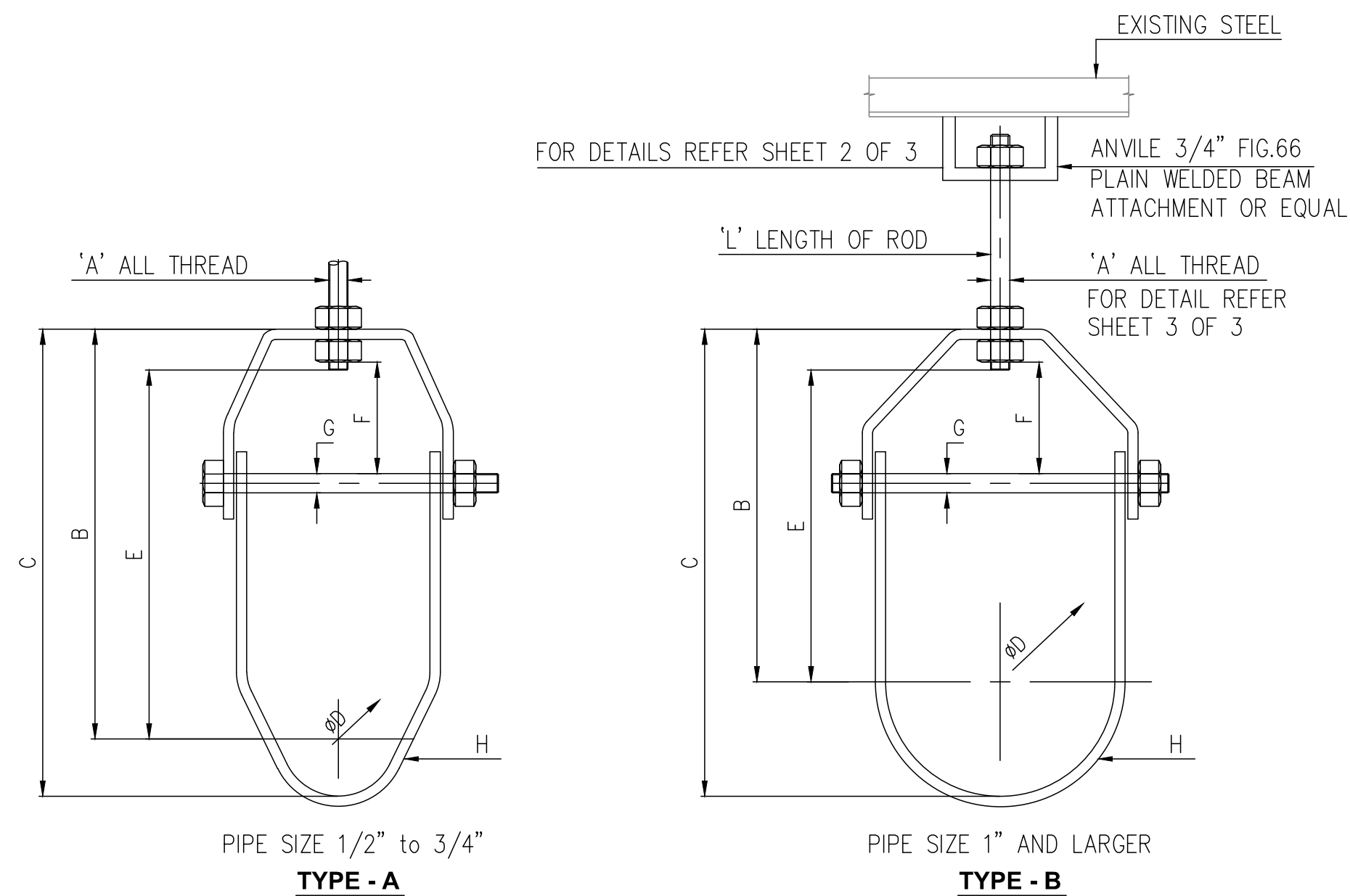
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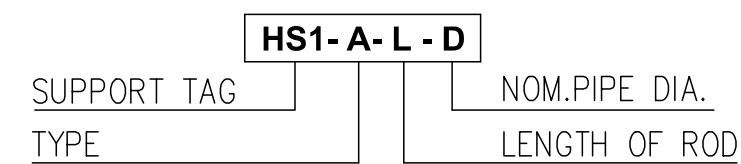
ENGINEER: **BIOGAS ENGINEERING**
2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING SUPPORT STANDARD
(SHEET 6 OF 7)
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. **M-445AK**

C:\Users\MukeshThakur\Biosgas Engineering\Biosgaseng - Documents\Engineering\Projects\USH2126.100 - Indian River County LF\Drawings\M-Mechanical\M-445AF to M-445AL.dwg 21-06-2023 MukeshThakur

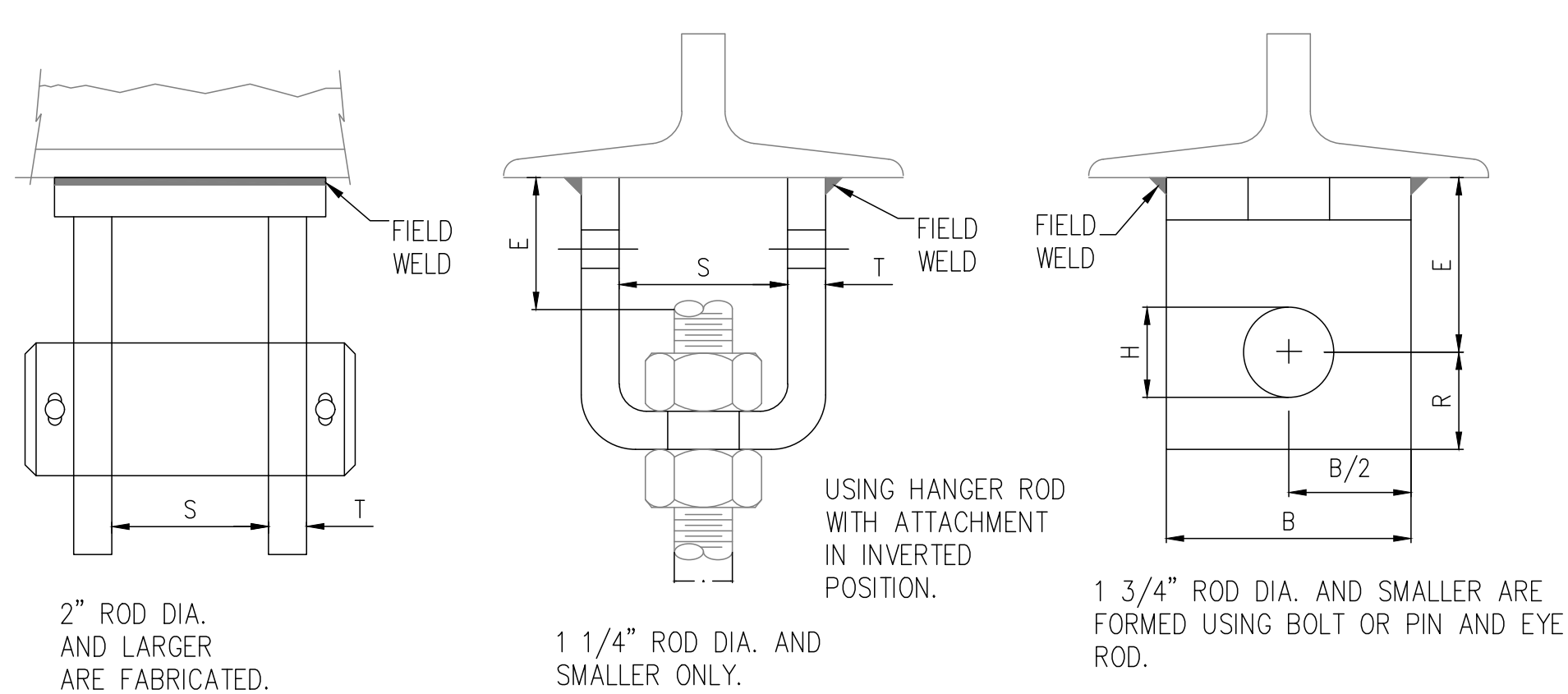


STAINLESS STEEL HANGERS: LOADS (LBS) . WEIGHTS (LBS) . DIMENSIONS (IN)																
Pipe Size	Max Load		Weight	Rod Size A	B	C	Rod Take Out E	Adjust. F	G	H Width Lower						
	450° F	650° F														
1/2	520	470	0.34	3/8	2 3/16	2 11/16	1 1/2	0.00	1/4	1						
3/4			0.34		2	1 5/16										
1			0.35		2 5/16	3	1 3/8									
1 1/4			0.40		2 3/8	3 1/4	1 11/16									
1 1/2			0.45		2 13/16	3 13/16	2 1/8									
2			0.50		3 5/16	4 1/2	2 5/8									
2 1/2			0.65		4 1/16	5 1/2	3 3/16									
3			0.85		4 3/4	6 1/2	4 1/16									
4			1.51		5 9/16	7 13/16	4 1/2									
5			1.70		6 9/16	8 15/16	5 1/2									
6			1.650		1.485	3.10	4 3/8				6 15/16	10 1/4	5 3/4	1 11/16	1/2	1 7/16
8			1700		1530	4.75	7/8				8 3/8	12 11/16	7 3/16	2	5/8	1 1/2
10	1750	1575	8.60	1	9 7/8	15 1/4	8 7/16	2 3/8	3/4	1 3/4						
12	1850	1665	11.20	1 1/8	11 9/16	17 15/16	10 1/8	2 13/16	1	2						



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



WELDED BEAM ATTACHMENT: LOAD (LBS) . WEIGHT (LBS) . DIMENSIONS (IN)												
Rod Size A	Pin or Bolt Size	Max Load		Weight		Rod Take Out		B	H	R	S	T
		650° F	750° F	Without Bolt and Nut	With Bolt and Nut	E	E'					
3/8	1/2 X 2 1/2	730	572	-	1.2	1 7/8	-	-	9/16	-	-	-
1/2	5/8 X 2 1/2	1350	1057	0.96	1.3	-	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	-	-	13/16	-	-	-
3/4	7/8 X 4	3230	2530	1.9	2.8	-	-	2 1/2	15/16	1 1/8	1 7/8	3/8
7/8	1X4	4480	3508	2.5	3.9	2 5/8	-	-	1 1/8	1 1/4	2	-
1	1 1/8 X 5	5900	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	-	4	1 1/2	2	2 1/2	5/8
1 1/2	1 5/8 X 6	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	-	-	-	2 3/8	3 1/4	-	1/2
2 1/4	2 1/2 X 7 3/8	32300	25295	-	36.8	-	-	6	2 5/8	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	-	3 5/8	-	-	-
3 1/2	3 3/4 X 7 3/4	84700	66331	-	72.4	-	7 1/2	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

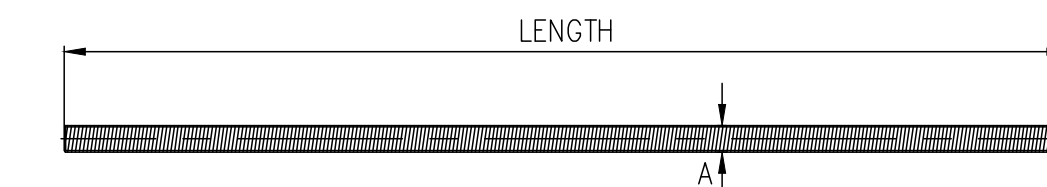


FIG. 146:
LOADS (LBS) • WEIGHT (LBS) • DIMENSIONS (IN)

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: 1/4" 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

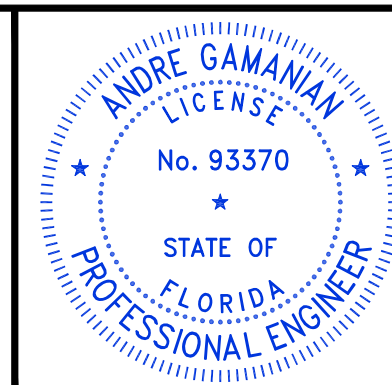
NOTE : THE ACCEPTABILITY OF GALVANIZED COATING AT TEMPERATURES ABOVE 450° F IS AT THE DISCRETION OF THE END USER.

ISSUED FOR CONSTRUCTION

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)	MT	TP	AG

PROFESSIONAL ENGINEER

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

OWNER: 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING SUPPORT STANDARD
(SHEET 7 OF 7)

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. M-445AL

Mechanical Isometric Drawings

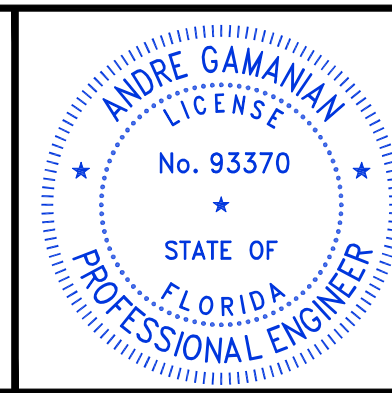
Sr No	Drawing No.	Description	Date	Rev
1	1/2"-IA-0509-SS1-N-1	PIPING ISOMETRIC	06/21/2023	1
2	1/2"-IA-0513-SS1-N-1	PIPING ISOMETRIC	06/21/2023	1
3	1/2"-IA-0515-SS1-N-1	PIPING ISOMETRIC	06/21/2023	1
4	3/4"-FG-0520-SS1-N-1	PIPING ISOMETRIC	06/21/2023	1
5	1-C-0411-SS1-HT-1	PIPING ISOMETRIC	06/21/2023	1
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	

ANDRE GAMANIAN, P.E.
FL LICENCE NO.93370
EXP. 02/28/2025

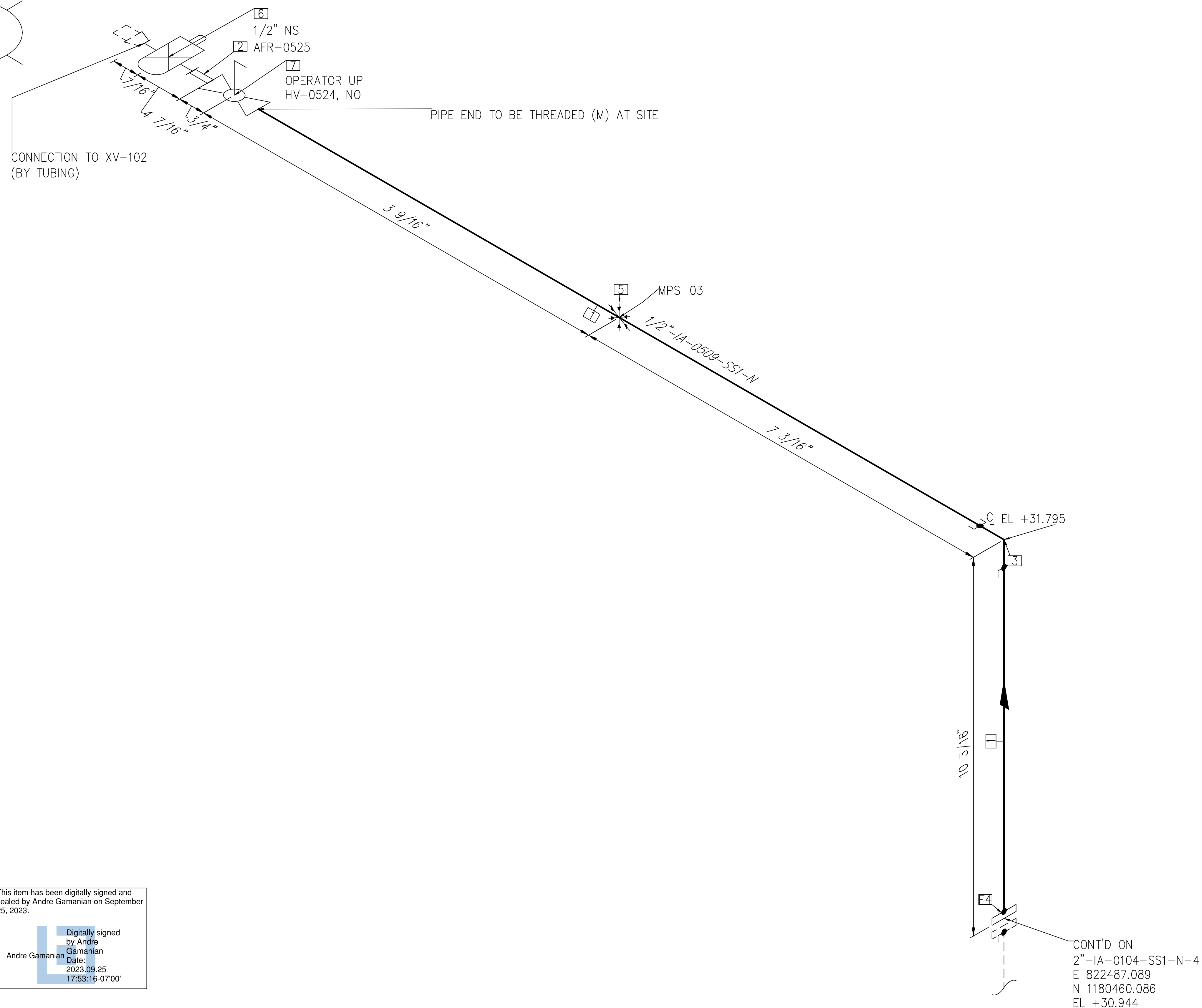
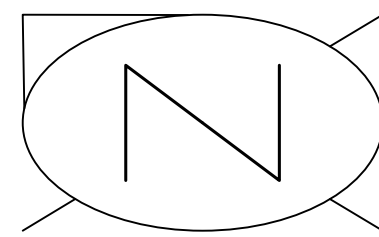


This item has been digitally signed and sealed by Andre Gamalian on September 25, 2023.
Digitally signed by Andre Gamalian
Date: 2023.09.25 17:53:16-07'00'

OWNER: 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

MECHANICAL ISOMETRIC INDEX SHEET
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
DRAWING NO. **M-445AM**



BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	1	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 SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
5	1	1/2"	US1-1-1/2"	U-BOLT FOR BARE PIPE SIZE 1/2" THRU 16"
VALVES				
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

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

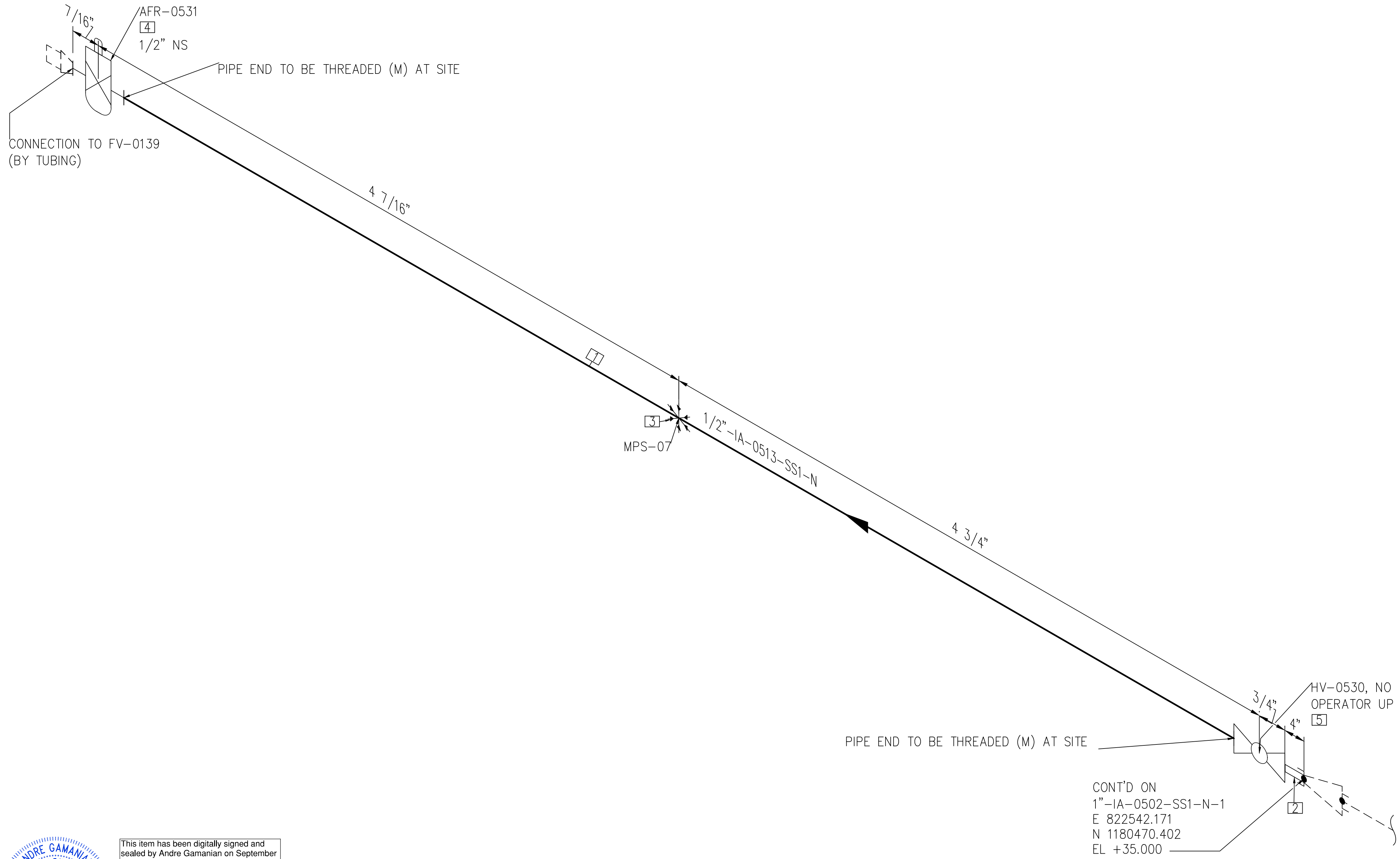
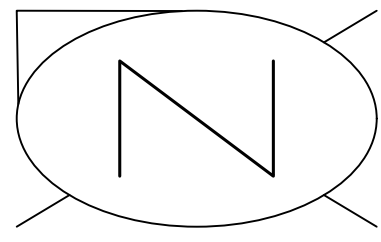
Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-0700'

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

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	SERVICE	IA	OWNER:	ENGINEER:	PIPING ISOMETRIC	SHEET
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG	PIPE SPEC	SS1	 INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW, VERO BEACH, FLORIDA 32968	 BIOGAS ENGINEERING 2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM	1/2"-IA-0509-SS1-N	1
					P&ID DWG	P2.05	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT			SCALE	
					INSULATION SPEC	N	N.T.S				
					INSULATION THK	-					

C:\Users\MukeshThakur\Biosgas Engineering\Biosgaseng - Documents\Engineering\Projects\USH2126:100 - Indian River County LF V-H-Design\M-Mechanical\04# isometric\04# isometric\FC-Stick-Built isometric\22.05\0.5-IA-0509-SS1-N-1.dwg 03-02-2023 MukeshThakur



BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	8"	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, PE X NPT (M), ASME A733, ASTM A312 GR TP 304
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
3	1	1/2"	US1-1-1/2"	U-BOLT FOR BARE PIPE SIZE 1/2" THRU 16"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
4	1	1/2"	AFR-0531	COMPRESSED AIR FILTER REGULATOR WITH GAUGE, OUTDOOR RATED, METAL BOWL W/SITE GLASS
5	1	1/2"	HV-0530	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR

ISSUED FOR CONSTRUCTION

C:\Users\MukeshThakur\Biosgas Engineering\Projects\U\SH2126-100 - Indian River County LF V-H-Design\M-Mechanical\04# isometric\FC-Stick Built isometric\22.05\0.5-IA-0513-SS1-N-1.dwg 06-02-2023 MukeshThakur

ANDRE GAMANIAN
LICENSE
No. 93370
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

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'

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
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

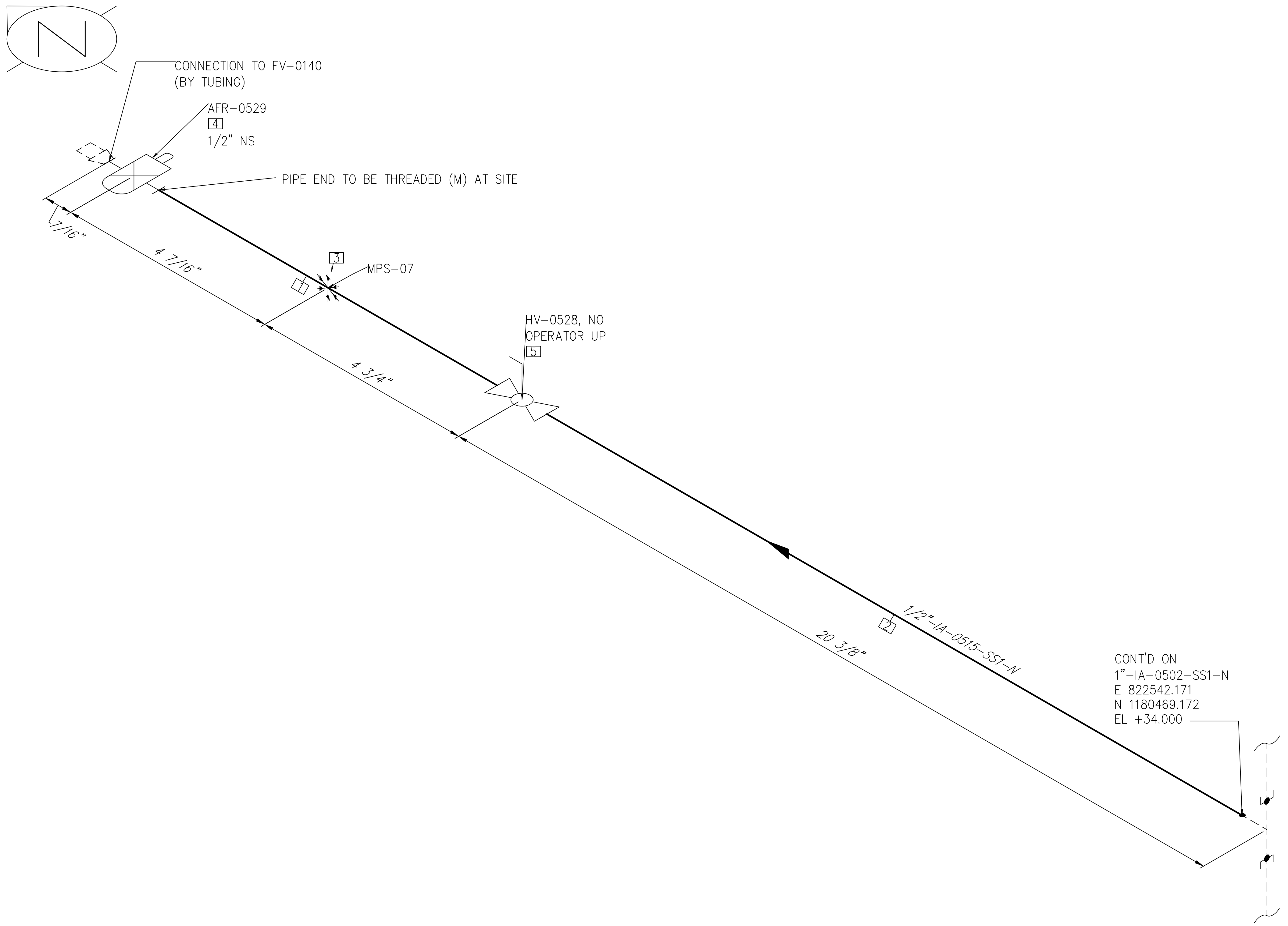
SERVICE	IA
PIPE SPEC	SS1
P&ID DWG	P2.05
INSULATION SPEC	N
INSULATION THK	-

OWNER: 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
1/2"-IA-0513-SS1-N	1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

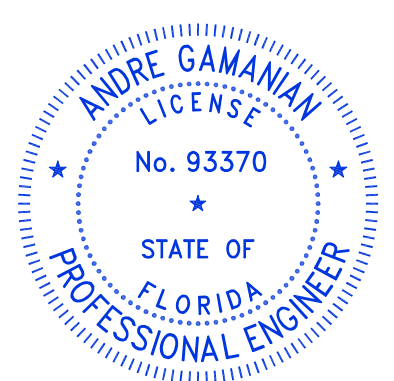
C:\Users\MukeshThakur\Biosgas Engineering\Biosgaseng - Documents\Engineering\Projects\USH2126:100 - Indian River County LF V-H-Design\M-Mechanical\04# Isometric\04# Isometric\FC-Stick-Built Isometric\03-02-2023 MukeshThakur



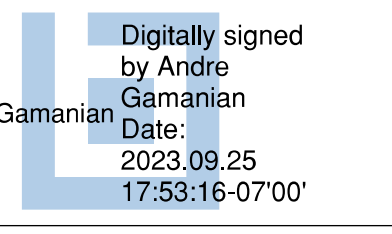
BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	8"	1/2"	80S	PIPE, SMLS, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304
2	1'-7"	1/2"	80S	PIPE, SMLS, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
3	1	1/2"	US1-1-1/2"	U-BOLT FOR BARE PIPE SIZE 1/2" THRU 16"
VALVES				
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

CONT'D ON
 1"-IA-0502-SS1-N
 E 822542.171
 N 1180469.172
 EL +34.000

ISSUED FOR CONSTRUCTION




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



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

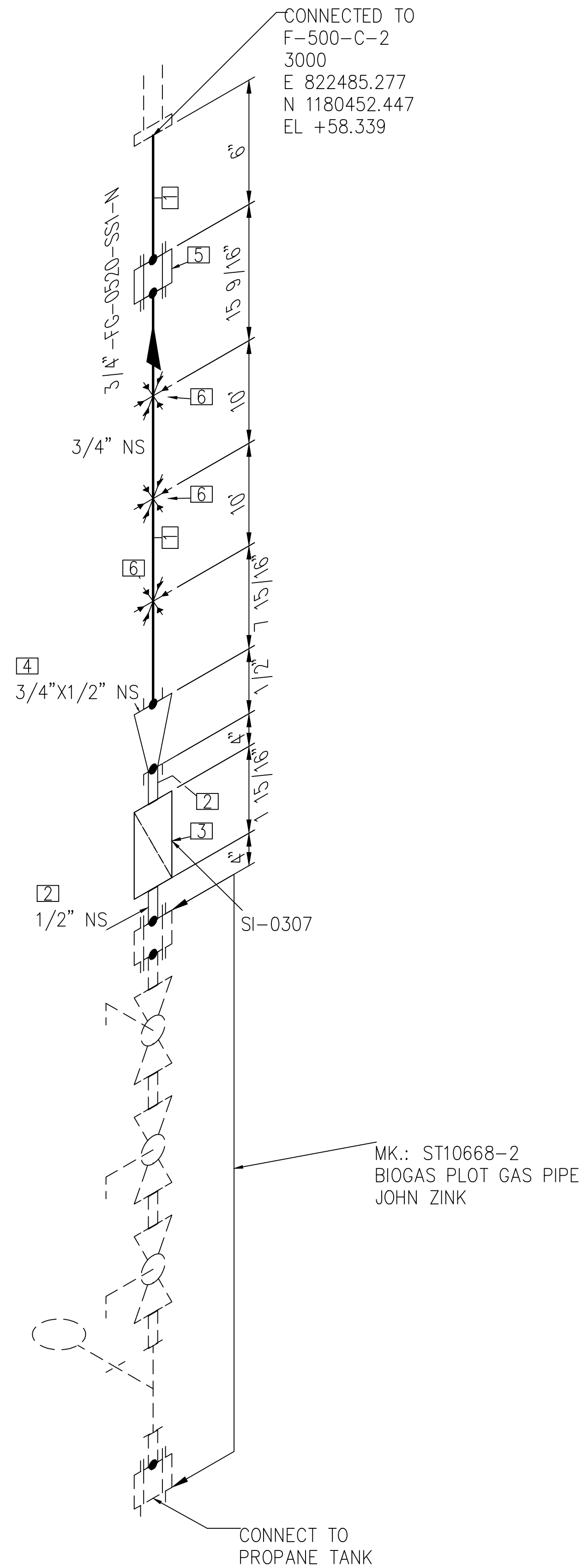
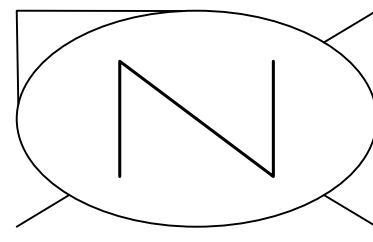
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

OWNER:  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) 726-3565
 EMAIL: INFO@BIOGASENG.COM

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



CONNECTED TO
F-500-C-2
3000
E 822485.277
N 1180452.447
EL +58.339

MK.: ST10668-2
BIOGAS PLOT GAS PIPE
JOHN ZINK

CONNECT TO
PROPANE TANK

BILL OF MATERIALS

PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	22'-5"	3/4"	80S	PIPE, SMLS, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	2	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, PE X NPT (M), ASME A733, ASTM A312 GR TP 304
3	1	1/2"	SI-0307	Y-STRAINER, NPT(F), PROPANE SUPPLY(VENDOR TO SPECIFY SUITABLE STRAINER FOR SERVICE)
4	1	3/4" X 1/2"	3000	RED COUPLING, CLASS 3000, SW, ASTM B16.11, ASTM A182 GR F304
5	1	3/4"	3000	UNION, SW, CLASS 3000, ASME B16.11, ASTM A182 GR F304
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
6	3	3/4"	US1-1-3/4"	U-BOLT FOR BARE PIPE SIZE 1/2" THRU 16"

ISSUED FOR CONSTRUCTION


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

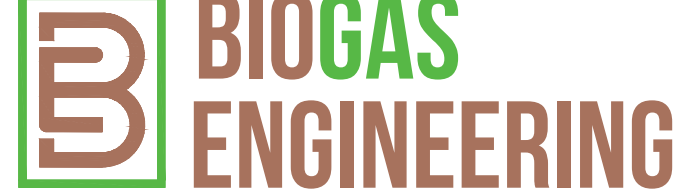
Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-07'00'

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
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

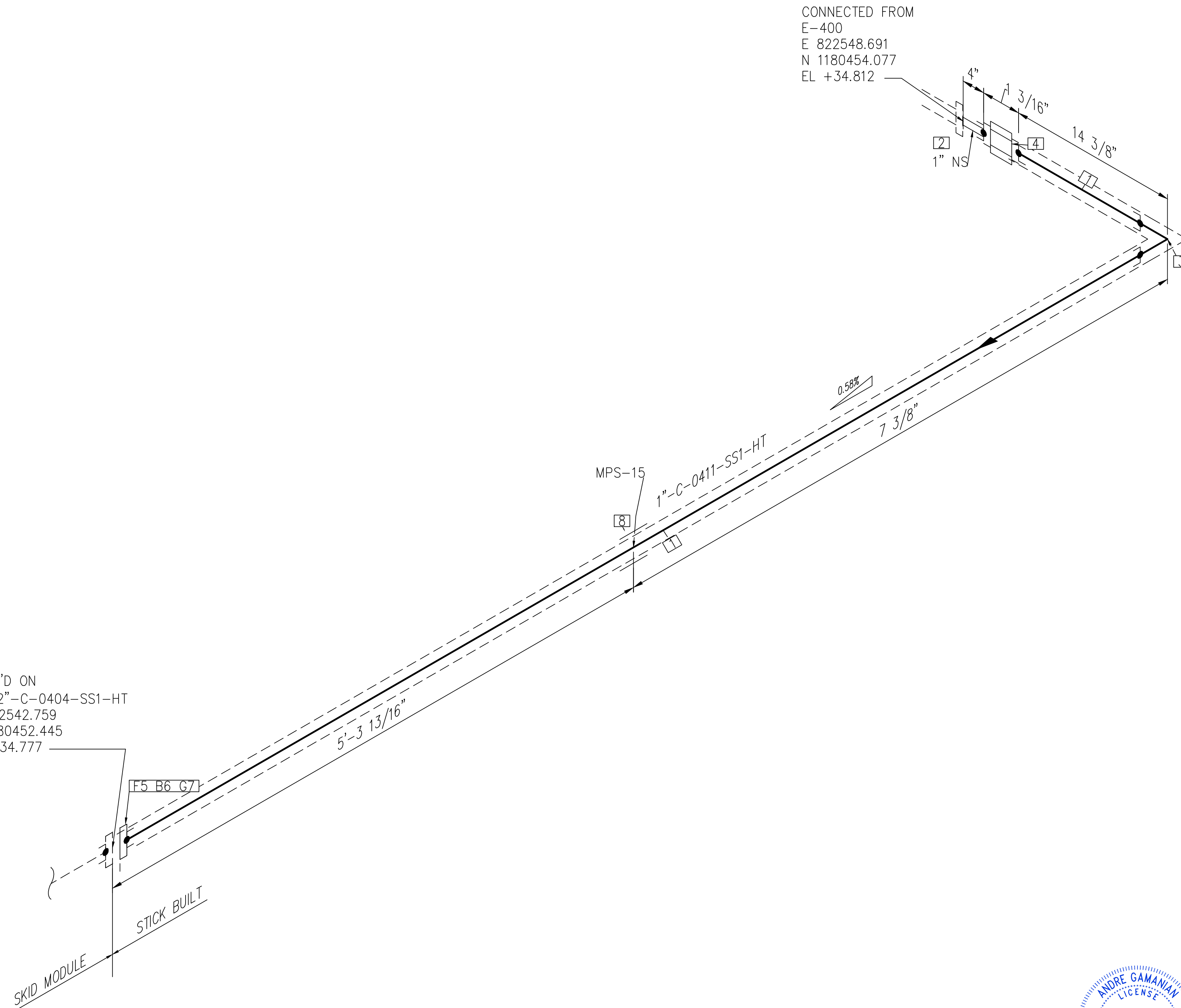
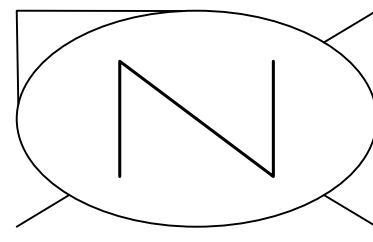
SERVICE	FG
PIPE SPEC	SS1
P&ID DWG	P2.05
INSULATION SPEC	N
INSULATION THK	-

OWNER:  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) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
3/4"-FG-0520-SS1-N	1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE
	N.T.S

C:\Users\MukeshTrakur\Bioseng\Engineering\Biosaseng - Documents\Engineering\Projects\USH2126:100 - Indian River County LF\H-Design\M-Mechanical\04# Isometric\04# Isometric\04# Isometric\FC-Stick Built Isometric\22.05\0.75-FC-0520-SS1-N-1.dwg 06-02-2023 MukeshTrakur



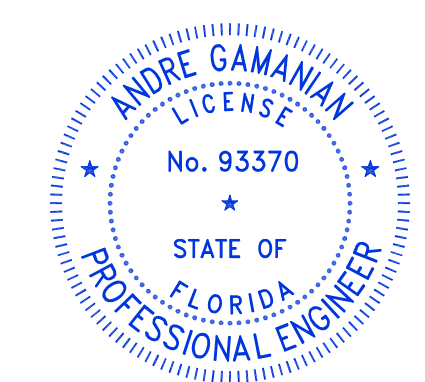
CONNECTED FROM
E-400
E 822548.691
N 1180454.077
EL +34.812

CONT'D ON
1 1/2"-C-0404-SS1-HT
E 822542.759
N 1180452.445
EL +34.777

SKID MODULE
STICK BUILT

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'	1"	80S	PIPE, ERW, SCH 80S, BE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	1"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304
3	1	1"	3000	ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304
4	1	1"	3000	UNION, SW, CLASS 3000, ASME B16.11, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	1"	150	FLANGE SW, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	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
7	1	1"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
8	1	1"	SS1-4"-2-6"	PIPE SADDLE FOR INSULATED PIPE SIZE 1/2" TO 6"



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

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

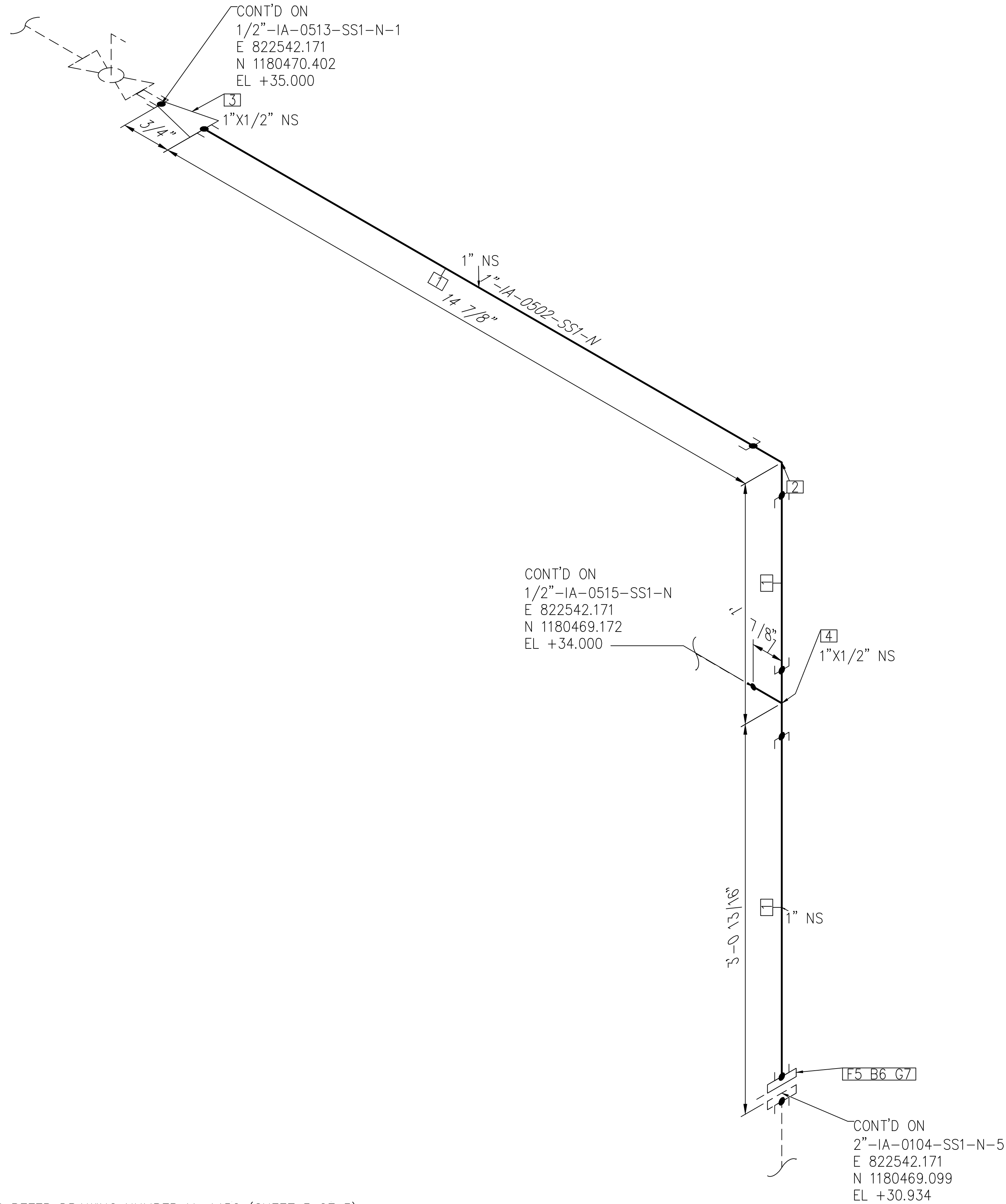
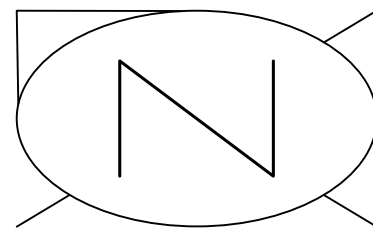
SERVICE	C
PIPE SPEC	SS1
P&ID DWG	P2.04
INSULATION SPEC	HT
INSULATION THK	1"

OWNER:
 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
1"-C-0411-SS1-HT	1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

C:\Users\MukeshThakur\Documents\Engineering\Biosgaseng - Indian River County LF\H-Design\M-Mechanical\04# isometric\04# isometric\FC-Stick Built isometric\22.04\1-C-0411-SS1-HT-1.dwg 06-02-2023 MukeshThakur



BILL OF MATERIALS

PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	5'	1"	80S	PIPE, SMLS, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	1"	3000	ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304
3	1	1"x1/2"	3000	RED COUPLING, CLASS 3000, SW, ASTM B16.11, ASTM A182 GR F304
4	1	1"x1/2"	3000	TEE REDUCING, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	1"	150	FLANGE SW, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	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
7	1	1"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20

ISSUED FOR CONSTRUCTION

Andre Gamanian License No. 93370 State of Florida Professional Engineer

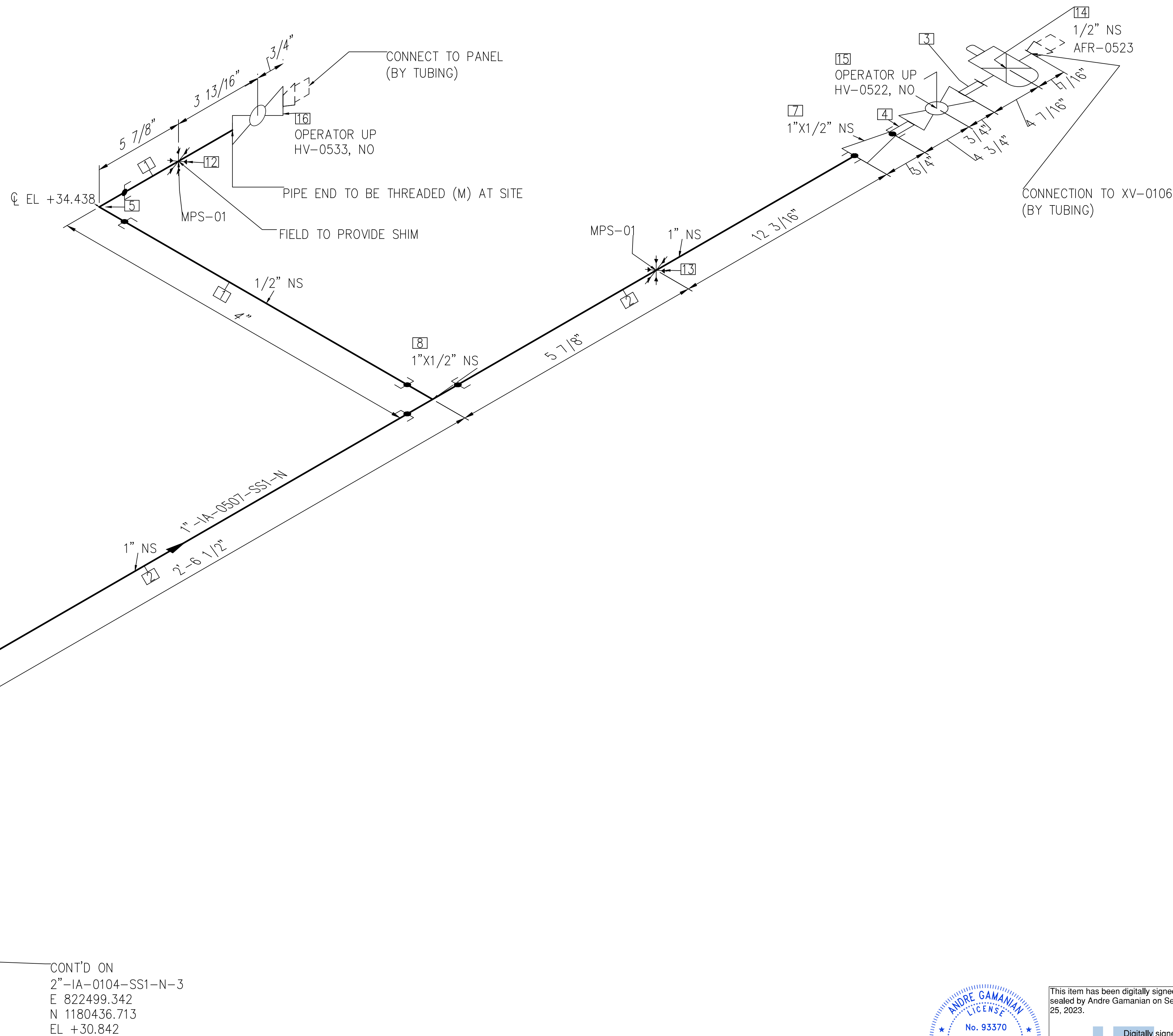
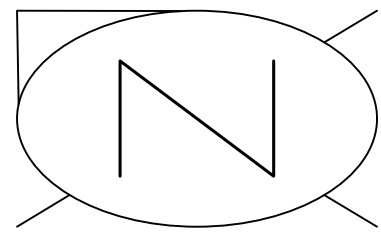
This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.

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

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	IA	OWNER:	ENGINEER:	PIPING ISOMETRIC	SHEET
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG	PIPE SPEC	SS1	INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW, VERO BEACH, FLORIDA 32968	BIOGAS ENGINEERING 2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM	1"-IA-0502-SS1-N	1
					P&ID DWG	P2.05	LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT			SCALE	
					INSULATION SPEC	N	N.T.S				
					INSULATION THK	-					

C:\Users\MukeshThakur\Biosgas Engineering\Biosgaseng - Documents\Engineering\Projects\UHS2126:100 - Indian River County LF V-H-Design\M-Mechanical\04# isometric\FC-Stick Built isometric\p2.05\1-IA-0502-SS1-N-1.dwg 06-02-2023 MukeshThakur



CONNECT TO PANEL (BY TUBING)
 OPERATOR UP HV-0533, NO
 PIPE END TO BE THREADED (M) AT SITE
 FIELD TO PROVIDE SHIM

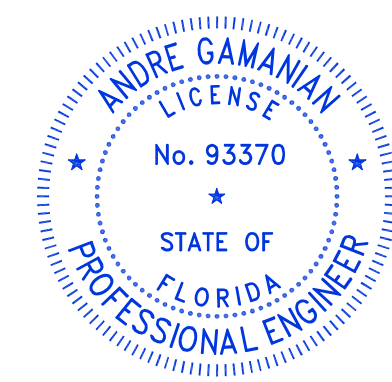
OPERATOR UP HV-0522, NO
 CONNECTION TO XV-0106 (BY TUBING)
 1/2" NS AFR-0523

CONT'D ON
 2"-IA-0104-SS1-N-3
 E 822499.342
 N 1180436.713
 EL +30.842

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	11"	1/2"	80S	PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304
2	7'-4"	1"	80S	PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	1	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, NPT (M), ASME A733, ASTM A312 GR TP 304
4	1	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304
5	1	1/2"	3000	ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304
6	1	1"	3000	ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304
7	1	1"x1/2"	3000	RED COUPLING, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304
8	1	1"x1/2"	3000	TEE REDUCING, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
9	1	1"	150	FLANGE SW, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
10	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
11	1	1"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
12	1	1/2"	US1-1-1/2"	U-BOLT FOR BARE PIPE SIZE 1/2" THRU 16"
13	1	1"	US1-1-1"	U-BOLT FOR BARE PIPE SIZE 1/2" THRU 16"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
14	1	1/2"	AFR-0523	COMPRESSED AIR FILTER REGULATOR WITH GAUGE, OUTDOOR RATED, METAL BOWL W/SITE GLASS
15	1	1/2"	HV-0522	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
16	1	1/2"	HV-0533	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR

ISSUED FOR CONSTRUCTION



This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.
 Digitally signed by Andre Gamanian
 Date: 2023.09.25 17:53:16-0700'

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

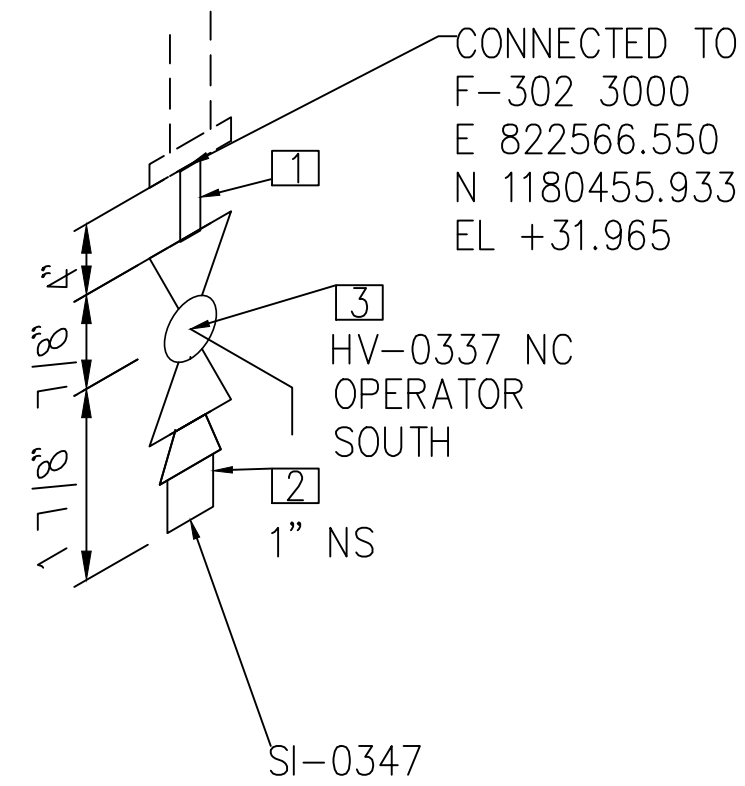
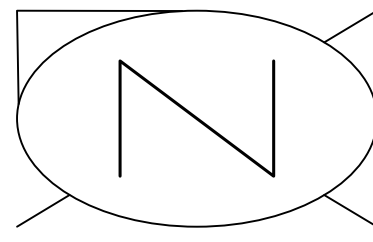
SERVICE	IA
PIPE SPEC	SS1
P&ID DWG	P2.05
INSULATION SPEC	N
INSULATION THK	-

OWNER: 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) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
1"-IA-0507-SS1-N	1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

C:\Users\MukeshThakur\Documents\Engineering\Biosgas\Projects\U\SH2126\100 - Indian River County LF V-H-Design\M-Mechanical\04# isometric\FC-Stick-Built isometric\02.05\1-IA-0507-SS1-N-1.dwg 06-02-2023 MukeshThakur



BILL OF MATERIALS				
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	1	1"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, NPT (M), ASME A733, ASTM A312 GR TP 304
2	1	1"	3000	PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A182 GR F304
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
3	1	1"	HV-0337	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR

ANDRE GAMANIAN
LICENSE
No. 93370
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

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

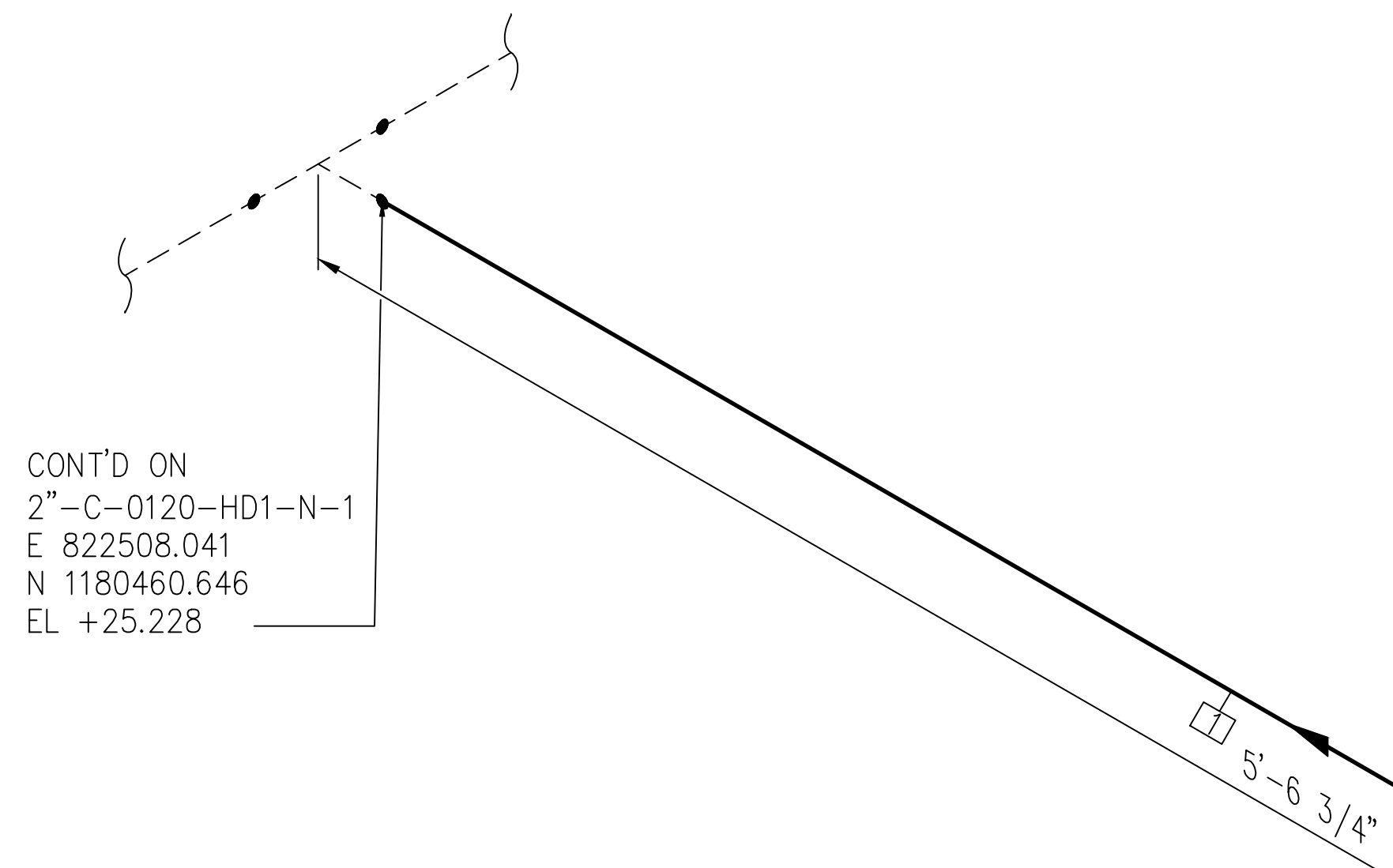
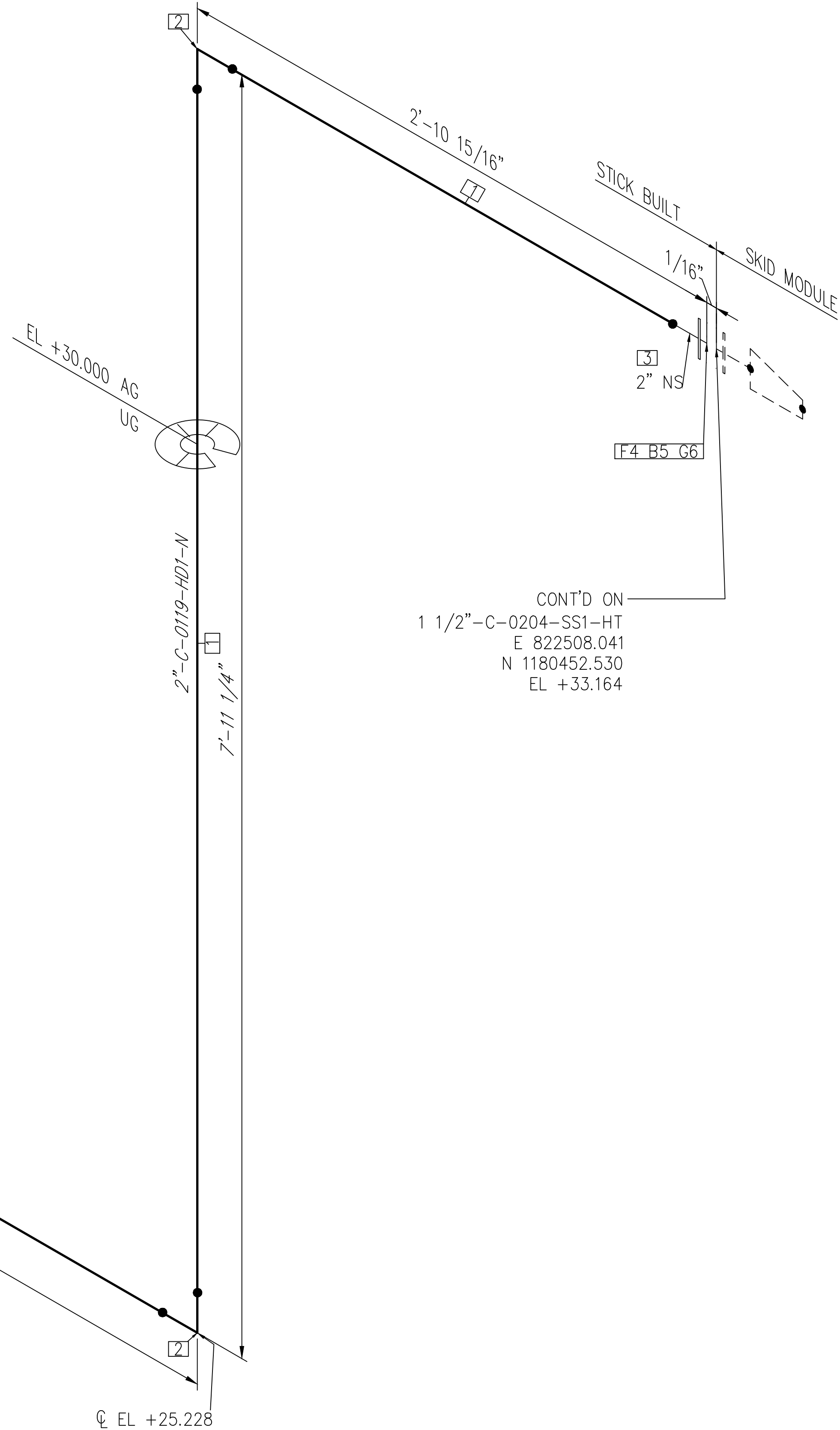
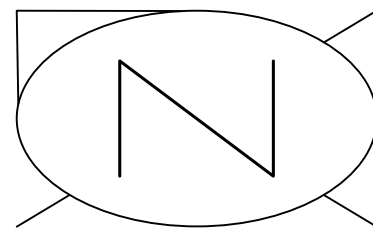
Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-07'00'

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

ISSUED FOR CONSTRUCTION

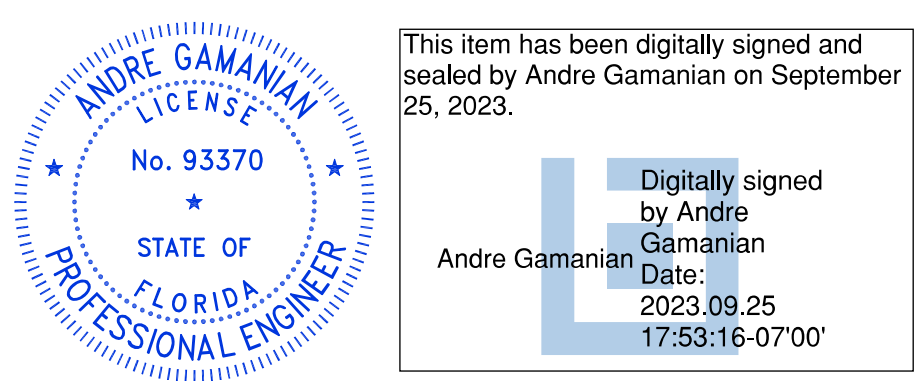
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY		SERVICE	T	OWNER:	ENGINEER:	PIPING ISOMETRIC	SHEET	
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG		PIPE SPEC	SS1	 INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW, VERO BEACH, FLORIDA 32968	 BIOGAS ENGINEERING 2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM	1"-T-0316-SS1-H	1	
						P&ID DWG	P2.03						SCALE
						INSULATION SPEC	H						N.T.S
						INSULATION THK	1"						

c:\Users\WukeshTrakur\Biosgas Engineering\Biosgaseng - Documents\Engineering\Projects\U\SH2126-100 - Indian River County LF V-H-Design\M-Mechanical\04# isometric\04# isometric\FC-Stick Built isometric\p2.03\1-T-0316-SS1-N-1.dwg 03-02-2023 intel



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
FITTINGS				
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
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	1	2"	150	BACK UP FLANGE, ASME B16.5, CLASS 150, A105, FLAT FACE
FASTENERS				
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


ISSUED FOR CONSTRUCTION

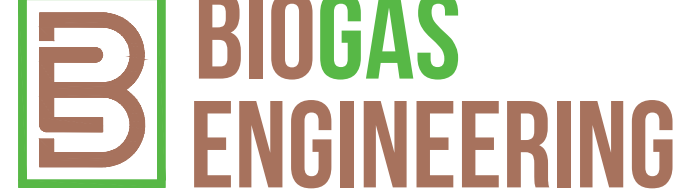


NOTE: - FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

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

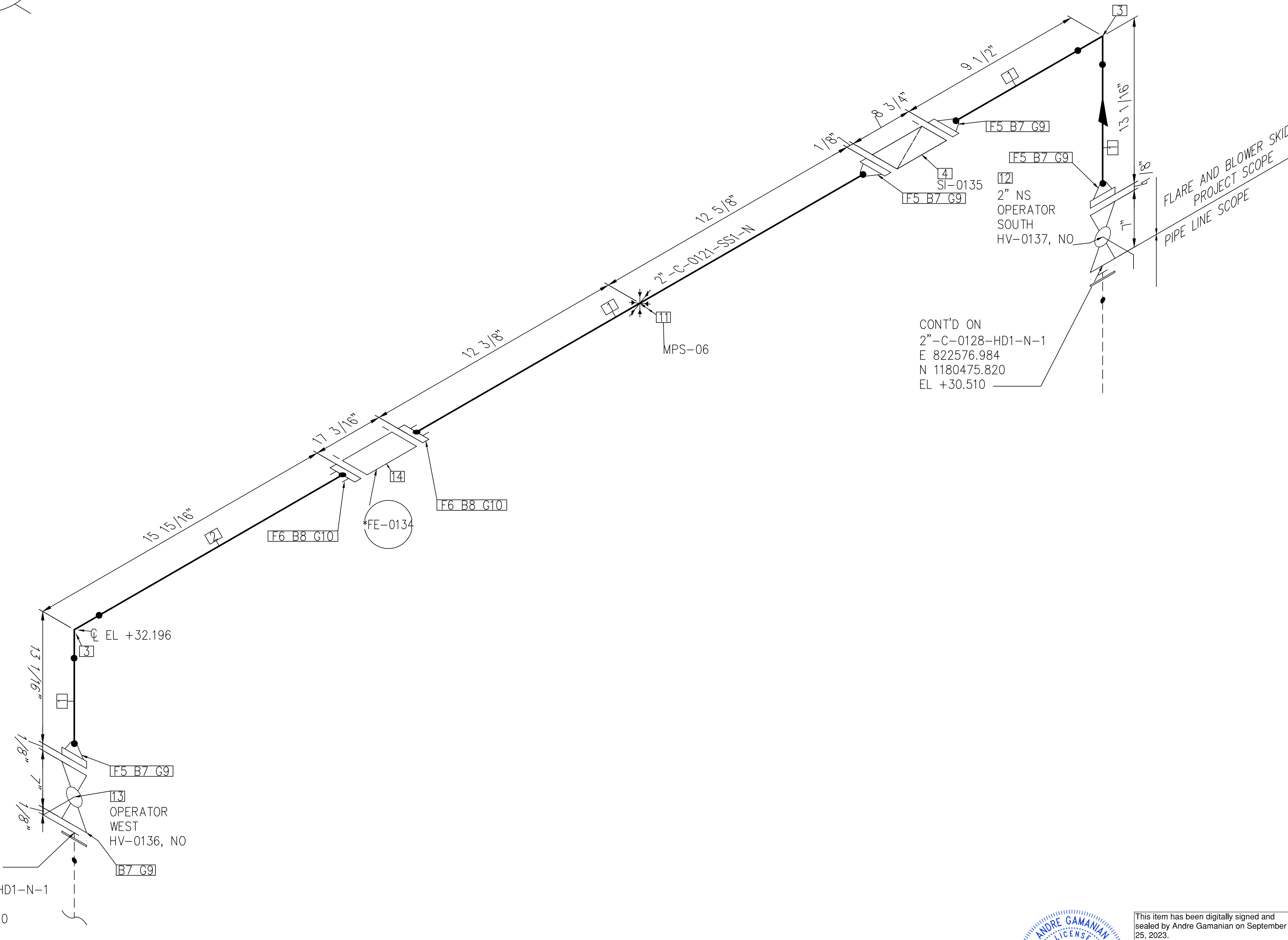
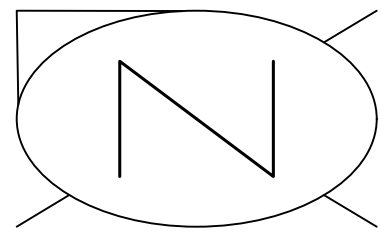
SERVICE	C
PIPE SPEC	HD1
P&ID DWG	P2.02
INSULATION SPEC	N
INSULATION THK	-

OWNER:  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) 726-3565 EMAIL: INFO@BIOGASENG.COM

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

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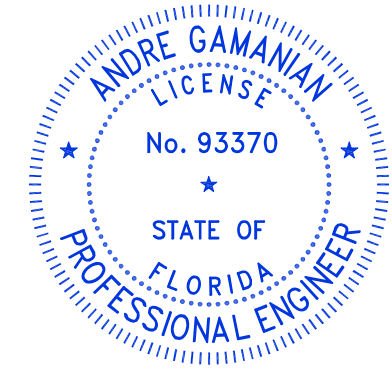


CONT'D ON
2"-C-0120-HD1-N-1
E 822570.611
N 1180475.820
EL +30.500

CONT'D ON
2"-C-0128-HD1-N-1
E 822576.984
N 1180475.820
EL +30.510

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	3'-5"	2"	80S	PIPE, ERW, SCH 80S, BE, ASME B36.19, ASTM A312 GR TP 304
2	1'	2"	80S	PIPE, ERW, SCH 80S, BE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	2	2"	80S	ELBOW 90 LR, SMLS, SCH 80S, BW, ASME B16.9, ASTM A403 GR WP 304
4	1	2"	150	Y-TYPE STRAINER, CLASS 150, RF, ASME B16.10
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	4	2"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
6	2	2"	150	AWWA TWO BOLT ELLIPTICAL FLANGE, SW
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
7	20	5/8"x3 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
8	4	5/8"x3 1/2"		STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
9	5	2"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
10	2	2"		NEOPRENE RUBBER GASKET, FF
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
11	1	2"	US1-1-2"	U-BOLT FOR BARE PIPE SIZE 1/2" THRU 16"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
12	1	2"	HV-0137	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF
13	1	2"	HV-0136	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
14	1	2"	FE-0134	ROTARY FLOW METER, AWWA TWO BOLT ELLIPTICAL FLANGE



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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
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

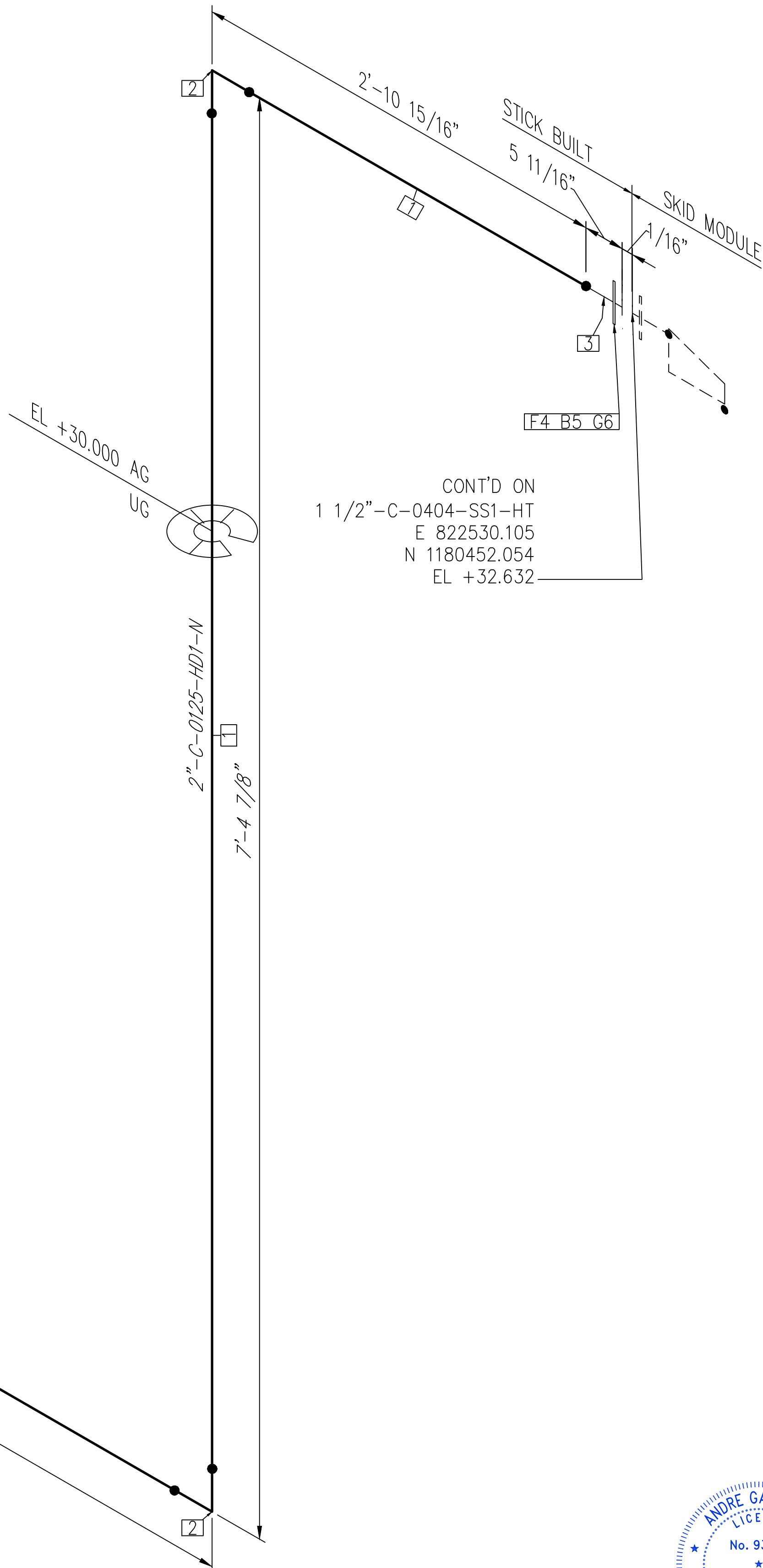
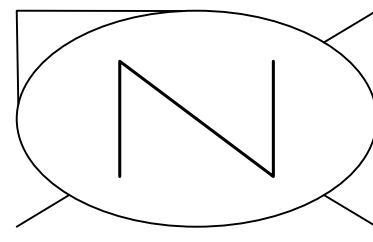
SERVICE	C
PIPE SPEC	SS1
P&ID DWG	P2.01
INSULATION SPEC	N
INSULATION THK	-

OWNER: 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) 726-3565 EMAIL: INFO@BIOGASENG.COM

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

C:\Users\MukeshTrakur\Documents\Engineering\Biosaseng - Indian River County LF\H-Design\M-Mechanical\04# isometric\FC-Stick Built isometric\02\01\2-C-0121-SS1-N-1.dwg 06-02-2023 MukeshTrakur

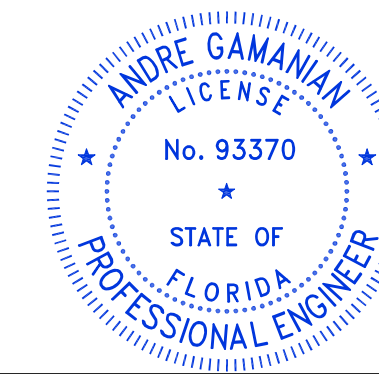


CONT'D ON
 2"-C-0120-HD1-N-1
 E 822530.105
 N 1180460.646
 EL +25.228

CONT'D ON
 1 1/2"-C-0404-SS1-HT
 E 822530.105
 N 1180452.054
 EL +32.632

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	14'-1"	2"	SDR17	PIPE, HDPE, ASTM D3035, IRON PIPE SIZE (IPS) PE 3408, SDR 17
FITTINGS				
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
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	1	2"	150	BACK UP FLANGE, ASME B16.5, CLASS 150, A105, FLAT FACE
FASTENERS				
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




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

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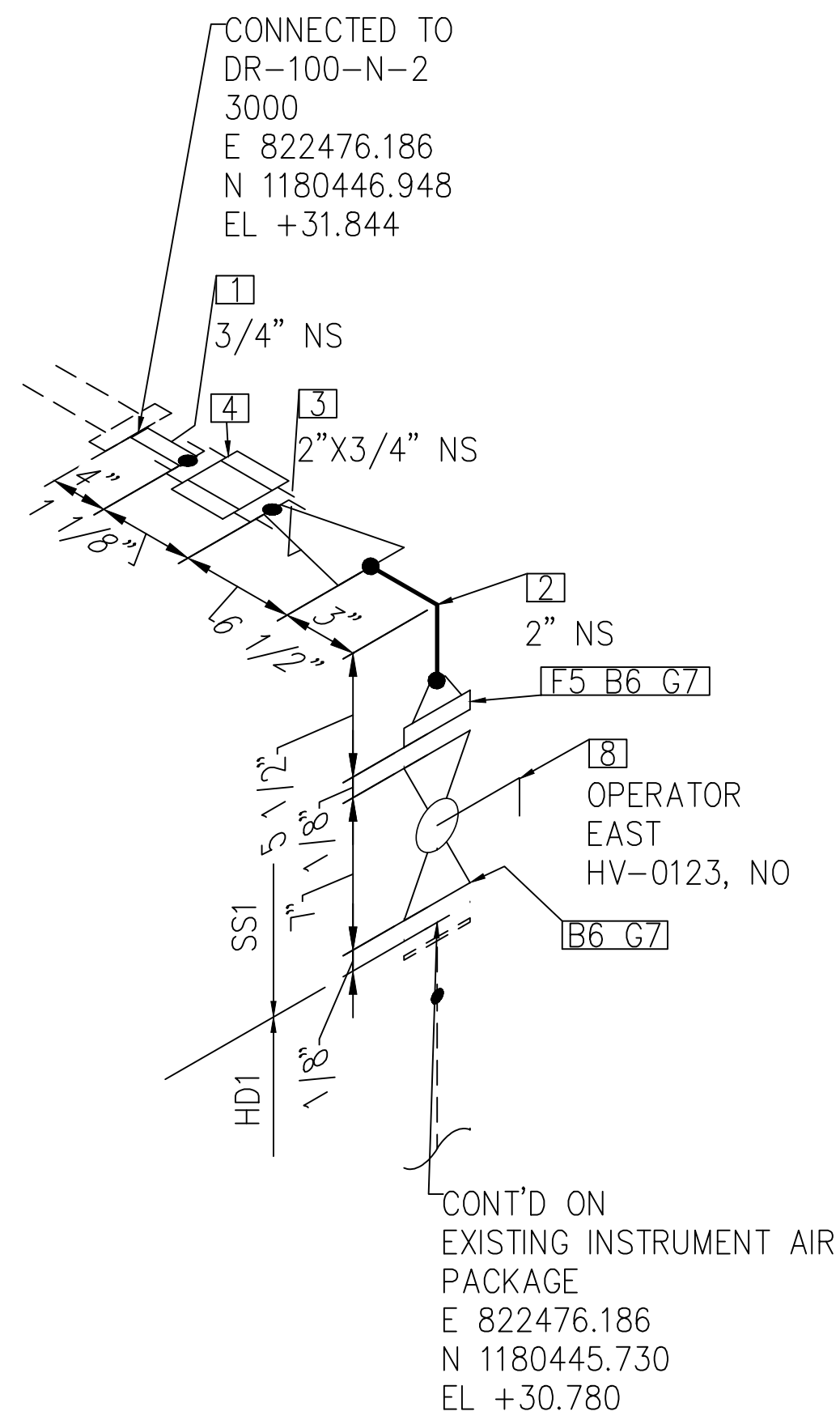
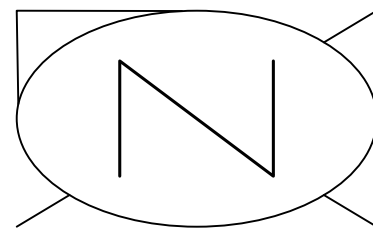
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

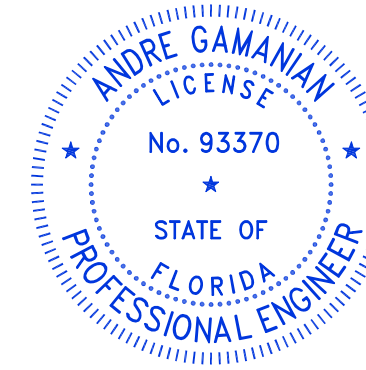
OWNER:  INDIAN RIVER COUNTY FLORIDA
 1325 74th AVE SW, VERO BEACH, FLORIDA 32968

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

PIPING ISOMETRIC	SHEET
2"-C-0125-HD1-N	1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



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



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				
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	1	3/4"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304
2	1	2"	80S	ELBOW 90 LR, SMLS, SCH 80S, BW, ASME B16.9, ASTM A403 GR WP 304
3	1	2"X3/4"	3000	SWAGE (CONC), CLASS 3000, BW X SW, MSS-SP-95, ASTM A182 GR F304
4	1	3/4"	3000	UNION, SW, CLASS 3000, ASME B16.11, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	2"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	8	5/8"X3 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
7	2	2"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20

VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
8	1	2"	HV-0123	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF

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

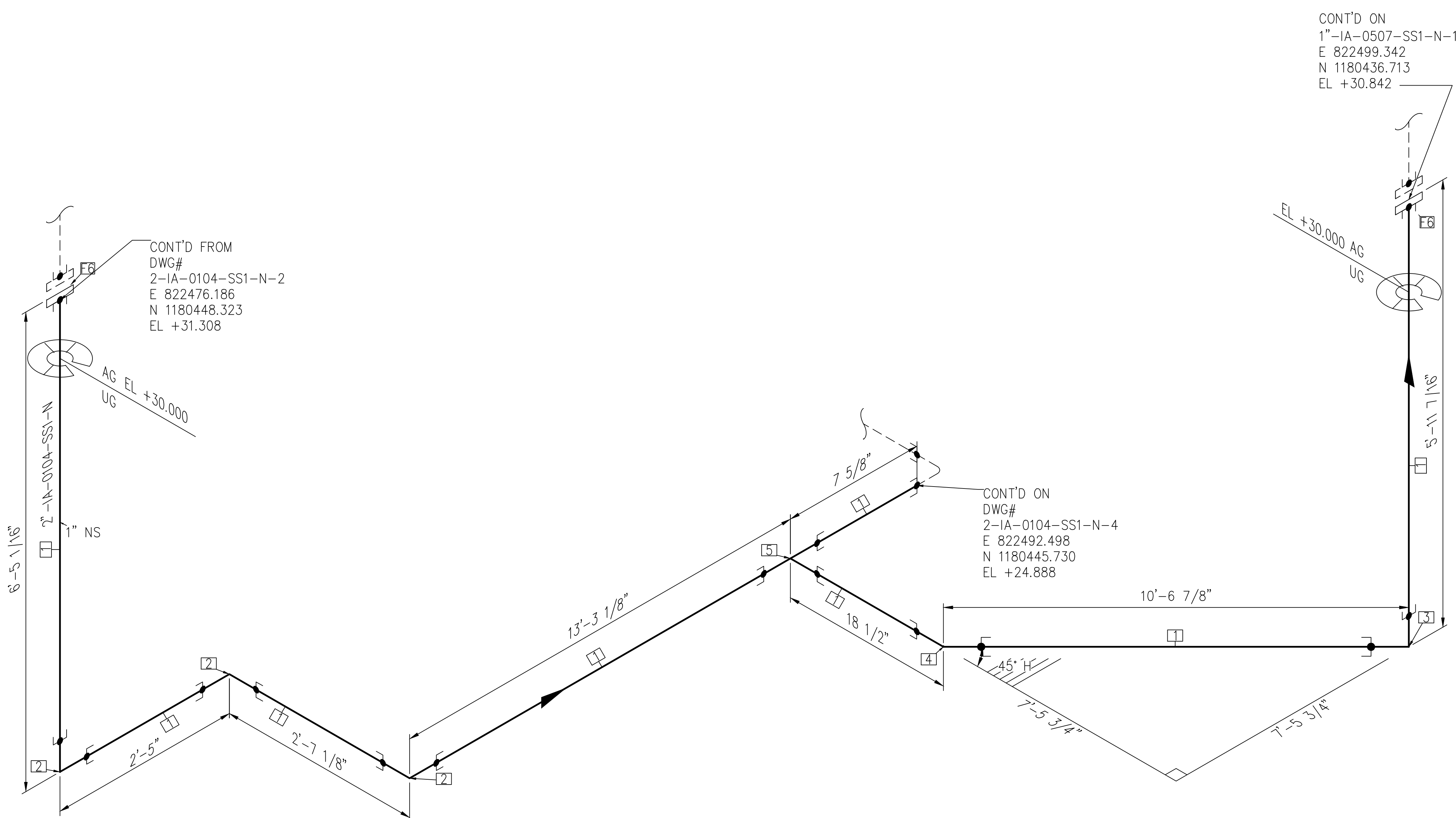
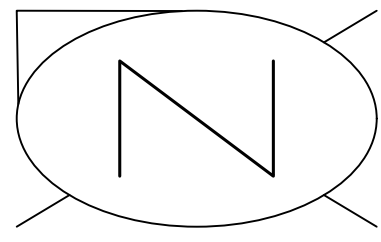
SERVICE	IA
PIPE SPEC	SS1
P&ID DWG	P2.01
INSULATION SPEC	N
INSULATION THK	-

OWNER:  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) 726-3565
EMAIL: INFO@BIOGASENG.COM

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

C:\Users\MukeshThakur\Biosgas Engineering\Biosgaseng - Documents\Engineering\Projects\U\SH2126:100 - Indian River County LF V-H-Design\M-Mechanical\04# Isometric\04# Isometric\FC-Stick Built Isometric\22.01\2-IA-0104-SS1-N-1.dwg 06-02-2023 MukeshThakur



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N 1180436.713
EL +30.842

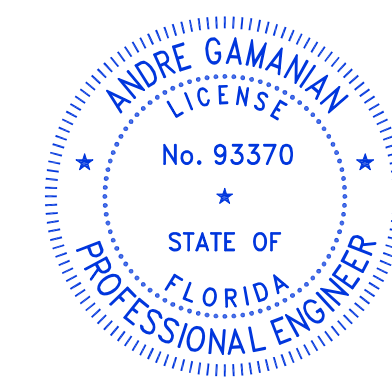
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2-IA-0104-SS1-N-2
E 822476.186
N 1180448.323
EL +31.308

CONT'D ON
DWG#
2-IA-0104-SS1-N-4
E 822492.498
N 1180445.730
EL +24.888

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	42'-6"	1"	80S	PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	3	1"	3000	ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304
3	1	1"	3000	ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304
4	1	1"	3000	ELBOW 45 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304
5	1	1"	3000	EQUAL TEE, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	2	1"	150	FLANGE SW, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304



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Date: 2023.09.25 17:53:16-0700

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
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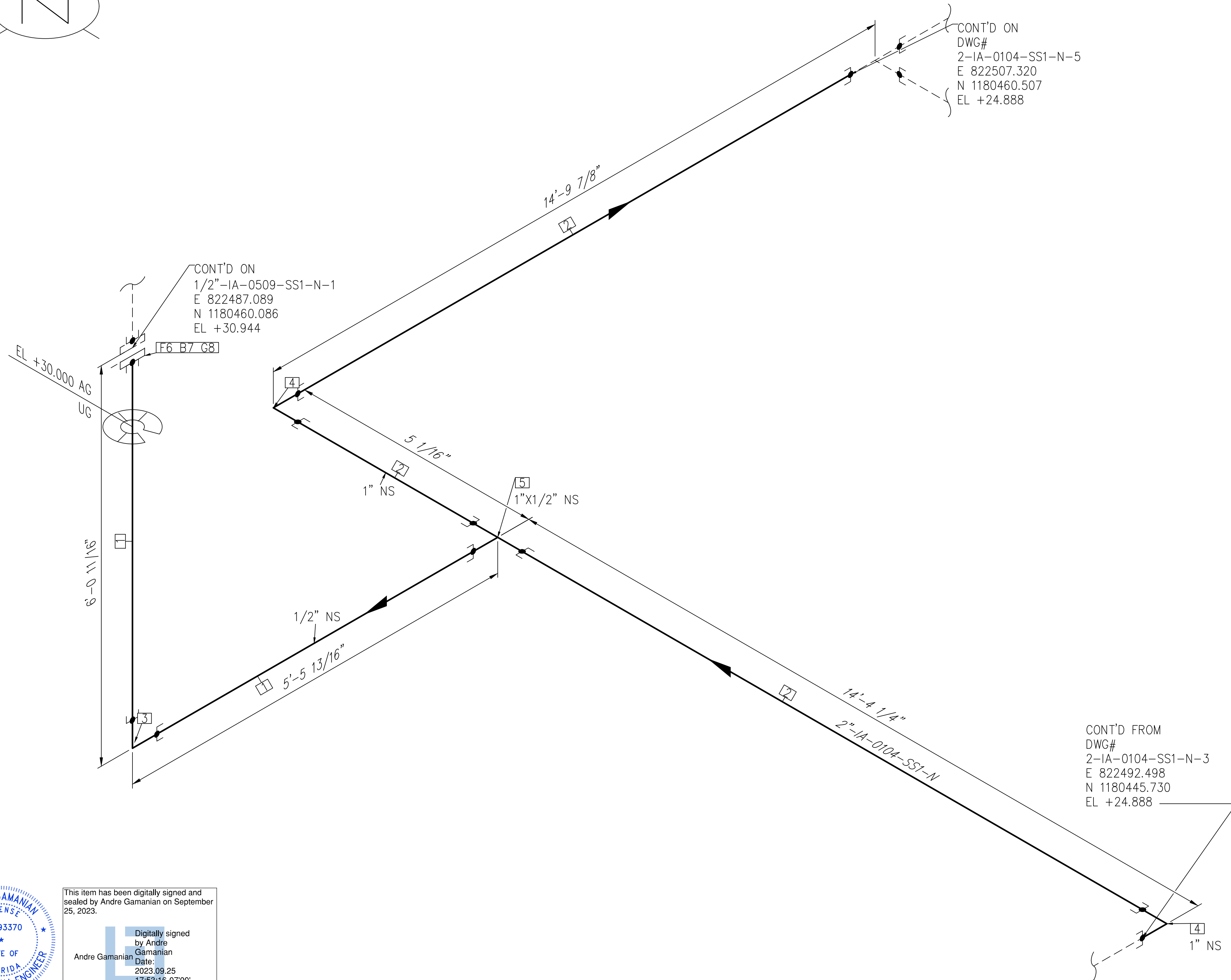
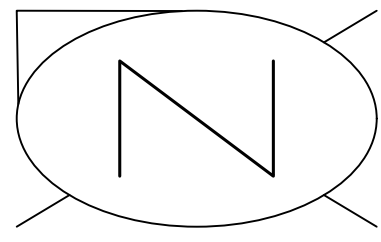
SERVICE	IA
PIPE SPEC	SS1
P&ID DWG	P2.01
INSULATION SPEC	N
INSULATION THK	-

OWNER:
 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
2"-IA-0104-SS1-N	3
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

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Digitally signed by Andre Gamanian Date: 2023.09.25 17:53:16-0700'

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	11'-4"	1/2"	80S	PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304
2	29'-2"	1"	80S	PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
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
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	1	1/2"	150	FLANGE SW, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
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

ISSUED FOR CONSTRUCTION

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

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

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

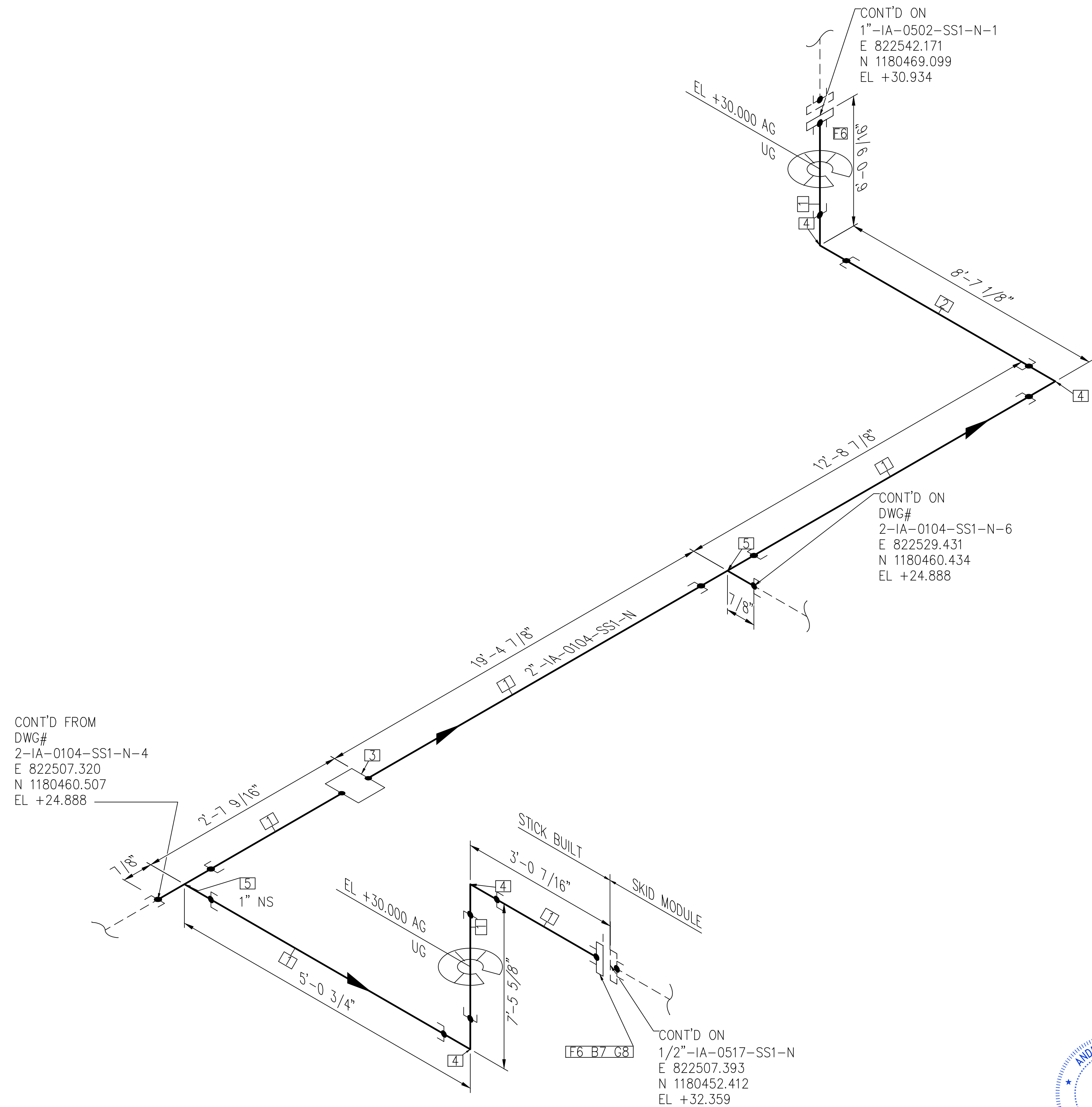
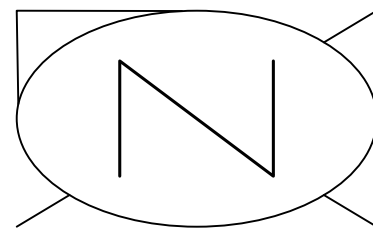
ENGINEER: **BIOGAS ENGINEERING**
 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC
 2"-IA-0104-SS1-N

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

SHEET 4
 SCALE N.T.S

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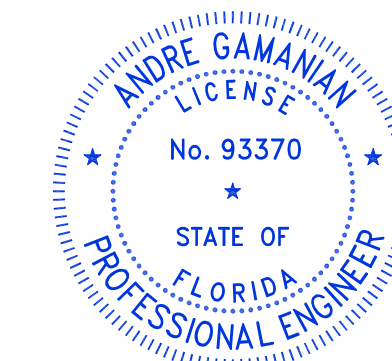


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N 1180460.507
EL +24.888

CONT'D ON
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2-IA-0104-SS1-N-6
E 822529.431
N 1180460.434
EL +24.888

CONT'D ON
1/2"-IA-0517-SS1-N
E 822507.393
N 1180452.412
EL +32.359

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



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'


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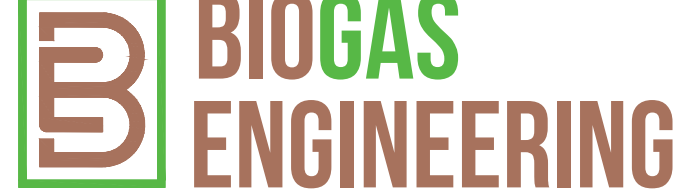
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PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
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2	8'-6"	1"	80S	PIPE, ERW, SCH 80S, PE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	1	1"	3000	COUPLING, CLASS 3000, SW, 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
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	2	1"	150	FLANGE SW, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
7	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
8	1	1"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20

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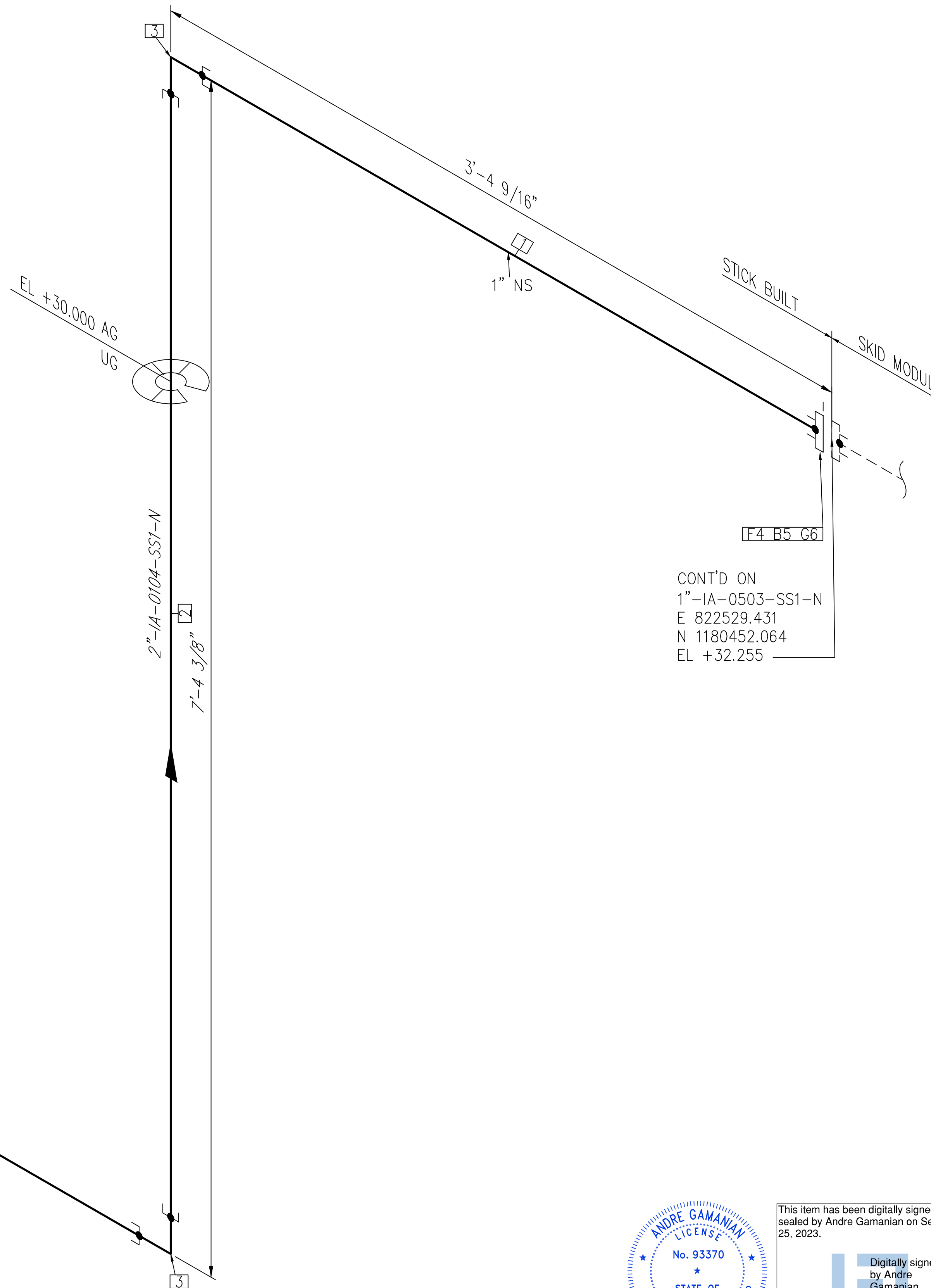
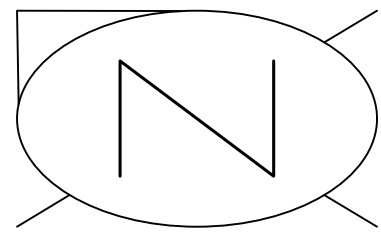
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

OWNER:
 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) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
2"-IA-0104-SS1-N	5
SCALE	N.T.S

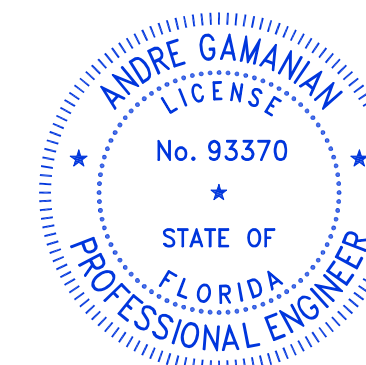


CONT'D FROM
 DWG#
 2-IA-0104-SS1-N-5
 E 822529.431
 N 1180460.434
 EL +24.888

CONT'D ON
 1"-IA-0503-SS1-N
 E 822529.431
 N 1180452.064
 EL +32.255

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	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
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	2	1"	3000	ELBOW 90 LR, CLASS 3000, SW, ASME B16.11, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	1	1"	150	FLANGE SW, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
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




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

ISSUED FOR CONSTRUCTION

C:\Users\MukeshThakur\Documents\Engineering\Biosgaseng - Documents\Engineering\Projects\U\SH2126:100 - Indian River County LF\H-Design\M-Mechanical\04# isometric\FC-Stick Built isometric\p2.01\2-IA-0104-SS1-N-5.dwg 03-02-2023 MukeshThakur

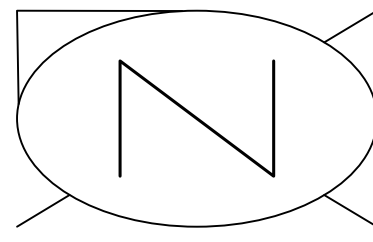
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

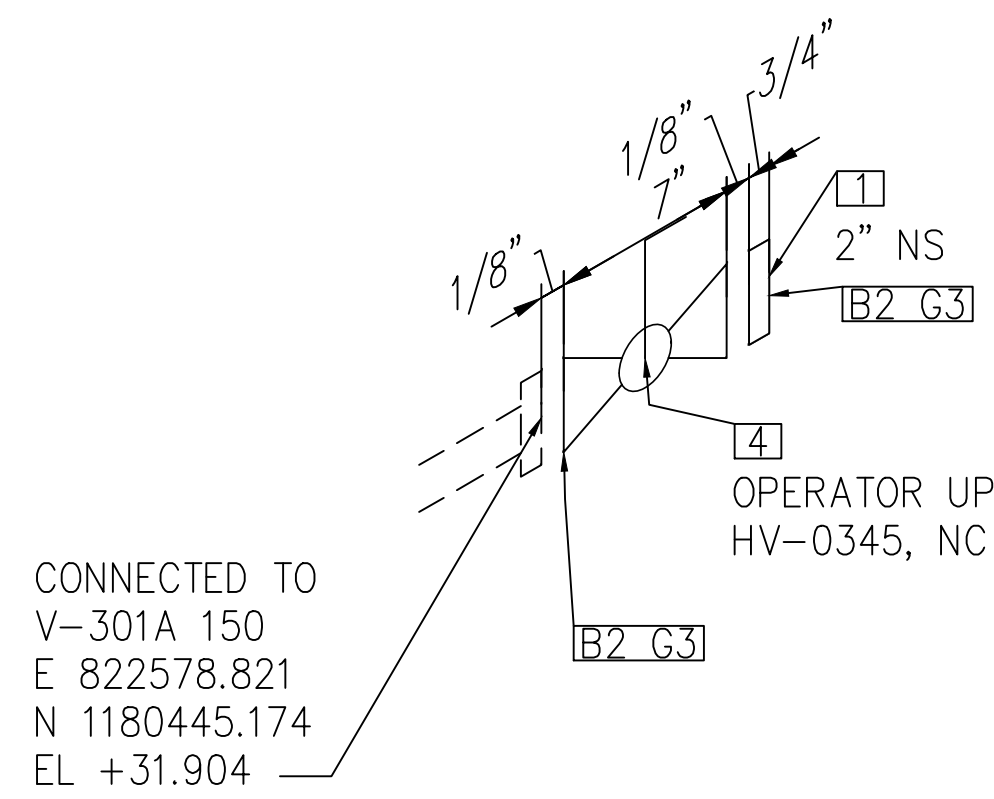
OWNER:
 INDIAN RIVER COUNTY
 FLORIDA
 1325 74th AVE SW,
 VERO BEACH, FLORIDA 32968

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

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



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BILL OF MATERIALS

FITTINGS

ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	1	2"	150	BLIND FLANGE, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304

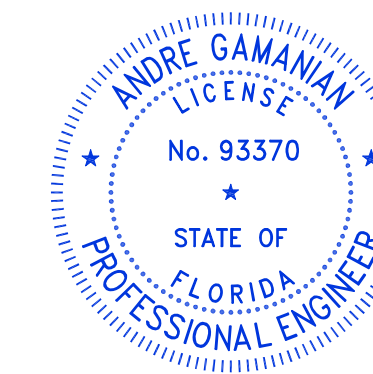
FASTENERS

ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	8	5/8"X3 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
3	2	2"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20

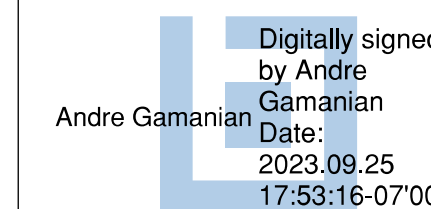
VALVES

ID	QTY	ND	ITEM CODE	DESCRIPTION
4	1	2"	HV-0345	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF

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



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




ISSUED FOR CONSTRUCTION

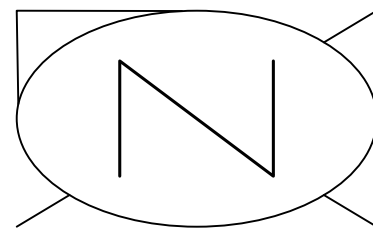
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

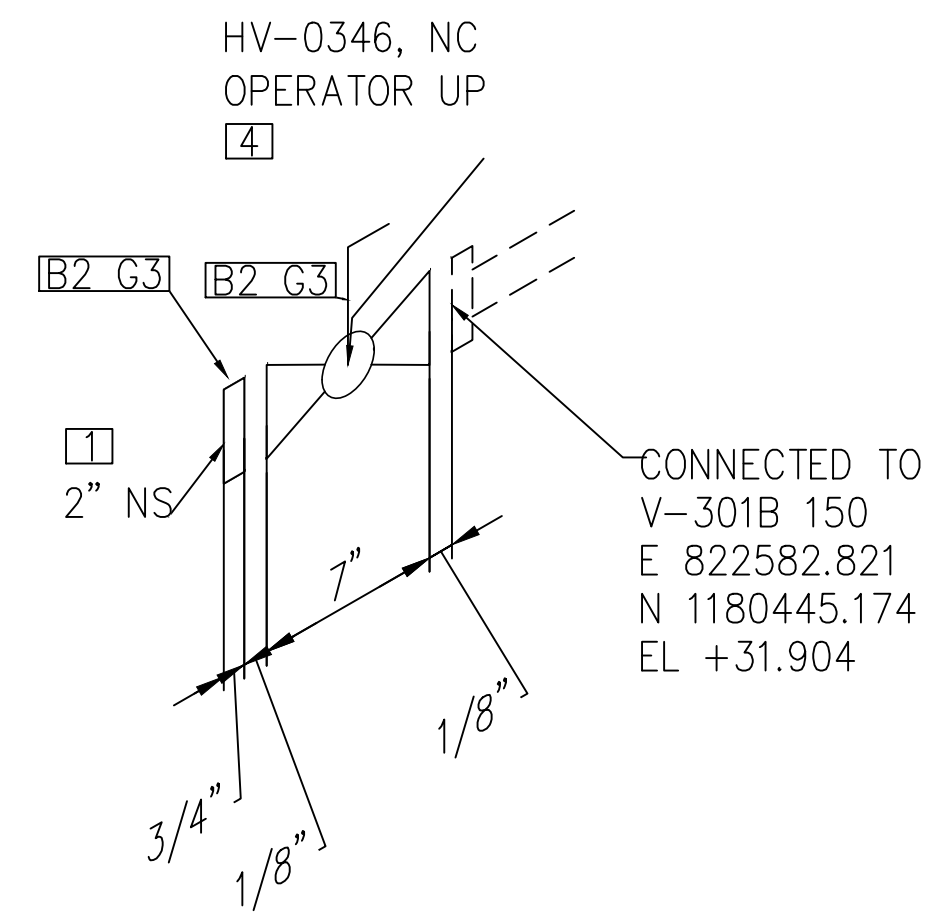
OWNER:  INDIAN RIVER COUNTY FLORIDA
1325 74th AVE SW, VERO BEACH, FLORIDA 32968

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

PIPING ISOMETRIC 2"-T-0315-SS1-H	SHEET 1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



C:\Users\MukeshThakur\Documents\Engineering\Biosaseng - Documents\Engineering\Projects\U\SH2126:100 - Indian River County LF V-H-Design\M-Mechanical\04# isometric\FC-Stick Built isometric\p2.03\2-T-0315-SS1-N-2.dwg 03-02-2023 MukeshThakur



BILL OF MATERIALS

FITTINGS

ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	1	2"	150	BLIND FLANGE, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304

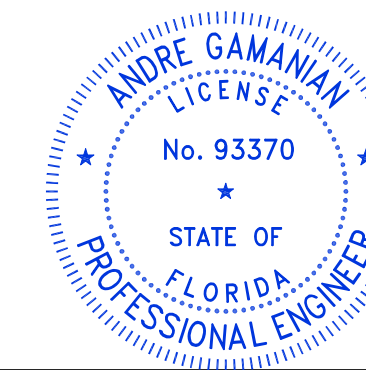
FASTENERS

ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	8	5/8"X3 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
3	2	2"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20

VALVES

ID	QTY	ND	ITEM CODE	DESCRIPTION
4	1	2"	HV-0346	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF

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



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

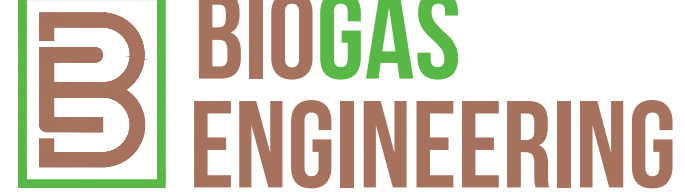
Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-07'00'

ISSUED FOR CONSTRUCTION

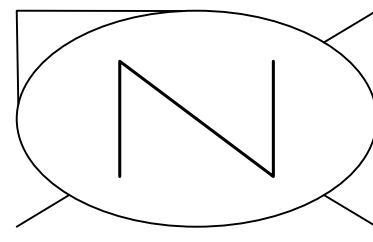
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

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

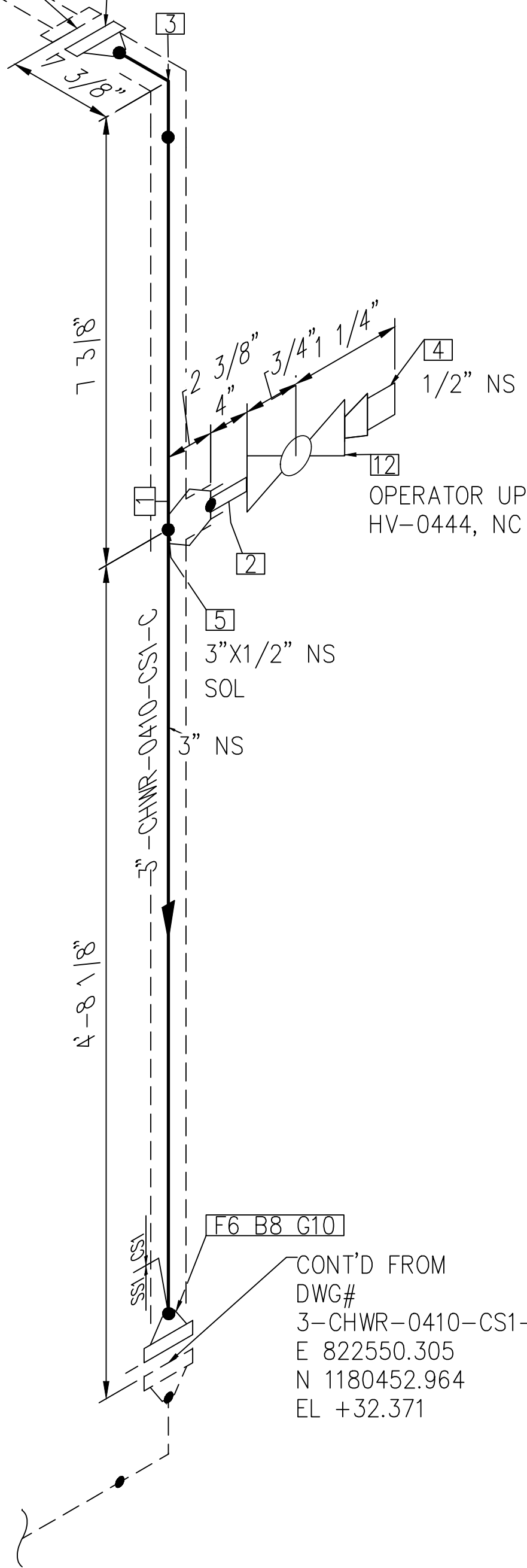
ENGINEER:  2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

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



CONNECTED TO
E-400-N-5
150
E 822550.305
N 1180453.579
EL +37.666

F7 B9 G11

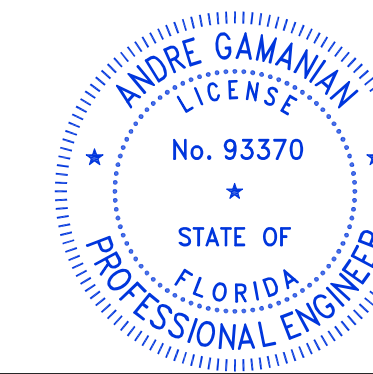


CONT'D FROM
DWG#
3-CHWR-0410-CS1-C-2
E 822550.305
N 1180452.964
EL +32.371

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	4'-9"	3"	40	PIPE, ERW, SCH 40, BE, ASME B36.10, ASTM A53 GR B
FITTINGS				
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	1	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
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	3"x1/2"	3000	SOCKOLET, CLASS 3000, BW X SW, MSS-SP 97, ASTM A105
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	1	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
FASTENERS				
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
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
12	1	1/2"	HV-0444	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR



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

C:\Users\MukeshThakur\Documents\Engineering\Blogsaseng - Documents\Engineering\Projects\ISH2126:100 - Indian River County LF-H-Design\M-Mechanical\04# isometric\FC-Stick Built isometric\02.04\3-CHWR-0410-CS1-C-1.dwg 06-02-2023 MukeshThakur

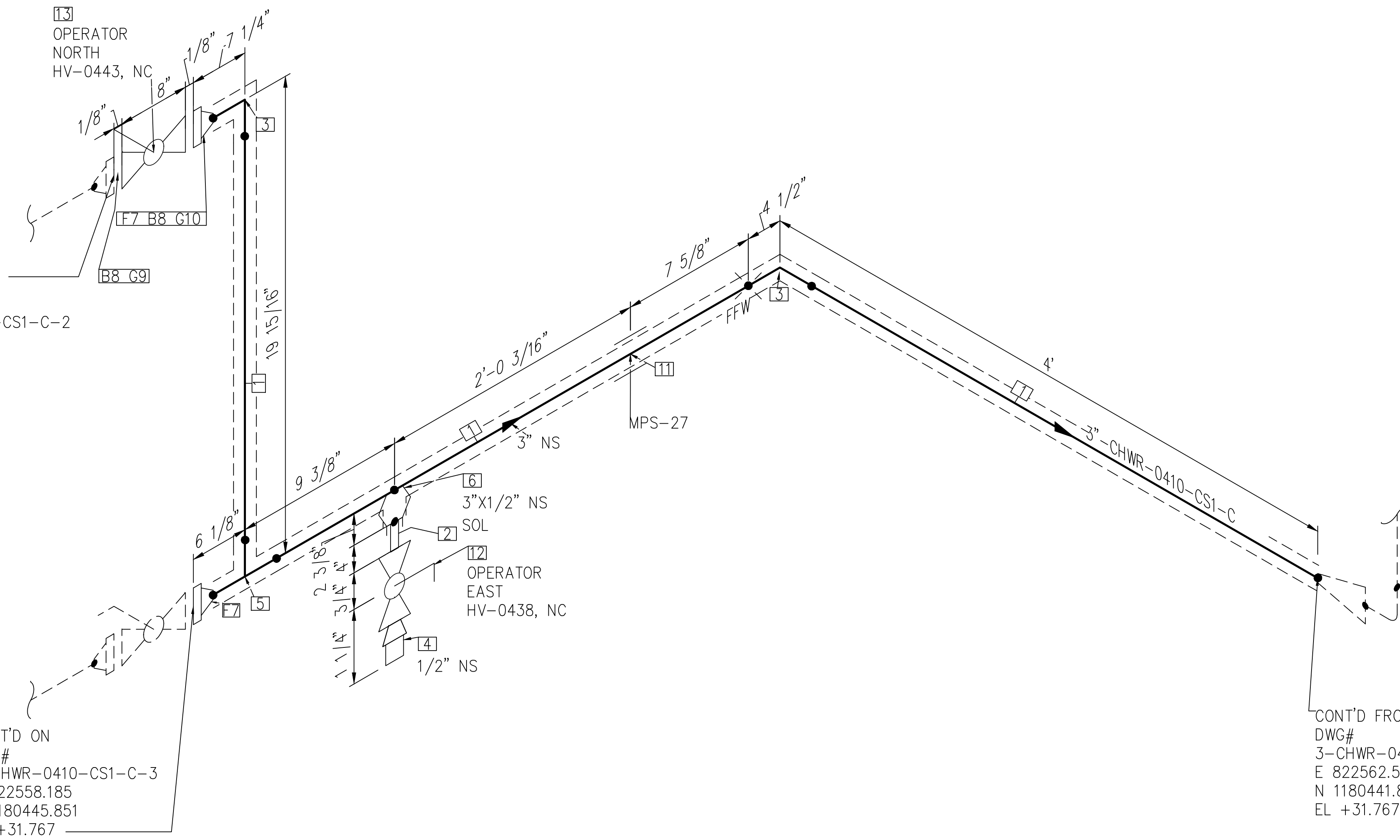
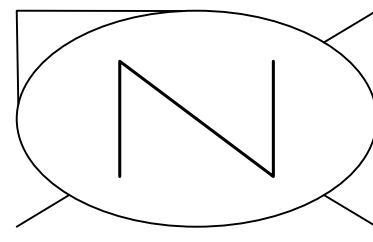
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

OWNER:  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) 726-3565
EMAIL: INFO@BIOGASENG.COM

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



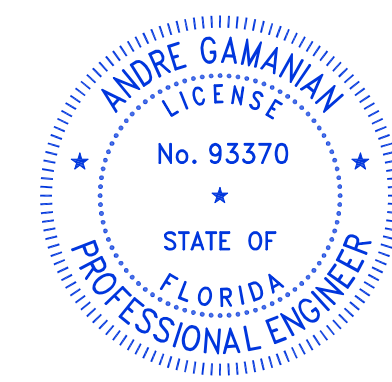
CONT'D FROM
 DWG#
 3-CHWR-0410-CS1-C-2
 E 822557.404
 N 1180445.851
 EL +33.428

CONT'D ON
 DWG#
 3-CHWR-0410-CS1-C-3
 E 822558.185
 N 1180445.851
 EL +31.767

CONT'D FROM
 DWG#
 3-CHWR-0410-CS1-C-5
 E 822562.504
 N 1180441.849
 EL +31.767

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	8'-1"	3"	40	PIPE, ERW, SCH 40, BE, ASME B36.10, ASTM A53 GR B
FITTINGS				
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	2	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
5	1	3"	40	EQUAL TEE, SMLS, SCH 40, BW, ASME B16.9, ASTM A234 GR WPB
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	1	3"x1/2"	3000	SOCKET, CLASS 3000, BW X SW, MSS-SP 97, ASTM A105
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
7	2	3"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A105
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
8	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
9	1	3"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, CS OUTER RING, CLASS 150, RF, ASME B 16.20
10	1	3"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, CS OUTER RING, CLASS 150, RF, ASME B 16.20
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
11	1	3"	SS1-4"-2-6"	PIPE SADDLE FOR INSULATED PIPE SIZE 1/2" TO 6"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
12	1	1/2"	HV-0438	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
13	1	3"	HV-0443	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF

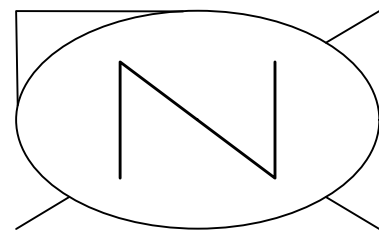


This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.
 Digitally signed by Andre Gamanian
 Date: 2023.09.25 17:53:16-0700

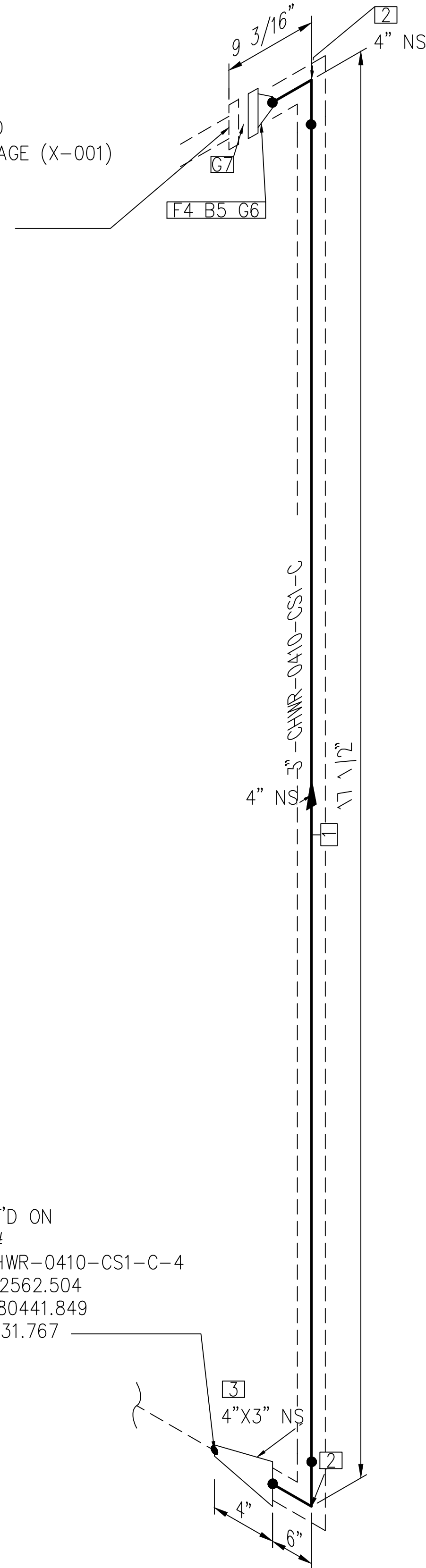
ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	SERVICE	CHWR	OWNER:	ENGINEER:	PIPING ISOMETRIC	SHEET
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG	PIPE SPEC	CS1	INDIAN RIVER COUNTY FLORIDA	BIOGAS ENGINEERING	3"-CHWR-0410-CS1-C	4
						P&ID DWG	P2.04	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 BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S
						INSULATION SPEC	C				
						INSULATION THK	1"				

C:\Users\MukeshTrakur\Documents\Engineering\Blogsaseng - Documents\Engineering\Projects\USR2126:100 - Indian River County LF V-H-Design\M-Mechanical\04# Isometric\FC-Stick Built Isometric\P2.04\3-CHWR-0410-CS1-C-4.dwg 06-02-2023 MukeshTrakur



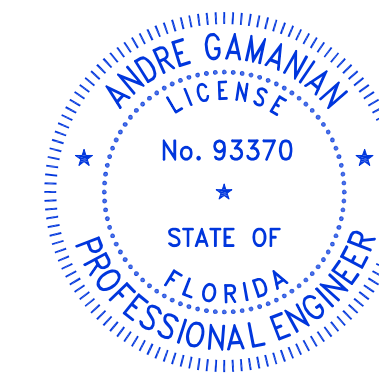
CONNECTED TO
CHILLER PACKAGE (X-001)
E 822561.738
N 1180441.015
EL +33.225



CONT'D ON
DWG#
3-CHWR-0410-CS1-C-4
E 822562.504
N 1180441.849
EL +31.767

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	6"	4"	40	PIPE, ERW, SCH 40, BE, ASME B36.10, ASTM A53 GR B
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	2	4"	40	ELBOW 90 LR, SMLS, SCH 40, BW, ASME B16.9, ASTM A234 GR WPB
3	1	4"X3"	40	REDUCER (CONC), SMLS, SCH 40, BW, ASME B16.9, ASTM A234 GR WPB
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	1	4"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A105
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	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
6	1	4"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, CS OUTER RING, CLASS 150, RF, ASME B 16.20
7	1	4"	150	GRUVLOK FIGURE 7012, FLANGE ADAPTER INSERT




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

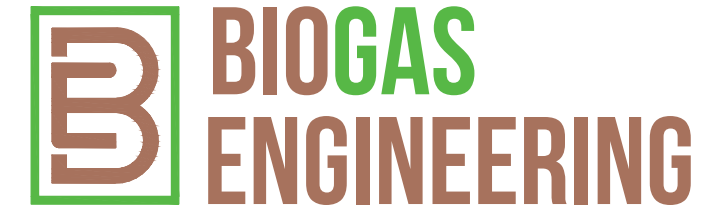
Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-07'00'

ISSUED FOR CONSTRUCTION

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

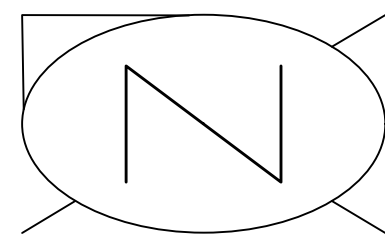
SERVICE	CHWR
PIPE SPEC	CS1
P&ID DWG	P2.04
INSULATION SPEC	C
INSULATION THK	1"

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

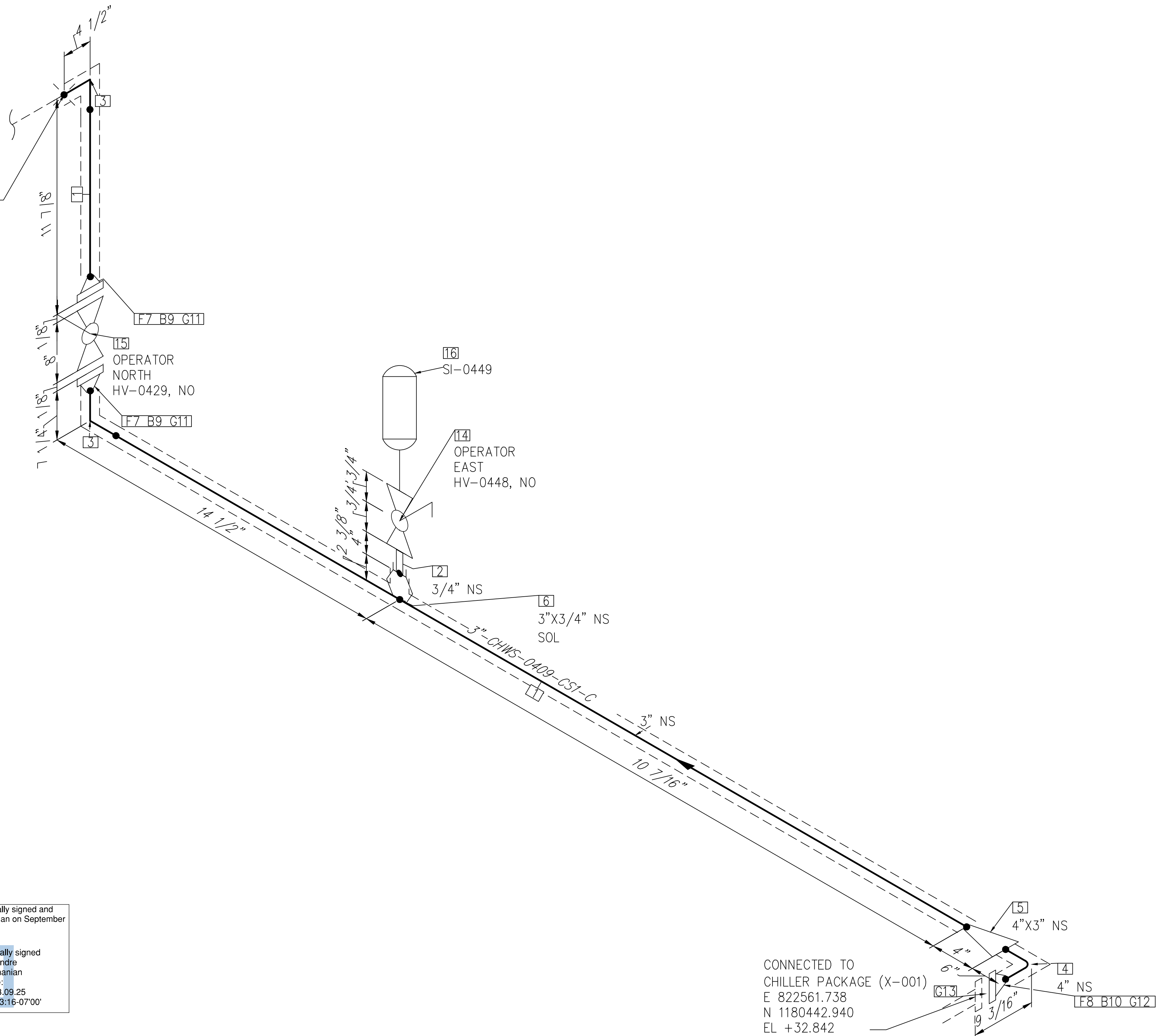
ENGINEER:  **BIOGAS ENGINEERING**
2321 E. 28TH STREET, SUITE 400
SIGNAL HILL, CA 90755, Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM

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

D:\Biogas Engineering\Projects\USH2126.100 - Indian River County LF\H-Design\M-Mechanical\04# Isometric\FC-Stick-Built Isometric\P2.04\3-CHWR-0410-CS1-C-5.dwg 08-02-2023 MRKartnik



CONT'D ON
 DWG#
 3-CHWS-0409-CS1-C-2
 E 822562.129
 N 1180445.851
 EL +35.125



CONNECTED TO
 CHILLER PACKAGE (X-001)
 E 822561.738
 N 1180442.940
 EL +32.842

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'

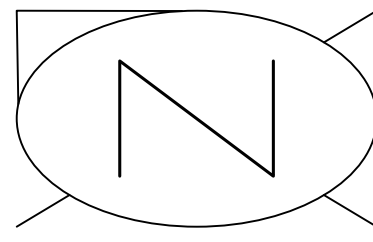
NOTE: -
 FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	2'-2"	3"	40	PIPE, ERW, SCH 40, BE, ASME B36.10, ASTM A53 GR B
FITTINGS				
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
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	1	3"X3/4"	3000	SOCKOLET, CLASS 3000, BW X SW, MSS-SP 97, ASTM A105
FLANGES				
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
FASTENERS				
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
VALVES				
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)

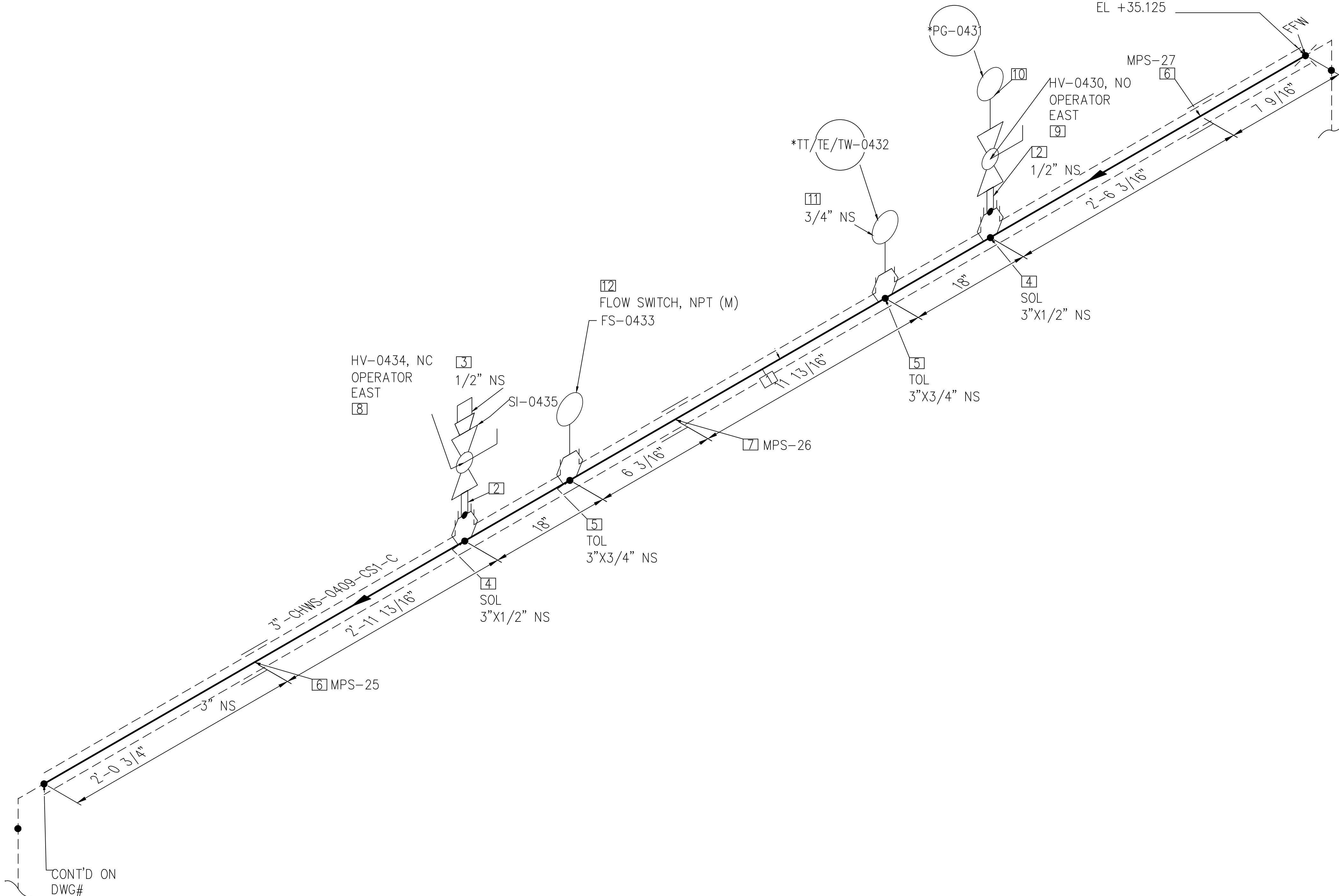
ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	SERVICE	CHWS	OWNER:	ENGINEER:	PIPING ISOMETRIC	SHEET
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG	PIPE SPEC	CS1	INDIAN RIVER COUNTY FLORIDA 1325 74th AVE SW, VERO BEACH, FLORIDA 32968	BIOGAS ENGINEERING 2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM	3"-CHWS-0409-CS1-C	1
					P&ID DWG	P2.04	SCALE				
					INSULATION SPEC	C	N.T.S				
					INSULATION THK	1"					

D:\Biogas Engineering\Biosenseeng - Documents\Engineering\Projects\USH2126.100 - Indian River County LF\H-Design\M-Mechanical\04# Isometric\FC-Stick-Built Isometric\P2.04\3-CHWS-0409-CS1-C-1.dwg 08-02-2023 MRKartik



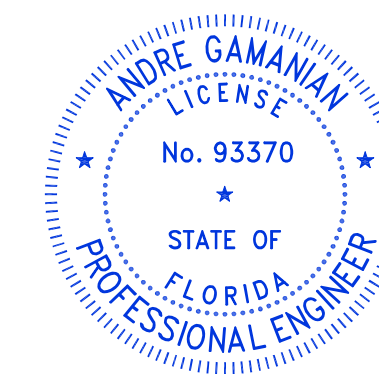
CONT'D FROM
 DWG#
 3-CHWS-0409-CS1-C-1
 E 822562.123
 N 1180445.851
 EL +35.125



CONT'D ON
 DWG#
 3-CHWS-0409-CS1-C-3
 E 822549.430
 N 1180445.851
 EL +35.125

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	12'-9"	3"	40	PIPE, ERW, SCH 40, BE, ASME B36.10, ASTM A53 GR B
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	2	1/2"	80	PIPE NIPPLE, SMLS, 4" LG, SCH 80, PE X NPT (M), ASME A733, ASTM A53 GR B
3	1	1/2"	3000	PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A105
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	2	3"x1/2"	3000	SOCKOLET, CLASS 3000, BW X SW, MSS-SP 97, ASTM A105
5	2	3"x3/4"	3000	THREADOLET, CLASS 3000, BW X NPT (F), MSS-SP-97, ASTM A105
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
6	2	3"	SS1-4"-2-6	PIPE SADDLE FOR INSULATED PIPE SIZE 1/2" TO 6"
7	1	3"	SS1-4"-1-6"	PIPE SADDLE FOR INSULATED PIPE SIZE 1/2" TO 6"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
8	1	1/2"	HV-0434	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
9	1	1/2"	HV-0430	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
10	1	1/2"	PG-0431	PRESSURE GAUGE, NPT (M)
11	1	3/4"	TT/TE/TW-0432	TEMPERATURE TRANSMITTER & TEMPERATURE ELEMENT WITH THERMOWELL, NPT (M)
12	1	3/4"	FS-0433	FLOW SWITCH TRANSMITTER, NPT (M)



This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.
 Digitally signed by Andre Gamanian
 Date: 2023.09.25 17:53:16-0700'

ISSUED FOR CONSTRUCTION

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

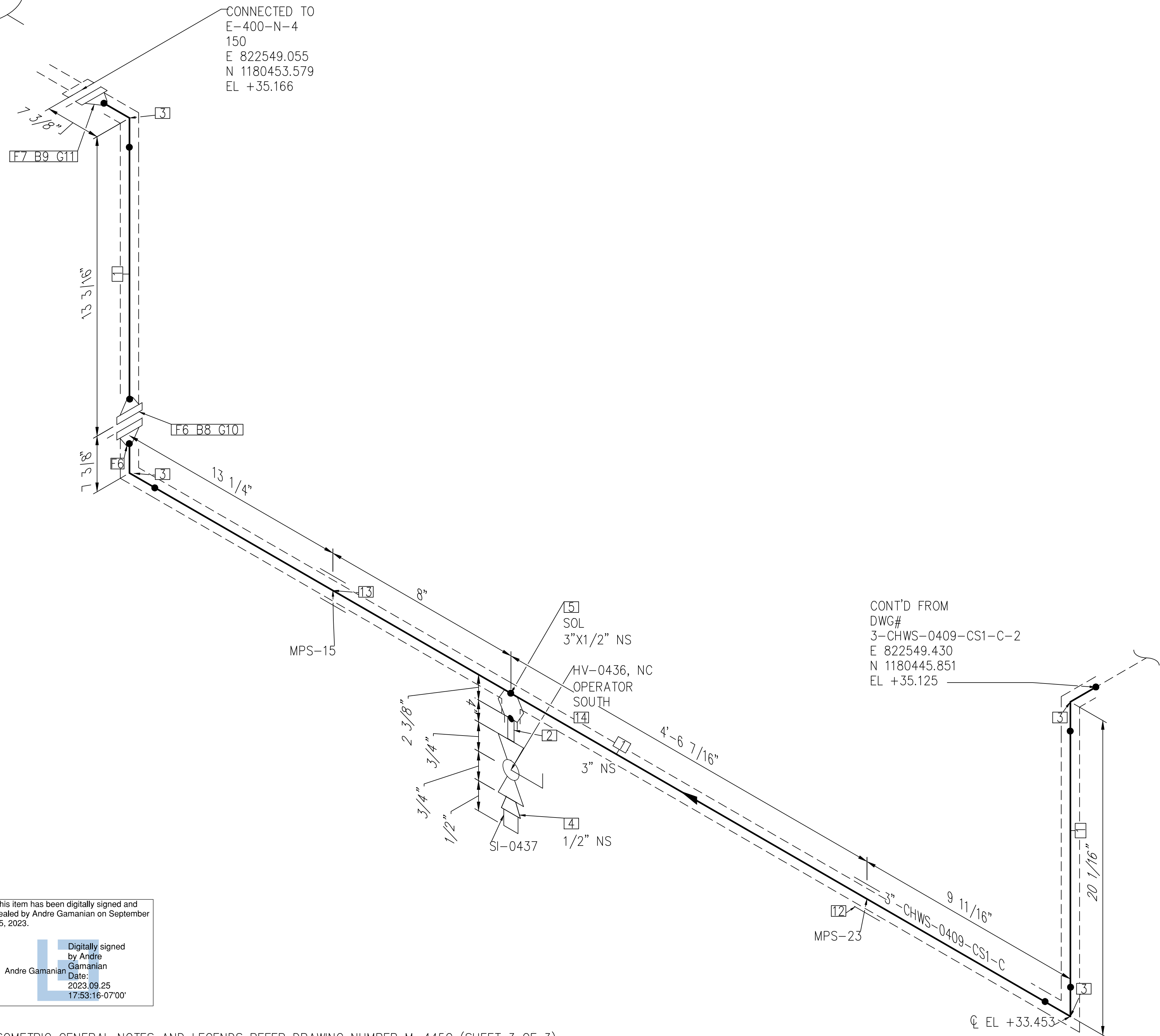
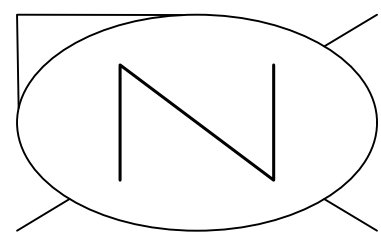
SERVICE	CHWS
PIPE SPEC	CS1
P&ID DWG	P2.04
INSULATION SPEC	C
INSULATION THK	1"

OWNER:
 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) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
3"-CHWS-0409-CS1-C	2
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE
	N.T.S

C:\Users\MukeshTrakur\Documents\Engineering\Blogsaseng - Documents\Engineering\Projects\U\SH2126:100 - Indian River County LF H-Design\M-Mechanical\04# Isometric\04# Isometric\FC-Stick Built Isometric\22.04\3-CHWS-0409-CS1-C-2.dwg 06-02-2023 MukeshTrakur



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'

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"	40	PIPE, ERW, SCH 40, BE, ASME B36.10, ASTM A53 GR B
FITTINGS				
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
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	3"X1/2"	3000	SOCKOLET, CLASS 3000, BW X SW, MSS-SP 97, ASTM A105
FLANGES				
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
FASTENERS				
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 SUPPORTS				
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"
VALVES				
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
ISSUED FOR CONSTRUCTION				

C:\Users\MukeshTrakur\Documents\Engineering\Blogsaseng - Indian River County LF\H-Design\M-Mechanical\04# isometric\FC-Stick Built isometric\22.04\3-CHWS-0409-CS1-C-3.dwg 06-02-2023 MukeshTrakur

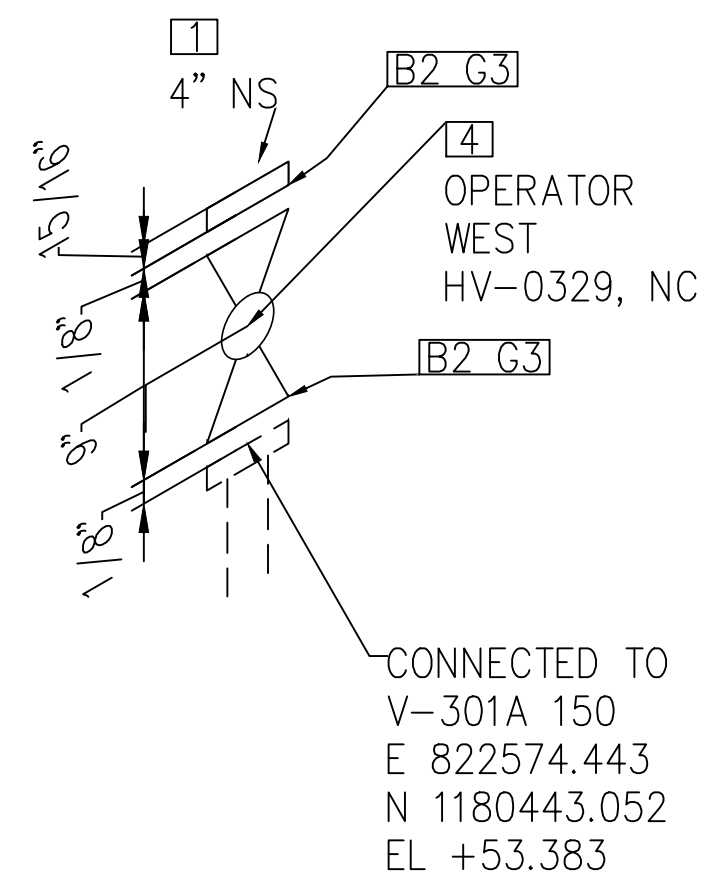
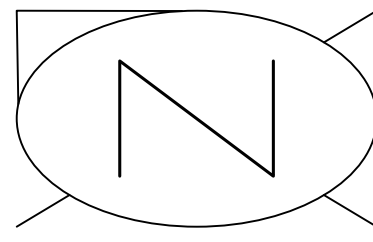
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

SERVICE	CHWS
PIPE SPEC	CS1
P&ID DWG	P2.04
INSULATION SPEC	C
INSULATION THK	1"

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

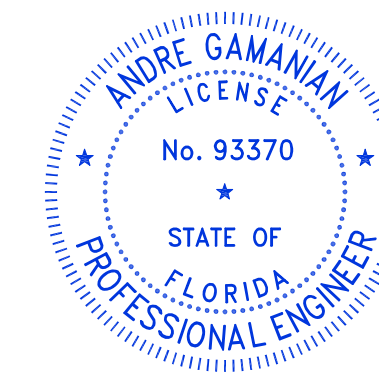
ENGINEER: **BIOGAS ENGINEERING**
 2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

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



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

BILL OF MATERIALS				
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	1	4"	150	BLIND FLANGE, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	16	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
3	2	4"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
4	1	4"	HV-0329	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF

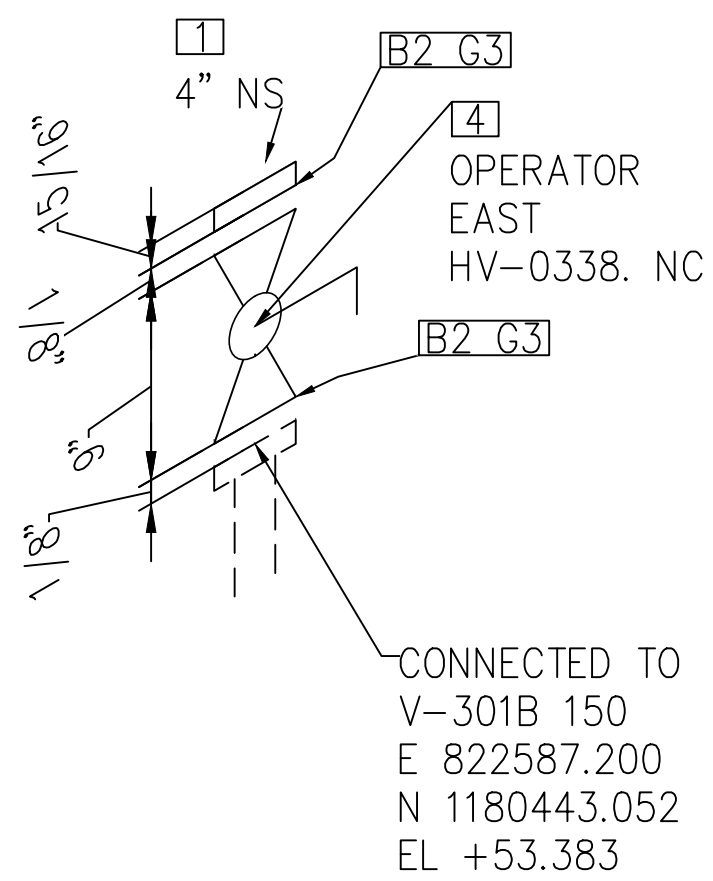
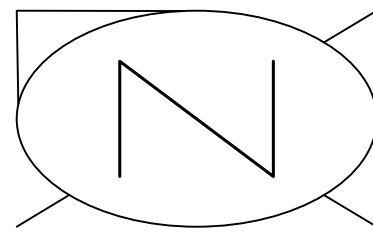


This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.

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

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	SERVICE	T	OWNER:	ENGINEER:	PIPING ISOMETRIC	SHEET
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG	PIPE SPEC	SS1	 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	4"-T-0315-SS1-H	1
					P&ID DWG	P2.03	SCALE				
					INSULATION SPEC	H	N.T.S				
					INSULATION THK	1"					



BILL OF MATERIALS

FITTINGS

ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	1	4"	150	BLIND FLANGE, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304

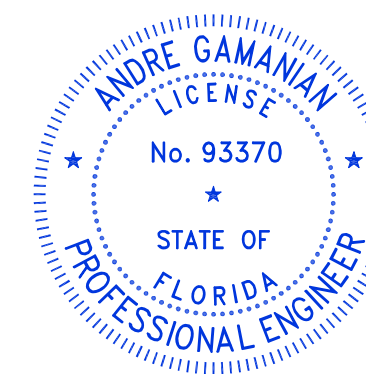
FASTENERS

ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	16	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
3	2	4"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20

VALVES

ID	QTY	ND	ITEM CODE	DESCRIPTION
4	1	4"	HV-0338	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF

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




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

ISSUED FOR CONSTRUCTION

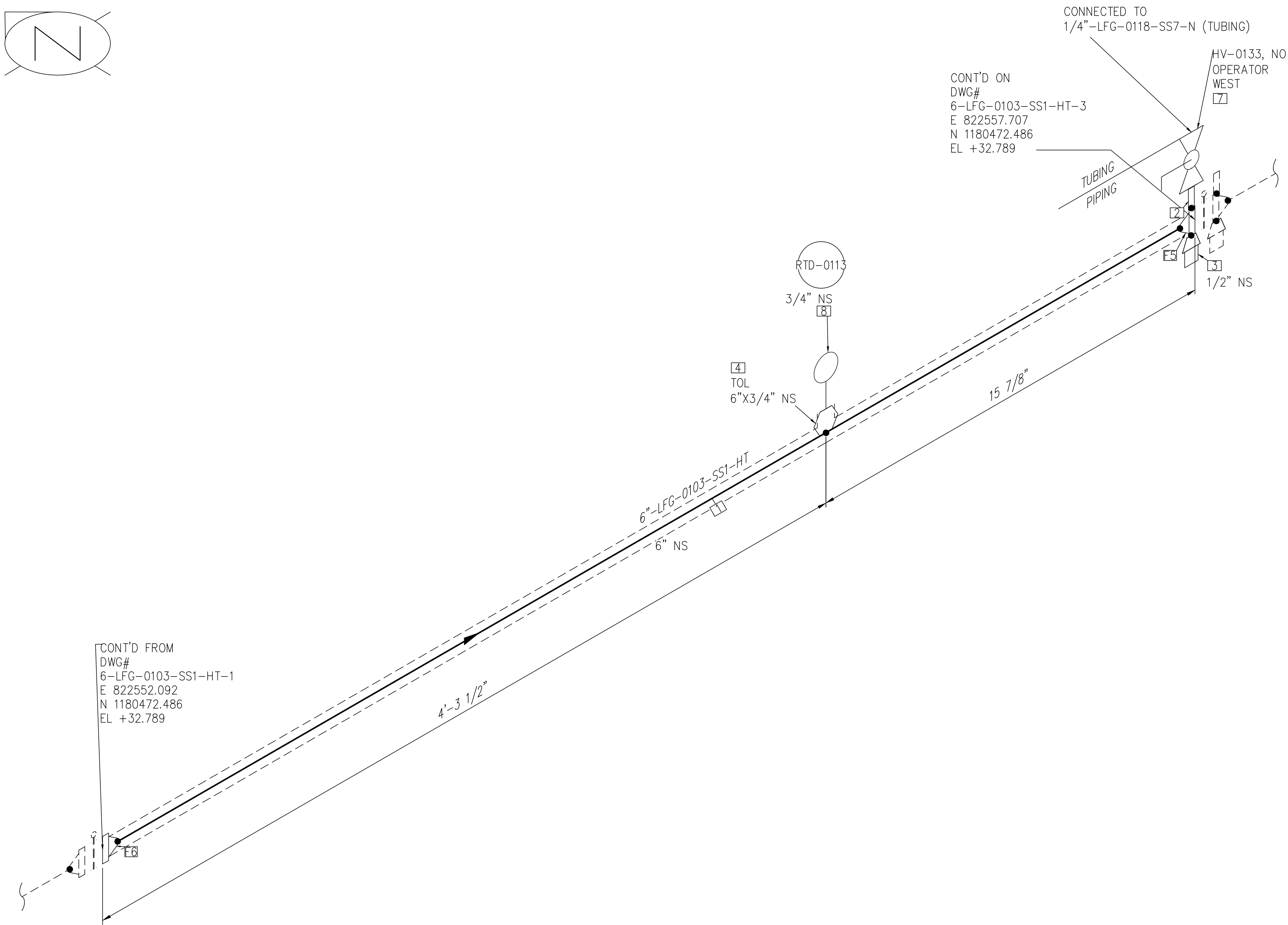
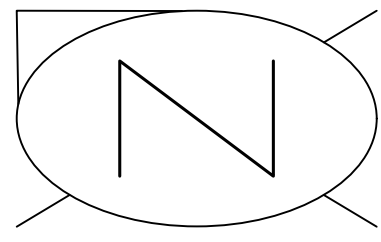
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

OWNER:  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) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC 4"-T-0315-SS1-H	SHEET 2
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

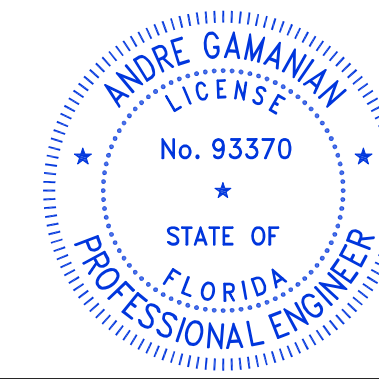


CONT'D ON
DWG#
6-LFG-0103-SS1-HT-3
E 822557.707
N 1180472.486
EL +32.789

CONT'D FROM
DWG#
6-LFG-0103-SS1-HT-1
E 822552.092
N 1180472.486
EL +32.789

BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	5'	6"	40S	PIPE, ERW, SCH 40S, BE, 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	PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A182 GR F304
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	1	6"X3/4"	3000	THREAOLET, CLASS 3000, BW X NPT (F), MSS-SP-97, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	6"X1/2"	300	ORFICE WN, CLASS 300, WNRF X NPT (F), ASME B16.36, ASTM A182 GR F304
6	1	6"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
7	1	1/2"	HV-0133	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
8	1	3/4"	RTD-0113	RESISTANCE TEMPERATURE DETECTOR, NPT (M) (SUPPLIED BY BGE)

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



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

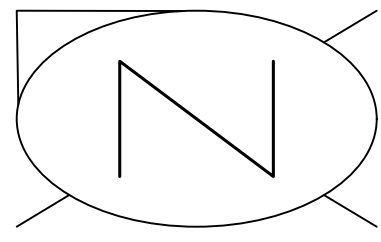
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

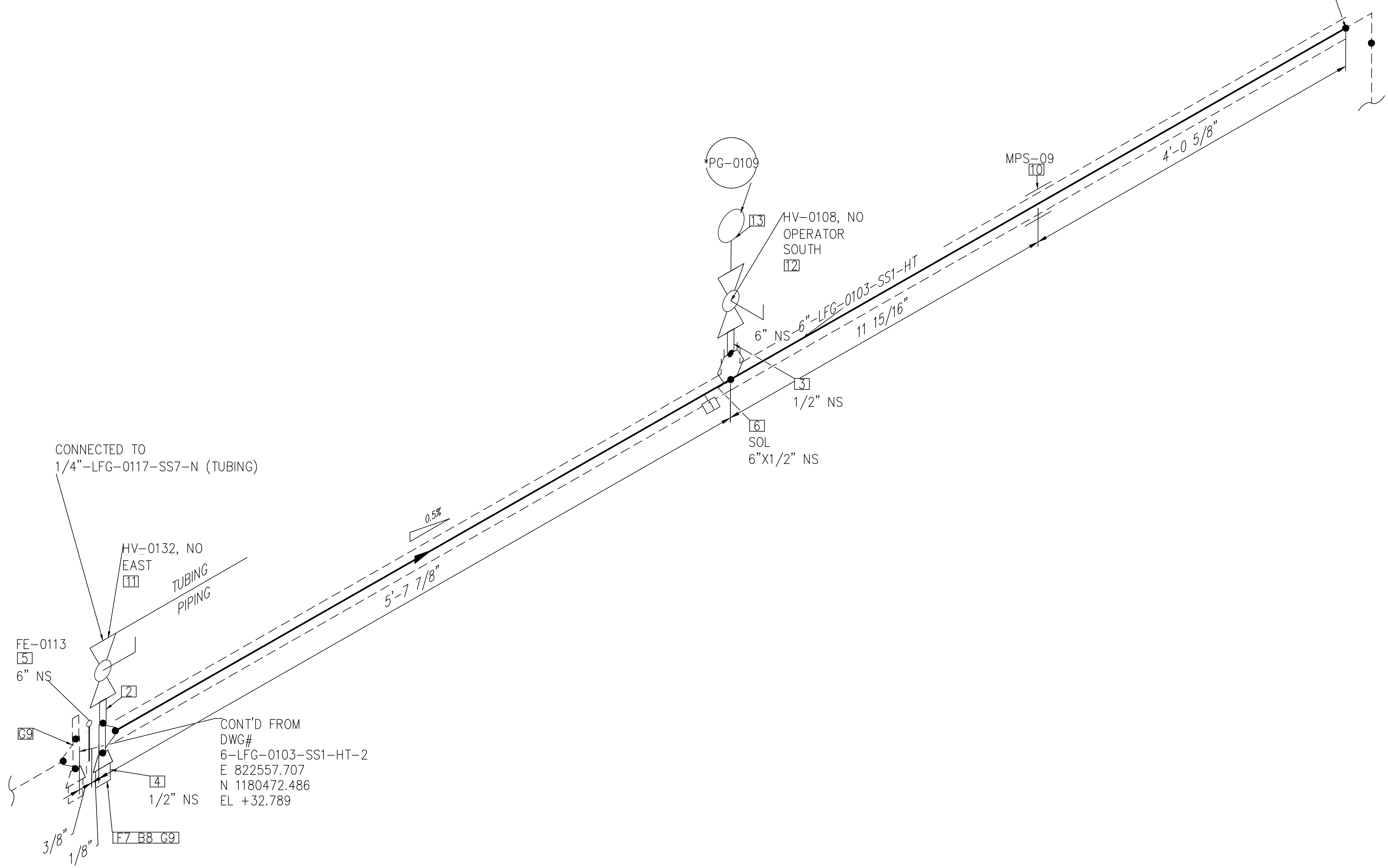
OWNER:
 INDIAN RIVER COUNTY
FLORIDA
1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

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

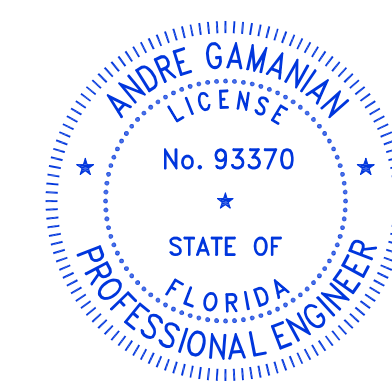
PIPING ISOMETRIC	SHEET
6"-LFG-0103-SS1-HT	2
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE
	N.T.S



CONT'D FROM
 DWG#
 6-LFG-0103-SS1-HT-4
 E 822568.455
 N 1180472.486
 EL +32.737



BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	10'-5"	6"	40S	PIPE, ERW, SCH 40S, BE, 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"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, PE X NPT (M), ASME A733, ASTM A312 GR TP 304
4	1	1/2"	3000	PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A182 GR F304
5	1	6"	300	FE-0113 FLOW ELEMENT (SUPPLIED BY BGE)
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	1	6"x1/2"	3000	SOCKET, CLASS 3000, BW X SW, MSS-SP-97, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
7	1	6"x1/2"	300	ORFICE WN, CLASS 300, WNRF X NPT (F), ASME B16.36, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
8	12	3/4"x5 1/4"	300	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
9	2	6"	300	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 300, RF, ASME B 16.20
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
10	1	6"	SS1-4"-1-8"	PIPE SADDLE FOR INSULATED PIPE SIZE 1/2" TO 6"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
11	1	1/2"	HV-0132	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
12	1	1/2"	HV-0108	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
13	1	1/2"	PG-0109	PRESSURE GAUGE, NPT (M)



This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.
 Digitally signed by Andre Gamanian
 Date: 2023.09.25 17:53:16-0700

ISSUED FOR CONSTRUCTION

C:\Users\MukeshThakur\Documents\Engineering\Blogsaseng - Indian River County LF H-Design M-Mechanical\04# isometric\FC-Stick Built isometric\22.01\6-LFG-0103-SS1-HT-3.dwg 06-02-2023 MukeshThakur

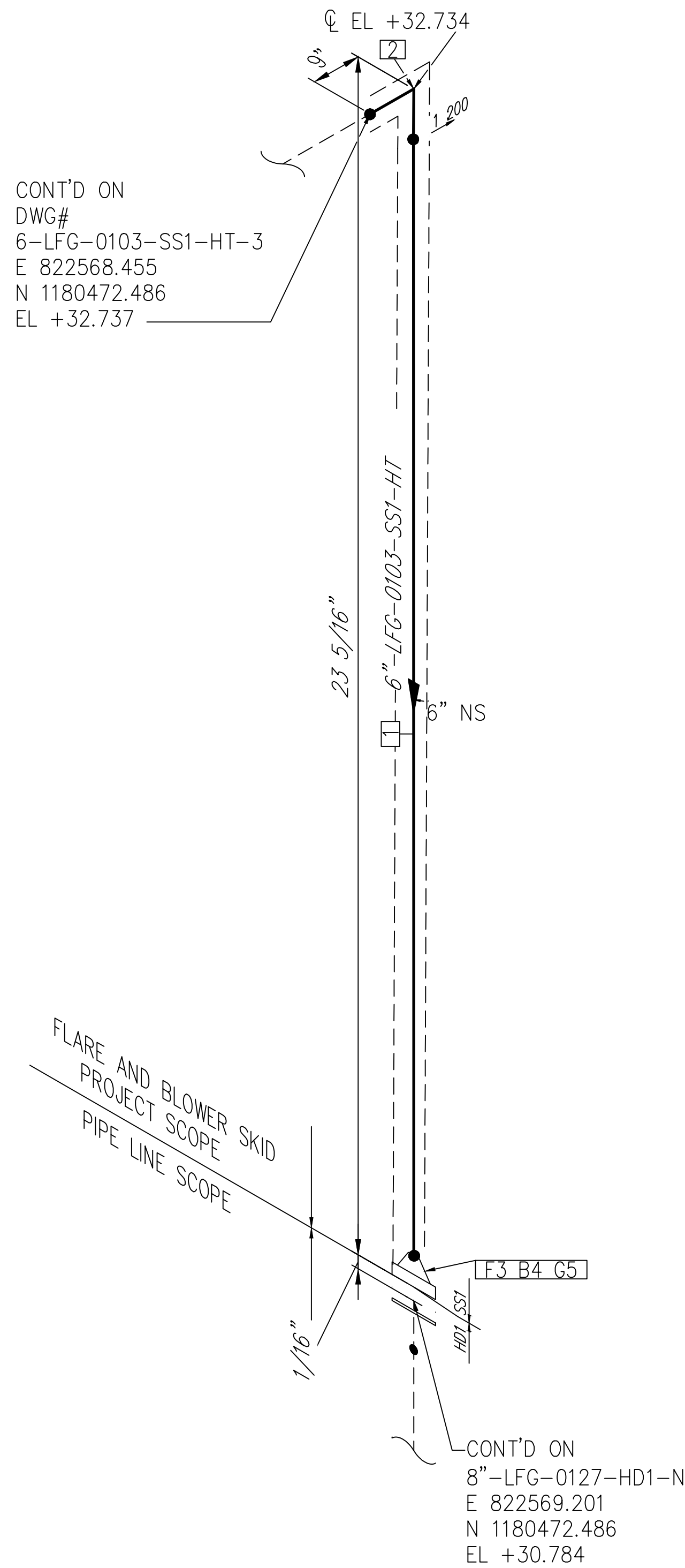
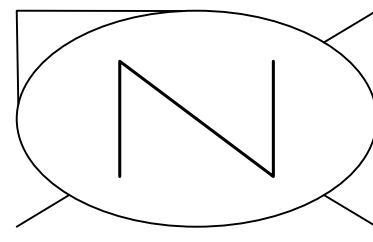
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

OWNER: 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) 726-3565 EMAIL: INFO@BIOGASENG.COM

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



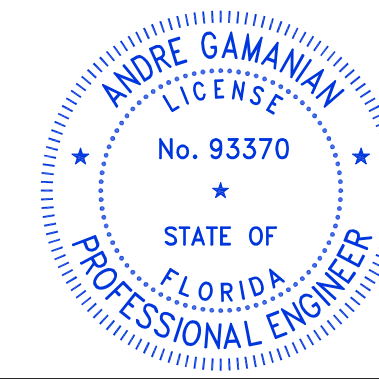
CONT'D ON
 DWG#
 6-LFG-0103-SS1-HT-3
 E 822568.455
 N 1180472.486
 EL +32.737

CONT'D ON
 8"-LFG-0127-HD1-N
 E 822569.201
 N 1180472.486
 EL +30.784

FLARE AND BLOWER SKID
 PROJECT SCOPE
 PIPE LINE SCOPE

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	11"	6"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	6"	40S	ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	1	6"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	8	3/4"x4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
5	1	6"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20




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

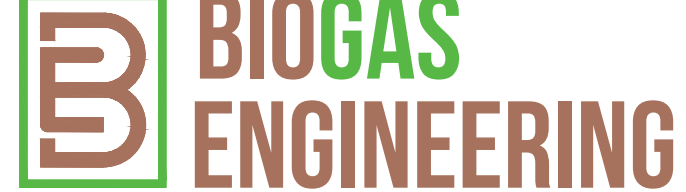
Digitally signed by Andre Gamanian
 Date: 2023.09.25 17:53:16-0700

ISSUED FOR CONSTRUCTION

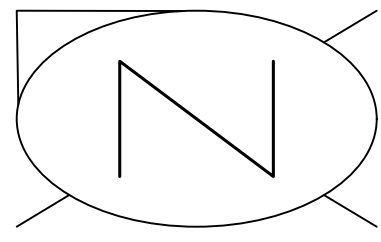
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

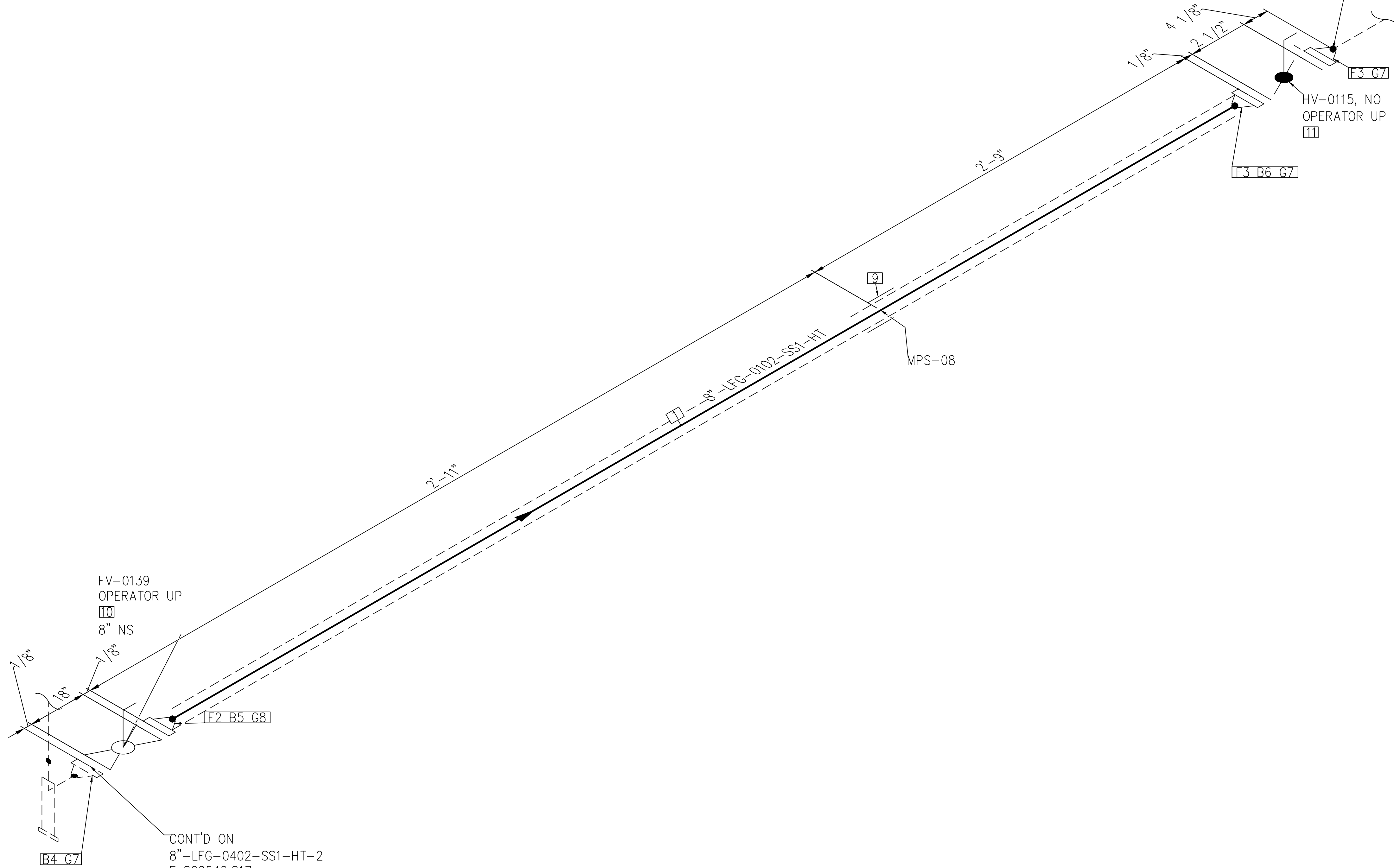
OWNER:  INDIAN RIVER COUNTY FLORIDA
 1325 74th AVE SW,
 VERO BEACH, FLORIDA 32968

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

PIPING ISOMETRIC	SHEET
6"-LFG-0103-SS1-HT	4
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



CONT'D FROM
 DWG#
 8-LFG-0102-SS1-HT-2
 E 822550.566
 N 1180473.653
 EL +32.872



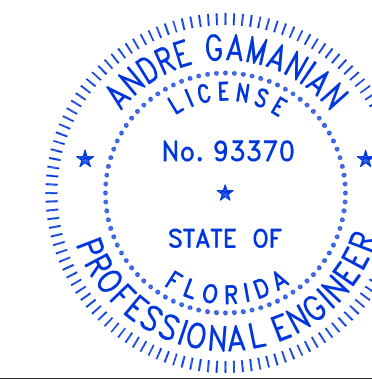
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 OPERATOR UP
 [10]
 8" NS

CONT'D ON
 8"-LFG-0402-SS1-HT-2
 E 822542.817
 N 1180473.653
 EL +32.872

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	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
FASTENERS				
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 SUPPORTS				
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




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

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

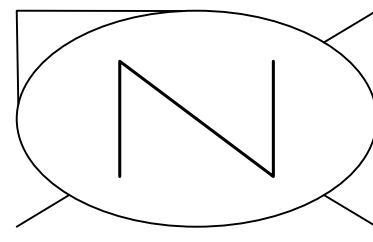
SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.01A
INSULATION SPEC	HT
INSULATION THK	1"

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

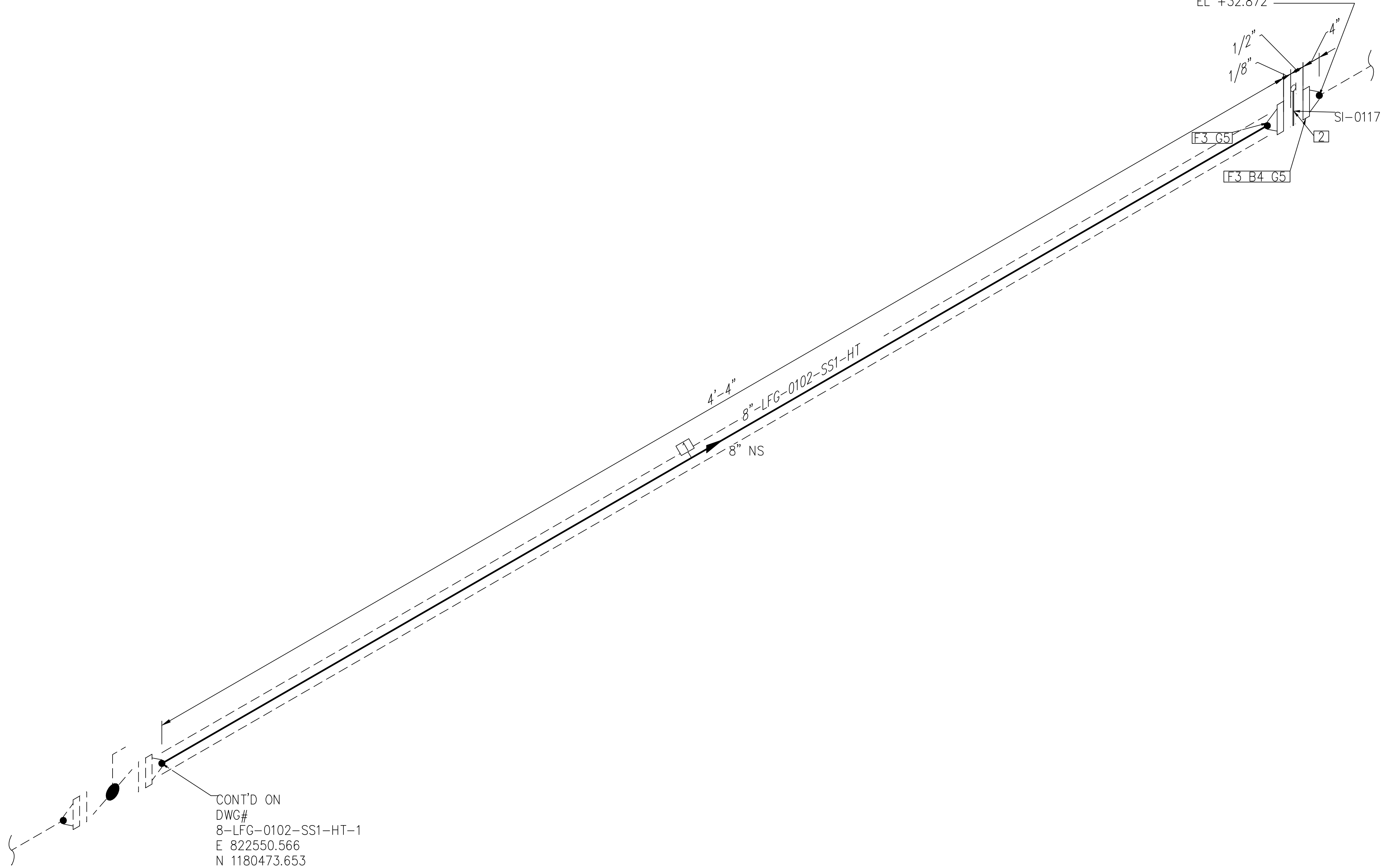
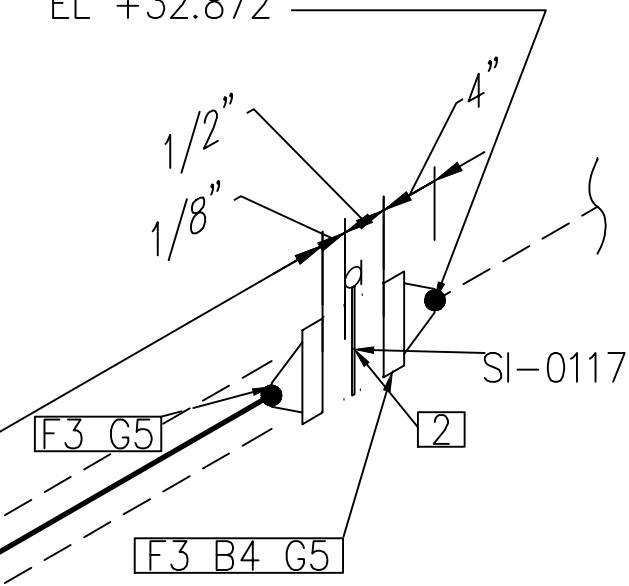
ENGINEER:
 **BIOGAS ENGINEERING**
 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
 EMAIL: INFO@BIOGASENG.COM

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

C:\Users\MukeshTrakur\Documents\Engineering\Biosgas\Projects\U\SH2126:100 - Indian River County LF V-Design M-Mechanical\04# isometric\04# isometric\FC-Stick Built isometric\p2.01\8-LFG-0102-SS1-HT-1.dwg 03-02-2023 MukeshTrakur

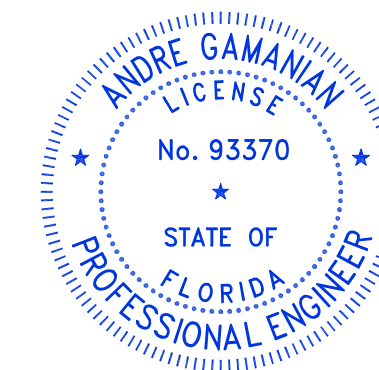


CONT'D FROM
 DWG#
 8-LFG-0102-SS1-HT-3
 E 822555.285
 N 1180473.653
 EL +32.872



CONT'D ON
 DWG#
 8-LFG-0102-SS1-HT-1
 E 822550.566
 N 1180473.653
 EL +32.872

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



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


ISSUED FOR CONSTRUCTION

BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	4'	8"	40S	PIPE, SMLS, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	8"	150	FLOW CONDITIONER, 8"CPA 50E, TYPE A, RF, SCH 40, SS 316
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	2	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	8	3/4"X4 3/4"	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

C:\Users\MukeshThakur\Documents\Engineering\Blogsaseng - Documents\Engineering\Projects\USHT26:100 - Indian River County LF V-Design M-Mechanical\04# isometric\FC-Stick Built isometric\02.01\8-LFG-0102-SS1-HT-3.dwg 03-02-2023 MukeshThakur

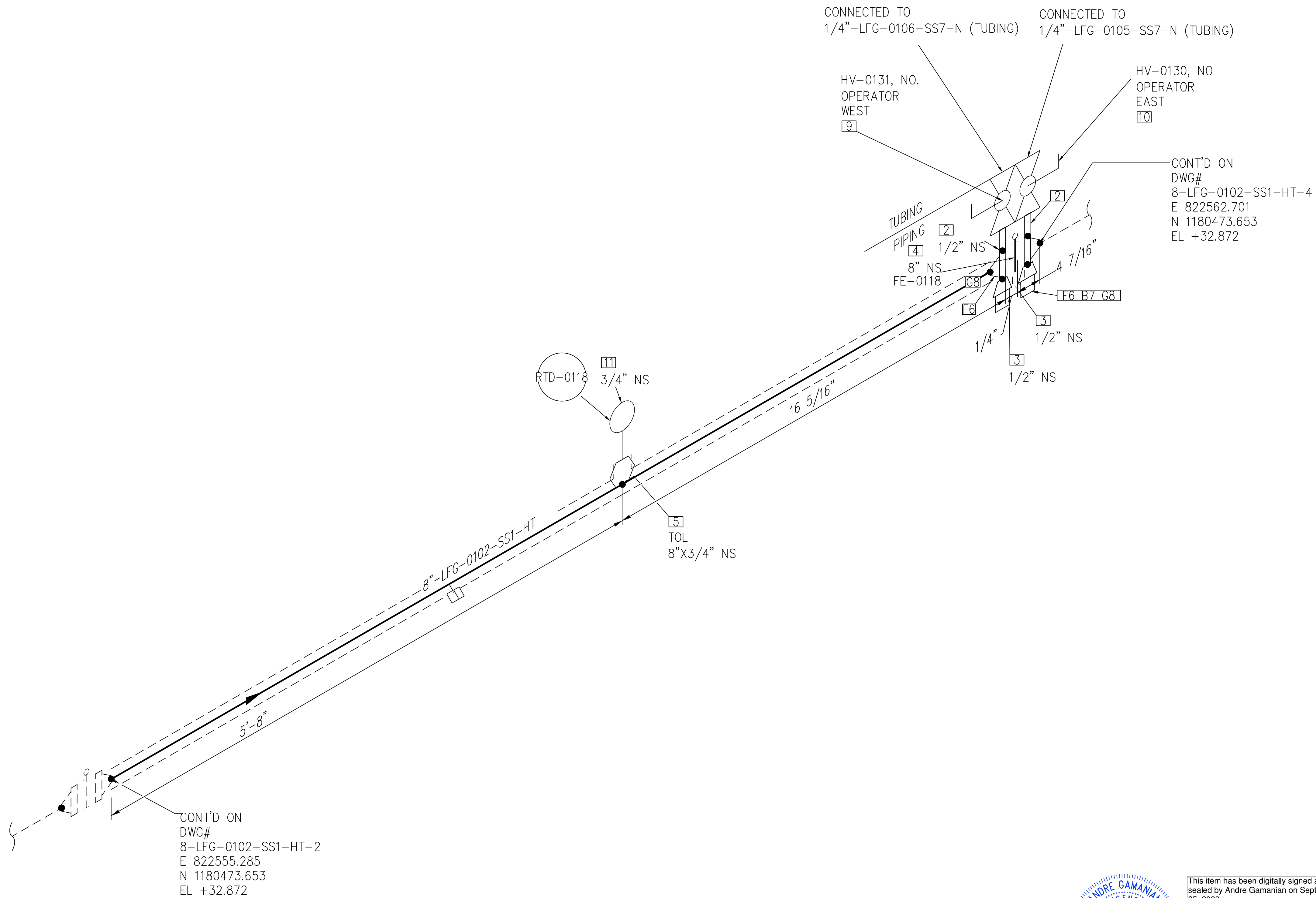
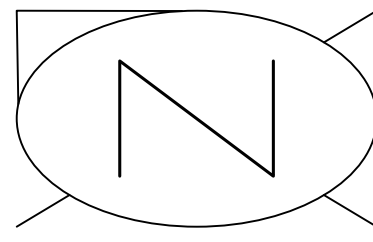
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

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

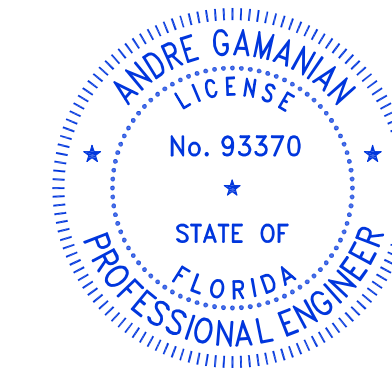
ENGINEER:
 **BIOGAS ENGINEERING**
 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
8"-LFG-0102-SS1-HT	2
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



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	6'-8"	8"	40S	PIPE, SMLS, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	2	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304
3	2	1/2"	3000	PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A182 GR F304
4	1	8"	300	FE-0118 FLOW ELEMENT (SUPPLIED BY BGE)
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	8"X3/4"	3000	THREADOLET, CLASS 3000, BW X NPT (F), MSS-SP-97, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	2	8"X1/2"	300	ORFICE WN, CLASS 300, WNRF X NPT (F), ASME B16.36, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
7	12	7/8"X5/8"	300	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
8	2	8"	300	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 300, RF, ASME B 16.20
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
9	1	1/2"	HV-0131	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
10	1	1/2"	HV-0130	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
11	1	3/4"	RTD-0118	RESISTANCE TEMPERATURE DETECTOR, NPT (M) (SUPPLIED BY BGE)



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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
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

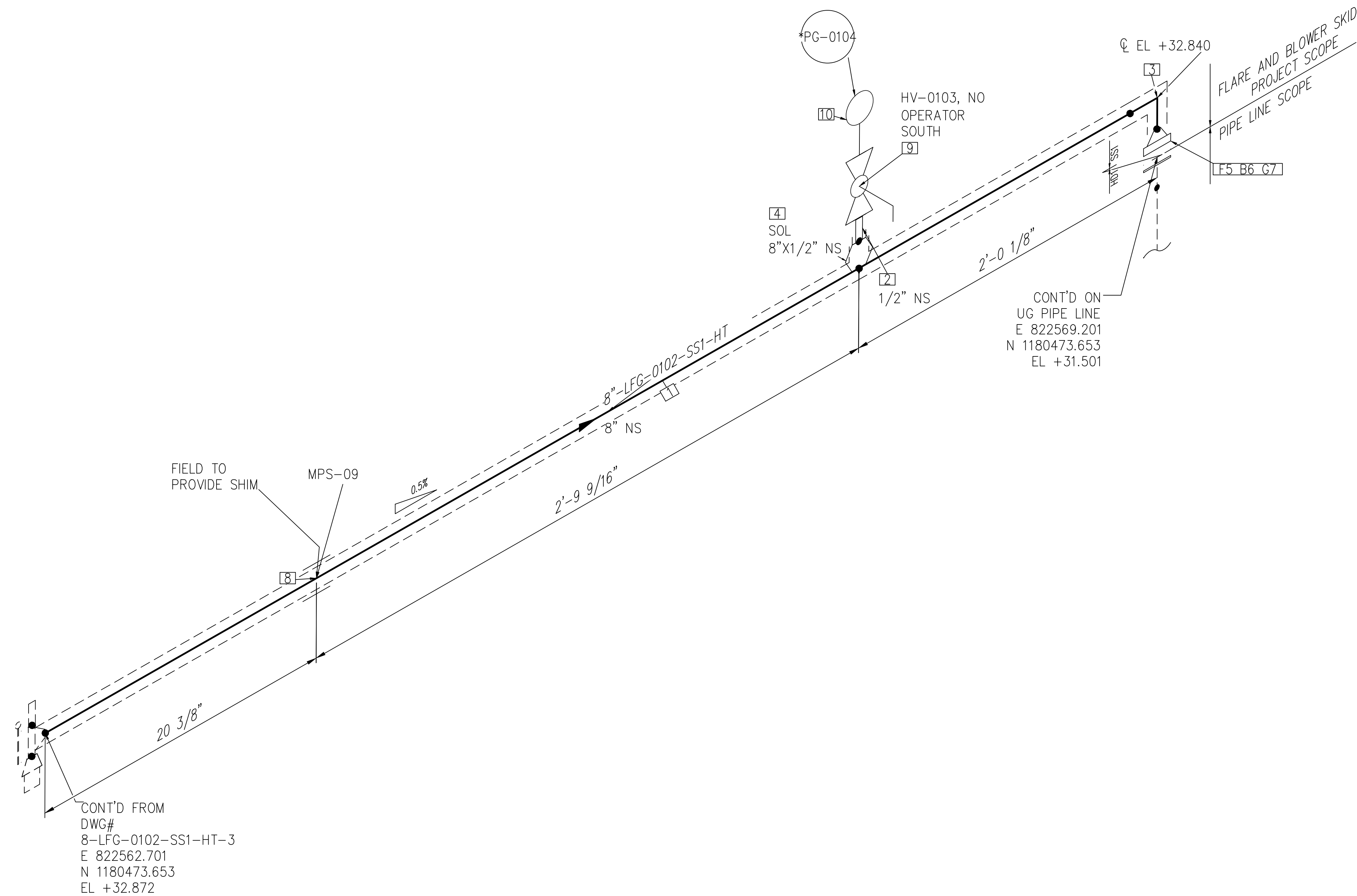
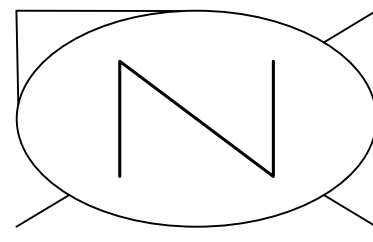
SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.01A
INSULATION SPEC	HT
INSULATION THK	1"

OWNER: 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) 726-3565
EMAIL: INFO@BIOGASENG.COM

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

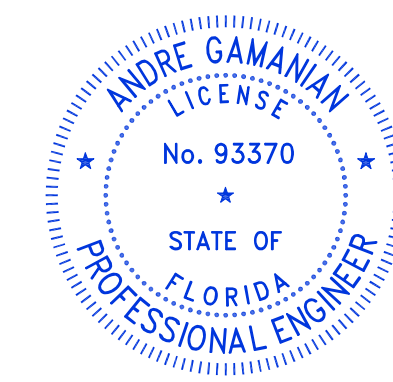
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CONT'D FROM
DWG#
8-LFG-0102-SS1-HT-3
E 822562.701
N 1180473.653
EL +32.872

CONT'D ON
UG PIPE LINE
E 822569.201
N 1180473.653
EL +31.501

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



This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.
Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-0700


ISSUED FOR CONSTRUCTION

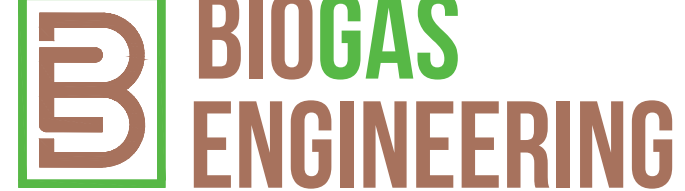
BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	5'-7"	8"	40S	PIPE, SMLS, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304
3	1	8"	40S	ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	1	8"x1/2"	3000	SOCKOLET, CLASS 3000, BW X SW, MSS-SP-97, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	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
7	1	8"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
8	1	8"	SS2-4"-1-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
9	1	1/2"	HV-0103	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
10	1	1/2"	*PG-0104	PRESSURE GAUGE, NPT (M)

C:\Users\MukeshThakur\Documents\Engineering\Biosgaseng - Documents\Engineering\Projects\ISH2126:100 - Indian River County LFV-Design\M-Mechanical\04# isometric\FC-Stick-Built isometric\p2.01\8-LFG-0102-SS1-HT-4.dwg 03-02-2023 MukeshThakur

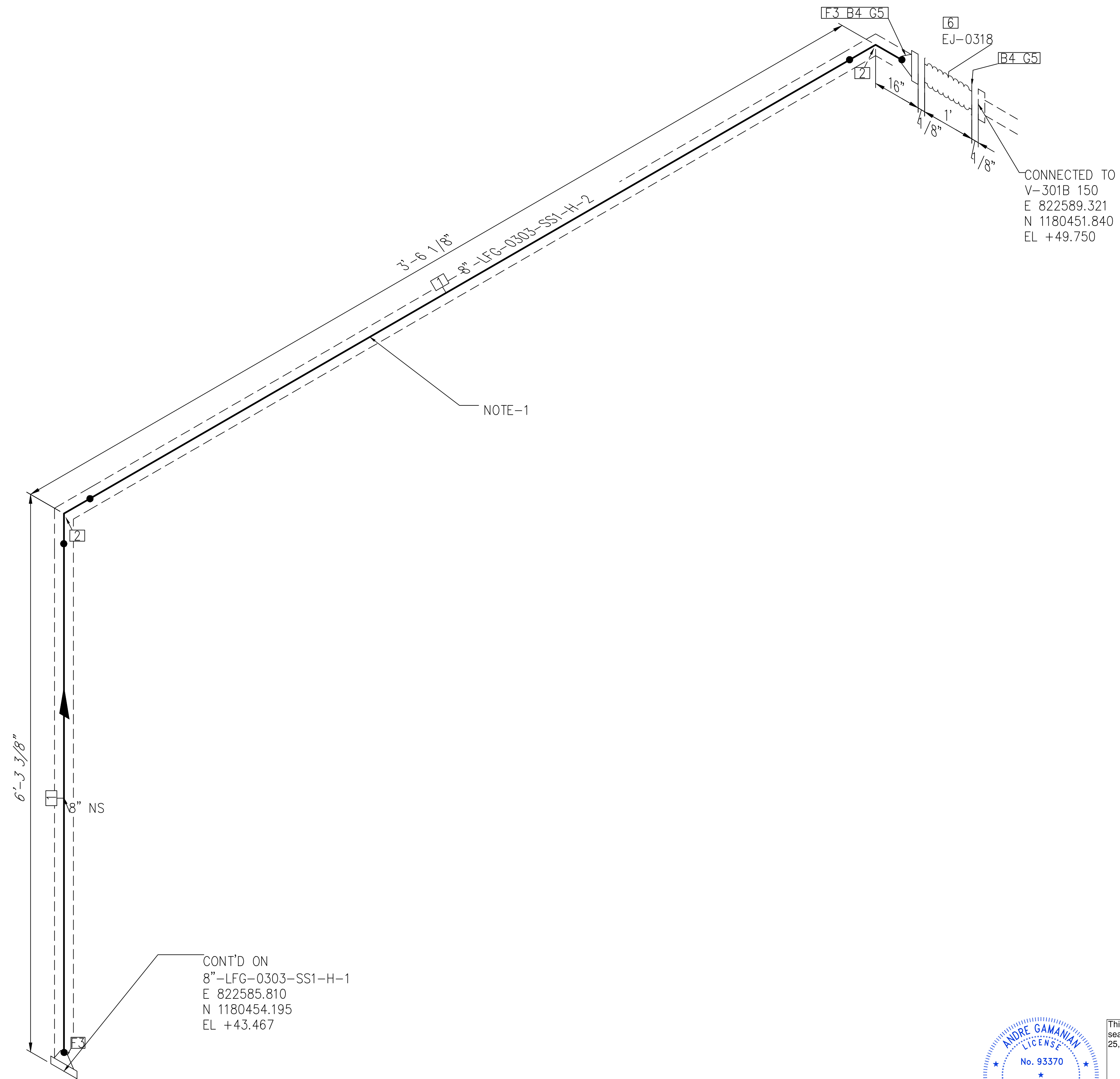
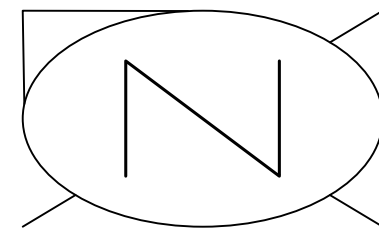
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

OWNER:
 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) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC
 8"-LFG-0102-SS1-HT
 LANDFILL GAS BLOWER SKID
 & FLARE REPLACEMENT
 SHEET
 4
 SCALE
 N.T.S

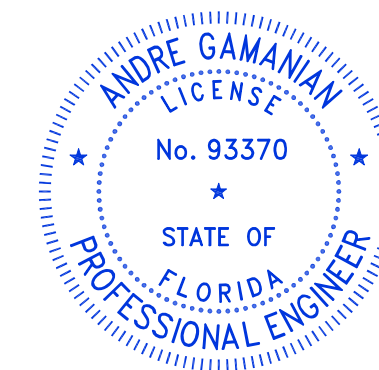


NOTE:

1. PIPE SPOOL TO BE FABRICATE IN CURRENT SCOPE, AND INSTALL ALONG WITH H2S REMOVAL BED VESSEL.
2. FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)

CONT'D ON
 8"-LFG-0303-SS1-H-1
 E 822585.810
 N 1180454.195
 EL +43.467

CONNECTED TO
 V-301B 150
 E 822589.321
 N 1180451.840
 EL +49.750



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

Digitally signed by Andre Gamanian
 Date: 2023.09.25 17:53:16-0700'

ISSUED FOR CONSTRUCTION

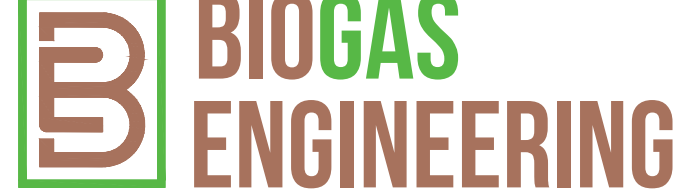
BILL OF MATERIALS

PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	6'-6"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
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
FASTENERS				
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
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
6	1	8"	EJ-0318	STAINLESS STEEL, 12" LG BELLOW WITH TIE RODS, CLASS 150, RF, ASME B16.5

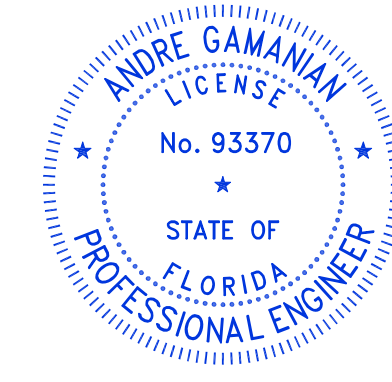
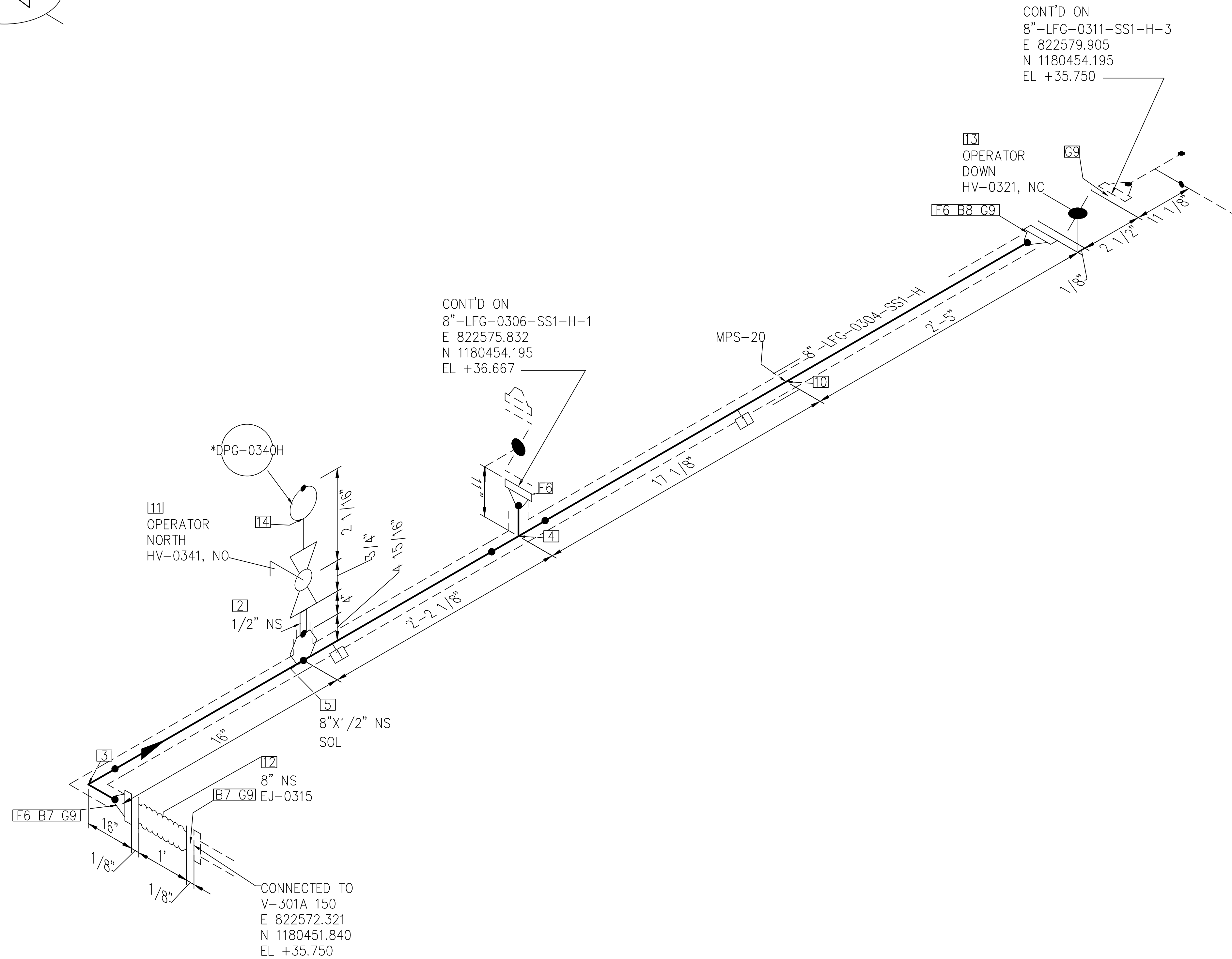
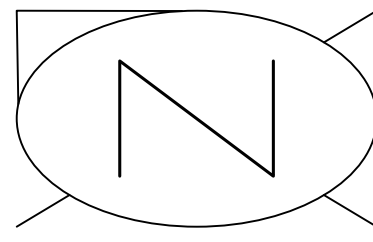
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

OWNER:  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) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC 8"-LFG-0303-SS1-H	SHEET 2
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 17:53:16-0700

BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	4'-11"	8"	40S	PIPE, ERW, SCH 40S, BE, 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, 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
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	8"x1/2"	3000	SOCKET, CLASS 3000, BW X SW, MSS-SP-97, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	3	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
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, ASME B 16.20
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
10	1	8"	SS2-4"-2-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
VALVES				
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
13	1	8"	HV-0321	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
14	1	1/2"	DPG-0340H	DIFFERENTIAL PRESSURE GAUGE, NPT (M)

ISSUED FOR CONSTRUCTION

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

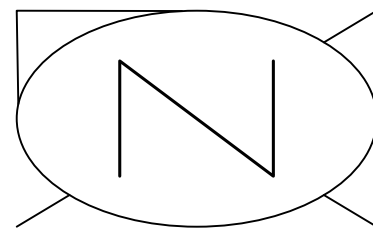
SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.03
INSULATION SPEC	H
INSULATION THK	1"

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

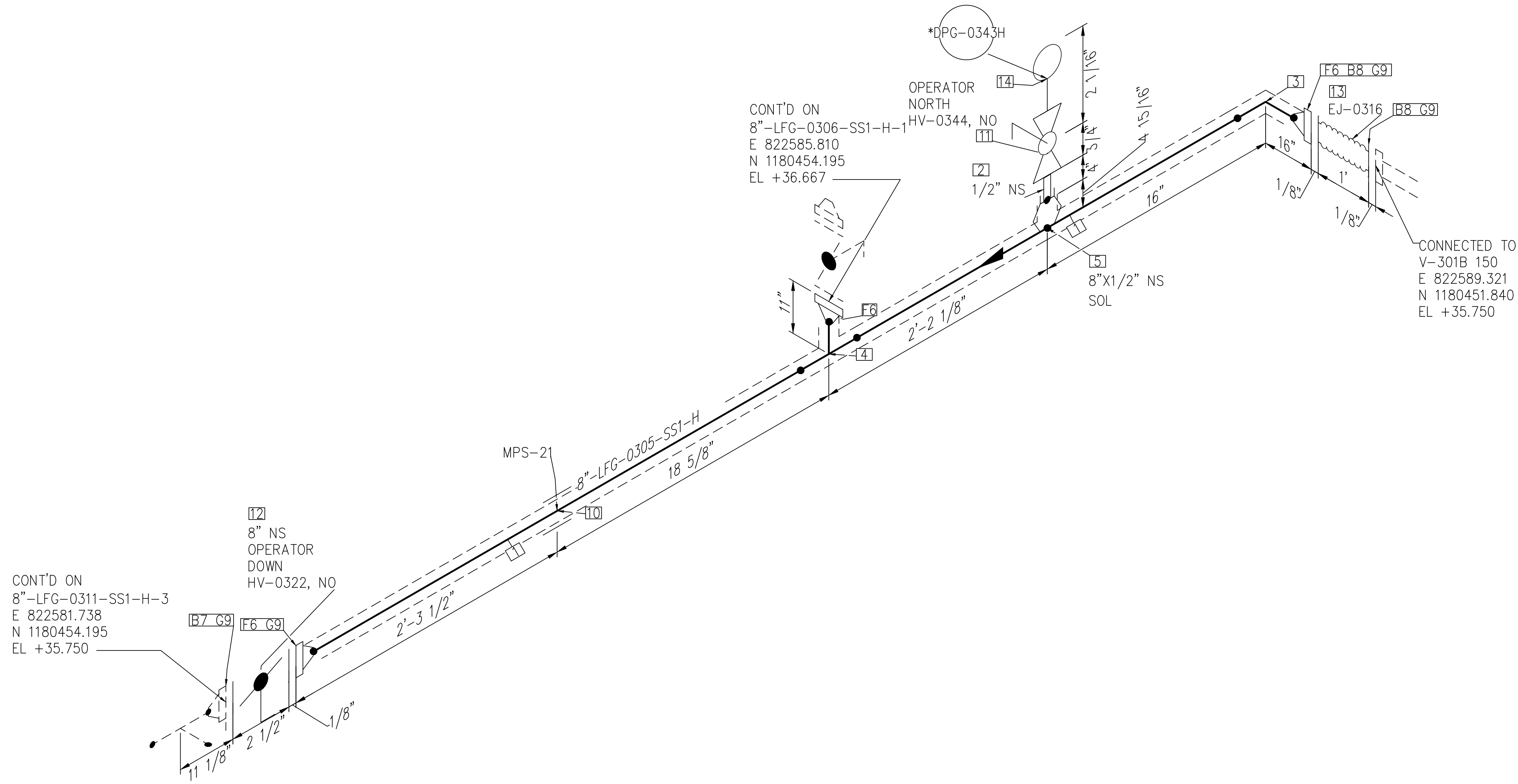
ENGINEER: **BIOGAS ENGINEERING**
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC
8"-LFG-0304-SS1-H
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
SHEET 1
SCALE N.T.S.

C:\Users\MukeshTrakur\Documents\Engineering\Biosaseng - Documents\Engineering\Projects\ISH2126:100 - Indian River County LF H-Design\M-Mechanical\04# Isometric\FC-Stick Built Isometric\22.03\8-LFG-0304-SS1-H-1.dwg 06-02-2023 MukeshTrakur



C:\Users\MukeshThakur\Documents\Engineering\Biosgaseng - Indian River County\LF-H-Design\M-Mechanical\04# Isometric\FC-Stick Built Isometric\02.03\8-LFG-0305-SS1-H-1.dwg 06-02-2023 MukeshThakur

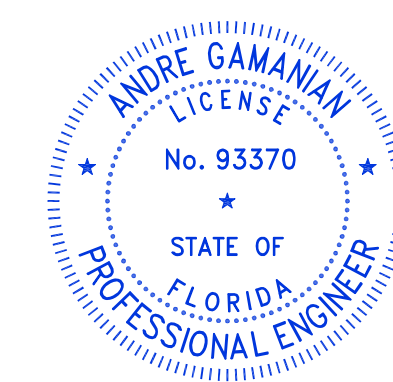


CONT'D ON
8"-LFG-0311-SS1-H-3
E 822581.738
N 1180454.195
EL +35.750

CONT'D ON
8"-LFG-0306-SS1-H-1
E 822585.810
N 1180454.195
EL +36.667

CONNECTED TO
V-301B 150
E 822589.321
N 1180451.840
EL +35.750

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



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				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	4'-11"	8"	40S	PIPE, ERW, SCH 40S, BE, 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, 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
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	8"x1/2"	3000	SOCKET, CLASS 3000, BW X SW, MSS-SP-97, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	3	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
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, ASME B 16.20
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
10	1	8"	SS2-4"-2-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
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
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
14	1	1/2"	DPG-0343H	DIFFERENTIAL PRESSURE GAUGE, NPT (M)

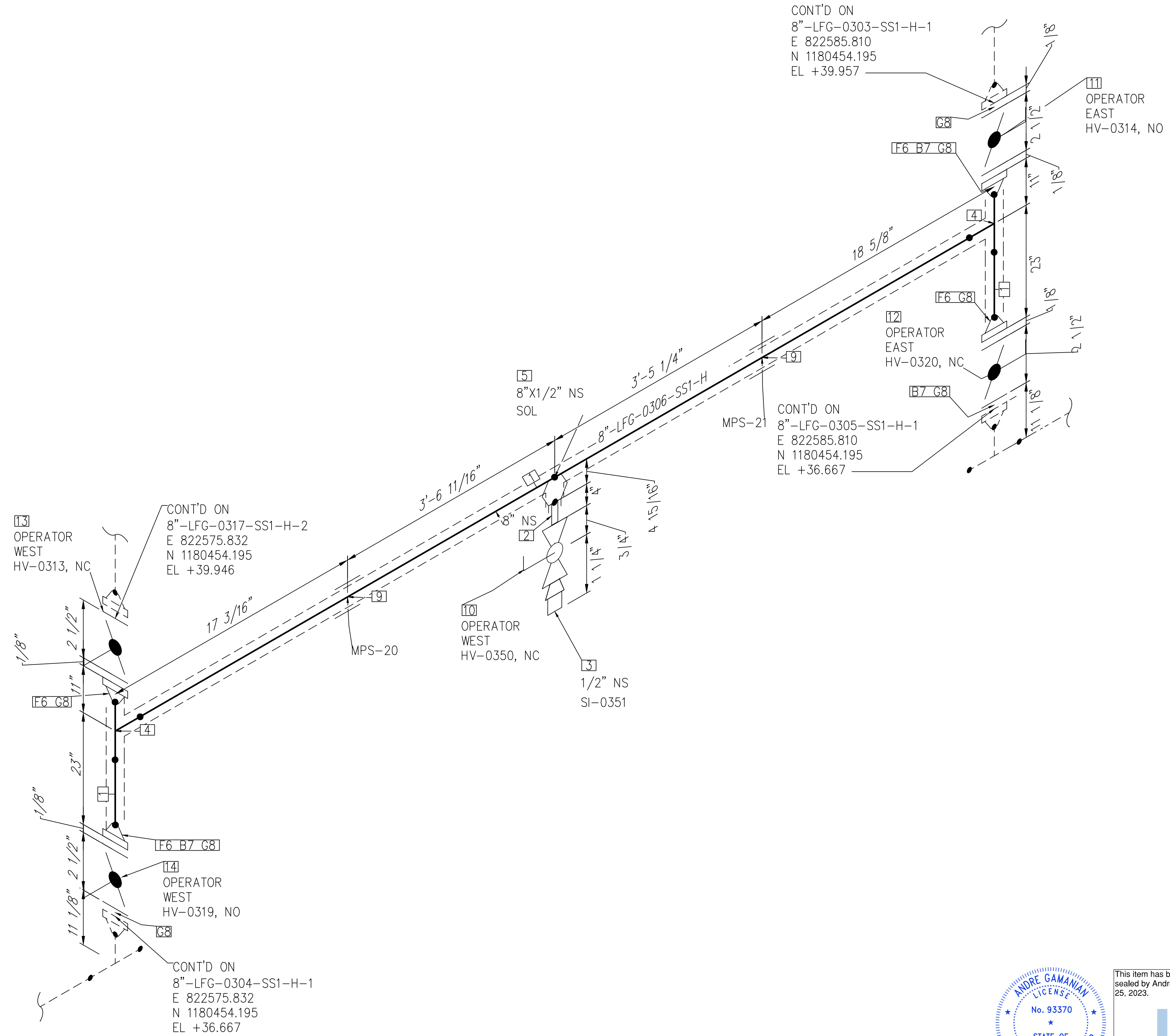
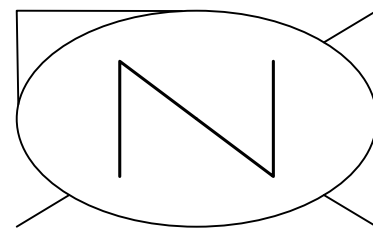
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

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

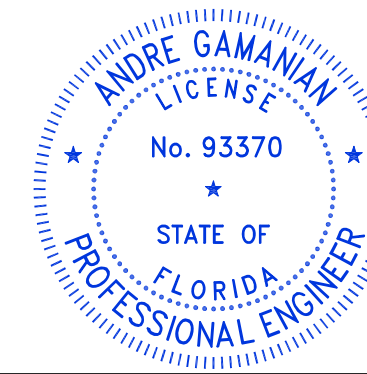
ENGINEER: **BIOGAS ENGINEERING**
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

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



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	10'-10"	8"	40S	PIPE, ERW, SCH 40S, BE, 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, 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
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	8"X1/2"	3000	SOCKET, CLASS 3000, BW X SW, MSS-SP-97, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	4	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
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 SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
9	2	8"	SS2-4"-1-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
VALVES				
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



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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
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

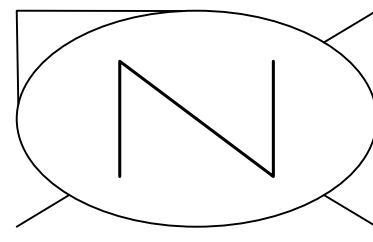
OWNER: INDIAN RIVER COUNTY FLORIDA
1325 74th AVE SW, VERO BEACH, FLORIDA 32968

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

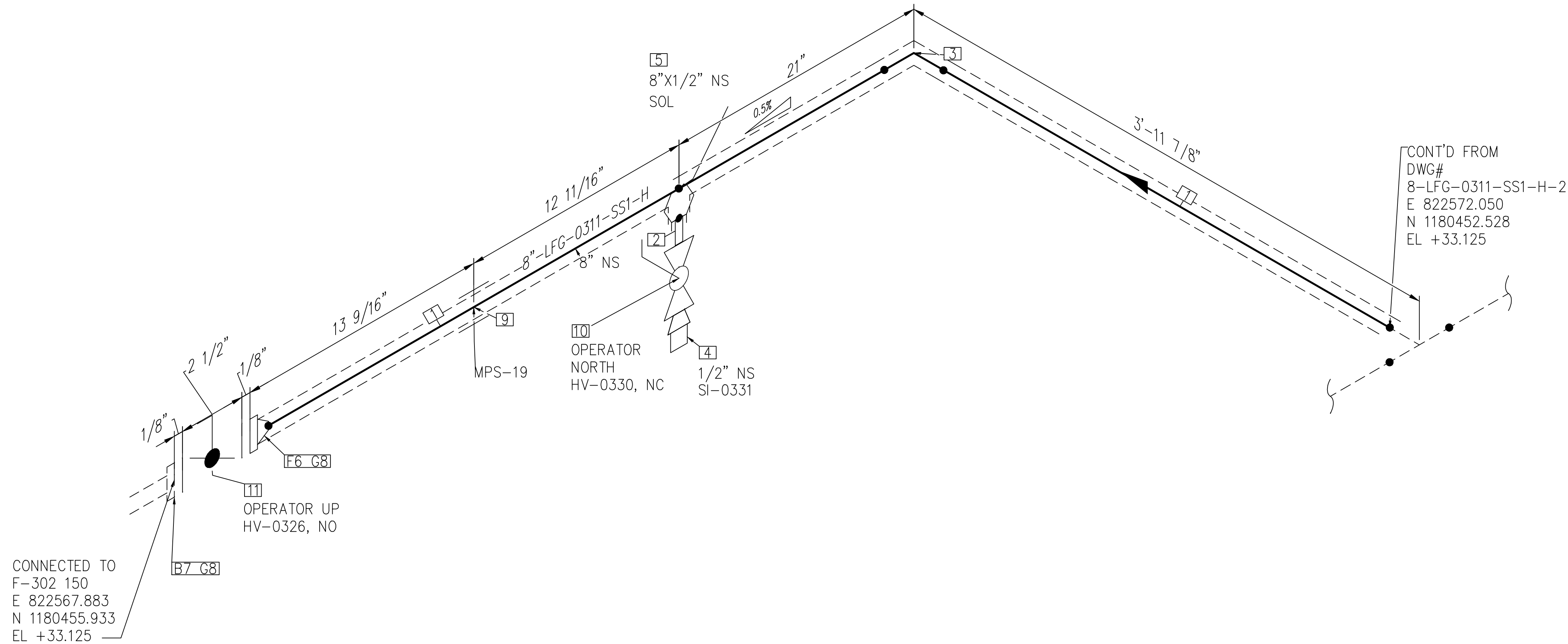
PIPING ISOMETRIC
8"-LFG-0306-SS1-H

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

SHEET 1
SCALE N.T.S



C:\Users\MukeshTrakur\Documents\Engineering\Blogsaseng - Documents\Engineering\Projects\UHS2126:100 - Indian River County LF V-H-Design\M-Mechanical\04# Isometric\FC-Stick-Built Isometric\02.03\8-LFG-0311-SS1-H-1.dwg 06-02-2023 MukeshTrakur

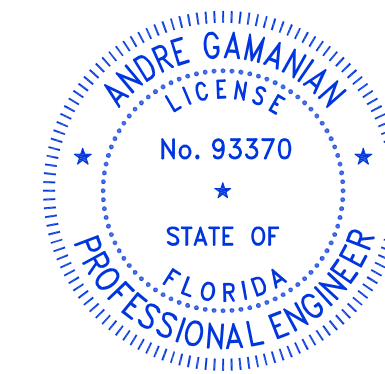


CONNECTED TO
F-302 150
E 822567.883
N 1180455.933
EL +33.125

CONT'D FROM
DWG#
8-LFG-0311-SS1-H-2
E 822572.050
N 1180452.528
EL +33.125

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	5'-1"	8"	40S	PIPE, ERW, SCH 40S, BE, 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, 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	1/2"	3000	PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A182 GR F304
OLETS				
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
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	1	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
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	2	8"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
9	1	8"	SS2-4"-1-1	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
10	1	1/2"	HV-0330	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
11	1	8"	HV-0326	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF



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Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-0700

ISSUED FOR CONSTRUCTION

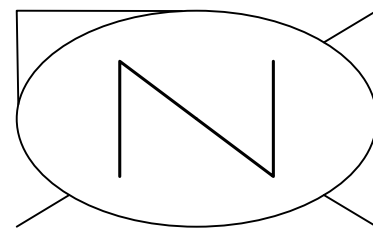
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

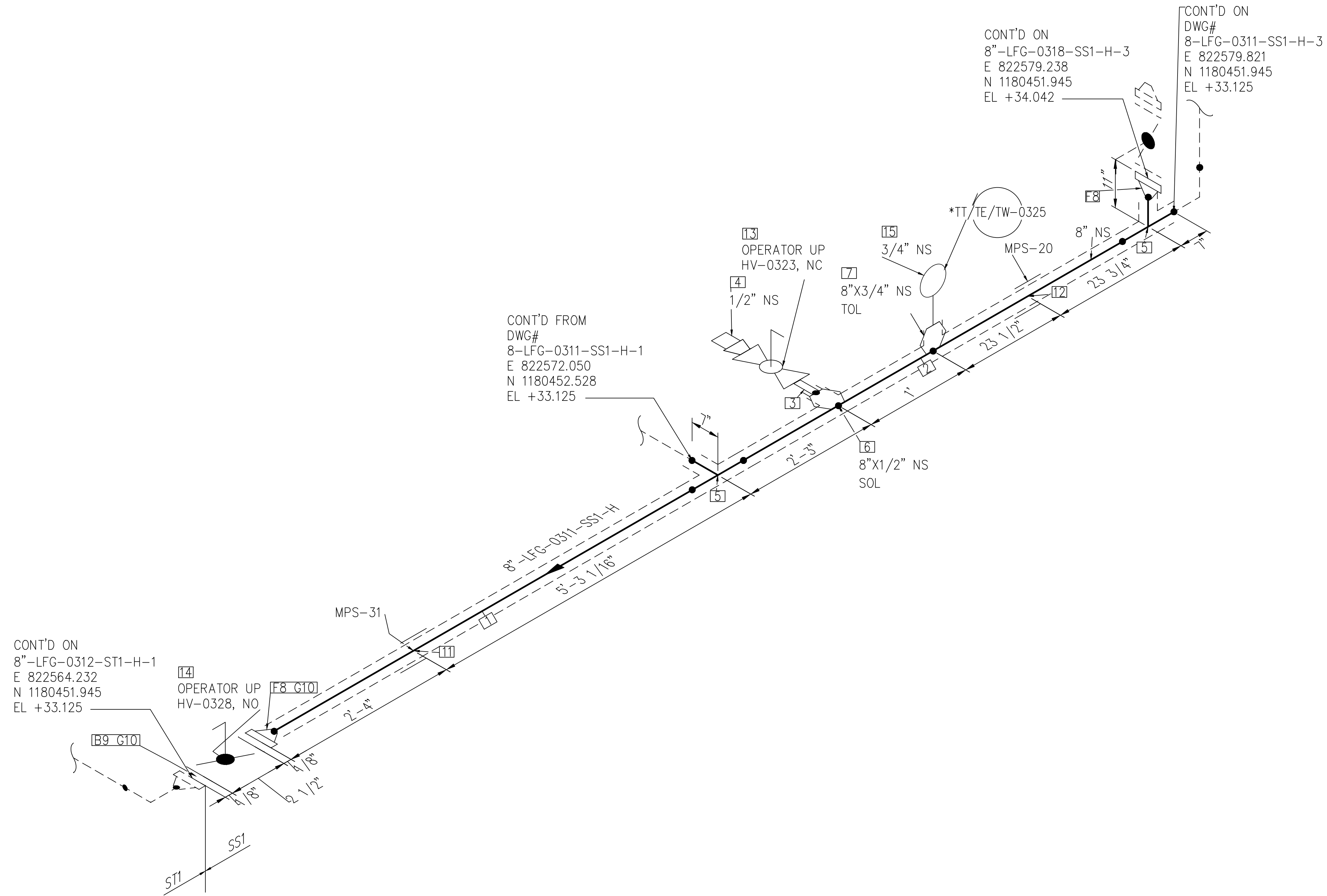
OWNER:  INDIAN RIVER COUNTY
FLORIDA
1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

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

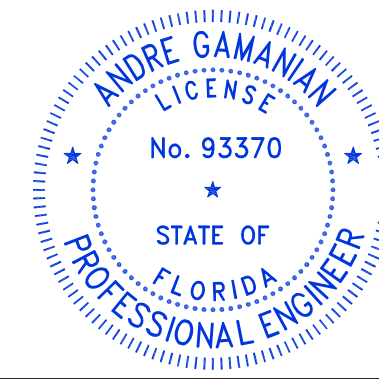
PIPING ISOMETRIC	SHEET
8"-LFG-0311-SS1-H	1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



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

ISSUED FOR CONSTRUCTION

BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	6'-9"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304
2	6'-1"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	1	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304
4	1	1/2"	3000	PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A182 GR F304
5	2	8"	40S	EQUAL TEE, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	1	8"x1/2"	3000	SOCKOLET, CLASS 3000, BW X SW, MSS-SP-97, ASTM A182 GR F304
7	1	8"x3/4"	3000	THREDOLET, CLASS 3000, BW X NPT (F), MSS-SP-97, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
8	2	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
9	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
10	2	8"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
11	1	8"	SS2-4"-2-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
12	1	8"	SS2-4"-1-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
13	1	1/2"	HV-0323	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
14	1	8"	HV-0328	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
15	1	3/4"	TT/TE/TW-0 325	TEMPERATURE TRANSMITTER & TEMPERATURE ELEMENT WITH THERMOWELL, NPT (M)

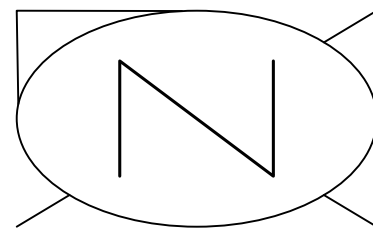
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

OWNER: 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) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC
 8"-LFG-0311-SS1-H
 LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
 SHEET 2
 SCALE N.T.S



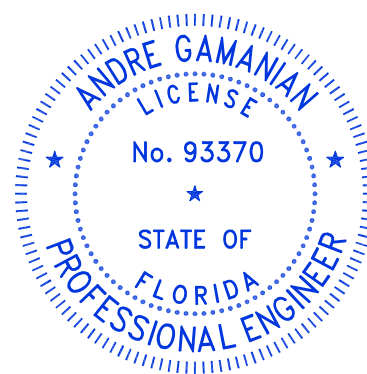
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 8"-LFG-0304-SS1-H-1
 E 822579.905
 N 1180454.195
 EL +35.750

CONT'D ON
 8"-LFG-0305-SS1-H-1
 E 822581.738
 N 1180454.195
 EL +35.750

8"-LFG-0311-SS1-H
 2'-3"

CONT'D FROM
 DWG#
 8-LFG-0311-SS1-H-2
 E 822579.821
 N 1180451.945
 EL +33.125

8" NS



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 Digitally signed by 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)

BILL OF MATERIALS

PIPE

ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	1'-4"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304

FITTINGS

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
3	1	8"	40S	EQUAL TEE, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304

FLANGES


ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	2	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304

ISSUED FOR CONSTRUCTION

c:\Users\MukeshThakur\Biosgas Engineering\Biosgaseng - Documents\Engineering\Projects\U\SH2126:100 - Indian River County LF V-H-Design\M-Mechanical\04# isometric\FC-Stick Built isometric\22.03\8-LFG-0311-SS1-H-3.dwg 06-02-2023 MukeshThakur

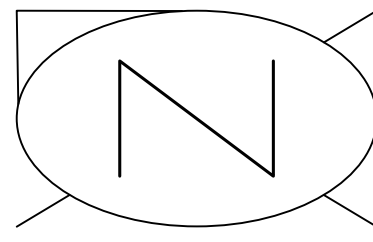
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

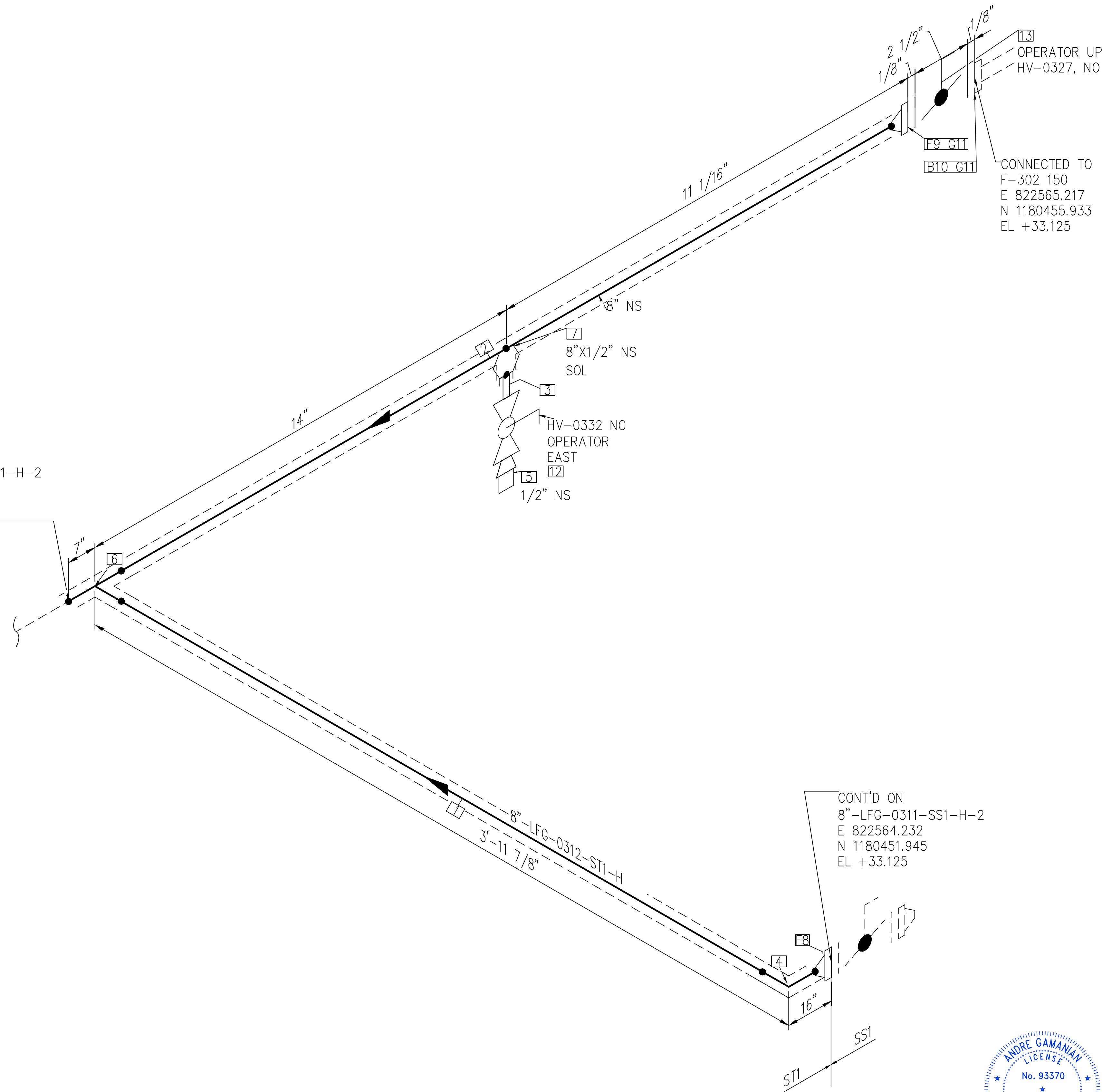
OWNER:
 INDIAN RIVER COUNTY
 FLORIDA
 1325 74th AVE SW,
 VERO BEACH, FLORIDA 32968

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

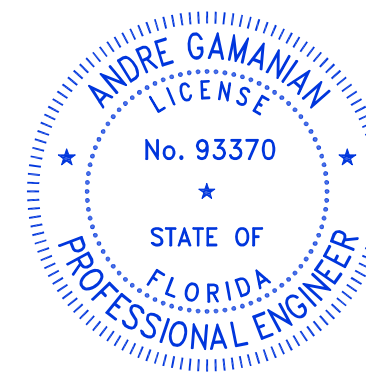
PIPING ISOMETRIC	SHEET
8"-LFG-0311-SS1-H	3
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



CONT'D FROM
DWG#
8-LFG-0312-ST1-H-2
E 822562.315
N 1180455.933
EL +33.125



CONT'D ON
8"-LFG-0311-SS1-H-2
E 822564.232
N 1180451.945
EL +33.125



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

ISSUED FOR CONSTRUCTION

BILL OF MATERIALS

PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	2'-5"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 316
2	1'-3"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 316
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	1	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, PE, ASME A733, ASTM A312 GR TP 304
4	1	8"	40S	ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 316
5	1	1/2"	3000	PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A182 GR F304
6	1	8"	40S	EQUAL TEE, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 316
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
7	1	8"x1/2"	3000	SOCKOLET, CLASS 3000, FW X SW, MSS-SP-97, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
8	1	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F316
9	1	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F316
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
10	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
11	2	8"	150	SPIRAL WOUND GASKET, 1/8" THK, SS316 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
12	1	1/2"	HV-0332	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
13	1	8"	HV-0327	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF


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
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

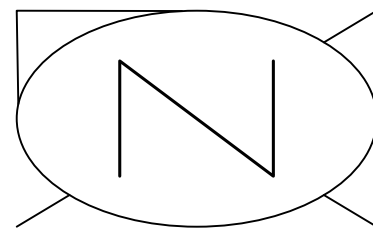
SERVICE	LFG
PIPE SPEC	ST1
P&ID DWG	P2.03
INSULATION SPEC	H
INSULATION THK	1"

OWNER:

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

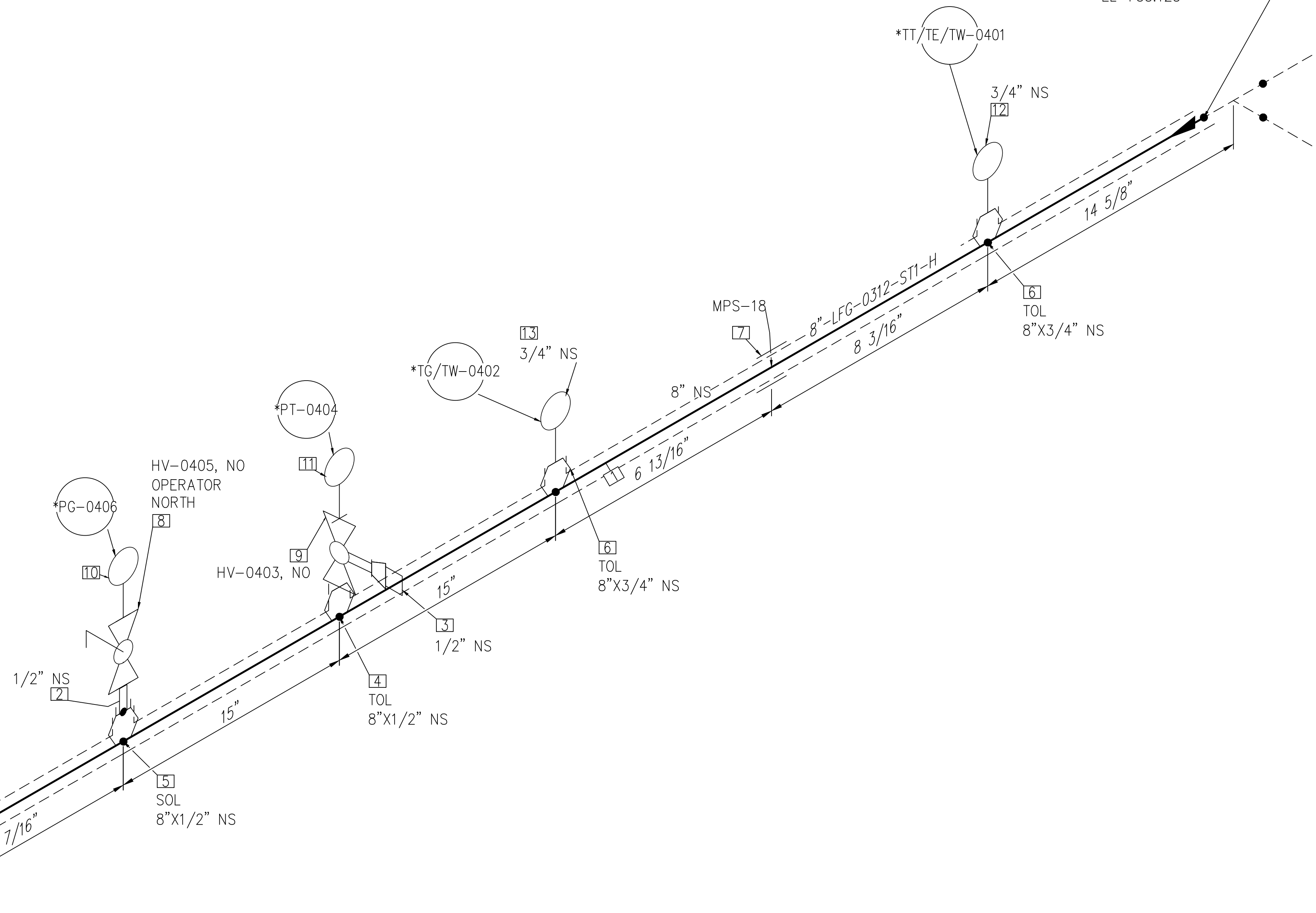
ENGINEER:

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

PIPING ISOMETRIC	SHEET
8"-LFG-0312-ST1-H	1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

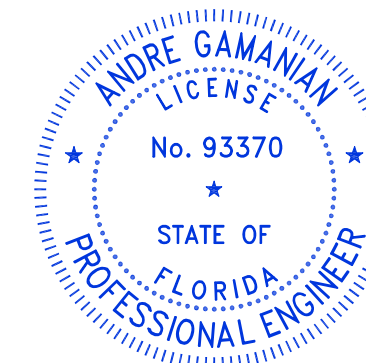


CONT'D ON
 DWG#
 8-LFG-0312-ST1-H-1
 E 822562.315
 N 1180455.933
 EL +33.125

CONT'D FROM
 DWG#
 8-LFG-0312-ST1-H-3
 E 822557.473
 N 1180455.933
 EL +33.125



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



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				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	4'-11"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 316
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, PE X NPT (M), ASME A733, ASTM A312 GR TP 316
3	1	1/2"	3000	PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A182 GR F304
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	1	8"X1/2"	3000	THREDOLET, CLASS 3000, FW X NPT (F), MSS-SP-97, ASTM A182 GR F316
5	1	8"X1/2"	3000	SOCKOLET, CLASS 3000, FW X SW, MSS-SP-97, ASTM A182 GR F316
6	2	8"X3/4"	3000	THREDOLET, CLASS 3000, FW X NPT (F), MSS-SP-97, ASTM A182 GR F316
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
7	1	8"	SS2-4"-1-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
8	1	1/2"	HV-0405	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
9	1	1/2"	HV-0403	MULTI-PORT BLOCK & BLEED VALVE, SOFT SEAT, PTFE PACKING, BLEED PORT
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
10	1	1/2"	PG-0406	PRESSURE GAUGE, NPT (M)
11	1	1/2"	PT-0404	PRESSURE TRANSMITTER NPT(M)
12	1	3/4"	TT/TE/TW-0401	TEMPERATURE TRANSMITTER AND TEMPERATURE ELEMENT WITH THERMOWELL, NPT(M)
13	1	3/4"	TG/TW-0402	TEMPERATURE GAUGE WITH THERMOWELL, NPT(M)

C:\Users\MukeshThakur\Documents\Engineering\Projects\UHS2126:100 - Indian River County LF H-Design\M-Mechanical\04# Isometric\FC-Stick Built Isometric\22.03\8-LFG-0312-ST1-H-2.dwg 06-02-2023 MukeshThakur

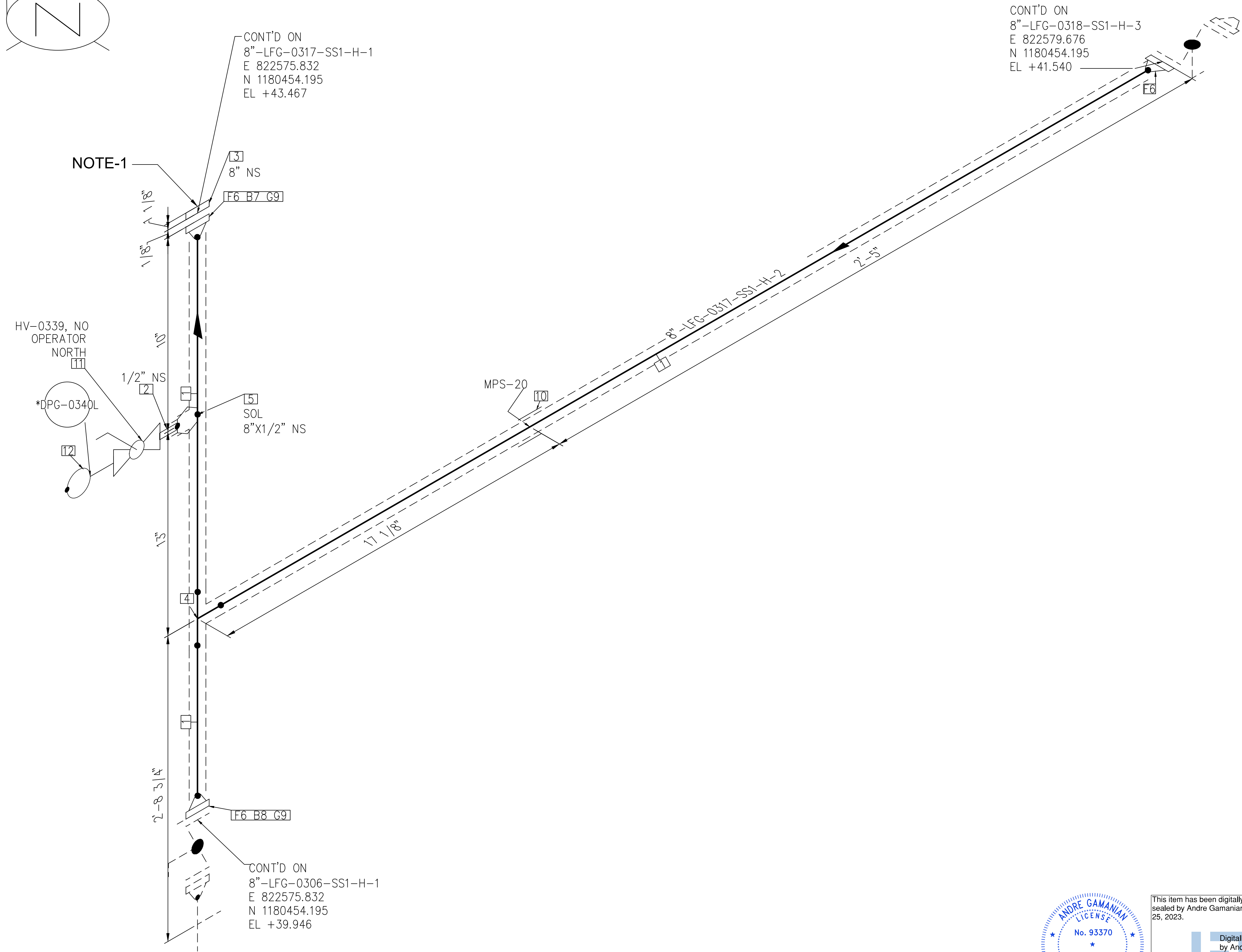
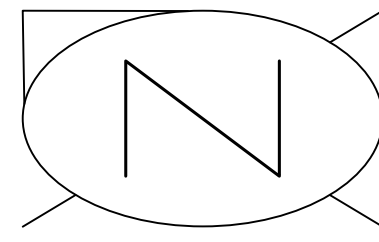
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

SERVICE	LFG
PIPE SPEC	ST1
P&ID DWG	P2.03
INSULATION SPEC	H
INSULATION THK	1"

OWNER:  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) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
8"-LFG-0312-ST1-H	2
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S



NOTE-1

CONT'D ON
8"-LFG-0317-SS1-H-1
E 822575.832
N 1180454.195
EL +43.467

CONT'D ON
8"-LFG-0318-SS1-H-3
E 822579.676
N 1180454.195
EL +41.540

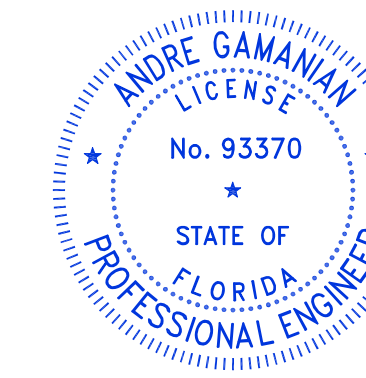
[5]
SOL
8"x1/2" NS

[F6 B8 G9]

CONT'D ON
8"-LFG-0306-SS1-H-1
E 822575.832
N 1180454.195
EL +39.946

NOTE:

1. BLIND FLANGE TO BE REMOVE AND INSTALL PIPE SPOOL (8"-LFG-0317-SS1-H-1) ALONG WITH H2S REMOVAL BED VESSEL.
2. FOR MECHANICAL ISOMETRIC GENERAL NOTES AND LEGENDS REFER DRAWING NUMBER M-445G (SHEET 3 OF 3)



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

Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-0700


ISSUED FOR CONSTRUCTION


BILL OF MATERIALS

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
FITTINGS				
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"	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
OLETS				
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
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	3	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
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	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	2	8"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
10	1	8"	SS2-4"-2-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
11	1	1/2"	HV-0339	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
12	1	1/2"	DPG-0340L	DIFFERENTIAL PRESSURE GAUGE, NPT (M)

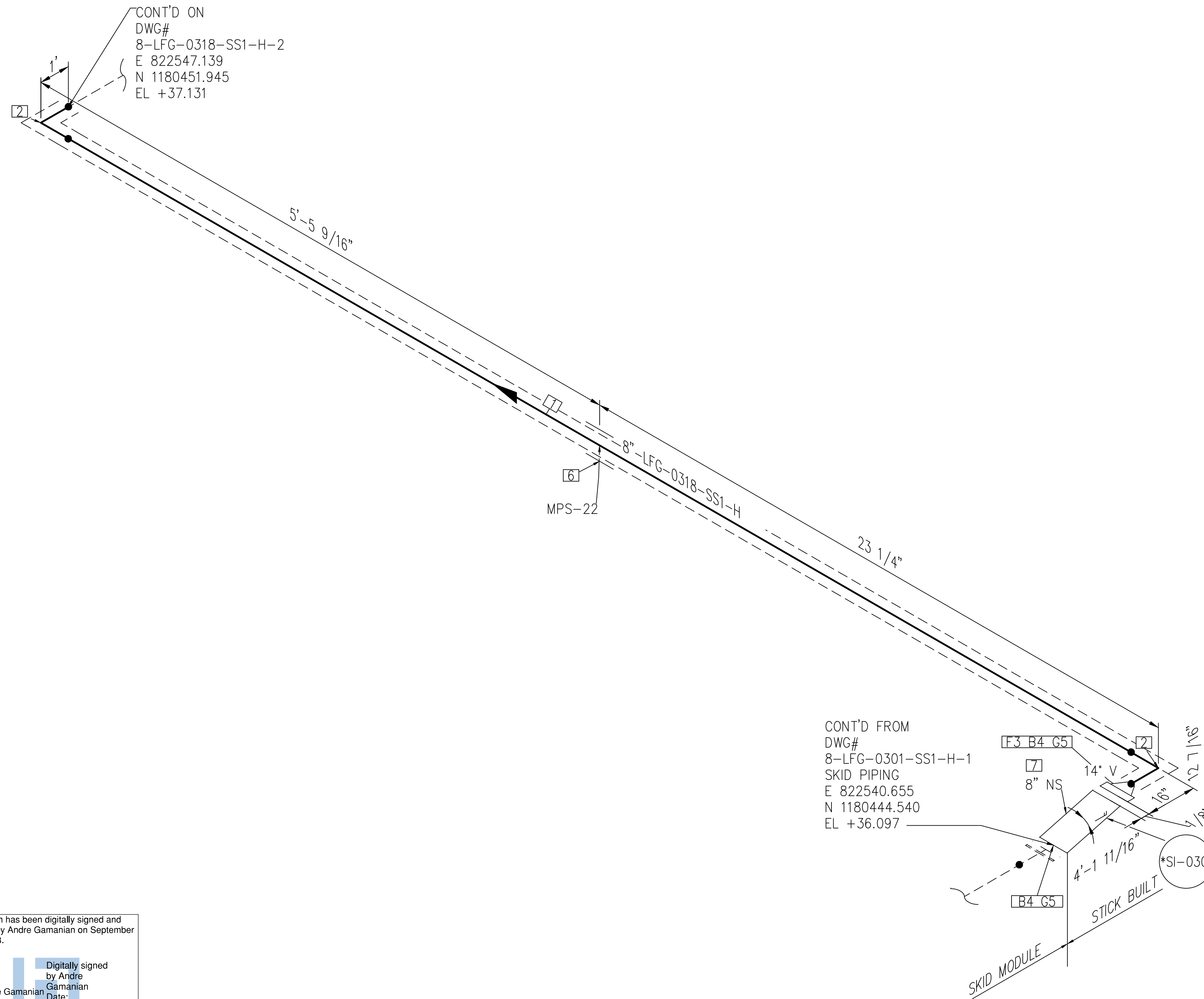
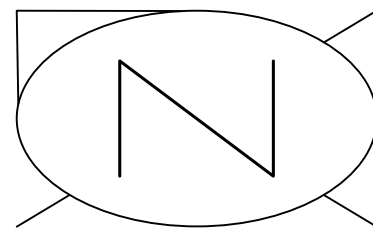
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

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

OWNER:  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) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
8"-LFG-0317-SS1-H	2
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE
	N.T.S



CONT'D ON
 DWG#
 8-LFG-0318-SS1-H-2
 E 822547.139
 N 1180451.945
 EL +37.131

CONT'D FROM
 DWG#
 8-LFG-0301-SS1-H-1
 SKID PIPING
 E 822540.655
 N 1180444.540
 EL +36.097

ANDRE GAMANIAN
 LICENSE
 No. 93370
 STATE OF
 FLORIDA
 PROFESSIONAL ENGINEER

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'


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

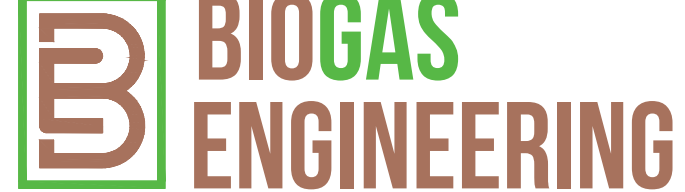
BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	5'-5"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	2	8"	40S	ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	1	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
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
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
6	1	8"	SS2-4"-4-1 6"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
7	1	8"	SI-0301	FLEXIBLE HOSE, RF, CLASS 150

ISSUED FOR CONSTRUCTION

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

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

OWNER:

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

ENGINEER:

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

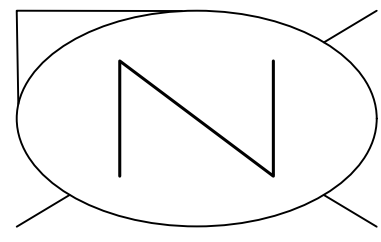
PIPING ISOMETRIC
 8"-LFG-0318-SS1-H

LANDFILL GAS BLOWER SKID
 & FLARE REPLACEMENT

SHEET
 1

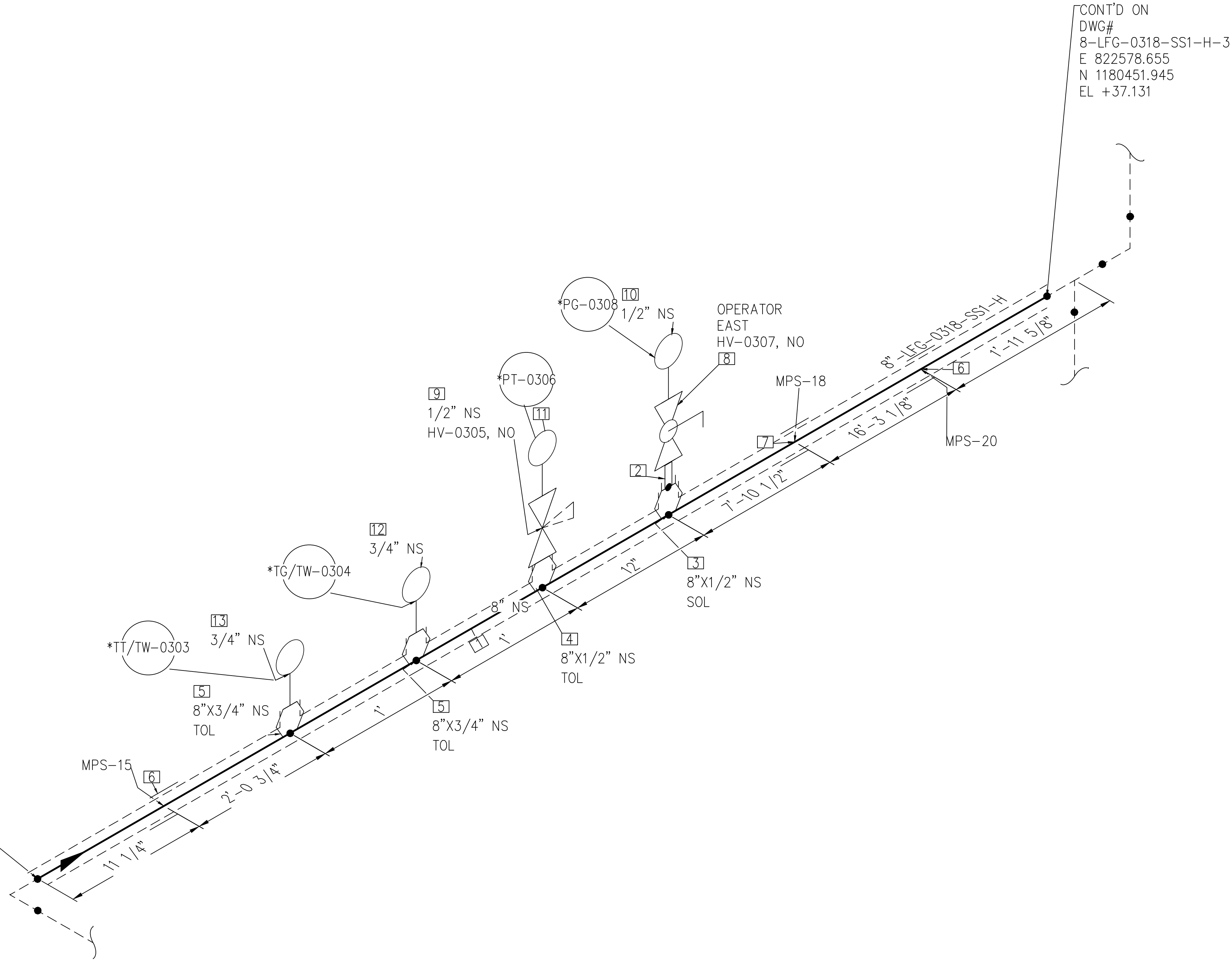
SCALE
 N.T.S

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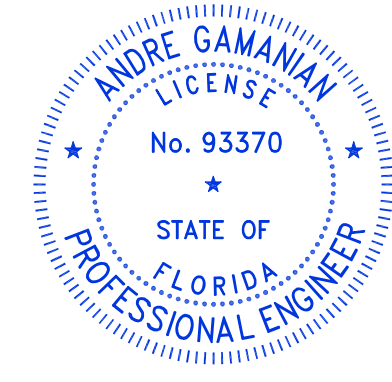
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CONT'D FROM
 DWG#
 8-LFG-0318-SS1-H-1
 E 822547.139
 N 1180451.945
 EL +37.131



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	31'-7"	8"	40S	PIPE, ERW, SCH 40S, BE, 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, BE X NPT (M), ASME A733, ASTM A312 GR TP 304
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	1	8"x1/2"	3000	SOCKOLET, CLASS 3000, BW X SW, MSS-SP-97, ASTM A182 GR F304
4	1	8"x1/2"	3000	THREDOLET, CLASS 3000, BW X NPT (F), MSS-SP-97, ASTM A182 GR F304
5	2	8"x3/4"	3000	THREDOLET, CLASS 3000, BW X NPT (F), MSS-SP-97, ASTM A182 GR F304
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
6	2	8"	SS2-4"-1-1-2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
7	1	8"	SS2-4"-2-1-2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
8	1	1/2"	HV-0307	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
9	1	1/2"	HV-0305	MULTIPOINT BLOCK & BLEED VALVE, SOFT SEAT, PTFE PACKING, BLEED PORT
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
10	1	1/2"	PG-0308	PRESSURE GAUGE, NPT (M)
11	1	1/2"	PT-0306	PRESSURE TRANSMITTER, NPT (M)
12	1	3/4"	TG/TW-0304	TEMPERATURE GAUGE WITH THERMOWELL, NPT (M)
13	1	3/4"	TT/TW-0303	TEMPERATURE TRANSMITTER WITH THERMOWELL, NPT (M)




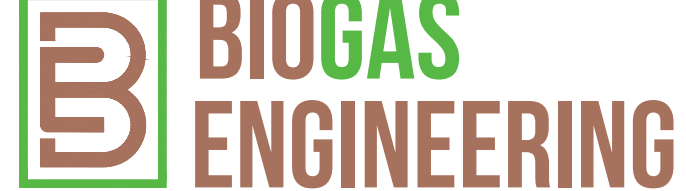
This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.
 Digitally signed by Andre Gamanian
 Date: 2023.09.25 17:53:16-07'00'

ISSUED FOR CONSTRUCTION

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

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

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

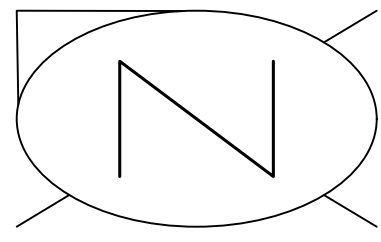
ENGINEER:
 **BIOGAS ENGINEERING**
 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC
 8"-LFG-0318-SS1-H

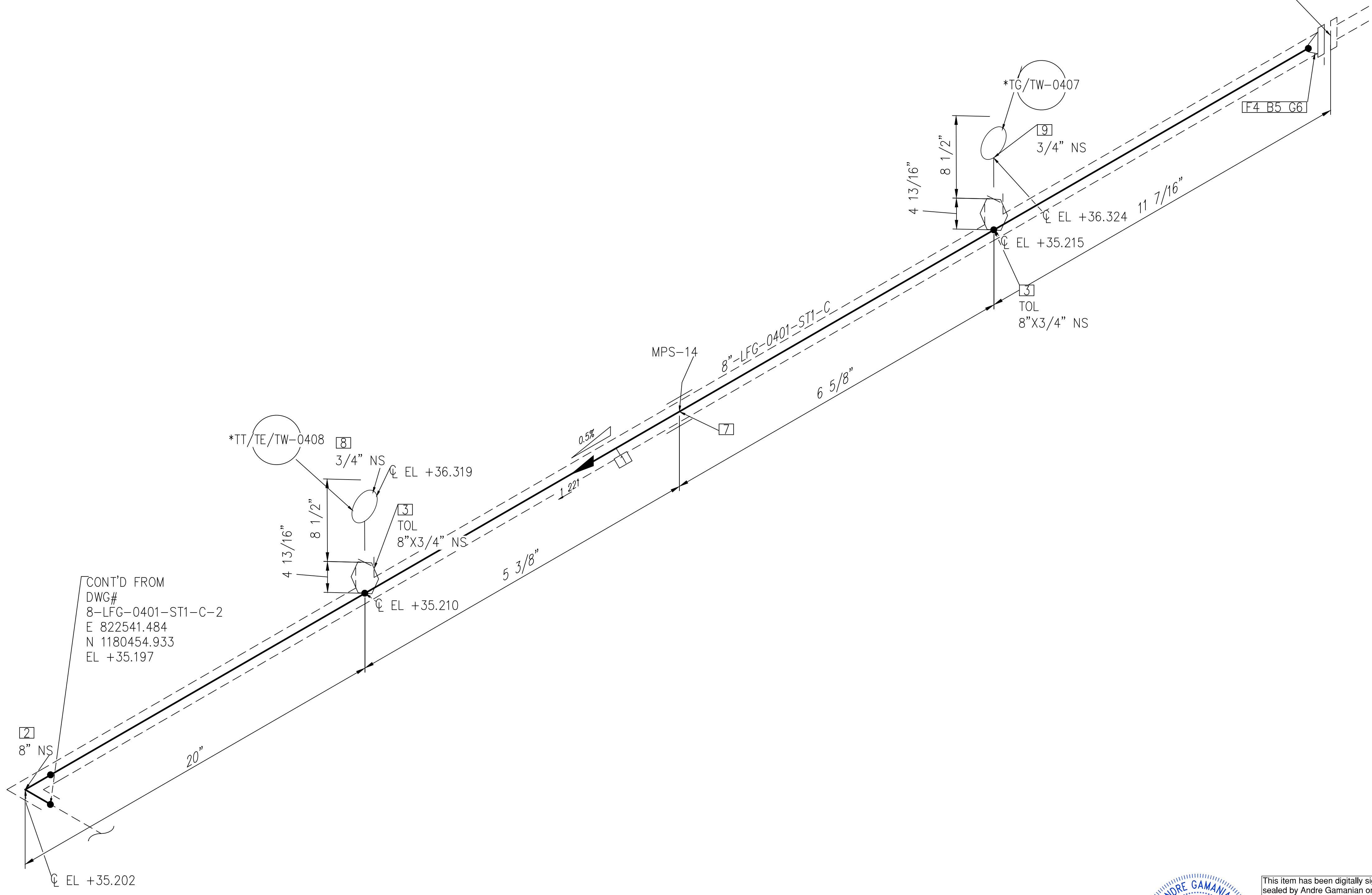
LANDFILL GAS BLOWER SKID
 & FLARE REPLACEMENT

SHEET
 2

SCALE
 N.T.S



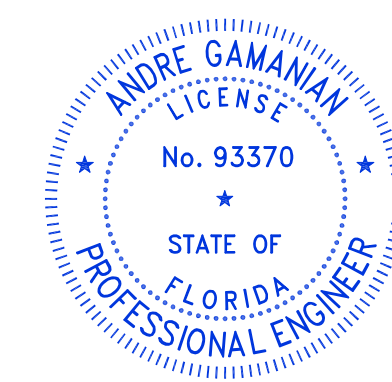
CONNECTED TO
E-400-N-1
150
E 822545.102
N 1180455.933
EL +35.218



CONT'D FROM
DWG#
8-LFG-0401-ST1-C-2
E 822541.484
N 1180454.933
EL +35.197

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	2'-4"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 316
FITTINGS				
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
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	2	8"X3/4"	3000	THREDOLET, CLASS 3000, FW X NPT (F), MSS-SP-97, ASTM A182 GR F316
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	1	8"	150	FLANGE WN, CLASS 150, FF, ASME B16.5, ASTM A182 GR F316
FASTENERS				
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
PIPE SUPPORTS				
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-0408	TEMPERATURE TRANSMITTER & TEMPERATURE ELEMENT WITH THERMOWELL, NPT (M)
9	1	3/4"	TG/TW-0407	TEMPERATURE GAUGE, NPT (M)



This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.
Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-0700

ISSUED FOR CONSTRUCTION

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

SERVICE	LFG
PIPE SPEC	ST1
P&ID DWG	P2.04
INSULATION SPEC	C
INSULATION THK	1"

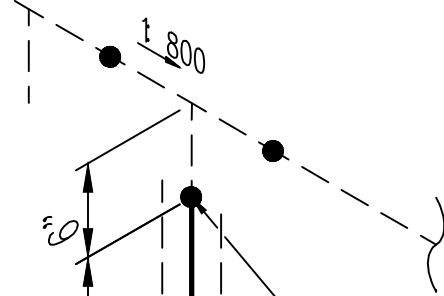
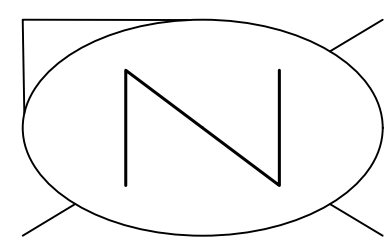
OWNER:
 INDIAN RIVER COUNTY
FLORIDA
1325 74th AVE SW,
VERO BEACH, FLORIDA 32968

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

PIPING ISOMETRIC	SHEET
8"-LFG-0401-ST1-C	1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

C:\Users\MukeshThakur\Documents\Engineering\Biosgaseng - Indian River County LF H-Design\M-Mechanical\04# Isometric\FC-Stick Built Isometric\02.04\8-LFG-0401-ST1-C-1.dwg 06-02-2023 MukeshThakur

C:\Users\MukeshThakur\Biosgas Engineering\Biosgaseng - Documents\Engineering\Projects\US2126:100 - Indian River County LFV-Design\M-Mechanical\04# isometric\04# isometric\FC-Stick-Built isometric\22.04\8-LFG-0402-SS1-HT-1.dwg 06-02-2023 MukeshThakur



CONT'D FROM
DWG#
8-LFG-0402-SS1-HT-2
E 822541.484
N 1180472.486
EL +37.820

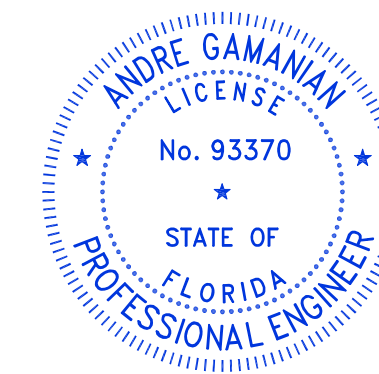
CONT'D ON
6"-LFG-0103-SS1-HT-1
E 822545.265
N 1180472.486
EL +32.789

5'-0 3/8"

3" NS-8"-LFG-0402-SS1-HT
3'-9 3/8"

F3 B4 G5

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



This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.
Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-0700'

ISSUED FOR CONSTRUCTION

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
FITTINGS				
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
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	1	3"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
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

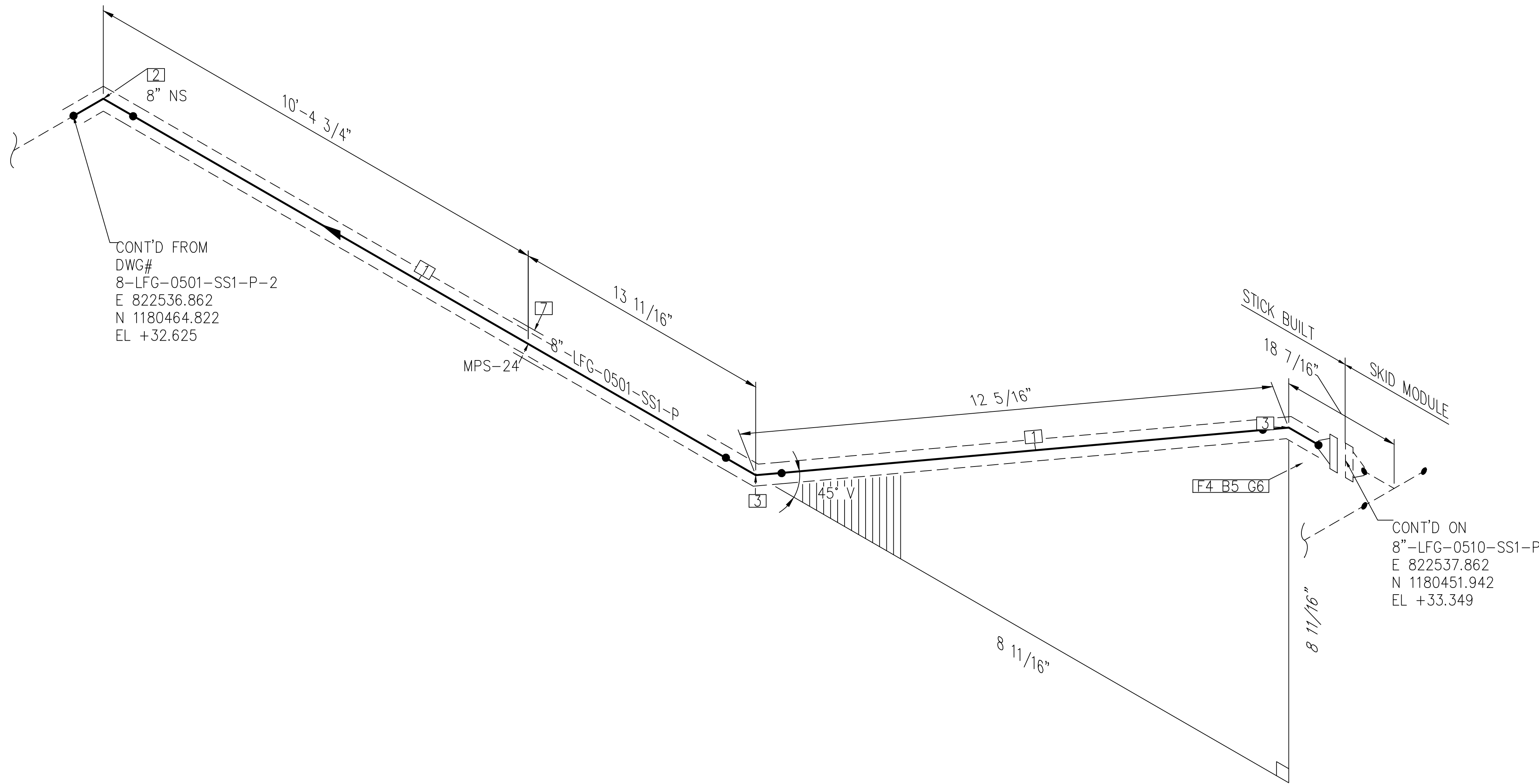
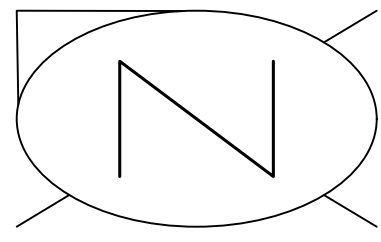
REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG

SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.04
INSULATION SPEC	HT
INSULATION THK	1"

OWNER:  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) 726-3565
EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
8"-LFG-0402-SS1-HT	1
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

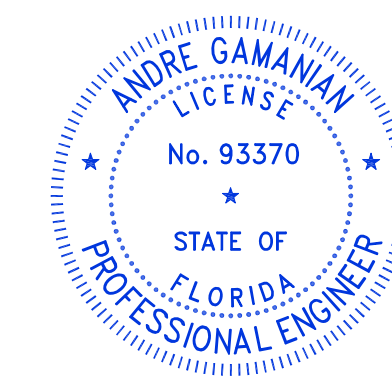


CONT'D FROM
DWG#
8-LFG-0501-SS1-P-2
E 822536.862
N 1180464.822
EL +32.625

CONT'D ON
8"-LFG-0510-SS1-P
E 822537.862
N 1180451.942
EL +33.349

BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	10'-9"	8"	40S	PIPE, ERW, SCH 40S, BE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	8"	40S	ELBOW 90 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304
3	2	8"	40S	ELBOW 45 LR, SMLS, SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	1	8"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
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, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
7	1	8"	SS2-4"-2-1 2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"

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

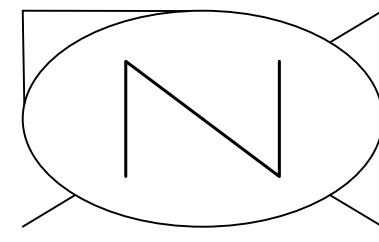


This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.
Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-07'00'

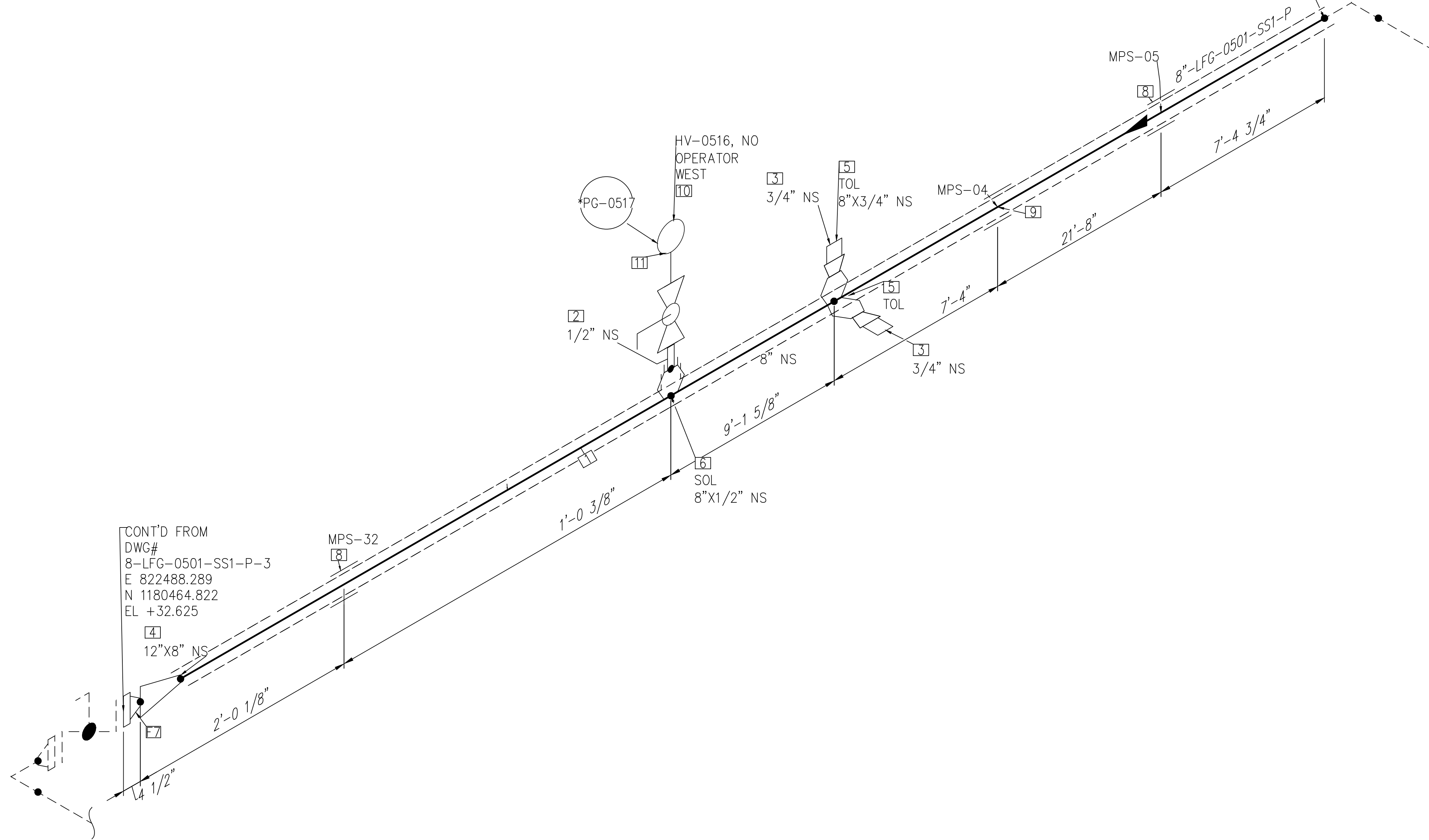
ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY	SERVICE	LFG	OWNER:	ENGINEER:	PIPING ISOMETRIC	SHEET
1	01/06/2023	ISSUED FOR CONSTRUCTION	MT	SS	AG	PIPE SPEC	SS1	 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	8"-LFG-0501-SS1-P	1
					P&ID DWG	P2.05	SCALE				
					INSULATION SPEC	P	N.T.S				
					INSULATION THK	1"					

C:\Users\MukeshTrakur\Biosgas Engineering\Biosgaseng - Documents\Engineering\Projects\USH2126:100 - Indian River County LFVH-Design\M-Mechanical\04# isometric\04# isometric\FC-Stick Built isometric\22.05\8-LFG-0501-SS1-P-1.dwg 06-02-2023 MukeshTrakur

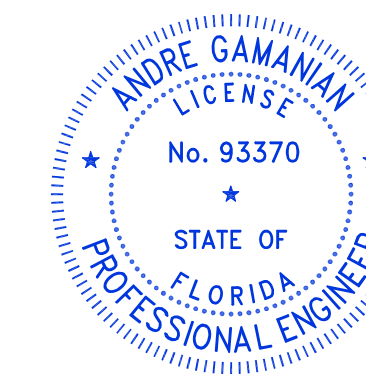


CONT'D ON
 DWG#
 8-LFG-0501-SS1-P-1
 E 822536.862
 N 1180464.822
 EL +32.625



CONT'D FROM
 DWG#
 8-LFG-0501-SS1-P-3
 E 822488.289
 N 1180464.822
 EL +32.625

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



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 Digitally signed by Andre Gamanian
 Date: 2023.09.25 17:53:16-0700'

ISSUED FOR CONSTRUCTION


BILL OF MATERIALS


PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	47'-7"	8"	40S	PIPE, ERW, SCH 40S, BE, 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, BE X NPT (M), ASME A733, ASTM A312 GR TP 304
3	2	3/4"	3000	PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A182 GR F304
4	1	12"X8"	10S X 40S	REDUCER (CONC), ERW, SCH 10S X SCH 40S, BW, ASME B16.9, ASTM A403 GR WP 304
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	2	8"X3/4"	3000	THREADOLET, CLASS 3000, BW X NPT (F), MSS-SP-97, ASTM A182 GR F304
6	1	8"X1/2"	3000	SOCKOLET, CLASS 3000, BW X SW, MSS-SP-97, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
7	1	12"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
8	2	8"	SS2-4"-1-1-2"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"
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	1/2"	HV-0516	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
11	1	1/2"	PG-0517	PRESSURE GAUGE, NPT (M)

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

SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.05
INSULATION SPEC	P
INSULATION THK	1"

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

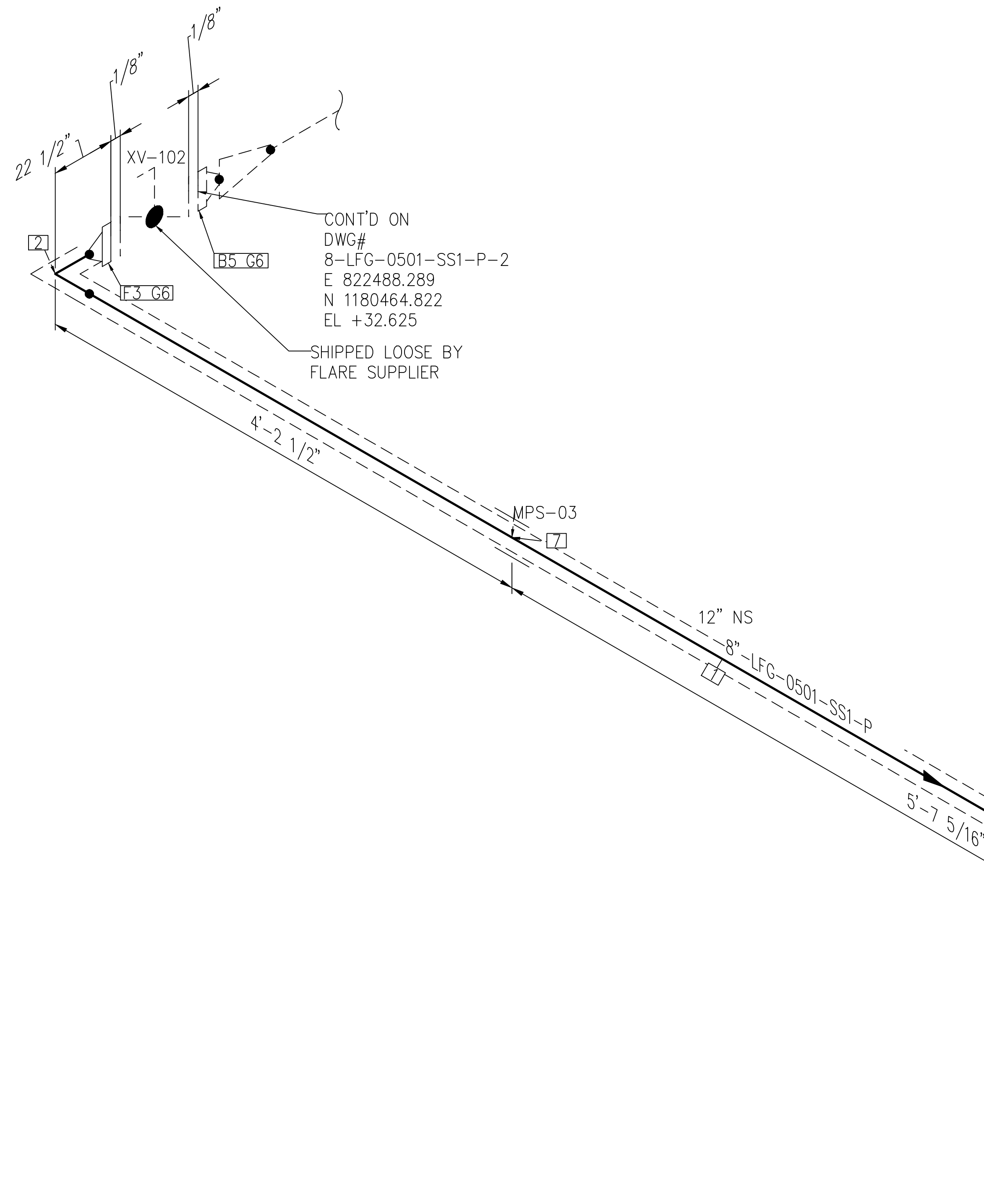
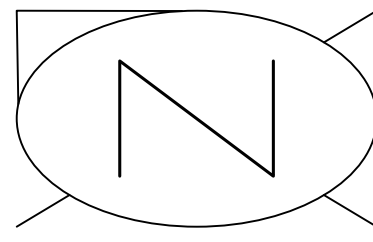
ENGINEER:
 **BIOGAS ENGINEERING**
 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC
 8"-LFG-0501-SS1-P

LANDFILL GAS BLOWER SKID
 & FLARE REPLACEMENT

SHEET
 2

SCALE
 N.T.S

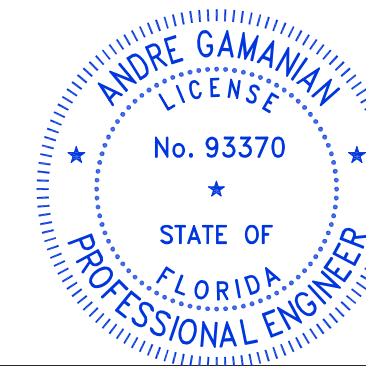


CONT'D ON
 DWG#
 8-LFG-0501-SS1-P-2
 E 822488.289
 N 1180464.822
 EL +32.625

SHIPPED LOOSE BY
 FLARE SUPPLIER

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

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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	8'	12"	10S	PIPE, ERW, SCH 10S, BE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	12"	10S	ELBOW 90 LR, ERW, SCH 10S, BW, ASME B16.9, ASTM A403 GR WP 304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	2	12"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	24	7/8"X4 3/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
5	12	7/8"X8 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
6	4	12"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
7	1	12"	SS2-4"-2-1 5"	PIPE SADDLE FOR INSULATED PIPE SIZE 8" TO 16"

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

SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.05
INSULATION SPEC	P
INSULATION THK	1"

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

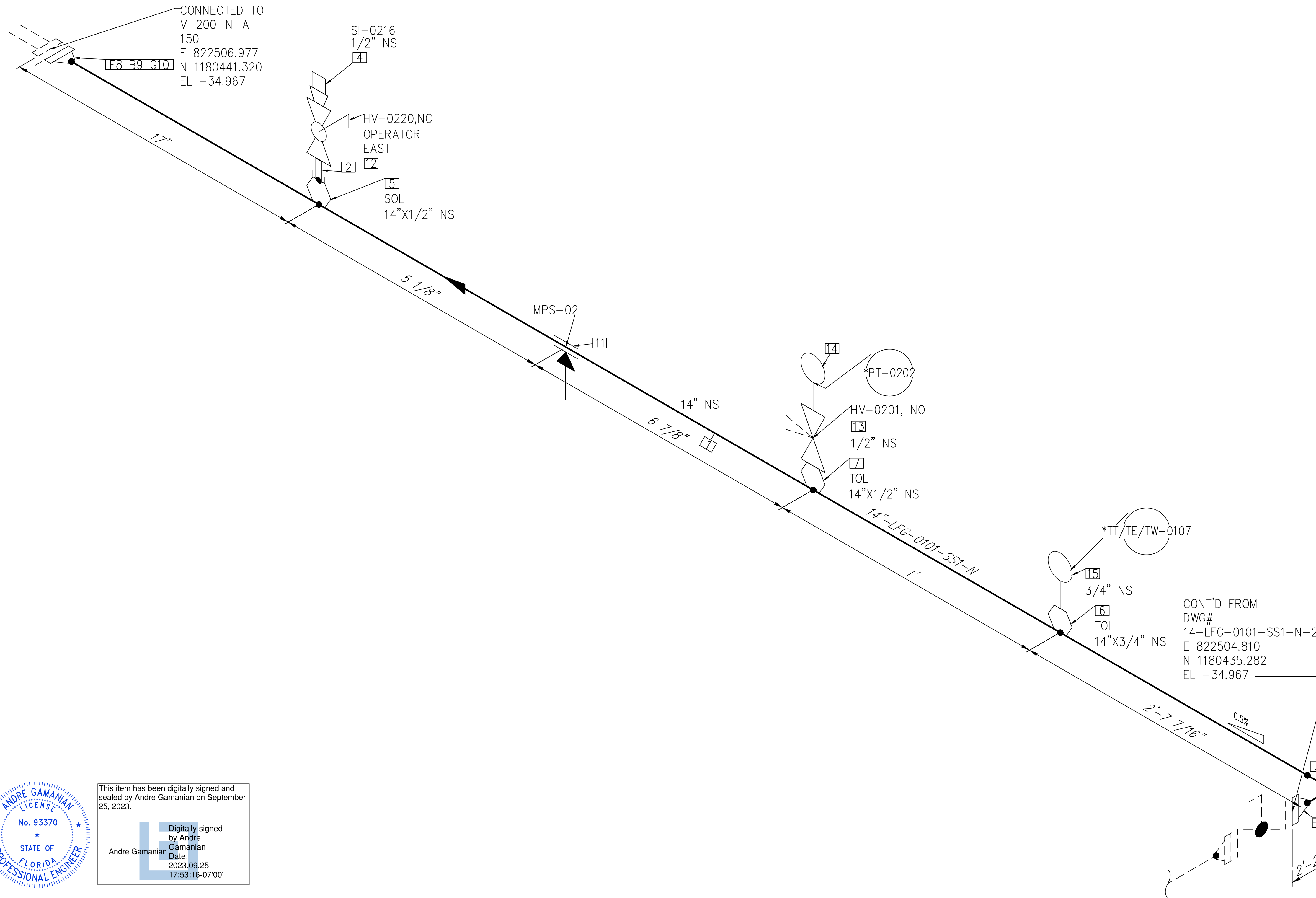
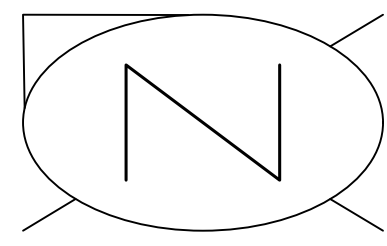
ENGINEER:
 **BIOGAS ENGINEERING**
 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC
 8"-LFG-0501-SS1-P

LANDFILL GAS BLOWER SKID
 & FLARE REPLACEMENT

SHEET
 3

SCALE
 N.T.S





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 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)

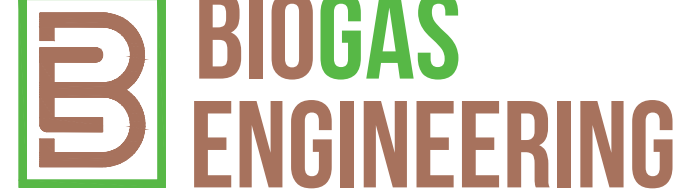
BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	3'-11"	14"	10S	PIPE, ERW, SCH 10S, BE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
2	1	1/2"	80S	PIPE NIPPLE, SMLS, 4" LG, SCH 80S, BE X NPT (M), ASME A733, ASTM A312 GR TP 304
3	1	14"	10S	ELBOW 90 LR, ERW, SCH 10S, BW, ASME B16.9, ASTM A403 GR WP 304
4	1	1/2"	3000	PLUG, HEX HEAD, CLASS 3000, NPT (M), ASME B16.11, ASTM A182 GR F304
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	14"x1/2"	3000	SOCKOLET, CLASS 3000, BW X SW, MSS-SP-97, ASTM A182 GR F304
6	1	14"x3/4"	3000	THREDOLET, CLASS 3000, BW X NPT (F), MSS-SP-97, ASTM A182 GR F304
7	1	14"x1/2"	3000	THREDOLET, CLASS 3000, BW X NPT (F), MSS-SP-97, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
8	2	14"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
9	12	1"x5 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
10	1	14"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
11	1	14"	GS2-14"	GUIDE SUPPORT FOR BARE PIPE-SIZE 14" TO 24"
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
12	1	1/2"	HV-0220	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, NPT (F), MANUAL LEVER LOCKABLE OPERATOR
13	1	1/2"	HV-0201	MULTI-PORT BLOCK & BLEED VALVE, SOFT SEAT, PTFE PACKING, BLEED PORT
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
14	1	1/2"	PT-0202	PRESSURE TRANSMITTER, NPT (M)
15	1	3/4"	TT/TE/TW-0107	TEMPERATURE TRANSMITTER & TEMPERATURE ELEMENT WITH THERMOWELL, NPT (M)

ISSUED FOR CONSTRUCTION

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

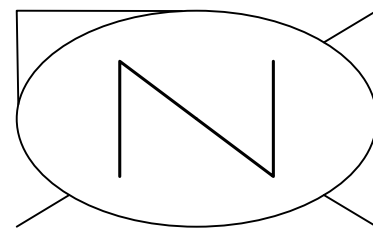
SERVICE	LFG
PIPE SPEC	SS1
P&ID DWG	P2.01
INSULATION SPEC	N
INSULATION THK	-

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

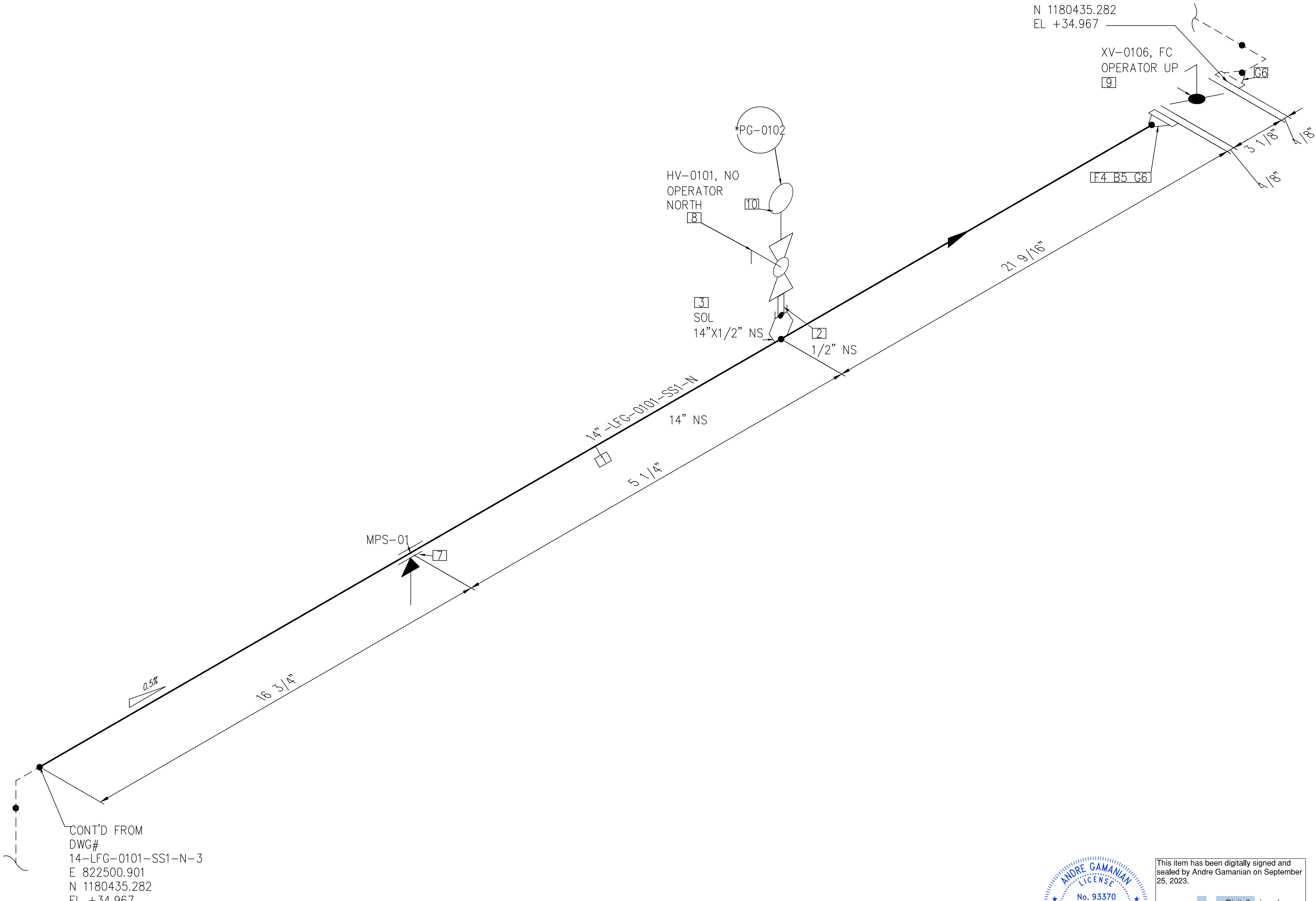
ENGINEER:  **BIOGAS ENGINEERING**
 2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755, Ph: (562) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC
 14"-LFG-0101-SS1-N
 LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT
 SHEET 1
 SCALE N.T.S.

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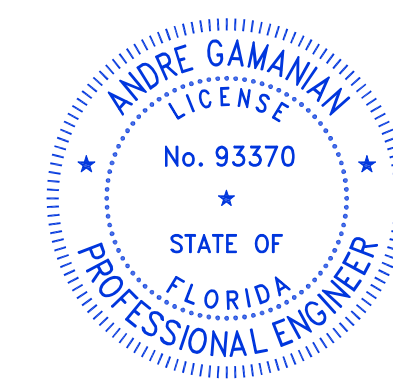


CONT'D ON
 DWG#
 14-LFG-0101-SS1-N-1
 E 822504.810
 N 1180435.282
 EL +34.967



CONT'D FROM
 DWG#
 14-LFG-0101-SS1-N-3
 E 822500.901
 N 1180435.282
 EL +34.967

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



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

ISSUED FOR CONSTRUCTION

BILL OF MATERIALS				
PIPE				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
1	3'-3"	14"	10S	PIPE, ERW, SCH 10S, BE, 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, BE X NPT (M), ASME A733, ASTM A312 GR TP 304
OLETS				
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
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
4	1	14"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
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
PIPE SUPPORTS				
ID	QTY	ND	ITEM CODE	DESCRIPTION
7	1	14"	GS2-14"	GUIDE SUPPORT FOR BARE PIPE-SIZE 14" TO 24"
VALVES				
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
INSTRUMENT				
ID	QTY	ND	ITEM CODE	DESCRIPTION
10	1	1/2"	PG-0102	PRESSURE GAUGE, NPT (M)

C:\Users\MukeshTrakur\Documents\Engineering\Biosgaseng - Indian River County LF\H-Design\M-Mechanical\04# isometric\FC-Stick\Buit isometric\02.01\14-LFG-0101-SS1-N-2.dwg 03-02-2023 MukeshTrakur

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

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

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

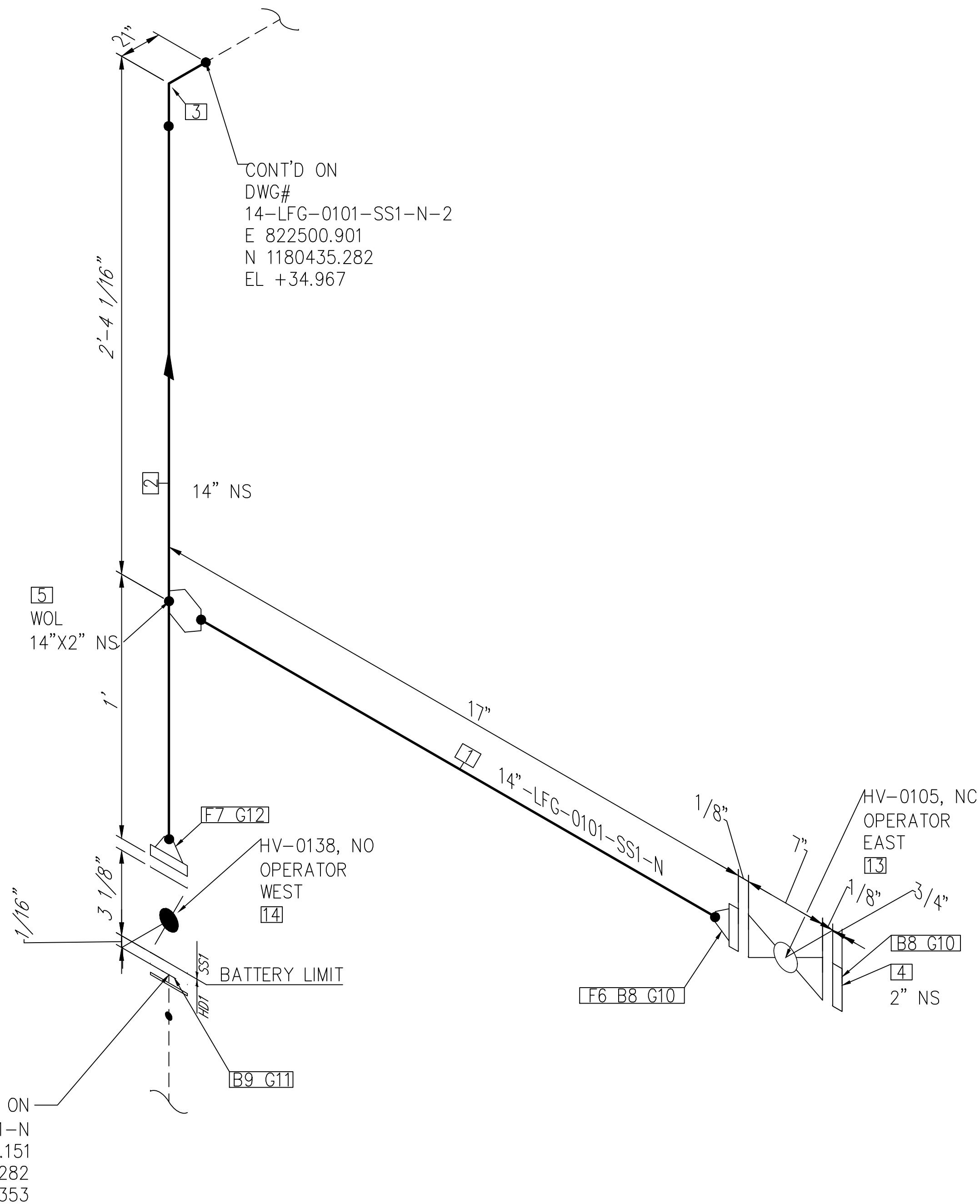
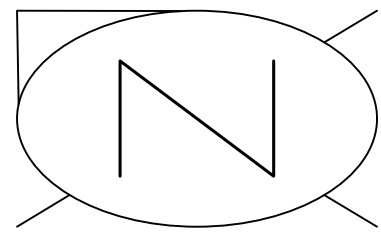
ENGINEER:
BIOGAS ENGINEERING
 2321 E. 28TH STREET, SUITE 400
 SIGNAL HILL, CA 90755, Ph: (562) 726-3565
 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC
 14"-LFG-0101-SS1-N

LANDFILL GAS BLOWER SKID
 & FLARE REPLACEMENT

SHEET
 2

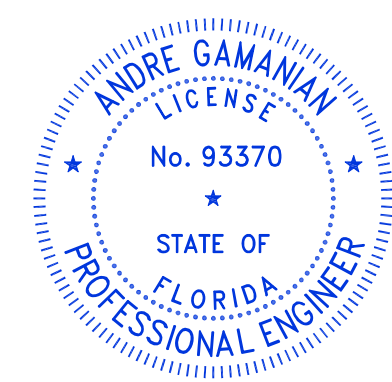
SCALE
 N.T.S



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	6"	2"	80S	PIPE, ERW, SCH 80S, BE, ASME B36.19, ASTM A312 GR TP 304
2	1'-3"	14"	10S	PIPE, ERW, SCH 10S, BE, ASME B36.19, ASTM A312 GR TP 304
FITTINGS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
3	1	14"	10S	ELBOW 90 LR, ERW, SCH 10S, BW, ASME B16.9, ASTM A403 GR WP 304
4	1	2"	150	BLIND FLANGE, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
OLETS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
5	1	14"x2"	3000	WELDOLET, LIGHTWEIGHT, CLASS 3000, BW, MSS-SP 97, ASTM A182 GR F304
FLANGES				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
6	1	2"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
7	1	14"	150	FLANGE WN, CLASS 150, RF, ASME B16.5, ASTM A182 GR F304
FASTENERS				
ID	QTY	ND	SCH/CLASS	DESCRIPTION
8	8	5/8"x3 1/4"	150	STUD BOLT ASTM A193 GR B8, ASME 18.2.1, HEXAGONAL NUTS ASTM A194 GR 8, ASME 18.2.2
9	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
10	2	2"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
11	1	14"	150	GASKET NEOPRENE, ASME 16.5, CLASS 150, FLAT FACED
12	1	14"	150	SPIRAL WOUND GASKET, 1/8" THK, SS304 WINDING MATERIAL, SS OUTER RING, CLASS 150, RF, ASME B 16.20
VALVES				
ID	QTY	ND	ITEM CODE	DESCRIPTION
13	1	2"	HV-0105	BALL VALVE, UNI-BODY DESIGN, REGULAR BORE, CLASS 150, RF
14	1	14"	HV-0138	BUTTERFLY VALVE, GEAR OPERATED, CLASS 150, RF

ISSUED FOR CONSTRUCTION




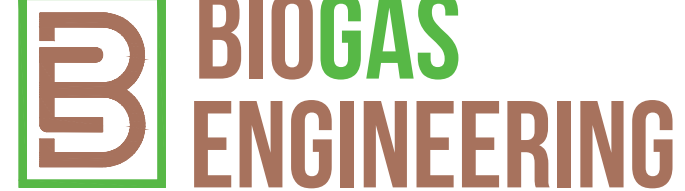
This item has been digitally signed and sealed by Andre Gamanian on September 25, 2023.
Digitally signed by Andre Gamanian
Date: 2023.09.25 17:53:16-07'00'

C:\Users\MukeshTrakur\Documents\Engineering\Biosgaseng - Indian River County LF H-Design\M-Mechanical\04# isometric\FC-Stick Built isometric\02.01\14-LFG-0101-SS1-N-3.dwg 03-02-2023 MukeshTrakur

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

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

OWNER:  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) 726-3565 EMAIL: INFO@BIOGASENG.COM

PIPING ISOMETRIC	SHEET
14"-LFG-0101-SS1-N	3
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT	SCALE N.T.S

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ELECTRICAL ABBREVIATIONS

(E)	EXISTING TO REMAIN
(ED)	EXISTING TO BE DEMOLISHED
(ER)	EXISTING TO BE RELOCATED
(N)	NEW
(RL)	EXISTING SHOWN RELOCATED
A	AMP, AMPERES
AF	AMPERE FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERES INTERRUPTING CAPACITY
AT	AMPERE TRIP
BOP	BALANCE OF PLANT
C	CONDUIT
CAB	CABINET
CB, C/B	CIRCUIT BREAKER
CKT	CIRCUIT
CLG	CEILING
CP	CONTROL PANEL
CT	CURRENT TRANSFORMER
DEG	DEGREE
DDT	DIRECT TRANSFER TRIP
DWG	DRAWING
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
ELEC	ELECTRICAL
EMERG	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EPO	EMERGENCY POWER OFF
EQ	EQUAL
FA	FIRE ALARM
FDR	FEEDER
FIXT	FIXTURE
FU	FUSE
G, GND	GROUND
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GF	GROUND FAULT INTERRUPTER
HH	HAND HOLE
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HZ	HERTZ
JB	JUNCTION BOX
K	KILO, THOUSANDS
KV	KILOVOLT
KVA	KILO VOLT-AMPERE
KW	KILOWATT
LP	LIGHTING PANEL
LSIG	LONG, SHORT, INSTANTANEOUS AND GROUND FAULT TRIP FUNCTIONS
LTG	LIGHTING
LTNG	LIGHTNING
M	MEGA, MILLIONS
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDR	MAIN DISTRIBUTION PANEL
MDSB	MAIN DISTRIBUTION SWITCHGEAR
MDSWMAIN	DISTRIBUTION SWITCHGEAR
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MST	MOTOR STARTER
MVA	MEGA VOLT-AMPERE
MW	MEGAWATT
N	NEUTRAL
NC	NORMALLY CLOSE
NEC	NATIONAL ELECTRICAL CODE
NFPA	NATIONAL FIRE PROTECTION AGENCY
NGR	NEUTRAL GROUNDING RESISTOR
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE
P	POLE(S), PHASE(S)
PNL	PANEL, PANLBOARD
PP	POWER PANEL
PR	PRIMARY
PT	POWER TRANSFORMER
PVC	POLYETHYLENE VINYL CHLORIDE
REC	RECESSED
RECP	RECEPT, RECEPTACLE
RGS	RIGID GALVANIZED STEEL
RM	ROOM
RP	RECEPTACLE PANEL
S/N	SOLID NEUTRAL
SEC	SECONDARY
SPEC	SPECIFICATIONS
STP	SHIELDED TWISTED PAIR
STT	SHIELDED TWISTED TRIPLET
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
T/M	THERMAL/MAGNETIC
TDR	TIME DELAY RELAY
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SOURCE
V	VOLTS
VA	VOLT-AMPERE
VFD	VARIABLE FREQUENCY DRIVE
W	WATT(S), WIRE(S)
W/	WITH
W/O	WITHOUT
WP	WEATHERPROOF
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

POWER DISTRIBUTION

	208/120 VOLT PANELBOARD
	480/277 VOLT PANELBOARD
	TRANSFORMER
	JUNCTION BOX
	NON-FUSED DISCONNECT SWITCH
	ENCLOSED CIRCUIT BREAKER
	FUSED DISCONNECT SWITCH
	SELECTOR SWITCH HOA = HAND-OFF-AUTO
	MAGNETIC MOTOR STARTER
	COMBINATION MAGNETIC MOTOR STARTER AND DISCONNECT SWITCH
	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
	UNDERGROUND WIRING
	CONDUIT DOWN
	CONDUIT UP
	EQUIPMENT DESIGNATION
	REFER TO NOTE
	NUMBER INDICATES EQUIPMENT ITEM No. UPPER CASE LETTER INDICATES CONTINUATION LINE

PROCESS EQUIPMENT POWER AND CONTROL

	PROCESS INSTRUMENT/DEVICE TOP LINE IS DEVICE TYPE BOTTOM LINE IS IDENTIFIER
	CONTROL PANEL (PROVIDED BY EQUIPMENT MANUFACTURER)
	JUNCTION BOX (PROVIDED BY EQUIPMENT MANUFACTURER)
	HEATER CONNECTION BOX (PROVIDED BY EQUIPMENT MANUFACTURER)
	HEAT TRACE CONTROLLER (PROVIDED BY EQUIPMENT MANUFACTURER)
	MOTOR CONNECTION BOX (PROVIDED BY EQUIPMENT MANUFACTURER)
	TEMPERATURE ELEMENT/THERMOCOUPLE (PROVIDED BY EQUIPMENT MANUFACTURER)
	VIBRATION SWITCH (PROVIDED BY EQUIPMENT MANUFACTURER)

SWITCHES

	SINGLE POLE SWITCH: LOWER CASE LETTER INDICATES DEVICE CONTROLLED
	THREE WAY SWITCH
	FOUR WAY SWITCH
	MANUAL MOTOR STARTER W/THERMAL OVERLOAD
	KEY OPERATED SWITCH
	SWITCH WITH PILOT LIGHT
	SINGLE POLE SWITCH ON EMERGENCY CIRCUIT (RED BODY)
	TWO BUTTON (ON/OFF) LOW VOLTAGE MOMENTARY CONTACT SWITCH. LOWER CASE LETTER INDICATE CONTROL ZONE.
	PUSH BUTTON
	STOP/START PUSH BUTTON

SINGLE LINE DIAGRAM

	TRANSFORMER
	CIRCUIT BREAKER 100 AF - INDICATES AMP FRAME 100 AT - INDICATES AMP TRIP
	CURRENT LIMITING CIRCUIT BREAKER
	THERMAL OVERLOAD
	DISCONNECT DEVICE FOR DRAWOUT EQUIPMENT
	NON-FUSED SWITCH
	FUSE
	FUSED SWITCH
	LIGHTNING ARRESTOR
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	POTENTIAL TRANSFORMER WITH FUSE
	STOP BUTTON MOMENTARY CONTACT
	START BUTTON MOMENTARY CONTACT
	GROUND CONNECTION
	BATTERY
	NORMALLY OPEN CONTACT
	NORMALLY CLOSED CONTACT
	METER
	GENERATOR
	TRANSFER SWITCH
	AMMETER
	AMMETER SWITCH
	VOLTMETER
	VOLTMETER SWITCH
	KIRK KEY INTERLOCK
	WATHOUR METER
	C/B WITH SHUNT TRIP
	DELTA CONNECTION
	GROUNDED WYE CONNECTION
	CONTACTOR
	RELAY
	POWER FACTOR CORRECTION CAPACITOR
	TRANSIENT VOLTAGE SURGE SUPPRESSION
	INDICATING LAMP
	ELECTRIC POLE
	POINT OF CONNECTION TO EXISTING EQUIPMENT.
	POINT OF DISCONNECTION TO EXISTING EQUIPMENT.
	EQUIPMENT RELAY

OUTLETS

	DUPLIX RECEPTACLE OUTLET
	QUADRUPLEX RECEPTACLE OUTLET
	DEDICATED DUPLIX RECEPTACLE OUTLET
	DEDICATED QUADRUPLEX RECEPTACLE OUTLET
	QUADRUPLEX RECEPTACLE OUTLET FLOOR MOUNTED
	DUPLIX RECEPTACLE OUTLET WITH GROUND FAULT INTERRUPTER
	CLASS 1 DIV 2 EXPLOSION PROOF RECEPTACLE
	SPECIAL PURPOSE RECEPTACLE OUTLET NEMA CONFIGURATION AS INDICATED ON DRAWING
	TELEPHONE OUTLET
	COMBINATION DATA/TELEPHONE OUTLET

MOUNTING HEIGHTS-ELEC. EQPT.

9" (BELOW FINISHED CEILING)	-WALL-MOUNTED BELLS AND FIRE ALARM SOUNDING DEVICE
CENTERED ABOVE DOOR OR WINDOW OPENING	-TV MONITOR OUTLETS AND SERVICE RECEPTACLES FOR SHELF MOUNTED TV
6'-8" AFF	-WARNING AND SIGNALING FIXTURES/SIGNS
6'-6" AFF	-FIRE ALARM STROBES MOUNTED AT 6'-8" OR 6" BELOW FINISHED CEILING (WHICHEVER IS LOWER)
6'-3" AFF	-TOP OF FLUSH AND SURFACE MOUNTED ELECTRICAL LIGHTING OR POWER PANELBOARDS AND TELEPHONE CABINETS
6'-3" AFF	-TOP OF BACK MOUNTED WALL EXIT FIXTURES (NOT MOUNTED ABOVE DOORS)
6'-0" AFF	-TOP OF HIGHEST ELECTRICAL SAFETY DISCONNECT SWITCHES, MAGNETIC STARTERS AND CONTACTORS
4'-6" AFF	-WALL-MOUNTED TELEPHONE AND PAY STATIONS (3'-6" AT HANDICAP LOCATIONS)
3'-10" AFF (CENTER OF DEVICE) (4'-0" MAXIMUM HEIGHT TO THE TOP OF THE OPERABLE DEVICE)	-WALL MOUNTED ELECTRICAL DEVICE LIGHTING SWITCHES, MANUAL MOTOR STARTERS, THERMOSTATS AND FIRE ALARM PULL STATIONS. -INCLUDES ALL FLOOR EQUIPMENT IN LABS AND EQUIPMENT ROOMS. -GFI OUTLETS IN TOILET ROOMS
1'-6" AFF	-ELECTRICAL RECEPTACLES WITHIN MECHANICAL SPACES, ELECTRICAL ROOMS. -ELECTRICAL RECEPTACLES -TELEPHONE, DATA AND COMMUNICATIONS OUTLETS -CATV AND A/V JUNCTION BOXES

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.
- THE ABOVE NOTED MOUNTING HEIGHTS SHALL BE ADHERE TO, UNLESS SPECIFICALLY INDICATED OR OTHERWISE DETAILED ON THE SPECIFICATIONS.
- ALL DEVICES SHOWN ON DRAWINGS ARE DIAGRAMMATICALLY 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
	EXTERIOR WALLPACK LUMINAIRE. TYPE AS INDICATED.
	LIGHTING FIXTURE, PENDANT MOUNT LUMINAIRE. TYPE AS INDICATED.
	WEATHER PROOF LIGHTING FIXTURE, STANCHION MOUNT LUMINAIRE. TYPE AS INDICATED
	WALL LIGHTING FIXTURE, SURFACE MOUNT LUMINAIRE. TYPE AS INDICATED
	WALL LIGHTING FIXTURE, SURFACE MOUNT EXIT LIGHT. TYPE AS INDICATED
	1'X4' INDUSTRIAL STRIP LIGHT FIXTURE
	CONTROL DEVICE OR ZONE ASSOCIATED WITH LIGHT FIXTURE

* SHADED SYMBOLS INDICATE FIXTURE POWERED FROM EMERGENCY CIRCUIT.

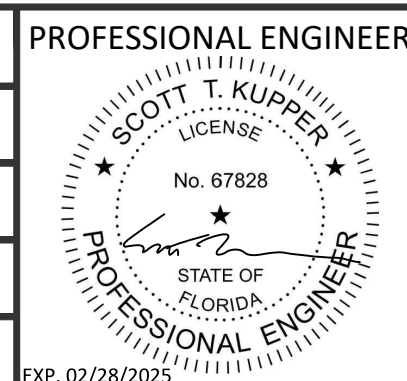
ELECTRICAL GENERAL NOTES:

- 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.
- 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.
- ALL NEW ELECTRICAL MATERIAL AND EQUIPMENT SHALL BE LISTED AND LABELED BY AN OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL), AND INSTALLED IN A MANNER CONSISTENT WITH ITS LISTING AND LABELING.
- WHERE EQUIPMENT AND CONDUITS PENETRATE FIRE AND SMOKE BARRIERS INCLUDING WALLS, PARTITIONS, FLOORS AND CEILINGS, INSTALL FIRE STOPPING AT PENETRATIONS AFTER CABLES ARE INSTALLED.
- THE DRAWINGS ARE DIAGRAMMATIC AND ALL SPECIALTIES AND APPURTENANCES ARE NOT SHOWN, HOWEVER THE E.C. SHALL BE REQUIRED TO PROVIDE A COMPLETE INSTALLATION, IN A NEAT WORKMANLIKE MANNER.
- UNLESS OTHERWISE NOTED ALL INDOOR ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH, AND HOUSED IN, A NEMA 1 ENCLOSURE. ALL OUTDOOR ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN NEMA 3R OR 4X ENCLOSURE.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE BEFORE PROCEEDING WITH THE WORK.
- 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.
- 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.
- THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR REVIEWING AND COORDINATING WITH THE DOCUMENTS OF ALL TRADES.
- 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
- CONTACT SITE UTILITY LOCATOR PRIOR TO EXCAVATING. CONTRACTOR IS RESPONSIBLE FOR LOCATING EXISTING UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
- 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.
- KUPPER ENGINEERING LLC, INCORPORATES COMMERCIALY 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.)
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LINE 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

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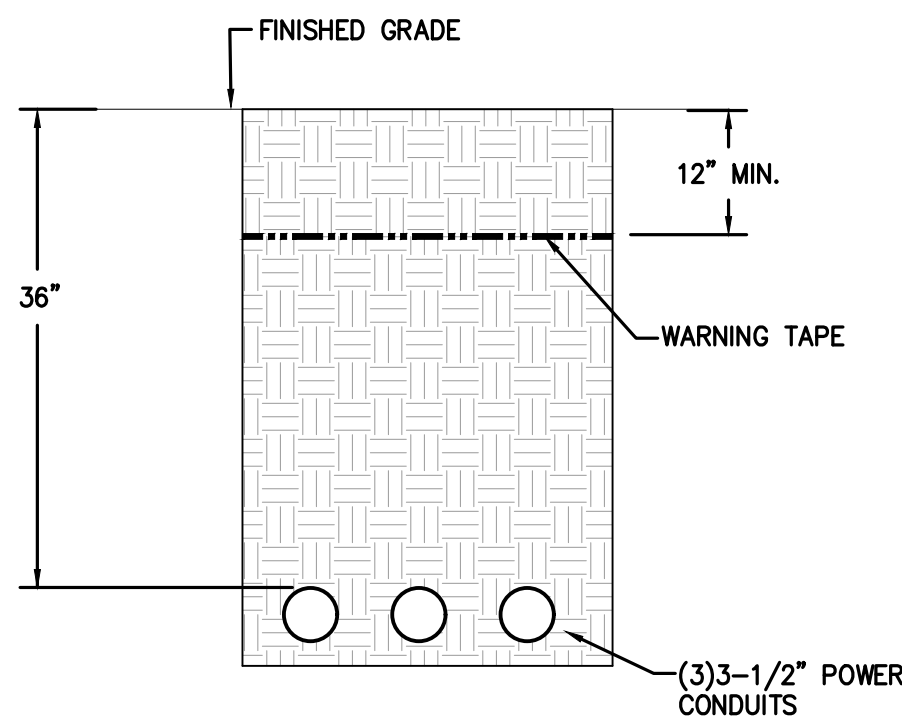
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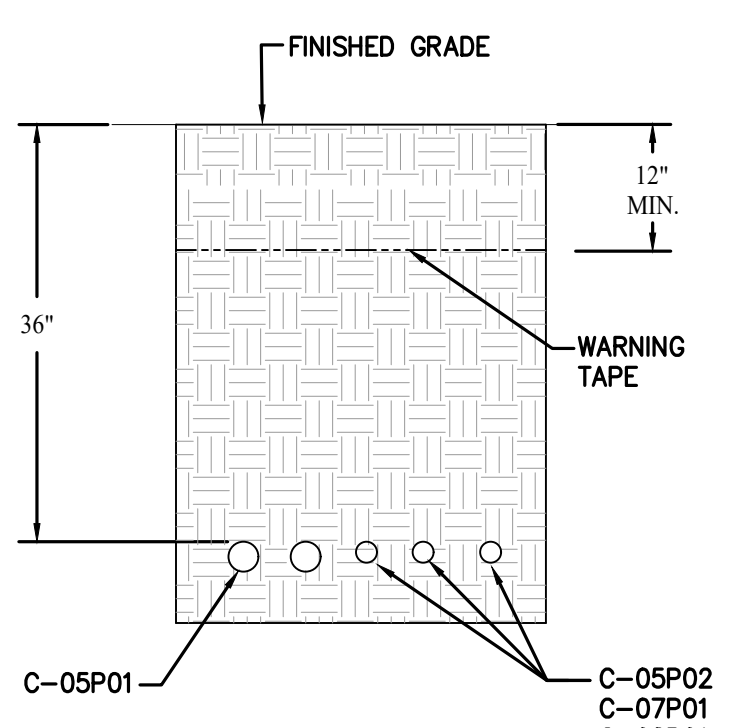
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ELECTRICAL LEGENDS, NOTES AND ABBREVIATIONS		DRAWING NO.
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT		E-445B
		PROJECT NO.
		032-22

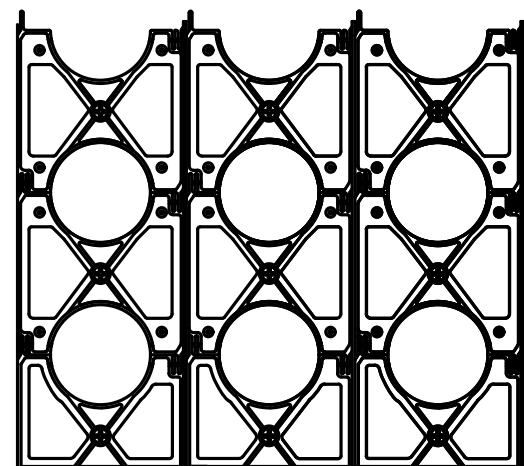
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2 DUCTBANK DETAIL 1
SCALE: NOT TO SCALE



3 DUCTBANK DETAIL 2
SCALE: NOT TO SCALE



4 PVC SPACER U/G DETAIL
SCALE: NOT TO SCALE

- PVC SPACER NOTES:**
1. PROVIDE PVC SPACERS IN CONFIGURATIONS AS REQUIRED BY CONDUIT RUNS. PROVIDE MINIMUM 3" BASE ON BOTTOM SPACER. PROVIDE MINIMUM 3" BETWEEN CONDUITS.
 2. CONDUIT SPACERS SHALL BE INSTALLED EVERY 7'-0" OR PER MANUFACTURER'S RECOMMENDATIONS.
 3. PROVIDE PVC SPACERS BY CARLON PRODUCTS "HI-IMPACT SPACERS" OR APPROVED EQUAL "MUNPEECE SPACERS" BY UNDERGROUND DEVICES.
 4. SPACER DETAIL IS SHOWN FOR REFERENCE ONLY. DIMENSIONS SHOWN DO NOT INDICATE SPACER REQUIREMENTS. COORDINATE SPACERS ACTUAL DIMENSION WITH MANUFACTURER.

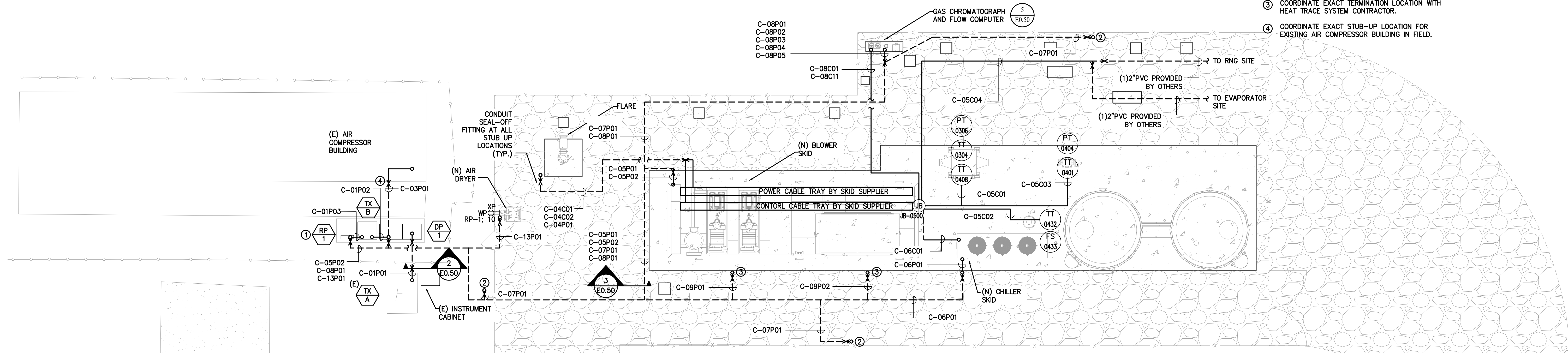
SHEET NOTES:

1. E.C. SHALL REFER TO MECHANICAL CONTRACTORS DRAWINGS FOR EXACT LOCATION OF EQUIPMENT AND ADDITIONAL INFORMATION.
2. UNLESS OTHERWISE NOTED, ALL SINGLE PHASE BRANCH CIRCUIT WIRING SHALL BE A MINIMUM OF 2#12 + 1 #12G, 3/4" PVC FOR 20A CIRCUITS WITH RUNS OF UP TO 200' AT 277V. FOR BRANCH CIRCUITS EXCEEDING 200' AT 277V, BRANCH WIRING SHALL BE 2#10 + 1#10G, 3/4" PVC.
3. CONDUIT ROUTING LAYOUTS ARE GENERIC AND DO NOT REPRESENT ALL CONDUITS REQUIRED IN SCOPE OF WORK. MAJOR CONDUIT RUNS ARE SHOWN TO PROVIDE COORDINATION BETWEEN TRADES AND TO LOCATE CONDUIT ENTRANCE POINTS. IN GENERAL, THESE ENTRANCE POINTS TO EQUIPMENT SHALL BE FOLLOWED TO PREVENT SHEARING OF CONDUITS FROM PAD SETTLEMENTS. COORDINATE LAYOUT OF PIPING AND EXACT BURIAL DEPTHS WITH MECHANICAL CONTRACTORS, MINIMAL BURIAL DEPTHS IN ACCORDANCE WITH THE NEC. UNLESS OTHERWISE NOTED ON PLANS.
4. DRAWINGS DO NOT REPRESENT EXACT END LOCATION OF WIRING AND CONDUIT. E.C. SHALL PROVIDE WIRE AND CONDUIT AS REQUIRED TO EXTEND TO THE FINAL TERMINATION BLOCK DESTINATIONS. E.C. SHALL COORDINATE WITH EACH MANUFACTURER'S SHOP DRAWINGS.
5. E.C. RESPONSIBLE TO LOCATE STUB-UPS TO ALLOW PROPER BEND RADII, CLEARANCE FROM EQUIPMENT, (BEAMS, OIL PANS, ETC.) AND INSTALLATION OF SEAL OFFS WHERE REQUIRED. RE-WORK OF UG CONDUITS OR MODIFICATION OF EQUIPMENT TO RESOLVE INTERFERENCE BASED ON APPROVED SHOP DRAWINGS IS RESPONSIBILITY OF E.C.
6. E.C. SHALL BE RESPONSIBLE FOR ALL EXCAVATION AND BACKFILL FOR THE UNDERGROUND.

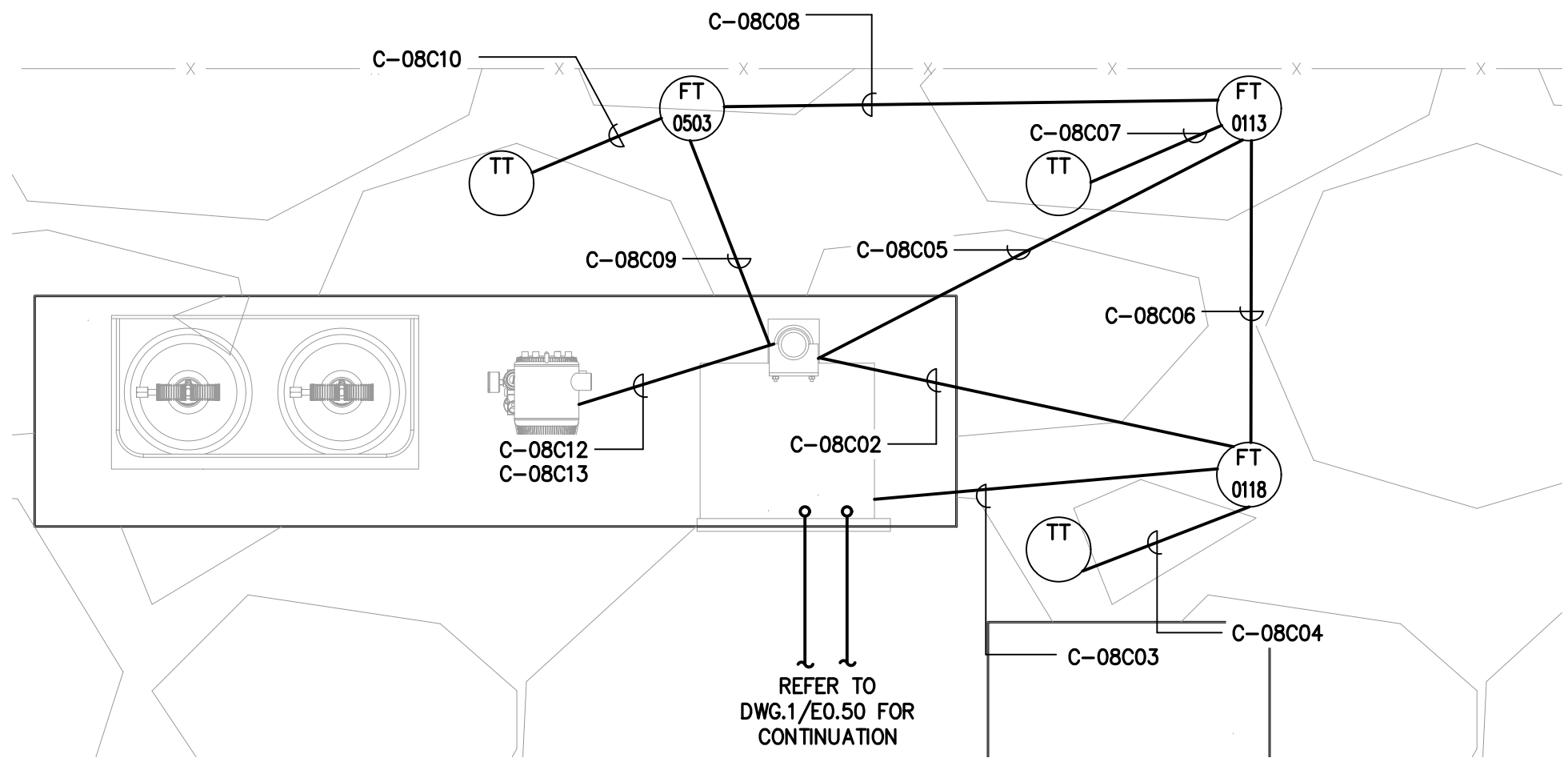
- ELECTRICAL SYSTEMS. TRENCHES SHALL BE BACKFILLED WITH CLEAN FILL PER SPECIFICATIONS AND COMPACTED TO MEET THE COMPACTION REQUIREMENTS OF THE GEOTECHNICAL REPORT AND STRUCTURAL AND CIVIL DRAWINGS. E.C. SHALL PROVIDE THIRD PARTY COMPACTION TESTS AND REPORTS TO VERIFY REQUIREMENTS ARE MET.**
7. PROVIDE SEAL OFF FITTINGS WHERE INDICATED. REFER TO 4/E5.01 FOR DETAIL. ARRANGE STUB-UPS SO ALL SEAL OFF FITTINGS ARE ACCESSIBLE AFTER INSTALLATION.
 8. WHERE MULTIPLE CONDUITS STUB-UP IN THE SAME LOCATION, CONTRACTOR SHALL ARRANGE THE CONDUITS IN PARALLEL WITH THE EQUIPMENT BEING SERVED, TO ALLOW FOR ACCESS TO EACH CONDUIT AND CLEAN OUT AFTER PROCESS EQUIPMENT HAS BEEN INSTALLED.

KEY NOTES:

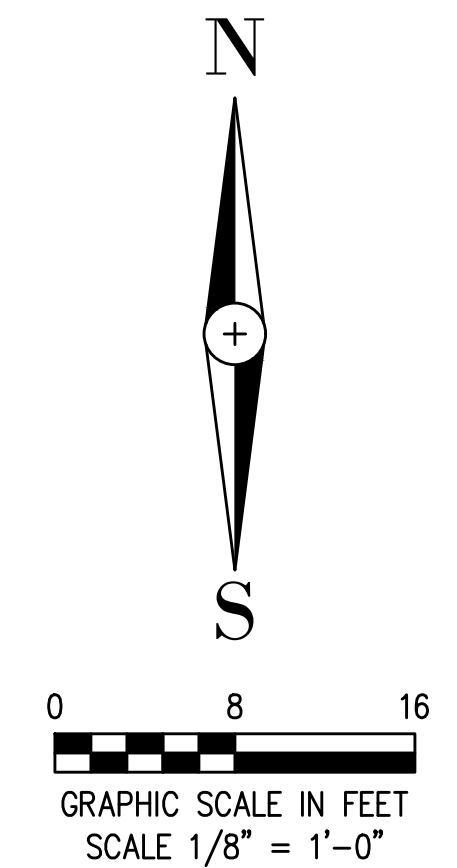
1. E.C. SHALL MOUNT PANEL RP-1 ON UNISTRUT. REFER TO DETAIL 3/E5.01 FOR MORE INFORMATION.
2. CONDUIT CONNECT TO THE LIGHTING POLES. REFER TO E6.01 FOR LOCATION AND LIGHTING SCHEDULE.
3. COORDINATE EXACT TERMINATION LOCATION WITH HEAT TRACE SYSTEM CONTRACTOR.
4. COORDINATE EXACT STUB-UP LOCATION FOR EXISTING AIR COMPRESSOR BUILDING IN FIELD.



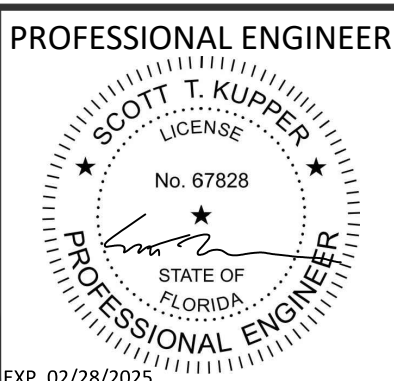
1 ELECTRICAL SITE PLAN
SCALE:



5 ENLARGED ELECTRICAL INSTRUMENT PLAN - FLOW COMPUTER SKID
SCALE: 1" = 1'-0"



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ELECTRICAL SITE PLAN
 LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **E-445C**
 PROJECT NO. 032-22

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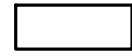
SHEET NOTES:

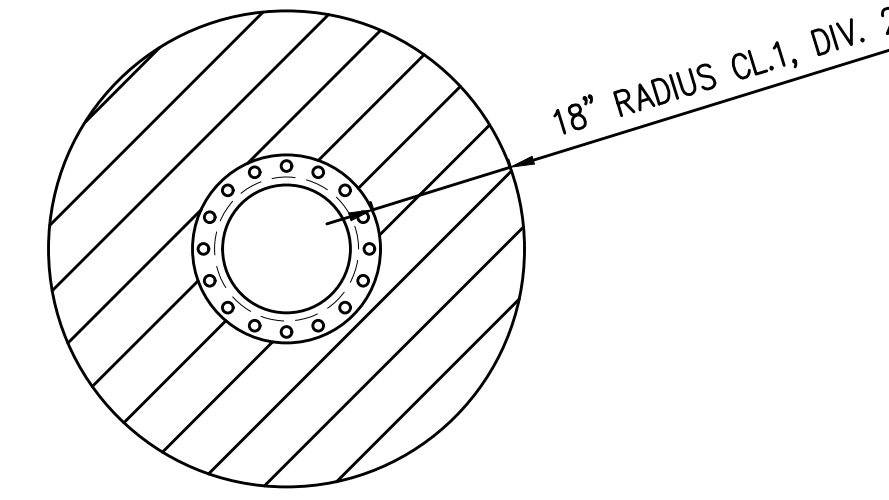
- HAZARDOUS AREAS SHOWN FOR REFERENCE ONLY. BOUNDARIES HAVE BEEN DETERMINED BY BGE ENGINEERS BASED ON NFPA 497.
- REFER TO E0.50 FOR EQUIPMENT DESCRIPTIONS.
- THE SOILS AROUND SKID AREAS SHALL BE CONSIDERED AS CLASS 1, DIVISION 1.

KEY NOTES:

- E.C. SHALL MOUNT PANEL RP-1 ON UNISTRUT. REFER TO DETAIL 3/E5.01 FOR MORE INFORMATION.
- CONDUIT CONNECT TO THE LIGHTING POLES. REFER TO E6.01 FOR LOCATION AND LIGHTING SCHEDULE.
- COORDINATE EXACT TERMINATION LOCATION WITH HEAT TRACE SYSTEM CONTRACTOR.
- COORDINATE EXACT STUB-UP LOCATION FOR EXISTING AIR COMPRESSOR BUILDING IN FIELD.

LEGEND:

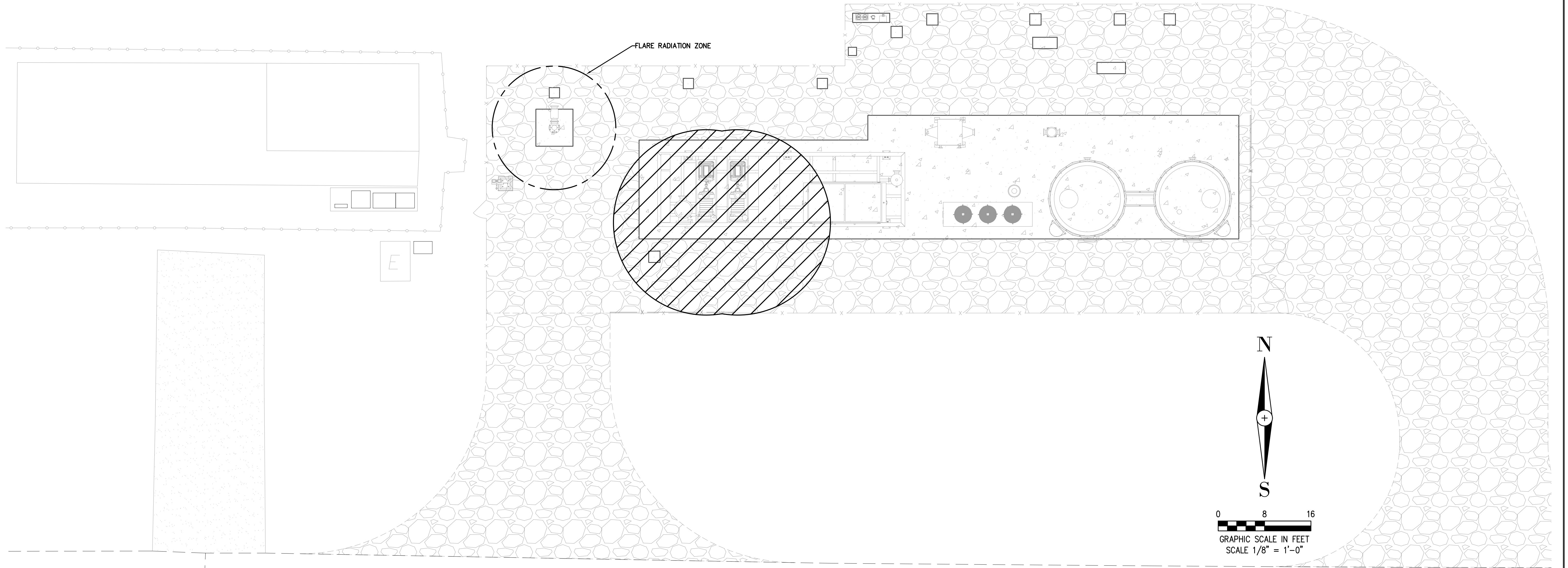
-  HAZARDOUS AREA CLASS I, DIVISION 2, GROUP D
-  UNCLASSIFIED AREA



TYPICAL FOR ALL HYDROCARBON(RAW BIOGAS/METHANE)

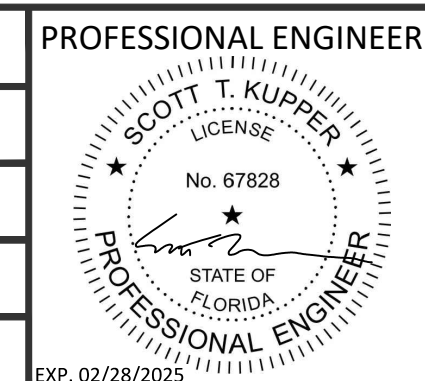
THEREADED OR FLANGED PIPE FITTINGS

SCALE:



1 ELECTRICAL HAZARDOUS AREA PLAN
SCALE:

1	09/08/2023	ISSUE FOR CONSTRUCTION	JML	CY	MAM
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 TELEPHONE 215-884-5970

ELECTRICAL HAZARDOUS AREA PLAN
 LANDFILL GAS BLOWER SKID
 & FLARE REPLACEMENT

DRAWING NO.
E-445D
 PROJECT NO.
 032-22

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SHEET NOTES:

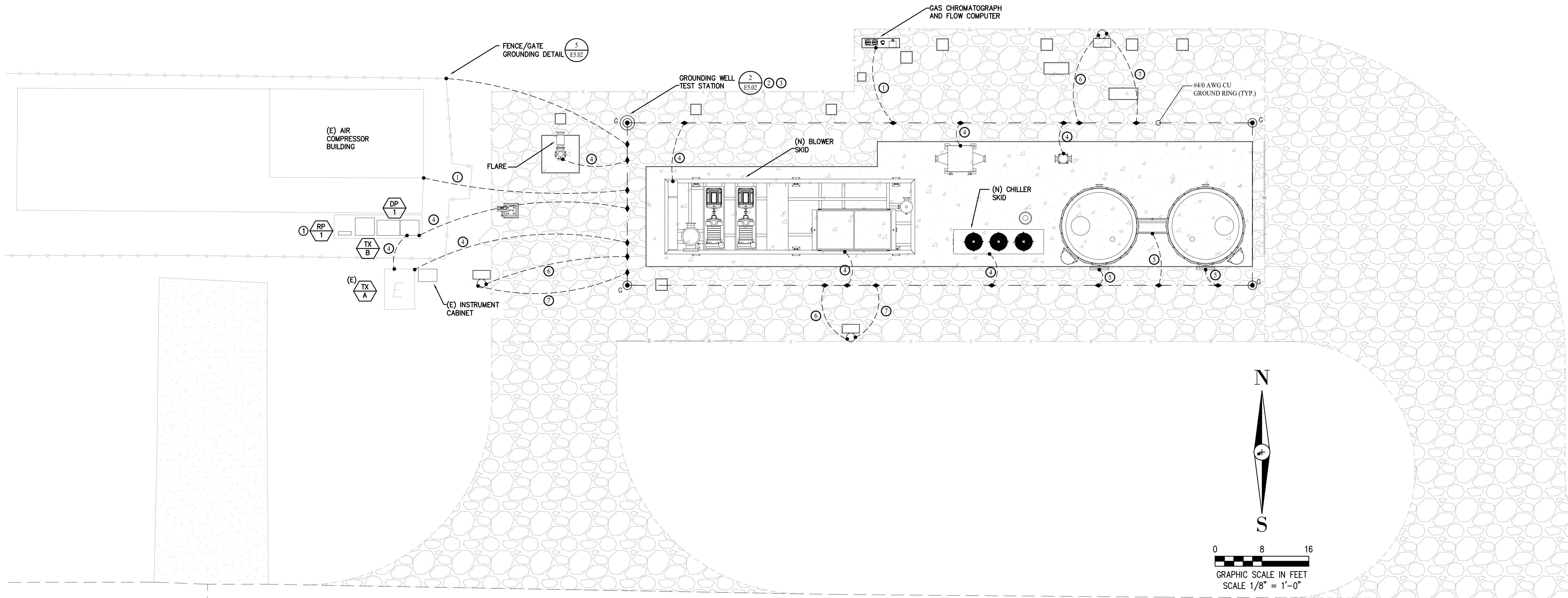
- REFER TO DRAWING E4.01 FOR EQUIPMENT SCHEDULE.
- E.C. SHALL PROVIDE ALLOWANCE IN THE BID FOR 10% ADDITIONAL GROUNDING CONNECTIONS. ENGINEER WILL INDICATE IN FIELD WHERE THESE SHALL BE REQUIRED.
- DRAWINGS DOES NOT INCORPORATE ALL BONDING CONNECTIONS. THIS IS A GUIDE ONLY. E.C. SHALL BOND ALL EQUIPMENT INCLUDING PIPE RACK FOR SAFE TOUCH POTENTIALS.
- 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.
- 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:

- #4/0 CU GROUND CABLE BOND TO CONCRETE REBAR PER DWG. DETAIL 4/E5.02.
- BOND WELL CASING TO #4/0 GROUND RING.
- PROVIDE AND COORDINATE EXACT LOCATION OF TWO GROUNDING WELL TEST STATION IN FIELD. SEE DRAWING DETAIL 3/E2.01 FOR DETAILS.
- #4/0 CU CABLE BOND EQUIPMENT TO GROUND RING
- #4/0 CU CABLE BOND METAL LADDER/STAIRWAY TO GROUND RING
- #4/0 CU CABLE BOND LIGHT POLE REBAR TO GROUND RING.
- #10G CU CABLE BOND LIGHT POLE GROUND CLAMP TO GROUND RING.

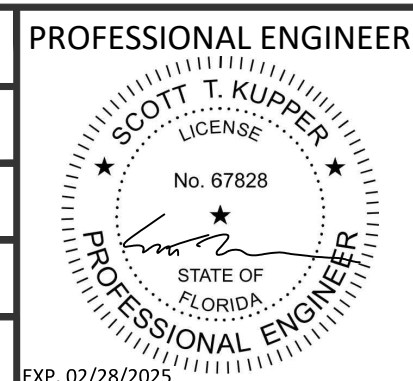
LEGEND

- NO. 4/0-19, SOFT DRAWN STRANDED COPPER CONDUCTOR.
- ⊙_G 3/4" x 10' COPPER CLAD GROUND RODS WITH GROUND ROD COUPLER AND EXOTHERMIC WELD CONNECTIONS.
- ⊙_G 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.



1 ELECTRICAL GROUNDING PLAN
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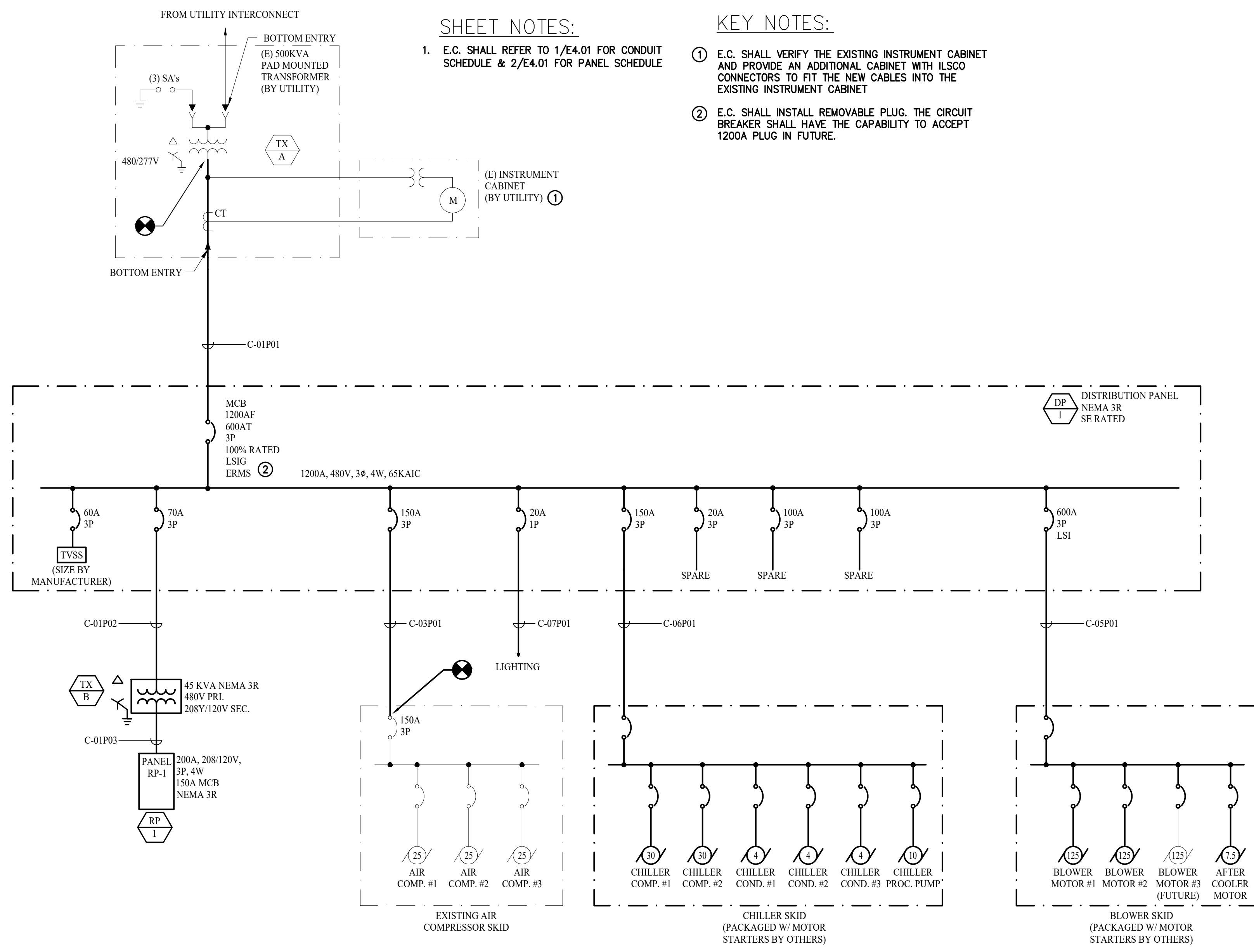
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ELECTRICAL GROUNDING PLAN
 LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO.
E-445E
 PROJECT NO.
 032-22

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SHEET NOTES:

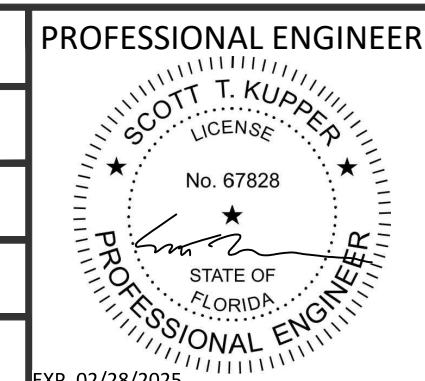
1. E.C. SHALL REFER TO 1/E4.01 FOR CONDUIT SCHEDULE & 2/E4.01 FOR PANEL SCHEDULE

KEY NOTES:

- ① E.C. SHALL VERIFY THE EXISTING INSTRUMENT CABINET AND PROVIDE AN ADDITIONAL CABINET WITH ILSCO CONNECTORS TO FIT THE NEW CABLES INTO THE EXISTING INSTRUMENT CABINET
- ② E.C. SHALL INSTALL REMOVABLE PLUG. THE CIRCUIT BREAKER SHALL HAVE THE CAPABILITY TO ACCEPT 1200A PLUG IN FUTURE.

1 ELECTRICAL SINGLE LINE DIAGRAM
NOT TO SCALE


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ELECTRICAL SINGLE LINE DIAGRAM
 LANDFILL GAS BLOWER SKID
 & FLARE REPLACEMENT

DRAWING NO.
E-445F
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 032-22

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CONDUIT AND FEEDER SCHEDULE

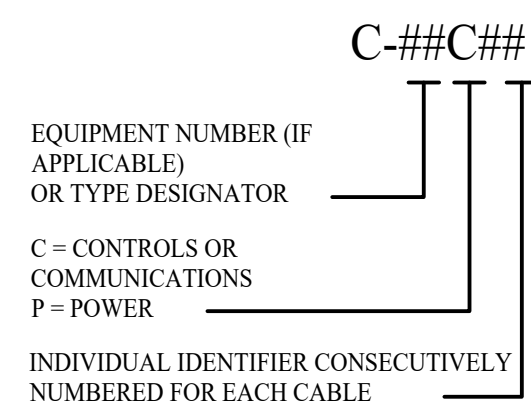
ID	UG/OH	VOLTAGE	ORIGIN			TERMINATION			QTY	SIZE	REF. DUCTBANK	CONDUCTORS OR CABLE REFERENCE	CONDUCTOR TYPE	REMARKS
			EQUIPMENT/ LOCATION	DEVICE/ ENCLOSURE	REF. DETAIL	EQUIPMENT/ LOCATION	DEVICE/ ENCLOSURE	REF. DETAIL						
C-01P01	UG	480VAC	(E.)TRANSFORMER			DP-1			4	3-1/2"	2/E0/50	(4)350KCMIL + (1)#3/0G		
C-01P02	OH	480VAC	DP-1			TX-B			1	1"		(3)#4 + (1)#8G		
C-01P03	OH	208VAC	TX-B			RP-1			1	2"		(4)#1/0 + (1)#6G		
C-03P01	UG	480VAC	DP-1			(E.) AIR COMPRESSOR BUILDING			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	OH	LV	BLOWER CONTROL CABLE TRAY	JB-0500		LOW PRESSURE COOLER	PT0306,TT0304,TT0408		1	3/4"		3 SETS OF 2C#18 OAL SHLD		
C-05C02	OH	LV	BLOWER CONTROL CABLE TRAY	JB-0500		PARTICULATE FILTER	FS0433,TT0432		1	3/4"		2 SETS OF 2C#18 OAL SHLD		
C-05C03	OH	LV	BLOWER CONTROL CABLE TRAY	JB-0500		PARTICULATE FILTER	PT0404,TT0401		1	3/4"		2 SETS OF 2C#18 OAL SHLD		
C-05C04	OH	LV	BLOWER CONTROL CABLE TRAY	JB-0500		RNG SITE/EVAPORATOR SKID			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	OH	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			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	OH	LV	GC SKID	12VDC JUNCTION BOX		FLOW METER	FT-0118		1	3/4"		4C#16		
C-08C03	OH	LV	GC SKID	FLOW COMPUTER		FLOW METER	FT-0118		1	3/4"		2C#18 TWST PAIR SHIELD	RS-485 CABLE	
C-08C04	OH	LV	FLOW METER	TT		FLOW METER	FT-0118		1	3/4"		4W RTI	RTD CALBE	
C-08C05	OH	LV	GC SKID	12VDC JUNCTION BOX		FLOW METER	FT-0113		1	3/4"		4C#16		
C-08C06	OH	LV	FLOW METER	FT-0118		FLOW METER	FT-0113		1	3/4"		2C#18 TWST PAIR SHIELD	RS-485 CABLE	
C-08C07	OH	LV	FLOW METER	TT		FLOW METER	FT-0113		1	3/4"		4W RTI	RTD CALBE	
C-08C08	OH	LV	GC SKID	12VDC JUNCTION BOX		FLOW METER	FT-0503		1	3/4"		4C#16		
C-08C09	OH	LV	FLOW METER	FT-0113		FLOW METER	FT-0503		1	3/4"		2C#18 TWST PAIR SHIELD	RS-485 CABLE	
C-08C10	OH	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	OH	LV	GC			NGC-8203			1	3/4"		2C#18 TWST PAIR SHIELD		
C-08C13	OH	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	3/4"		(2)#10 + (1)#10G		
C-08P03	UG	120VAC	RP-1			GC AIR CONDITIONER			1	3/4"		(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			1	3/4"		(3)#10 + (1)#10G		
C-09P02	UG	208VAC	RP-1			HEAT TRACE SYSTEM			1	3/4"		(3)#10 + (1)#10G		
C-13P01	UG	120VAC	RP-1			AIR DRYER			1	3/4"		(2)#10 + (1)#10G		

SHEET NOTES:

- 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		LOCATION:		MOUNTING TYPE:		SURFACE:		
CKT NO.	AREA SERVED/ DESCRIPTION OF LOADS	AMPS:		LOAD (VA)		LOAD (VA)		BREAKER		BREAKER		AREA SERVED/ DESCRIPTION OF LOADS		
		AMP	POLE	C	B	A	B	AMP	POLE	AMP	POLE	CKT NO.		
1	BLOWER PLC CABINET	20	1			500	600					30	2	HEAT TRACE(PROVIDE GFCI BREAKER)
3	GC	30	1	1500			600					30	2	HEAT TRACE(PROVIDE GFCI BREAKER)
5	STRIP HEATER/AC	20	1	1000			600					30	2	HEAT TRACE(PROVIDE GFCI BREAKER)
7	AIR CONDITIONER	20	1		300	600						30	2	HEAT TRACE(PROVIDE GFCI BREAKER)
9	GC ENC82S HEATER	15	1	500			1500					20	1	AIR DRYER(PROVIDE GFCI BREAKER)
11	GC HEAT TRACE(PROVIDE GFCI BREAKER)	20	1	500								20	1	SPARE
13	SPARE	20	1									20	1	SPARE
15	SPARE	20	1									20	1	SPARE
17	SPARE	20	1									20	1	SPARE
19	SPARE	20	1									20	1	SPARE
21	SPARE	20	1									20	1	SPARE
23	SPARE	20	1									20	1	SPARE
25	SPARE	20	1									20	1	SPARE
27	SPARE	20	1									20	1	SPARE
29	SPARE	20	1									20	1	SPARE
31	SPARE	20	1									20	1	SPARE
33	SPARE	20	1									20	1	SPARE
35	SPARE	20	1									20	1	SPARE
37	SPARE	20	1									20	1	SPARE
39	SPARE	20	1									20	1	SPARE
41	SPARE	20	1									20	1	SPACE
				1500	2000	800	1200	2100	600					
				A	2000	B	4100	C	2100					
				TOTAL KVA: 8.2		AMPS: 22.79								

CONDUIT NUMBER DESCRIPTION

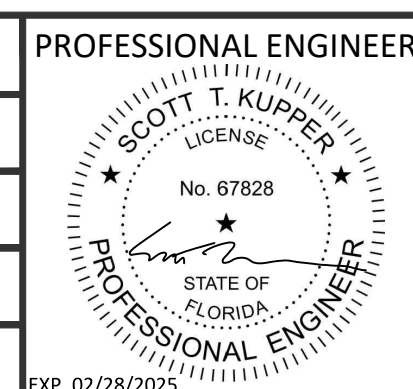


1 ELECTRICAL CONDUIT SCHEDULE
NOT TO SCALE

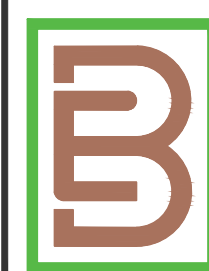
WHERE NO EQUIPMENT NUMBER IS ASSIGNED IN THE TABLE, A NUMBER WILL BE ASSIGNED TO THE EQUIPMENT AND BE CONSISTENT BETWEEN THE CONDUIT AND CABLE NUMBERS, I.E. BOP SHALL BE 99.

2 ELECTRICAL PANEL SCHEDULE
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ELECTRICAL CONDUIT & PANEL SCHEDULE

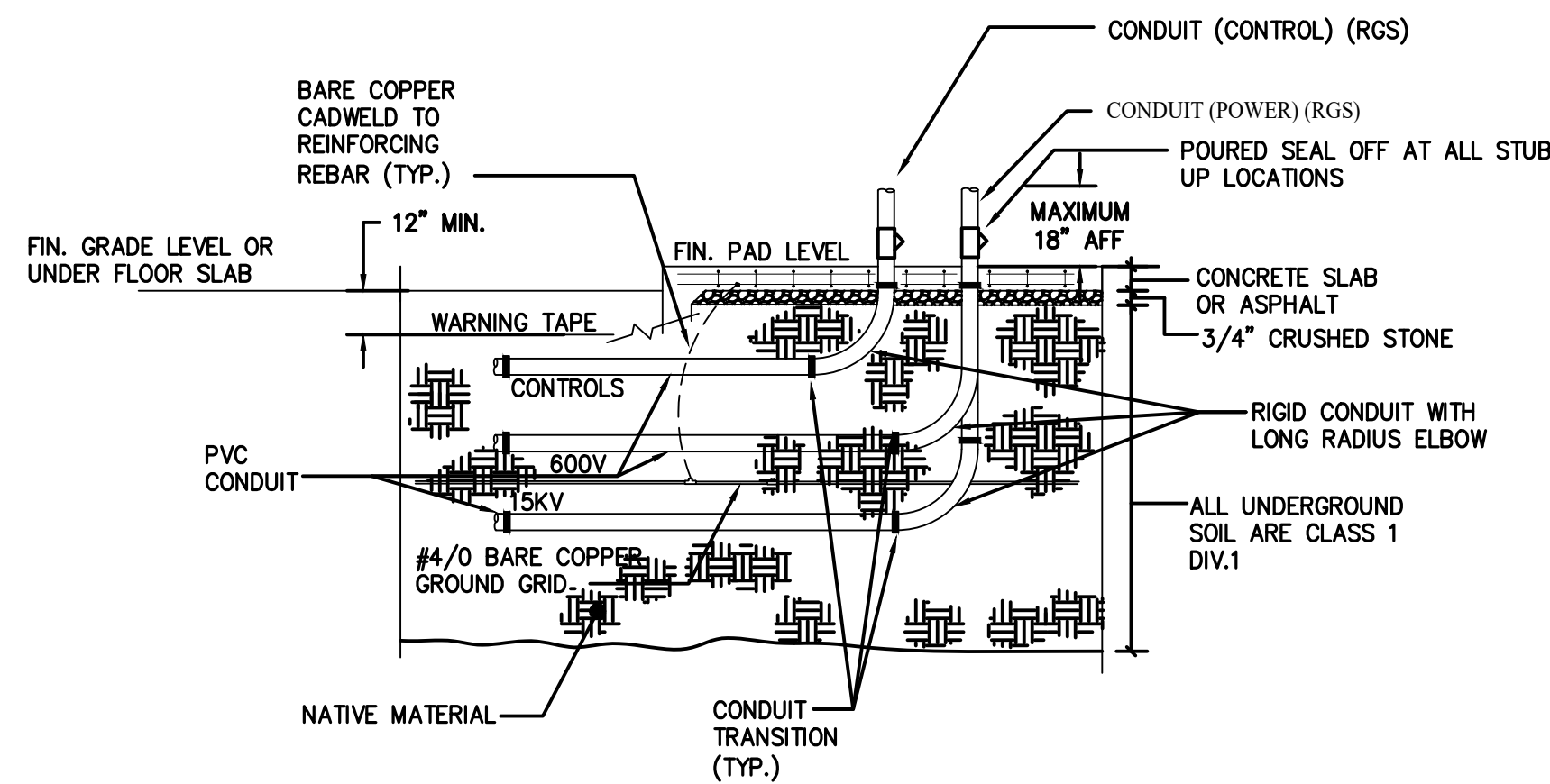
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO.

E-445G

PROJECT NO.
032-22

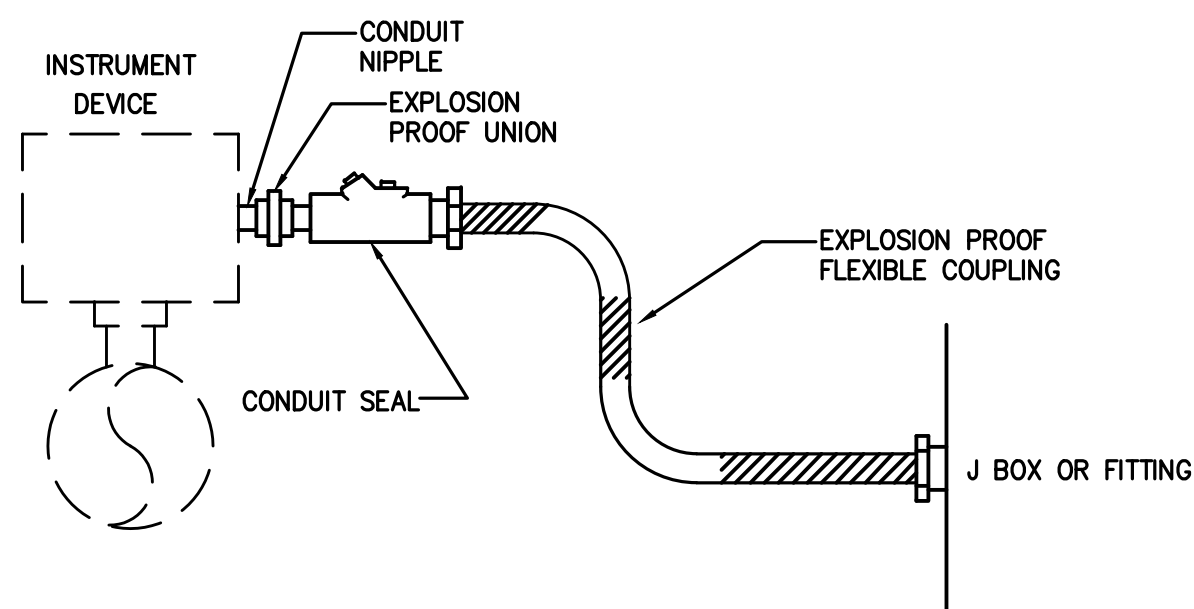
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1 TYP. GROUND FILL AND CONDUIT STUB UP DETAIL
NOT TO SCALE

NOTE:

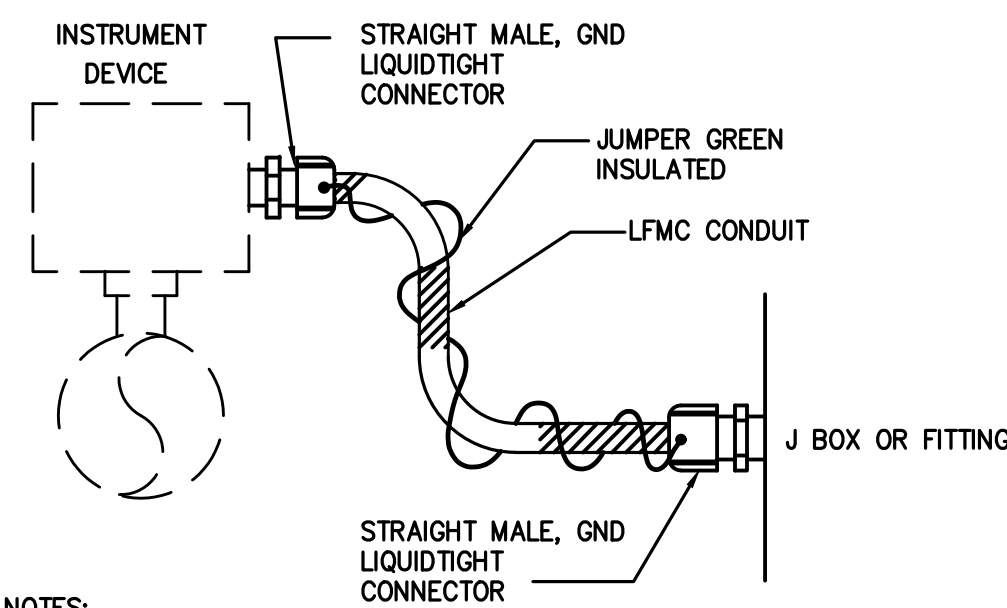
- WHERE CONDUITS STUB-UP WITHIN EQUIPMENT/ENCLOSURES, THE CONDUIT STUB-UP MAY BE PVC. WHERE CONDUIT STUBS UP EXPOSED THE CONDUIT ABOVE GRADE SHALL BE RIGID METAL CONDUIT.
- CONDUIT TRANSITIONS FOR STUB-UP SHALL BE BELOW GRADE.



NOTES:

- INSTALLATION APPLIES TO CLASS I, DIVISION 1 AREAS, GROUPS A, B, C, D.
- CONDUIT SEAL SHALL BE WITHIN 18" OF THE INSTRUMENT/DEVICE PORTION OF CONDUIT BETWEEN SEAL AND DEVICE SHALL BE IN ACCORDANCE WITH NEC 501.10.
- WHERE INSTRUMENT/DEVICE IS PROVIDED WITH FLYING LEADS PROVIDE JUNCTION BOX FOR WIRE SPLICES. SPLICES SHALL NOT BE MADE IN CONDUIT OR CONDUIT FITTINGS.
- ALL CONDUIT SEAL OFF FITTINGS SHALL BE CROUSE-HINDS EYS OR APPROVED EQUAL.
- FLEXIBLE COUPLING SHALL BE CROUSE-HINDS ECLK OR APPROVED EQUAL.

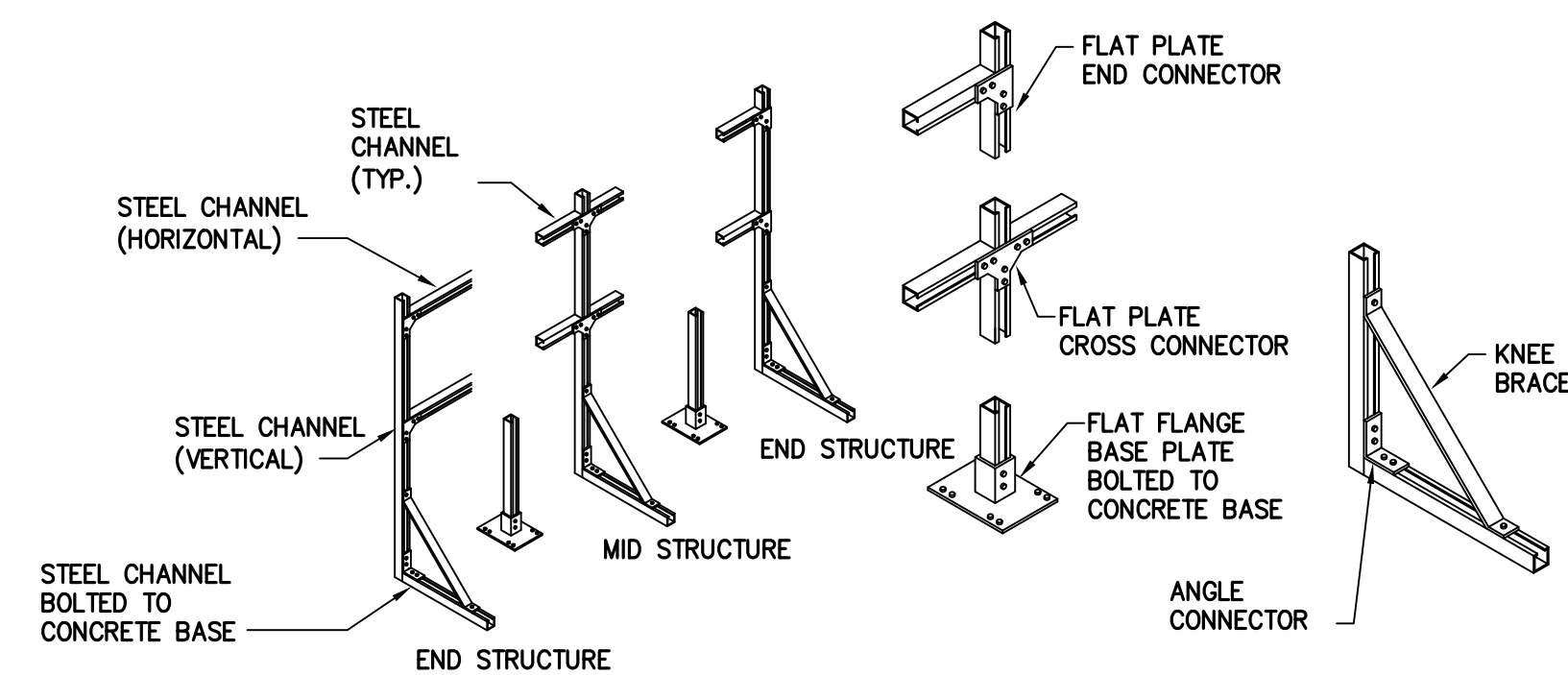
4 TYP. DEVICE CONNECTION DETAIL FOR EXPLOSION PROOF DEVICES
NOT TO SCALE



NOTES:

- INSTALLATION APPLIES TO CLASS I, DIVISION II OR UNCLASSIFIED AREAS.
- WHERE INSTRUMENT/DEVICE IS PROVIDED WITH FLYING LEADS PROVIDE JUNCTION BOX FOR WIRE SPLICES. SPLICES SHALL NOT BE MADE IN CONDUIT OR CONDUIT FITTINGS.

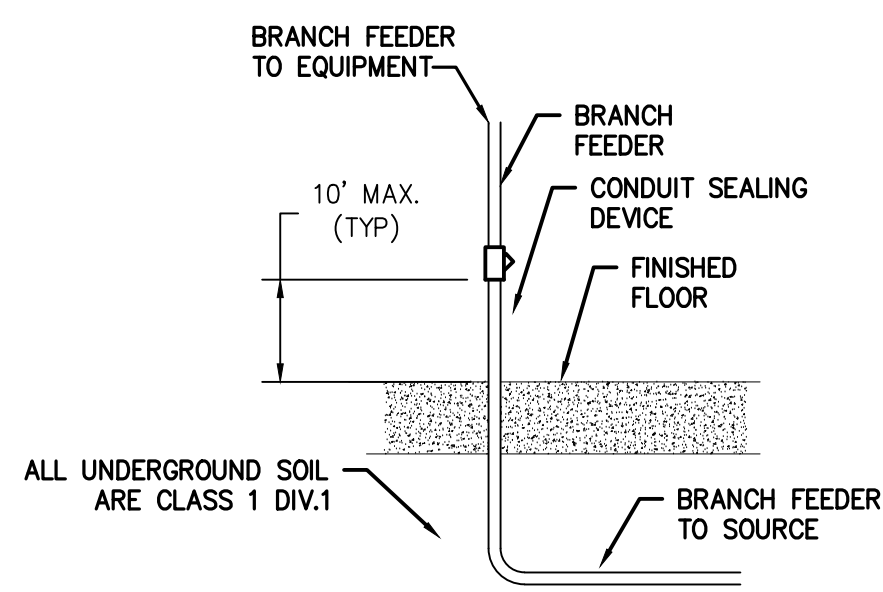
5 TYP. DEVICE CONNECTION DETAIL FOR STANDARD DEVICES
NOT TO SCALE



2 TYP. PANEL STEEL SUPPORTS
NOT TO SCALE

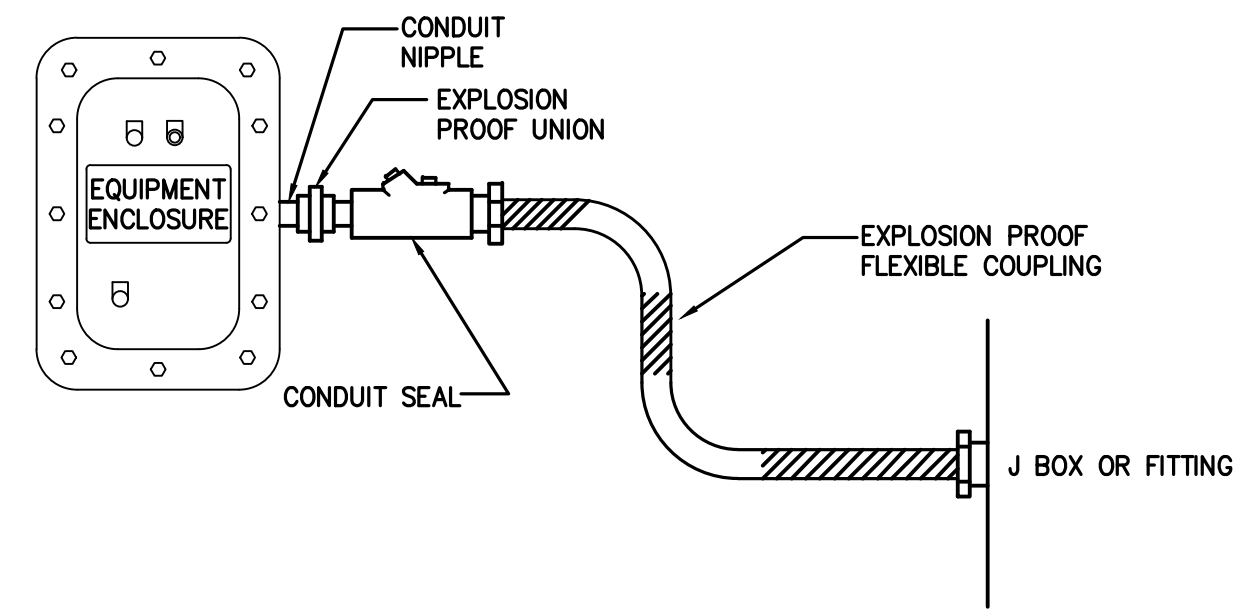
NOTES:

- INSTALLATION APPLIES TO CONDUITS CROSSING BOUNDARIES OF CLASS I, DIVISION II AREAS AND UNCLASSIFIED AREAS.
- CONDUIT SEAL SHALL BE WITHIN 10' OF THE BOUNDARY AND ANY PORTION OF CONDUIT BETWEEN THE SEAL AND THE BOUNDARY SHALL BE PER NEC 501.15 (B)(2). COORDINATE EXACT HEIGHT OF FITTING WITH INSTALLATION. IN GENERAL, FITTING SHALL BE WITHIN 18" OF FLOOR/BORDER.
- ALL CONDUIT SEAL OFF FITTINGS SHALL BE CROUSE-HINDS EYS OR APPROVED EQUAL.



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

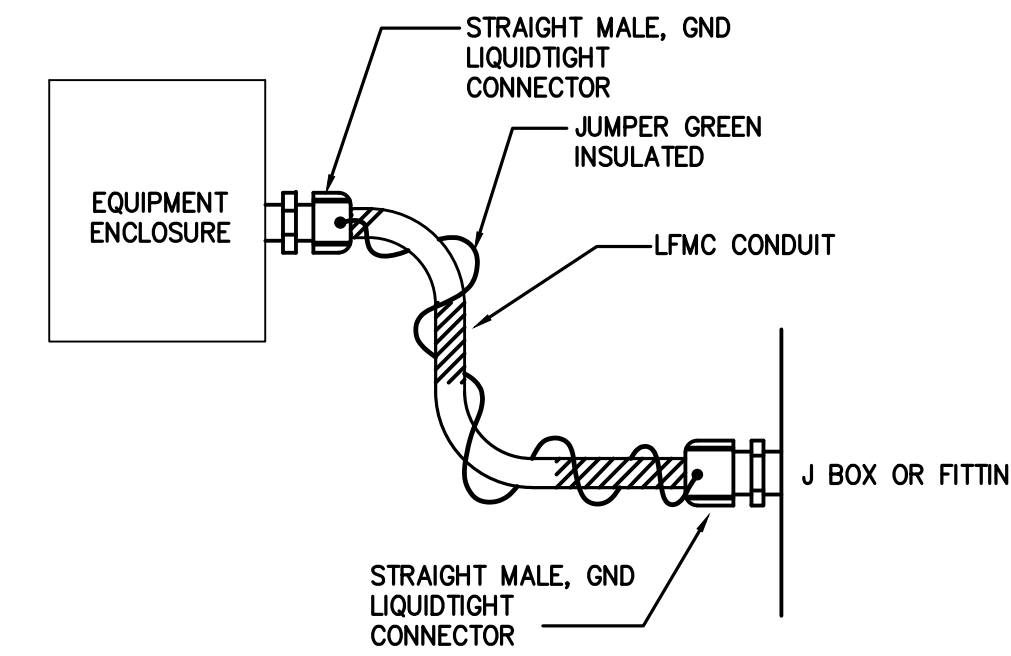
3 CLASS I DIV. II AREA CONDUIT STUB UP INSTALLATION
NOT TO SCALE



NOTES:

- INSTALLATION APPLIES TO CLASS I, DIVISION 1 AREAS, GROUPS A, B, C, D.
- CONDUIT SEAL SHALL BE WITHIN 18" OF THE ENCLOSURE. PORTION OF CONDUIT BETWEEN SEAL AND ENCLOSURE SHALL BE IN ACCORDANCE WITH NEC 501.10.
- ALL CONDUIT SEAL OFF FITTINGS SHALL BE CROUSE-HINDS EYS OR APPROVED EQUAL.
- FLEXIBLE COUPLING SHALL BE CROUSE-HINDS ECLK OR APPROVED EQUAL.

6 TYP. EQUIPMENT CONNECTION DETAIL FOR EXPLOSION PROOF ENCLOSURES
NOT TO SCALE

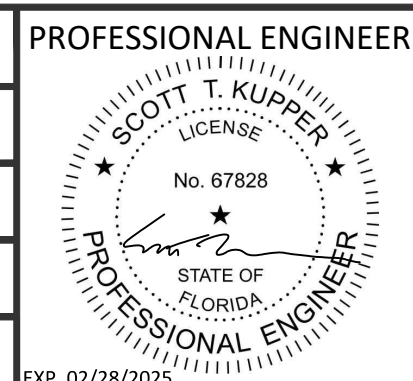


NOTES:

- INSTALLATIONS APPLIES TO CLASS I, DIVISION II OR UNCLASSIFIED AREAS.

7 TYP. EQUIPMENT CONNECTION DETAIL FOR STANDARD ENCLOSURES
NOT TO SCALE

1	09/08/2023	ISSUE FOR CONSTRUCTION	JML	CY	MAM
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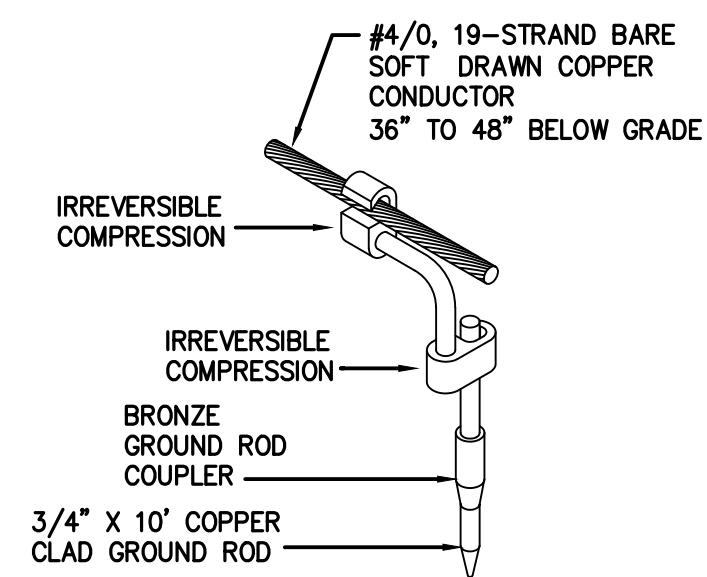
BIOGAS ENGINEERING
2321 E. 28TH STREET, SUITE 400 SIGNAL HILL, CA 90755
Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM

Kupper ENGINEERING, LLC AN ASPLUNDH ENGINEERING CO.
AMBLER YARDS
300 BROOKSIDE AVE. BLDG #14
AMBLER, PA 19002
TELEPHONE 215-884-5970

ELECTRICAL DETAILS
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

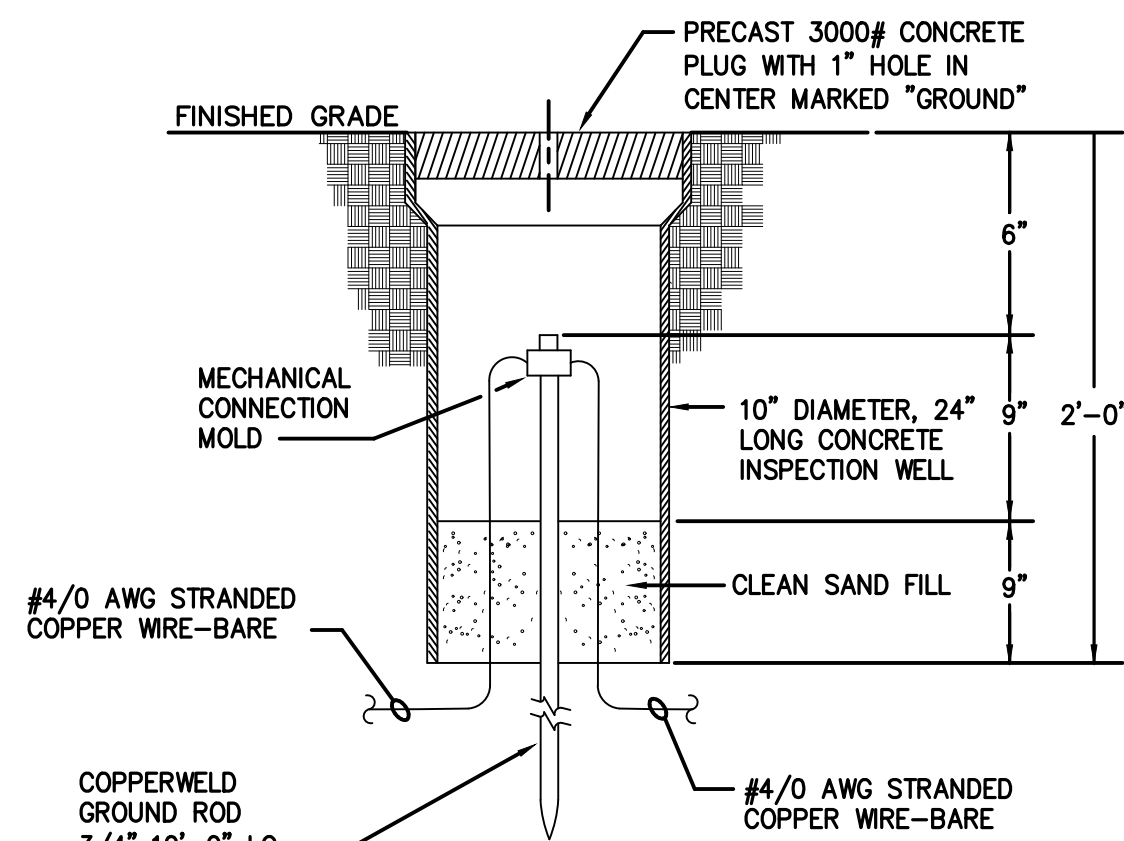
DRAWING NO. **E-445H**
PROJECT NO. 032-22

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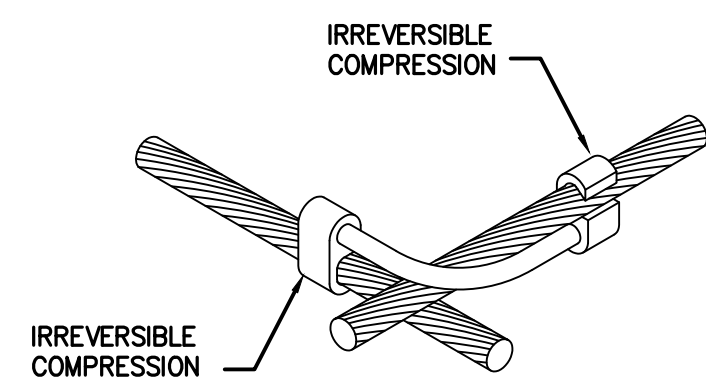
1 TYP. GROUND WIRE TO GROUND ROD CONNECTION DETAIL

NOT TO SCALE



2 GROUND WELL TEST STATION

NO TO SCALE

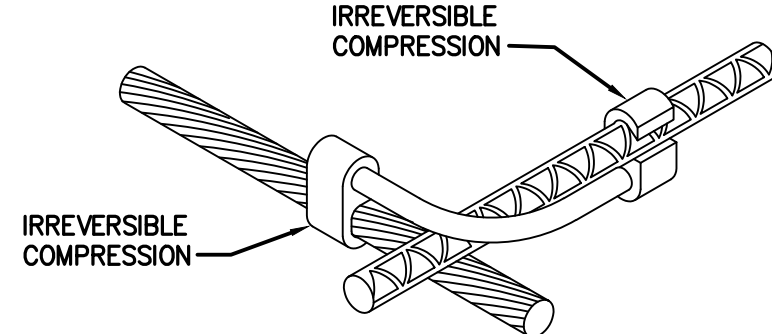


3 TYPICAL MECHANICAL GROUND CONNECTION DETAIL

NOT TO SCALE

REBAR SIZE	CABLE SIZE	MOLD PART #	MECH. METAL
#5	#4	**	**

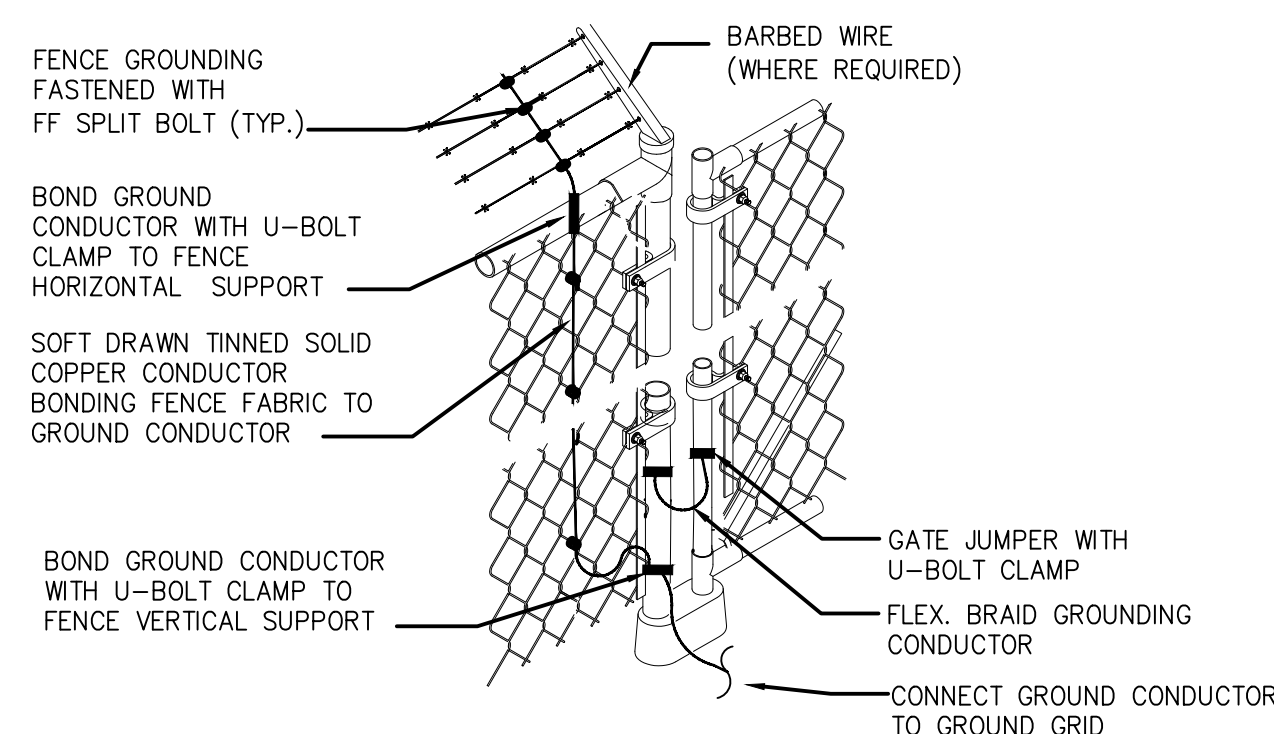
* = VERIFY EXACT REBAR SIZE IN FIELD.
** = VERIFY EXACT PART IN FIELD.



NOTE: REBAR SHALL BE INSTALLED IN A MINIMUM OF ONE CONTINUOUS 20FT LENGTH PER NEC250.52(A)(3).

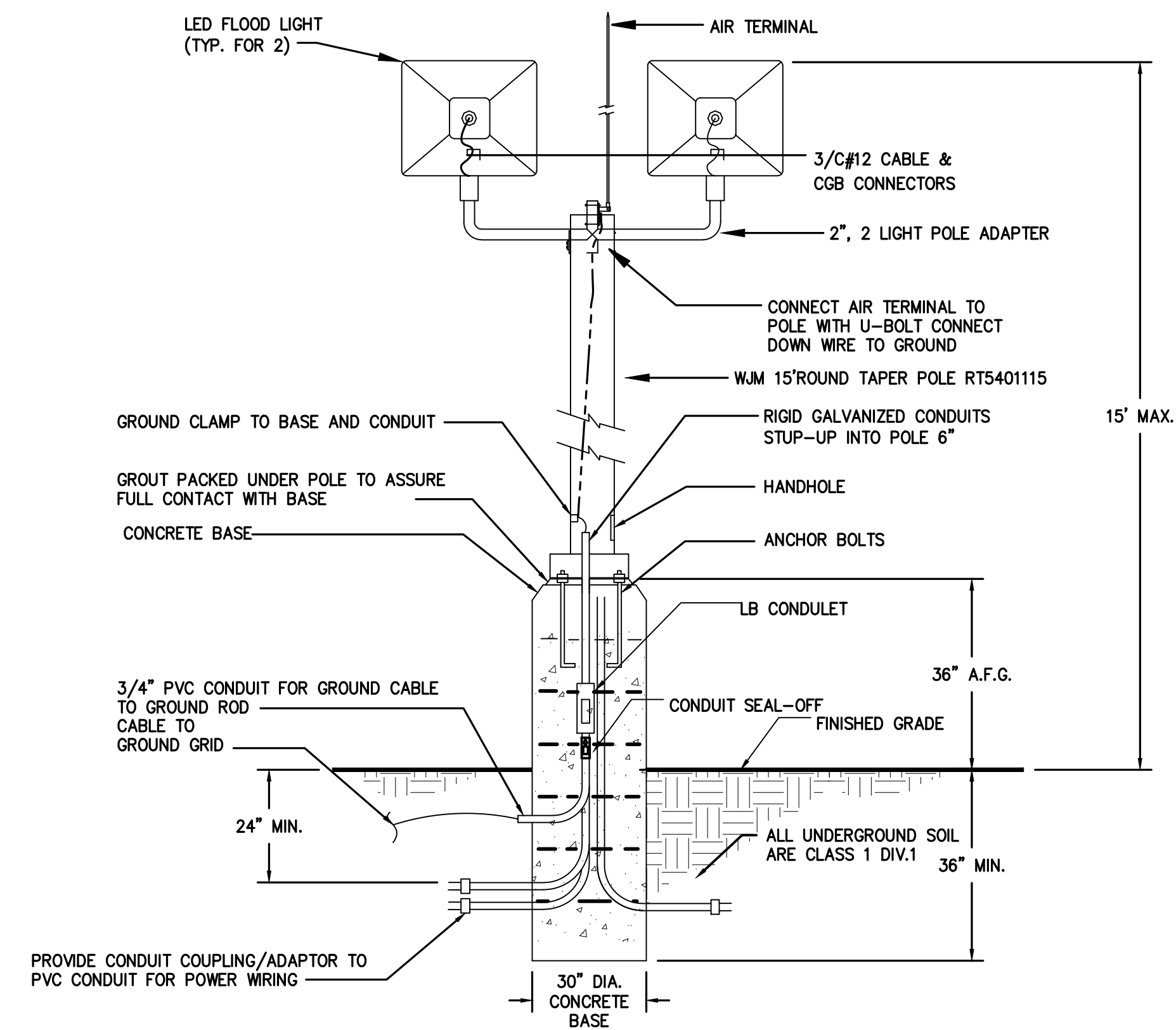
4 TYPICAL GROUND WIRE TO REBAR CONNECTION

NOT TO SCALE



5 FENCE/SWING GATE GROUNDING DETAIL

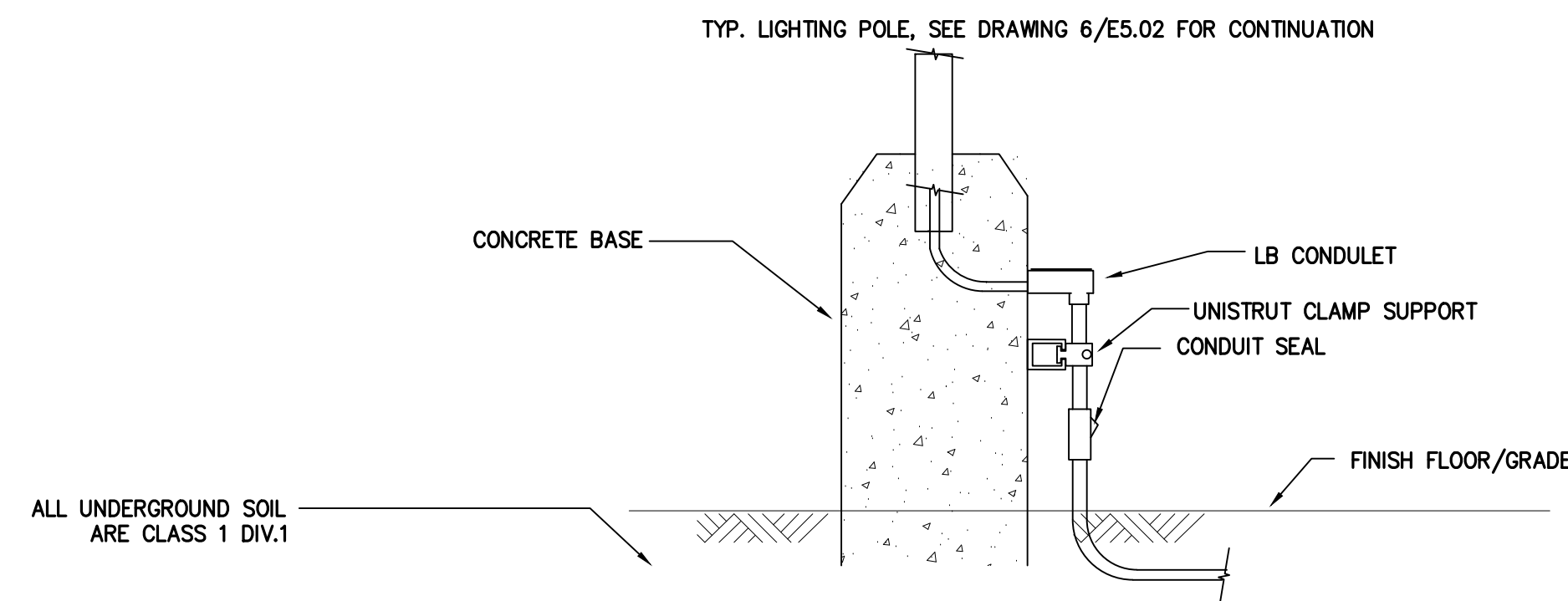
NOT TO SCALE



6 TYP. LIGHT POLE DETAIL

NOT TO SCALE

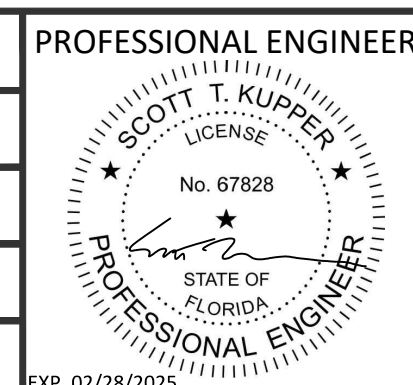
NOTES:
1. COORDINATE ALL ANCHORS, PLATES, ETC. WITH SPECIFIC APPROVED FIXTURE MANUFACTURER'S RECOMMENDATIONS.



7 TYP. LIGHT POLE CONCRETE BASE ENLARGED DETAIL(SIDE VIEW)

NOT TO SCALE

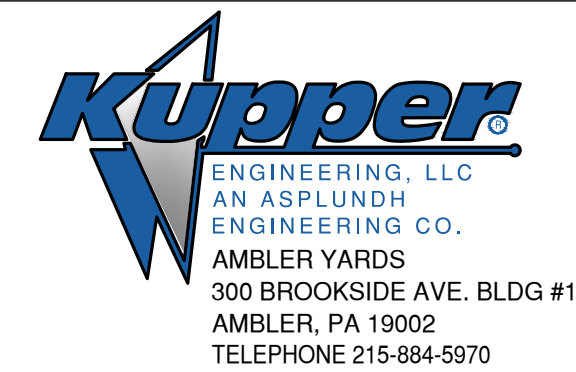
1	09/08/2023	ISSUE FOR CONSTRUCTION	JML	CY	MAM
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SIGNAL HILL, CA 90755
Ph: (562) 726-3565
EMAIL: INFO@BIOGASENG.COM



ELECTRICAL DETAILS
LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

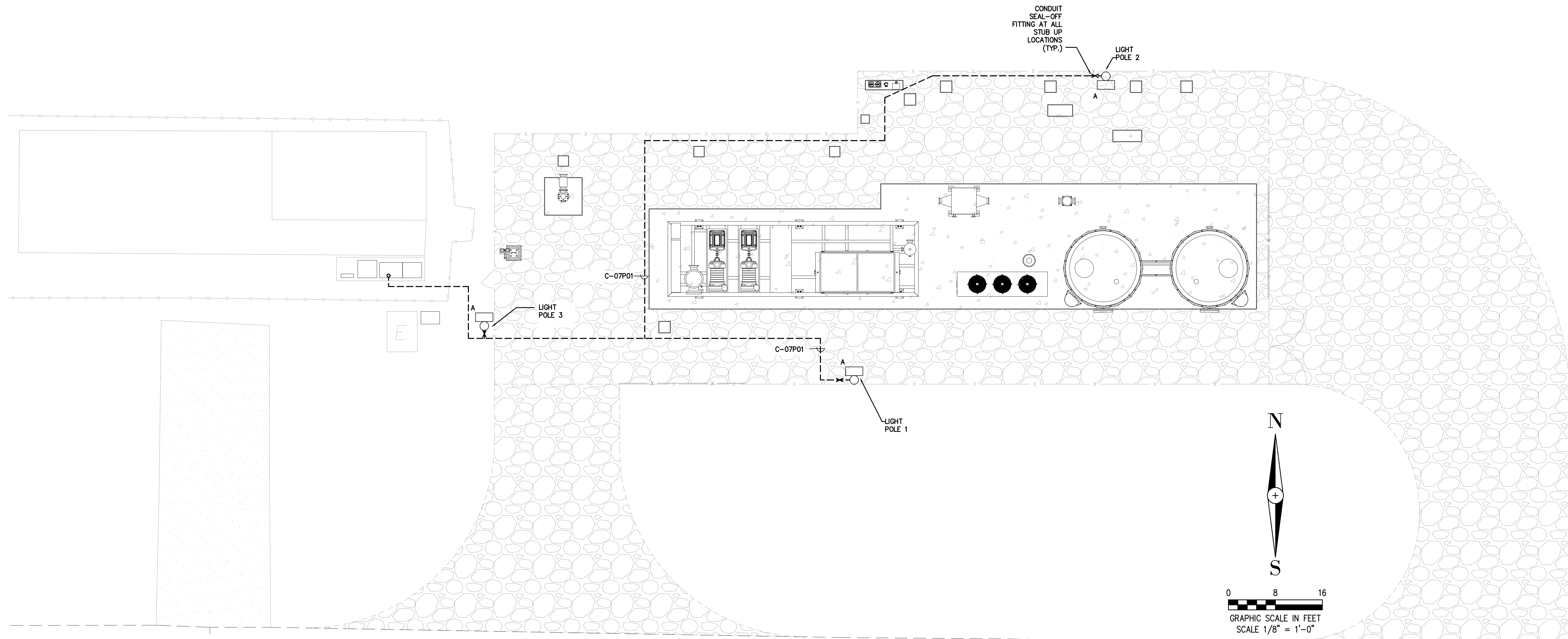
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E-4451
PROJECT NO.
032-22

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SHEET NOTES:

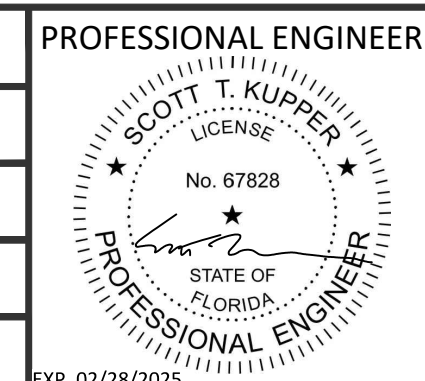
- UNLESS OTHERWISE NOTED, ALL SINGLE PHASE BRANCH CIRCUIT WIRING SHALL BE A MINIMUM OF 2#12 + 1#12G, 3/4" PVC FOR 20A CIRCUITS WITH RUNS OF UP TO 200' AT 277V. FOR CIRCUIT RUNS EXCEEDING 200' AT 277V, BRANCH CIRCUIT WIRING SHALL BE 2#10 + 1#10G, 3/4" PVC.

FIXTURE TAG	A
DESCRIPTION	CLASS 1, DIV 2 WP SINGLE FLOOD LIGHT, POLE MOUNTED W/SLIPFITTER ADAPTER
MANUFACTURER	EATON CROUSE-HINDS
CATALOG NUMBER	FMV-15L-C-Y-UNV1-76
LAMP TYPE	LED
LUMENS	15181
INPUT WATTS/VOLTS	131w/277v
POLE	WJM RT5401115
DETAIL	2/E5.01



1 ELECTRICAL LIGHTING PLAN
SCALE:

1	09/08/2023	ISSUE FOR CONSTRUCTION	JML	CY	MAM
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ELECTRICAL LIGHTING PLAN
LANDFILL GAS BLOWER SKID
& FLARE REPLACEMENT

DRAWING NO.
E-445J
PROJECT NO.
032-22

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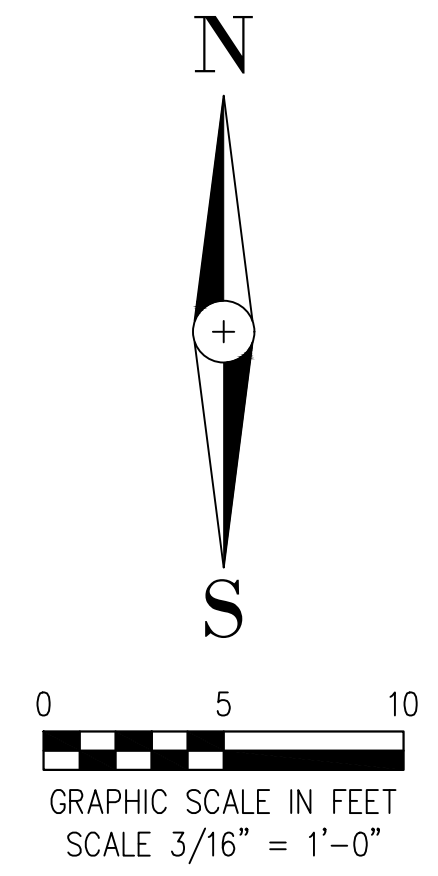
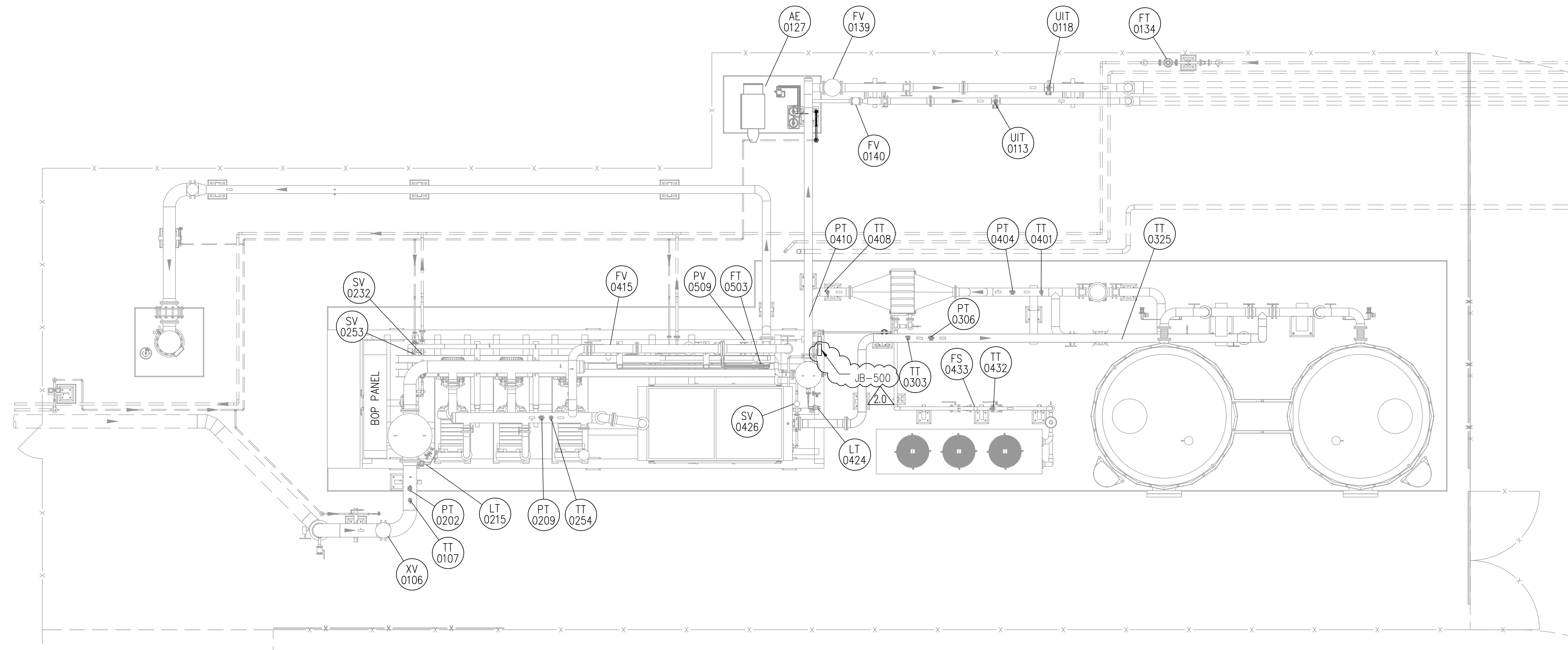


TABLE 1:-
INSTRUMENT LIST STICK BUILT

SR. NO.	INSTRUMENT TAG	P&ID NO.	APPROX. ELEVATION FT.-IN.
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:-
ABBREVIATIONS

TAG	DESCRIPTION
AE	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:

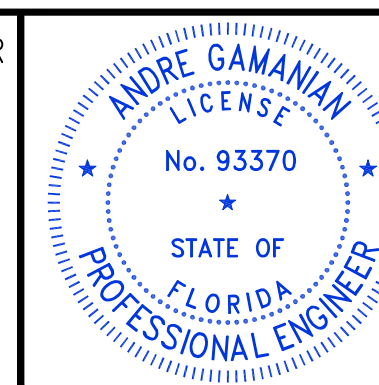
- FOR P&ID REFER DRAWING P-445G TO P-445L.
- REFER VALVE/SP-ITEM LIST & INSTRUMENT LIST DRAWING M-445S TO M-445AE (13 SHEETS) FOR THE SCOPE OF SUPPLY OF INSTRUMENTS, GAUGES, VALVES AND SP-ITEM

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN BY	CHK BY	APRV BY
1.0	08/24/2022	ISSUED FOR BID	AK	TP	AG
2.0	02/03/2023	ISSUED FOR CONSTRUCTION	AK	TP	AG


PROFESSIONAL ENGINEER

ANDRE GAMANIAN, P.E.
FL LICENCE NO.93370
EXP. 02/28/2025



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

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

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

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

INSTRUMENT LOCATION PLAN

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **J-445A**

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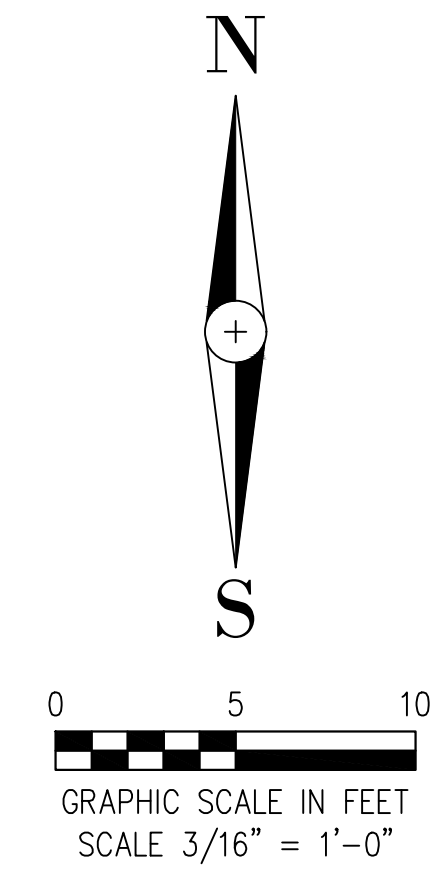
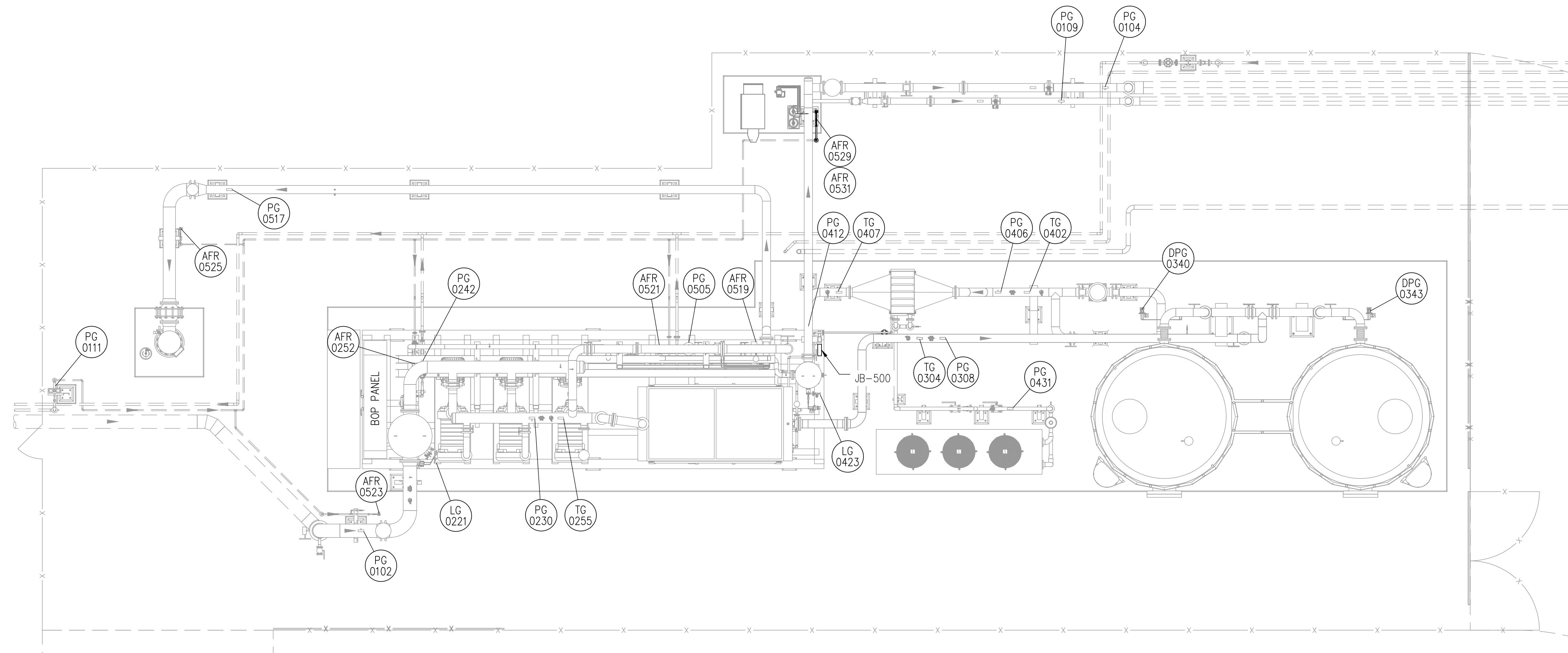


TABLE 1:-
GAUGE/VALVE LIST STICK BUILT

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:-
ABBREVIATIONS

TAG	DESCRIPTION
AFR	AIR FILTER REGULATOR
LG	LEVEL GAUGE
PG	PRESSURE GAUGE
PVRV	PRESSURE VACUUM RELIEF VALVE
PSV	PRESSURE SAFETY VALVE
TG	TEMPERATURE GAUGE
DPG/PDG	DIFFERENTIAL PRESSURE GAUGE

NOTES:

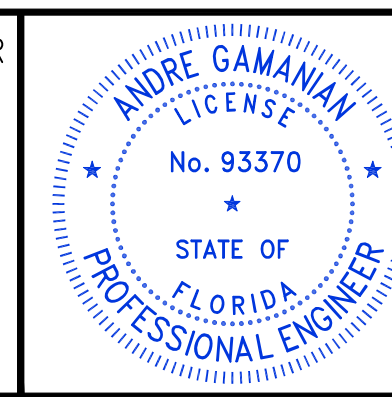
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ISSUED FOR CONSTRUCTION

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	AK	TP	AG

PROFESSIONAL ENGINEER

ANDRE GAMANIAN, P.E.
FL LICENCE NO.93370
EXP. 02/28/2025



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

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

GAUGE AND VALVE LOCATION PLAN

LANDFILL GAS BLOWER SKID & FLARE REPLACEMENT

DRAWING NO. **J-445B**