

GAS DETECTION SPECIFICATIONS

ELECTRONIC METHANE DETECTION SYSTEM

A. GENERAL

1. SCOPE: THE CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR, AND EQUIPMENT FOR THE CONSTRUCTION OF THE GAS DETECTION SYSTEM AS SPECIFIED HEREIN AND AS INDICATED ON THE DRAWINGS, COMPLETE IN PLACE, INCLUDING METHANE SENSORS, MONITOR PANELS, ALARMS, CONDUIT AND WIRING, ACCESS PANELS, AND POWER TO METHANE PANEL.
2. RELATED WORK NOT INCLUDED:
VENT PIPING AND MEMBRANE UNDER SLAB
3. THE CONTRACTOR SHALL NOTIFY THE CONTRACTING OFFICER OR HIS REP. PRIOR TO COMMENCEMENT OF WORK.
4. ALL METHANE DETECTION INSTALLATION SHALL BE PERFORMED BY A QUALIFIED FIRM, WITH EXTENSIVE EXPERIENCE IN THE INSTALLATION OF GAS ALARM SYSTEMS.
5. ALL CONDITIONS HEREIN ARE MINIMUM REQUIREMENTS FOR THE METHANE DETECTION SYSTEM. ANY MORE RESTRICTIVE REQUIREMENTS IN THE OVERALL PROJECT SPECIFICATIONS SHALL GOVERN THE WORK.
6. THE METHANE ENGINEER/INSPECTOR SHALL REJECT WORK WHICH IS NOT IN COMPLIANCE WITH THESE PLANS, SPECIFICATIONS, OR ANY FEDERAL CODES. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH ITS UL, FM OR OTHER APPROVED LISTINGS.

B. CONTRACTOR RESPONSIBILITY

1. SHOP DRAWINGS: SUBMIT FOR APPROVAL OF THE METHANE ENGINEER A MINIMUM OF FOUR (OR SUCH GREATER NUMBER AS REQUIRED BY THE OVERALL PROJECT SPECIFICATIONS) SETS OF SHOP DRAWINGS WHERE REQUIRED BELOW, OR WHERE ANY VARIATION OR DEVIATION IS INTENDED TO BE MADE TO THESE PLANS AND SPECIFICATIONS.
2. PLANS AND SPECIFICATIONS: THESE METHANE PLANS AND SPECIFICATIONS ARE INTENDED TO BE COMPLEMENTARY AND COOPERATIVE WITH ALL OTHER PROJECT DOCUMENTS, AND IN NO WAY ARE INTENDED TO CHANGE OR DELETE REQUIREMENTS OF OTHER PLAN AND SPECIFICATION SECTIONS OF THE PROJECT. SHOULD THE EQUIPMENT SUPPLIER OR CONTRACTOR DISCOVER ANY ERROR OR OMISSION IN THESE METHANE PLANS OR CONTRADICTION BETWEEN THE METHANE PLANS AND OTHER CONTRACT DOCUMENTS, THE MATTER SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE CONTRACTING OFFICER OR HIS REPRESENTATIVE.
3. SITE CONDITIONS: THE LOCATION OF THE WORK, ITS GENERAL NATURE AND EXTENT, THE FORM AND GENERAL DIMENSIONS OF THE PROJECT AND APPURTENANT WORK AS SHOWN ON THE CONTRACT DOCUMENTS ARE HEREBY MADE A PART OF THESE SPECIFICATIONS. WHILE MOST OF THE INFORMATION PERTAINING TO SITE CONDITIONS AFFECTING THE COST OF THE WORK IS CONTAINED IN THESE PLANS AND SPECIFICATIONS, THE COMPLETENESS OR ACCURACY IS NOT WARRANTED, AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ASCERTAIN THE EXISTENCE OF ANY CONDITIONS AFFECTING THE COST OF THE WORK WHICH WOULD HAVE BEEN DISCLOSED BY REASONABLE EXAMINATION OF THE SITE.
4. AS-BUILT DRAWINGS: THE CONTRACTOR SHALL HAVE ON FILE ONE SET OF DRAWINGS, HEREINAFTER REFERRED TO AS THE "RECORD DRAWINGS," THESE SHALL BE SUPPLEMENTED BY ANY AND ALL DETAILED SKETCHES AS NECESSARY TO INDICATE FULLY THE WORK AS-BUILT. THE RECORD DRAWINGS SHALL BE ACCESSIBLE AT ALL TIMES DURING THE CONSTRUCTION PERIOD AND SHALL BE DELIVERED TO THE CONTRACTING OFFICER OR HIS REP. UPON COMPLETION OF THE WORK.
5. APPLICABLE LAWS AND ORDINANCES: THE LOCATION OF THE WORK IS WITHIN THE CITY OF ██████████. THE CONTRACTOR SHALL AT ALL TIMES OBSERVE AND BE IN CONFORMANCE WITH ALL APPLICABLE ORDINANCES AND CODES OF SAID CITY. THE CONTRACTOR SHALL ALSO CONFORM TO ALL FEDERAL, STATE, AND LOCAL REGULATIONS PERTAINING TO SAFETY, AND SHALL SPECIFICALLY COMPLY WITH THE CONDITIONS OF ANY AND ALL PERMITS ISSUED BY THE CITY FIRE DEPARTMENT, AND OSHA REGULATIONS RELATED TO GASES AND CONFINED SPACES.
6. LAYOUT OF WORK: THE CONTRACTOR SHALL LAY OUT THE METHANE WORK FROM LINES, ELEVATIONS AND LOCATIONS ESTABLISHED BY THE OWNER AND SHALL BE RESPONSIBLE FOR ALL MEASUREMENTS IN CONNECTION THEREWITH. THE EXTENT OF THE LINES, ELEVATIONS AND LOCATIONS TO BE ESTABLISHED BY THE OWNER SHALL BE LIMITED TO THE MINIMUM AMOUNT NECESSARY FOR THE CONTRACTOR TO MAKE ESSENTIAL MEASUREMENTS THEREFROM FOR LAYOUT AND DETAIL OF THE WORK. THE CONTRACTOR SHALL AT HIS OWN EXPENSE FURNISH ALL EQUIPMENT AND LABOR THAT MAY BE REQUIRED IN SETTING AND LAYING OUT ANY PART OF THE WORK.
7. CLEANUP: AFTER COMPLETION OF ALL WORK OF THIS SECTION, AND PRIOR TO MAKING APPLICATION FOR FINAL ACCEPTANCE OF THE WORK BY THE METHANE ENGINEER, THE CONTRACTOR SHALL CLEAR THE SITE OF ALL DEBRIS, MATERIALS, EQUIPMENT, AND TEMPORARY CONSTRUCTION OR FACILITIES OF WHATEVER NATURE, INCLUDING ALL AREAS THAT HAVE BEEN USED FOR FIELD OFFICE, MANAGEMENT, STAGING, STORAGE, CUTTING OR OTHER PREPARATION.
8. INSURANCE: THE GAS DETECTION SYSTEM CONTRACTOR SHALL CARRY BOTH LIABILITY AND WORKMAN'S COMPENSATION INSURANCE IN SATISFACTION OF THE CONTRACTING OFFICER OR HIS REP'S REQUIREMENTS.
9. CONSTRUCTION SCHEDULE: THE GAS DETECTION SYSTEM CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR TO INSURE THAT ALL REQUIRED CONDUIT IS IN PLACE PRIOR TO CLOSING WALLS OR CEILINGS, AND THAT THE COMPLETE AND OPERABLE SYSTEM IS IN PLACE IN TIME TO ALLOW CALIBRATION OF THE SENSORS AND FIRE DEPARTMENT OBSERVATION OF START UP PRIOR TO OWNER'S REQUEST FOR CERTIFICATE OF OCCUPANCY.
10. GUARANTEE OF WORK: THE CONTRACTOR SHALL GUARANTEE THE ENTIRE ELECTRONIC GAS DETECTION SYSTEM WORK CONSTRUCTED UNDER THESE SPECIFICATIONS TO BE FREE OF DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FOLLOWING THE DATE OF ACCEPTANCE OF THE WORK BY THE CONTRACTING OFFICER OR HIS REP., OR SUCH LONGER PERIOD OF TIME AS MAY BE REQUIRED BY OVERALL CONTRACT DOCUMENTS OR BY LAW. THE CONTRACTOR SHALL AGREE TO MAKE AT NO COST TO THE CONTRACTING OFFICER, OR THE CONTRACTING OFFICER'S REP, ANY REPAIRS OR THE REPLACEMENTS MADE NECESSARY BY SUCH DEFECTS WHICH BECOME EVIDENT WITHIN THE GUARANTEE PERIOD. THE CONTRACTOR SHALL FURTHER AGREE TO INDEMNIFY AND SAVE HARMLESS, THE CONTRACTING OFFICER, OR THE CONTRACTING OFFICER'S REP, AND THE ENGINEER AND THEIR OFFICERS, AGENTS, AND EMPLOYEES AGAINST AND FROM ALL CLAIMS AND LIABILITY ARISING FROM DAMAGE OR INJURY DUE TO SAID DEFECTS. THE CONTRACTOR SHALL MAKE REPAIRS AND REPLACEMENTS PROMPTLY UPON RECEIPT OF WRITTEN ORDER FROM THE CONTRACTING OFFICER OR THE CONTRACTING OFFICER'S REP. IF THE CONTRACTOR FAILS TO MAKE THE REPAIRS OR REPLACEMENTS PROMPTLY, THE CONTRACTING OFFICER OR THE CONTRACTING OFFICER'S REP MAY DO SO, AND THE CONTRACTOR SHALL BE LIABLE TO THE CONTRACTING OFFICER OR THE CONTRACTING OFFICER'S REP, FOR THE COST SUCH REPAIRS AND REPLACEMENTS.

C. CHANGES IN WORK

1. CHANGES REQUESTED BY THE CONTRACTOR: CHANGES IN WORK REQUESTED BY THE CONTRACTOR MAY BE GRANTED IF THESE CHANGES FACILITATE THE WORK, DO NOT MATERIALLY AFFECT THE WORK, ARE NOT DETRIMENTAL TO THE INTERESTS OF THE CONTRACTING OFFICER OR HIS REP., AND ARE NOT OUTSIDE OF APPLICABLE CODES AND STANDARDS. WHEN CONTRACTOR REQUESTED CHANGES ARE GRANTED THEY SHALL BE AT NO ADDITIONAL COST OR A REDUCTION OF COST TO THE CONTRACTING OFFICER, OR THE CONTRACTING OFFICER'S REP. THE CONTRACTOR SHALL HAVE NO RIGHT TO DEMAND ACCEPTANCE OF REQUESTED CHANGES.
2. EXTRA WORK: EXTRA WORK SHALL BE DEFINED AS WORK WHICH WAS NOT INCLUDED IN THE PLANS, SPECIFICATIONS, OR OTHER CONTRACT DOCUMENTS, AND NOT REQUIRED BY APPLICABLE CODES AND ORDINANCES. ALL WORK OF THESE METHANE SYSTEM PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS IS COMPLEMENTARY TO AND IN CONJUNCTION WITH OTHER WORK OF THE PROJECT CONTRACT DOCUMENTS. APPLICABLE CODES AND STANDARDS, ANY AND ALL SUCH SEPARATE REQUIREMENTS SHALL ALSO BE A REQUIREMENT OF THIS SECTION, WHETHER OR NOT SPECIFICALLY STATED, AND SUCH WORK SHALL NOT BE CONSIDERED EXTRA WORK. IT SHALL BE THE BURDEN OF THE CONTRACTOR TO BECOME FAMILIAR WITH ALL CONTRACT DOCUMENTS, APPLICABLE CODES AND STANDARDS. THE CONTRACTING OFFICER OR THE CONTRACTING OFFICER'S REP. MAY REQUEST INCREASES, DECREASES, DELETIONS OR CHANGES TO THE WORK, WITH PAYMENT ADJUSTMENTS MADE AS MUTUALLY AGREED BETWEEN THE CONTRACTING OFFICER, OR THE CONTRACTING OFFICER'S REP, AND THE CONTRACTOR.
3. CHANGED CONDITIONS: UPON DISCOVERY THE CONTRACTOR SHALL PROMPTLY NOTIFY THE CONTRACTING OFFICER, OR THE CONTRACTING OFFICER'S REP, IN WRITING OF ANY CHANGE IN SITE CONDITIONS, AND SHALL ALLOW THE CONTRACTING OFFICER, OR THE CONTRACTING OFFICER'S REP, TO INVESTIGATE SUCH CONDITIONS BEFORE THEY ARE DISTURBED. AN ADJUSTMENT IN COMPENSATION AND/OR PERFORMANCE TIME MAY BE GRANTED IF APPROVED BY THE CONTRACTING OFFICER, OR THE CONTRACTING OFFICER'S REP.

D. HARDWARE SPECIFICATIONS

1. SCOPE
- THE INFRARED GAS DETECTION SYSTEM SHALL BE PROCURED AS A SYSTEM FROM A SINGLE SOURCE/VENDOR. THIS SHALL INCLUDE ALL INCIDENTAL AND APPURTENANT EQUIPMENT REQUIRED FOR PROPER OPERATION. THE SYSTEM SHALL CONSIST OF AN INSTRUMENT PACKAGE SPECIFICALLY DESIGNED FOR CONTINUOUS FIXED MONITORING OF AN ATMOSPHERE METHANE GAS AND ACTIVATION OF WARNING AND/OR ALARM DEVICES AND/OR SHALL INTERCONNECT WITH MECHANICAL EQUIPMENT AS SPECIFIED, WHEN PREDETERMINED GAS CONCENTRATION LEVELS ARE REACHED. THE LOCATIONS OF THE REQUIRED MONITORING POINTS ARE SPECIFIED ON THE DRAWINGS.
2. POWER REQUIREMENTS:
- Y. SYSTEM SHALL OPERATE 24Vdc (20Vdc MIN., 32 Vdc MAX.), @ .4 AMP, <4 WATT PER SENSOR, SUPPLIED THROUGH A CONTINUOUS BATTERY BACK-UP SYSTEM, OR IF APPROVED, BY A 120vac TO 24Vdc POWER SUPPLY WIRED TO IN THE METHANE CONTROL PANEL. IN THE EVENT OF A POWER FAILURE THE SYSTEM SHALL HAVE A RELIABLE EXTERNAL POWER SUPPLY CAPABLE OF POWERING THE DETECTION SYSTEM AND ANY AUXILIARY WARNING EQUIPMENT FOR A PERIOD OF 24 HOURS.
3. FABRICATION DRAWING APPROVAL:
- COMPLETE DETAILED SHOP DRAWINGS AND WIRING DIAGRAMS OF THE METHANE SYSTEM AND METHANE PANEL SHALL BE SUBMITTED FOR APPROVAL OF THE METHANE ENGINEER, PRIOR TO ANY FABRICATION OR SHIPPING. SHOP DRAWINGS SHALL INCLUDE DIMENSIONS OF PANEL AND LAYOUT OF ALL PANEL CONTENTS, DIMENSIONS AND WEIGHT OF BATTERY & CHARGER SETUP, AND RISER DIAGRAM OF THE SYSTEM.
4. METHANE PANEL(S)/GENERAL:
- METHANE PANEL(S) SHALL BE SHOP FABRICATED AND TESTED ~~NEMA~~ 12 FLOOR OR WALL MOUNT WITH PLEXIGLASS FRONT VIEWING PORT WITH ALL EQUIPMENT INSTALLED PRIOR TO SHIPPING. PANEL(S) SHALL INCLUDE PROVISION TO SECURELY MOUNT UNIT TO WALL, OR CONCRETE PAD, AS SHOWN ON THE DRAWINGS AND DETAILS.
5. SYSTEM SHALL INCLUDE:
- | | |
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| 13 | INFRARED METHANE GAS SENSOR(S)/TRANSMITTER(S) (PER SECTION 4. BELOW), EACH IN AN EXPLOSION PROOF HOUSING, WITH SENSORS WITH A SPLASHGUARD , ALL TO BE FIELD INSTALLED, AT LOCATIONS PER THE PLANS. |
| 0 | CALIBRATION SHROUDS |
| 0 | REMOTE CALIBRATION SETUPS, INCLUDING SENSOR EXTENSION KIT, AND PORTED ADAPTER WITH POREX FILTER |
| 1 | ENCLOSURE, DIMENSIONS AS REQUIRED TO HOUSE THE MONITORS. ENCLOSURE WILL PROVIDE PROTECTION FROM DUST, DIRT, OIL AND WATER. A PLEXIGLASS WINDOW WITH SIZE TO SEE ALL MONITOR CONTROLS AND INDICATORS SHALL BE PROVIDED, PLUS THE FOLLOWING-FOR OUTSIDE. |
| 13 | INDIVIDUAL CONTROL MODULES (PER SECTION 5. BELOW) |
| 5 | BLANK CONTROL MODULE EXPANSION SLOTS IN STANDARD RACK, AS SPACE FOR FUTURE EXPANSION OF THE SYSTEM. |
| 1 | SEPARATE AUXILIARY RELAY OUTPUTS FOR LOW GAS (WARNING) |
| 1 | SEPARATE AUXILIARY RELAY OUTPUTS FOR HIGH GAS (ALARM) |
| 1 | SEPARATE AUXILIARY RELAY OUTPUTS FOR MALFUNCTION (FAL) |
| N/A | S.A.M. (SEQUENTIAL ALARM MODULE(S)) |
| N/A | V.A.M. (VOTING ALARM MODULE(S)) |
| N/A | C.A.M. (COMMON ALARM MODULE(S)) |
| 1 | DIAL-UP SYSTEM(S) FOR REMOTE 24 HOUR MANNED FIRE WARNING SERVICE TO BE PROVIDED BY OWNER SECURITY CO. 24 VDC BATTERY BACK-UP SYSTEM (24 HOURS) MONITORING |
| 0 | POWER PLUS 10 MINUTES FULL ALARM, AS SPECIFIED. THIS MAY BE LOCATED OUTSIDE OF THE NEMA 12 PANEL, NEAR THE PANEL, UNLESS THE PLANS ELSEWHERE SPECIFY THAT IT MUST BE INSIDE |
| 1 | PRE-ALARM(S) PER SPECIFICATIONS. |
| 11 | STROBE(S), PER SPECIFICATIONS. |
6. SPARE PARTS TO BE SUPPLIED WITH SYSTEM:

QUANTITY	ITEM	RECOMMENDED STOCK
0	CONTROLLER	1 PER 20 CHANNELS
0	TRANSMITTER (AMP)	1 PER 20 CHANNELS
0	ZONE ALARM MODULE	1 PER SYSTEM
0	REMOTE CALIBRATION MODULE	1 PER 20 CHANNELS
0	REMOTE CALIBRATION METER	1 PER 10 CHANNELS
0	SENSOR (COMPLETE)	1 PER 5 CHANNELS
0	FLAME ARRESTOR	1 PER 10 CHANNELS
0	FLAME ARRESTOR TOOL	1 PER 20 CHANNELS
0	DUST COVER	1 PER 5 CHANNELS
0	SPLASH GUARD	1 PER 15 CHANNELS
0	CALIBRATION SCREWDRIVER	1 PER 15 CHANNELS
0	EXTENDER CARD	1 PER SYSTEM
0	CALIBRATION GAS BOTTLE	1 PER 15 CHANNELS PER GAS
0	STATIC CALIBRATION CHAMBER	1 PER 20 CHANNELS
0	CALIBRATION ADAPTOR	1 PER 20 CHANNELS
3	CONTRACTING OFFICER OR THE CONTRACTING OFFICER'S REPRESENTATIVE MANUAL	1 PER GAS PER SYSTEM

7. SENSORS/TRANSMITTERS:

GAS RANGE:	5% UP TO 100% LEL (LOWER EXPLOSIVE LIMIT) METHANE IN AIR.
ACCURACY:	5% LEL (UP TO 120% LEL) 20% OF READING (FROM 120% LEL TO 99% LEL)
REPEATABILITY:	+/- .3% OF TO 120% LEL
RESPONSE TIME:	<40 SECONDS TO 90% OF GAS CONCENTRATION WITHOUT SPLASH GUARD
NEC CLASSIFICATION:	THE TRANSMITTER/DETECTOR ASSEMBLY SHALL BE SUITABLE FOR CLASS 1, DIVISION 1, GROUPS A,B,C AND D.
ENCLOSURE:	EXPLOSION PROOF

CALIBRATION: ZERO CALIBRATION REQUIRED ANNUALLY. SPAN CALIBRATION NOT REQUIRED.

SERVICE LIFE: 2 TO 5 YEARS, WITH A 2 YEAR WARRANTY.

TRANSMITTER: SHALL OPERATE OVER AN ENVIRONMENTAL TEMPERATURE RANGE OF -40 DEGREES F TO +150 DEGREES F (-40 DEGREES C TO +70 DEGREES C), A HUMIDITY RANGE TO 99% RH, SHALL BE NON-CONDENSING, AND SHALL EXHIBIT MAXIMUM ZERO DRIFT OF LESS THAN +/- .2% OF FULL SCALE IN 30 DAYS.

ALARM RELAYS: ALARM RELAYS SHALL BE PLUG-IN SPOT AND SHALL BE PART OF EACH INDIVIDUAL READOUT MODULE. CONTACT RATING [5] AMPS, 115 VAC OR UP TO 24 VDC NON-INDUCTIVE LOAD.

8. REMOTE CALIBRATION SETUP:

WHERE ANY SENSOR IS IN AN ELEVATOR PIT, OR IS MORE THAN 254mm ABOVE THE FLOOR, OR IS IN CRAWL SPACE, OR IS OTHERWISE NOT EASILY ACCESSIBLE, CONTRACTOR SHALL MOUNT THE TRANSMITTER IN AN EASILY ACCESSIBLE LOCATION. CONTRACTOR SHALL ALSO RUN A 3mm I.D. TYGON TUBING, FROM INACCESSIBLE REMOTE SENSOR HEAD, TO A POINT NEAR THE EASILY ACCESSIBLE TRANSMITTER. THE TUBE SHALL ENABLE A TECHNICIAN TO SEND GAS TO THE INACCESSIBLE SENSING HEAD DURING CALIBRATION. THE INACCESSIBLE SENSING HEAD SHALL INCLUDE A REMOTE CALIBRATION PORT AND SHROUD, ESPECIALLY DESIGNED TO FACILITATE ACCURACY DURING THIS TYPE OF CALIBRATION.

9. MONITOR DESCRIPTION:

CONTROL MODULES: CONTROL MODULE FOR EACH SENSOR SHALL ACCEPT SIGNALS FROM REMOTE TRANSMITTERS (ONE TRANSMITTER FOR EACH SENSOR) PROVIDE CONVERSION FOR DISPLAY, ALARMS AND MALFUNCTION DETECTION ~~WITH FAULT CODES~~. SEND OUTPUTS VIA ALARM RELAYS, AND ALSO PROVIDE AN ANALOG DISPLAY (0 TO 100% LEL) AND RECORDER OUTPUT.

ALARM RELAYS: PROGRAMMABLE ALARM/WARNING RELAYS CAPABLE OF BEING NORMALLY ENERGIZED OR NORMALLY DE-ENERGIZED.

MODULE DIMENSIONS: 88mm HIGH x 25.4mm WIDE
175mm DEEP
MODULE WEIGHT: APPROX 2.3 OUNCES

METER SCALE: 0% UP TO 100% LEL (LOWER EXPLOSIVE LIMIT)

INDICATING PANEL: ALARM: RED / WARNING: ORANGE / FAIL: YELLOW
POWER INDICATION: GREEN

ACKNOWLEDGE/RESET: ONE PUSH BUTTON SWITCH FOR EACH SENSOR

DETECTOR WIRING: SHIELDED TWISTED PAIR THREE CONDUCTOR, ONE WIRE POWER SUPPLY NEGATIVE (-), ONE WIRE POWER SUPPLY POSITIVE (+), ONE WIRE SIGNAL.
POWER: 120 VOLT AC, 60 HERTZ, SINGLE PHASE TO METHANE PANEL & 24 VDC POWER WITH BATTERY BACK-UP TO SENSORS, IF REQUIRED BY PLANS.

RECORDER OUTPUT: 4-20 MA PER SENSOR CONTINUOUS.

ALARM OPTIONS: POLLING ALARM, SEQUENTIAL ALARM OR COMMON ALARM. COMMON ALARM PROVIDED BY PLUG-IN MODULE WITH DIMENSIONS TO ALLOW INTERCHANGE WITH CONTROL MODULES IN GAS MONITORING PANEL. CONTROL MODULES SHALL BE IDENTIFIED BY ALARM MODULE. SHALL HAVE ITS OWN "ACKNOWLEDGE" PUSH BUTTON SWITCH AND POLLING ALARM. SHALL HAVE ITS OWN "RESET" PUSH BUTTON SWITCH. BOTH PUSH BUTTON SWITCHES SHALL BE ACCESSIBLE FROM THE FRONT OF THE GAS MONITORING PANEL.

10. SETPOINTS (ALARM ACTIVATION)

ALL SENSORS SHALL BE FIELD CALIBRATED TO ACTIVATE AT A PRESET WARNING SERVICE TO BE PROVIDED BY OWNER SECURITY CO. 24 VDC BATTERY BACK-UP SYSTEM (24 HOURS) MONITORING AND A HIGH GAS LEVEL OF TWENTY FIVE PERCENT LEL AS METHANE. UNITS SHALL BE TOTALLY FIELD ADJUSTABLE TO ALARM AT ANY LEVEL OF METHANE UP TO THE LEL (LOWER EXPLOSIVE LIMIT). CONTRACTOR'S BID PRICE SHALL INCLUDE INITIAL FIELD CALIBRATION SERVICE. CALIBRATIONS AFTER THAT TIME SHALL BE THE RESPONSIBILITY OF THE CONTRACTING OFFICER OR HIS REP.

11. SENSOR LOCATIONS

GAS SENSORS SHALL BE INSTALLED IN THE VENT RISERS IN THOSE ROOMS INDICATED ON THE PLANS, OR WHERE ALTERNATELY INDICATED.

12. SENSOR INSTALLATION

a. SENSORS SHALL BE LOCATED WHERE SHOWN ON THE PLANS.

13. SENSOR IDENTIFICATION

EACH SENSOR SHALL BE PROVIDED WITH A TWO COLOR, TWO PLY ENGRAVED PLASTIC IDENTIFYING LABEL, WHICH SHALL READ THE SENSOR NUMBER, MINIMUM 10MM FONT CORRESPONDING TO THAT NUMBER SHOWN ON THE PLANS. THE RESPECTIVE SENSOR MONITOR IN THE METHANE PANEL SHALL ALSO BEAR A NUMBER, PAIRING IT TO THE REMOTE SENSOR. PLACARD SHALL BE AT LEAST 300mm².

14. AUDIBLE AND VISUAL ANNUNCIATORS

EXTERNAL AUDIBLE SIRENS AND VISUAL STROBE ANNUNCIATORS SHALL BE INSTALLED IN THE LOCATIONS SHOWN ON THE PLANS. THE ANNUNCIATORS SHALL INCLUDE MALFUNCTION AND LOW GAS ALERT AT THE MAIN PANEL, AND HIGH GAS ALERT-EVACUATION THROUGHOUT THE BUILDINGS AS SHOWN ON THE PLANS.

AUDIBLE ANNUNCIATORS SHALL BE A MINIMUM OF 70 DECIBELS OR 15 DECIBELS ABOVE AMBIENT, WHICHEVER IS GREATER. VISUAL ANNUNCIATORS SHALL BE COLOR CODED PER THE PLANS. SIGNS SHALL BE AFFIXED ADJACENT TO EACH ANNUNCIATOR PER THE PLANS.

THE AUDIBLE HIGH GAS ALARMS SHALL BE PER SHEET GC-10
THE MALFUNCTION ALARMS SHALL BE PER SHEET GC-10

CONTRACTOR SHALL INSURE THAT ALL AUDIBLE METHANE ALARMS ARE DISTINCTLY DIFFERENT IN SOUND FROM FIRE OR OTHER ALARMS IN THE PROJECT.

15. FUNCTIONAL START UP TESTING

THE EQUIPMENT SHALL BE INSTALLED AND WIRED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AND A MANUFACTURER'S AUTHORIZED REPRESENTATIVE SHALL FIELD CHECK THE INSTALLATION, PERFORM EQUIPMENT CALIBRATION AND ASSURE ALL SPECIFIED SYSTEM FUNCTIONS, SO THAT:

a. ALL SENSORS AND THEIR RESPECTIVE ALARM CHANNELS ARE OPERATIVE AND IN CALIBRATION.

b. ALL EXTERNAL VISUAL AND AUDIBLE ALARMS PROPERLY ACTIVATE.

EACH UNIT SHALL BE SHOWN TO ACTIVATE LOW GAS LEVEL ALARM SEQUENCE UPON EXPOSURE TO 15% LOWER EXPLOSIVE LIMIT (LEL) METHANE IN AIR. THE ALARM PANEL SHALL CORRECTLY INDICATE WHICH SENSOR IS IN LOW LEVEL ALARM; LOW LEVEL ALARM ANNUNCIATORS SHALL BE ACTIVATED IN ALL LOCATIONS SHOWN ON PLANS.

(b. continued)

EACH UNIT SHALL BE SHOWN TO ACTIVATE HIGH GAS LEVEL ALARM SEQUENCE UPON EXPOSURE TO 25% LEL METHANE IN AIR. THE ALARM PANEL SHALL CORRECTLY INDICATE WHICH SENSOR IS IN HIGH LEVEL ALARM; HIGH LEVEL ALARM ANNUNCIATORS SHALL BE ACTIVATED IN ALL LOCATIONS ON THE PROJECT. SEE SEQUENCE OF OPERATION ON SHEET GC-9

16. PERIODIC CALIBRATION:

THE SENSOR SYSTEM SHALL ALLOW FOR A PERSON WORKING ALONE TO ACCOMPLISH ALL ROUTINE PERIODIC CALIBRATION AT THE SENSOR/TRANSMITTER LOCATIONS.

17. WARRANTY:

GAS DETECTION SYSTEM VENDOR SHALL REPLACE AT NO COST SENSORS WHICH GO BAD OR CAUSE FALSE ALARMS WITHIN THE FIRST TWO (2) YEARS OF ACCEPTANCE.

18. EQUIPMENT AND SERVICE AVAILABILITY:

a. SENSORS AND MONITOR PANELS

THE INFRA-RED GAS DETECTION SYSTEM AND MANUFACTURER SHALL HAVE A REPRESENTATIVE BASED WITHIN 150 KILOMETERS OF THE INSTALLATION. THE MANUFACTURER SHALL DEMONSTRATE FACTORY MUTUAL APPROVAL OF CANADIAN STANDARDS ASSOCIATION APPROVAL OF THE SYSTEM SUPPLIED.

b. ALARMS:

PER SHEET GC-9.

c. CALIBRATION SERVICES:

SHALL BE PROVIDED BY A COMPANY OR INDIVIDUAL WITH AT LEAST 5 YEARS PRIOR EXPERIENCE IN GAS DETECTION SYSTEM MAINTENANCE, CALIBRATION AND REPAIR. ENTITY SHALL BE CAPABLE OF ARRIVING ON SITE WITHIN TWO HOURS OF BEING CALLED.

F. HVAC REQUIREMENTS

ALL VENTILATION REQUIREMENTS SHALL BE PROVIDED AS DESCRIBED ON THE DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.

ALL FANS OR A/C DEWONIZERS SHALL BE ACTIVATED BY GAS DETECTOR CONTROLS AT 15% LEL AND SHALL CONTINUE TO OPERATE UNTIL GAS DROPS BELOW 12% LEL.

ALL FANS SHALL RUN 24 HOURS A DAY WITH NO SHUTOFF.

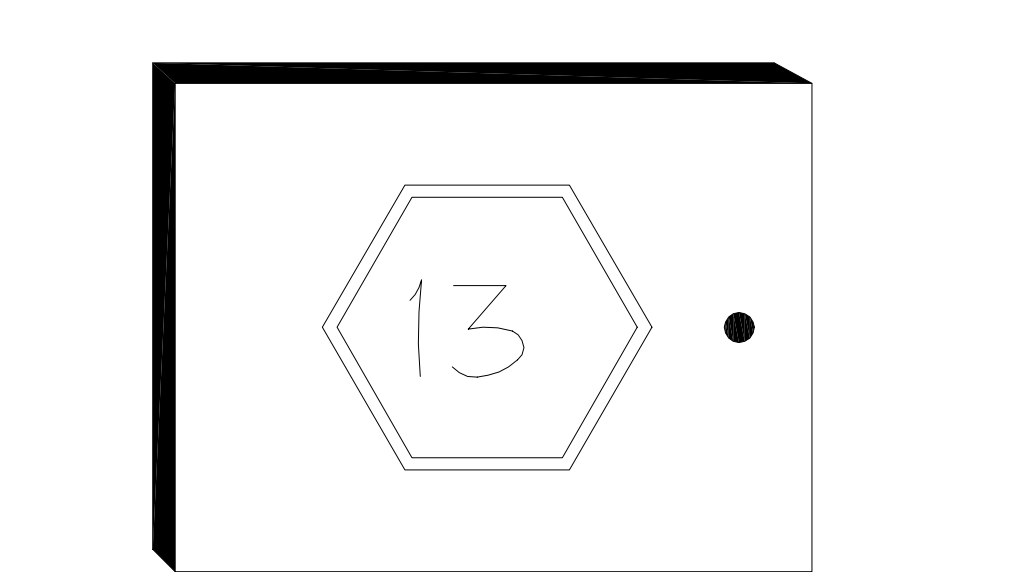
SEE MECHANICAL DRAWINGS AND CALCULATIONS BY OTHERS

G. OPERATION AND MAINTENANCE MANUAL

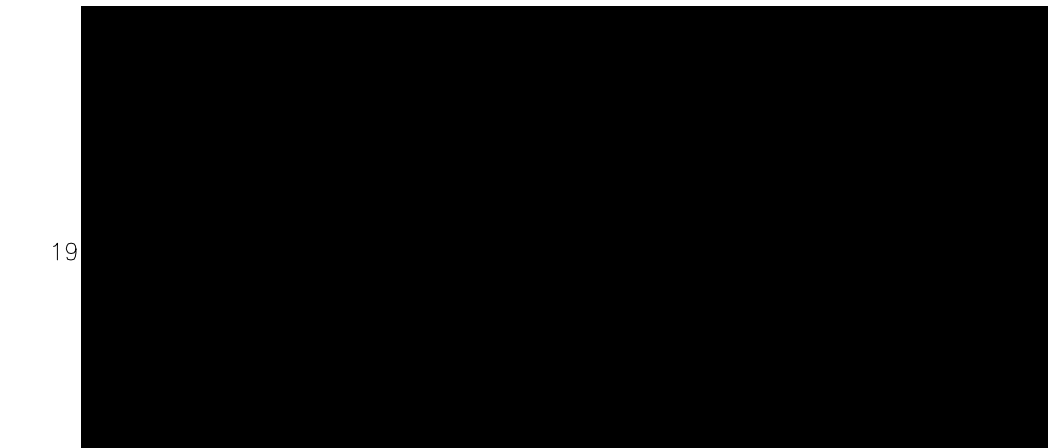
PRIOR TO OCCUPANCY, THE CONTRACTOR SHALL PROVIDE TO THE CONTRACTING OFFICER OR HIS REP., THE METHANE ENGINEER AND THE FIRE DEPARTMENT COPIES OF AN OPERATION AND MAINTENANCE MANUAL FOR THE SYSTEM, INCLUDING A COMPLETE AS-BUILT WIRING DIAGRAM OF THE PANELS AND SYSTEM, CATALOG OUTS ON ALL ITEMS OF EQUIPMENT AND MATERIALS, AND COMPLETE DESCRIPTION OF CALIBRATION, OPERATIONAL AND REPAIR PROCEDURES.

H. NO WIRE NUTS, NO SOLDER, NO SPLICES OF ANY KIND, ONLY CONTINUOUS SIGNAL CABLE FROM EACH SENSOR BACK TO CONTROLLER

J. SENSOR IDENTIFICATION



ENGRAVED PLASTIC TAGS PER NOTE D.13 THIS SHEET - SEE SPECIFICATIONS. SIXTEEN REQUIRED, NUMBERED 1-13 CONSECUTIVELY.



E. SPECIAL WIRING NOTES

1. GENERAL

THE CONTRACTOR SHALL SUPPLY AND INSTALL REQUIRED CONDUIT AND CONDUCTOR SUCH THAT THE ALARM PANEL WILL ACCEPT ALL ALARM CONTACT CLOSURES AND ACTIVATE EXTERNAL ALARM DEVICES AS SPECIFIED HEREIN. SENSORS SHALL BE CONNECTED TO THE ALARM PANEL WITH TEN STRANDED COPPER JACKETED CONDUCTORS IN CONDUIT, THE CONDUCTORS BEING OF A GAUGE AND CONSTRUCTION RECOMMENDED BY THE SENSOR MANUFACTURER FOR THE REQUIRED DISTANCE FROM EACH SENSOR TO THE MONITOR PANEL (SEE PLANS). ALL WIRING SHALL BE COLOR CODED.

2. 120 VAC AND GREATER

ALL 120VAC AND GREATER WIRING SHALL BE 90°C/600V THHN STRANDED CONDUCTORS INSTALLED.

3. 24VDC AND LESS

24VDC OR LESS WIRING SHALL NOT BE INSTALLED IN COMMON CONDUIT WITH 120 VAC LEL (LOWER EXPLOSIVE LIMIT) WIRING. LOW VOLTAGE (24VDC) WIRING SHALL BE PER THE PLANS.

4. HANGERS

CONDUIT HANGERS OR CLAMPS SHALL BE FASTENED TO JOISTS OR BEAMS, OR TO CAST CONCRETE OR MASONRY USING EXPANSION TYPE LAG BOLTS.
DO NOT USE OTHER SYSTEM HANGERS.

5. ALL MATERIAL SHALL BE NEW.

6. NO EXPOSED CONDUIT

EXPOSED CONDUIT IS NOT PERMITTED IN FINISHED SPACES. CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR REQUIRED LENGTH OF CONDUIT AND WIRING TO ACHIEVE THIS INTENT. THIS APPLIES TO CONDUIT FOR ALL ELEMENTS OF THE METHANE CONTROL SYSTEM, INCLUDING REMOTE SENSORS AND ALARMS.

7. CONDUIT

USE RIGID STEEL CONDUIT IN ALL SIZES, OR INTERMEDIATE STEEL CONDUIT UP TO 91.4mm IN THE FOLLOWING AREAS: IN SLAB ON GRADE WHERE PERMITTED IN WRITING AND OF SIZE PERMITTED; ON EXTERIOR; ENCASED IN EXTERIOR MASONRY OR CONCRETE WALLS; IN WET LOCATIONS; IN REFRIGERATED SPACES; IN EXPOSED LOCATIONS WITHIN 2135mm T OF FLOOR OR WALKING SURFACES; IN SUSPENDED SLAB, BUT ONLY WHERE PERMISSION IS OBTAINED FROM THE CITY ENGINEER IN WRITING FOR CONDUIT TO BE RUN IN SLAB. WHERE PERMITTED IN SUSPENDED SLABS, CONDUIT IS LIMITED TO 25.4mm TRADE SIZE AND IS RESTRICTED TO THE CENTER THIRD OF THE SLAB THICKNESS. RUN CONDUITS PARALLEL WITH STRUCTURAL MEMBERS. SEPARATE CONDUITS RUNNING EAST-WEST BY 152mm MINIMUM AND ROUTE THROUGH MIDDLE THIRD OF SPAN. PREPARED CONDUIT LAYOUT TO BE REVIEWED BY THE CITY ENGINEER FOR THE EFFECT ON THE SLAB STRUCTURAL INTEGRITY PRIOR TO POURING OF THE SLAB. RUN CONDUIT IN BLOCK WALL VERTICALLY IN CENTER THIRD, SPACED 203mm ON CENTER MINIMUM. DO NOT RUN HORIZONTALLY WITHOUT WRITTEN PERMISSION. ENT OR PVC IS NOT PERMITTED FOR METHANE SYSTEM INSTALLATION. IMC & EMT MAY BE USED IN PLENUM OR CEILING CAVITY AREAS WITH APPROVAL OF CITY ELECTRICAL INSPECTOR.

8. MANUFACTURER'S RECOMMENDATIONS

CONTRACTOR SHALL INSTALL ALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.

IF SHEET IS LESS THAN 28"x42", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

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MEDICAL/DENTAL CLINIC			
GAS DETECTION SPECIFICATIONS			
SIZE	CODE IDENT. NO.	DRAWING NO.	
F	XXXXX	8144534	
SCALE		CONST. CONTR. NO.	
		SPEC.	11998048
		SHEET 29 OF 316	