1 GENERAL:

PURPOSE: THE PURPOSE OF THESE PIPING AND WIRING DIAGRAMS IS TO STANDARDIZE THE WAY GAS PIPING SYSTEMS AND ELECTRIC SOLENOID VALVES ARE USED IN PINELLAS COUNTY SCHOOLS. THERE ARE MANY DIFFERENT PIPING AND WIRING SCENARIOS THAT ARISE AND THE MOST COMMON OF THESE SCENARIOS ARE DISCUSSED IN THESE DIAGRAMS. IT IS NOTED THAT ADDITIONAL SCENARIOS, NOT PRESENTED HERE, MAY ARISE. THESE NEW SCENARIOS ARE REQUESTED TO BE PRESENTED TO MR. GENE BANKS FOR INITIAL SAFETY REVIEW (HE WILL FORWARD THE NEW SCENARIOS FOR PINELLAS COUNTY SCHOOL BOARD TECHNICAL REVIEW AND COMMENT, AS NECESSARY).

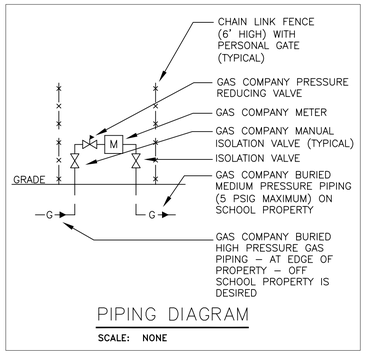
EXISTING INSTALLATIONS: EXISTING SYSTEMS THAT ARE DIFFERENT THAN THE ARRANGEMENT SHOWN ARE NOTED TO EXIST. THESE SYSTEMS MAY REMAIN UNTIL RENOVATION IS SCHEDULED.

NEW INSTALLATIONS, RENOVATIONS, AND ALTERATIONS: AS NEW WORK IS PERFORMED, THAT WORK IS INTENDED TO COMPLY WITH THESE STANDARDIZED GAS PIPING DIAGRAMS AND ELECTRIC SOLENOID WIRING DIAGRAMS.

2 GAS SUPPLY PIPED TO SCHOOL PROPERTY:

A SCENARIO 2A: HIGH PRESSURE GAS (OVER 5 PSIG) SUPPLIED BY GAS UTILITY COMPANY TO SCHOOL PROPERTY (REDUCE TO 5 PSIG MAXIMUM):

1 PIPING DIAGRAM:



PIPING DIAGRAM

SCALE: NONE

2 WIRING DIAGRAM: NONE

3 NARRATIVE:

A FOR STUDENT SAFETY REASONS, THE GAS SUPPLIED ONTO AND ACROSS THE SCHOOL BOARD PROPERTY IS REQUIRED TO BE REDUCED TO THE SAME PRESSURE SAFETY LEVEL THAT IS USED WITHIN BUILDINGS. MEDIUM PRESSURE (5 PSIG) GAS IS THE MAXIMUM THAT MAY BE USED WITHIN BUILDINGS WITHOUT SPECIAL EXCEPTIONS (FBC FG402.5.1).

B SCENARIO 2B: MEDIUM PRESSURE (5 PSIG 14 INCHES WG) AND LOW PRESSURE (14 INCHES WG AND LESS) GAS PIPING SUPPLIED TO SCHOOL BOARD PROPERTY: NO PRESSURE REDUCTION REQUIREMENTS. PIPING MAY BE ROUTED TO BUILDING SERVICE ENTRANCE.

1 PIPING DIAGRAM: NONE

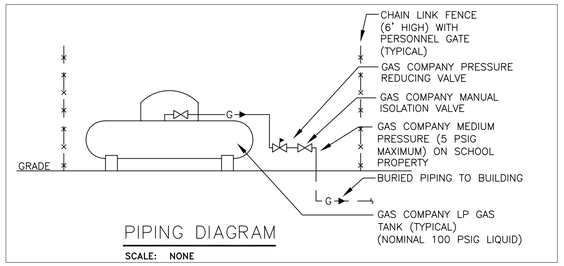
2 WIRING DIAGRAM: NONE

3 NARRATIVE: NONE

3 LP GAS TANK ON SCHOOL PROPERTY:

A SCENARIO 3A: HIGH PRESSURE LP GAS (OVER 5 PSIG) STORED IN GAS TANKS ON SCHOOL PROPERTY (REDUCE TO 5 PSIG MAXIMUM AFTER LEAVING TANKS AND BEFORE DISTRIBUTION ACROSS PROPERTY):

1 PIPING DIAGRAM:



PIPING DIAGRAM

SCALE: NONE

2 WIRING DIAGRAM: NONE

3 NARRATIVE:

A FOR STUDENT SAFETY REASONS, THE GAS SUPPLIED ONTO AND ACROSS THE SCHOOL BOARD PROPERTY IS REQUIRED TO BE REDUCED TO THE SAME PRESSURE SAFETY LEVEL THAT IS USED WITHIN BUILDINGS. MEDIUM PRESSURE (5 PSIG) GAS IS THE MAXIMUM THAT MAY BE USED WITHIN BUILDINGS WITHOUT SPECIAL EXCEPTIONS (FBC FG402.5.1). IN ADDITION, ALIGN THE RECTANGULAR TANK SO ITS LONGITUDINAL AXIS IS PARALLEL TO THE BUILDING, TO IMPROVE SAFETY DUE TO A CATASTROPHIC TANK FAILURE.

B SCENARIO 2B: MEDIUM PRESSURE LP GAS (5 PSIG MAXIMUM) STORED IN GAS TANKS ON SCHOOL PROPERTY: NO PRESSURE REDUCTION REQUIRED. PIPING MAY BE ROUTED TO BUILDING SERVICE ENTRANCE. ALIGN THE LONGITUDINAL AXIS OF THE TANK PARALLEL TO THE BUILDING.

1 PIPING DIAGRAM: NONE

2 WIRING DIAGRAM: NONE

3 NARRATIVE: NONE

4 NARRATIVE:

A GAS SERVICE #1 WITH GAS SOLENOID VALVE "V1" (ALL OTHER GAS USES IN BUILDING):

1 CODES
- A GAS SOLENOID VALVE "V1": FBC 423-(6),(F) (2004 2ND EDITION WITH 2006 REVISIONS):
  - * AUTOMATIC SHUTOFF REQUIRED (CONTROLLED FROM FIRE ALARM).
  - * EMERGENCY POWER SOURCES (GAS FIRED GENERATORS) SHALL NOT SHUTOFF DUE TO FIRE ALARM.
  - * KITCHEN GAS SUPPLIES SHALL BE SHUTOFF FROM HOOD EXTINGUISHING SYSTEM (IF APPLICABLE).
  - * SHUTOFF VALVE SHALL BE LOCATED EXTERIOR TO THE BUILDING.
  - * MANUAL RESET IS REQUIRED.
- B 1999 NFPA 72 6.15.2.2:
  - * GAS SOLENOID VALVE "V1" FIRE ALARM RELAY WITHIN 3 FEET OF CONTROLLED RESET RELAY CIRCUIT IN BOILER ROOM).
- C PINELLAS COUNTY SCHOOL BOARD:
  - * GAS SOLENOID VALVE "V1" FIRE AND SAFETY DEPARTMENT INTERPRETATION FOR SAFETY: ALL NON-KITCHEN HOOD AND NON-GENERATOR GAS SUPPLIES SHALL SHUTOFF DURING FIRE ALARM NOTIFICATION (WHETHER THE GAS SERVES STUDENT-OCCUPIED SPACES OR NOT, AND WHETHER THE GAS PIPING PASSED THROUGH STUDENT-OCCUPIED SPACES NOR NOT).

2 OPERATION:
- A IF THE BUILDING FIRE ALARM SYSTEM GOES INTO ALARM: THE FIRE ALARM CONTROL RELAY RELEASES (NORMALLY OPEN RELAY, ENERGIZED CLOSED); THE CONTROL CIRCUIT IN THE RESET RELAY IS OPENED; AND THE GAS VALVE CLOSES (NORMALLY CLOSED VALVE, ENERGIZED OPEN BY 120 VAC RESET RELAY CIRCUIT). THE DE-ENERGIZED CONTROL CIRCUIT ALSO CLOSES THE RELAY FOR THE REVOLVING LIGHT (NORMALLY CLOSED RELAY, ENERGIZED OPEN BY 120 VAC RESET RELAY CIRCUIT). NOTE THIS SAME ACTION OCCURS IF THE KITCHEN HOOD EXTINGUISHING SYSTEM RELEASES (SINCE IT INITIATES A BUILDING FIRE ALARM).
- B AFTER THE FIRE ALARM EVENT IS OVER AND THE FIRE ALARM SYSTEM IS RESET, THE HPO (OR HIS DESIGNEE) WILL MANUALLY RESET THE GAS SOLENOID VALVES AFTER HE VERIFIES ALL PILOT OPERATED EQUIPMENT HAS BEEN MANUALLY VALVED OFF. HPO WILL THEN MANUALLY LIGHT EACH REQUIRED PILOT OPERATED DEVICES. THE SIGNAGE AT THE RESET RELAY GIVES DETAILED INSTRUCTION SPECIFIC FOR THIS SCHOOL AND FOR THIS RESET RELAY.

3 SIGNAGE:
- A WALL PLATE MOUNTED ADJACENT TO RESET RELAY AND CONSTRUCTED AS ENGRAVED WHITE 1/2" HIGH LETTERS ON A RED BACKGROUND. SIGNAGE READS "RESET RELAY "RR1" CONTROLS OUTDOOR GAS VALVE "V1". LIGHT ON MEANS GAS VALVE IS OPEN AND FLOWING GAS. HPO: PUSH MANUAL RESET ONLY AFTER ALARM IS CLEARED AND STANDING GAS PILOT LIGHTS ARE EACH MANUALLY TURNED OFF.
- B WALL PLATE MOUNTED ADJACENT TO OUTSIDE GAS VALVE "V1" IS CONSTRUCTED THE SAME AS THE RESET RELAY BUT THE SIGNAGE READS "GAS VALVE "V1" – MANUAL RESET IN BOILER ROOM IN BUILDING 1, ROOM #2."

B GAS SERVICE #2 WITH GAS SOLENOID VALVE "V2" – APPLIANCES KITCHEN WITH EXTINGUISHING HOOD AND GAS BELOW HOOD ONLY:

1 CODES:
- A FBC 423-(6),(F) (2004 WITH 2006 REVISIONS).
  - * KITCHEN GAS SUPPLY SHALL BE SHUTOFF BY EXTINGUISHING SYSTEM (IF APPLICABLE).
- B EXHAUST FAN OPERATION AND GAS FLOW FBC FG 506.3.5,(B) (2004 WITH 2006 REVISIONS).

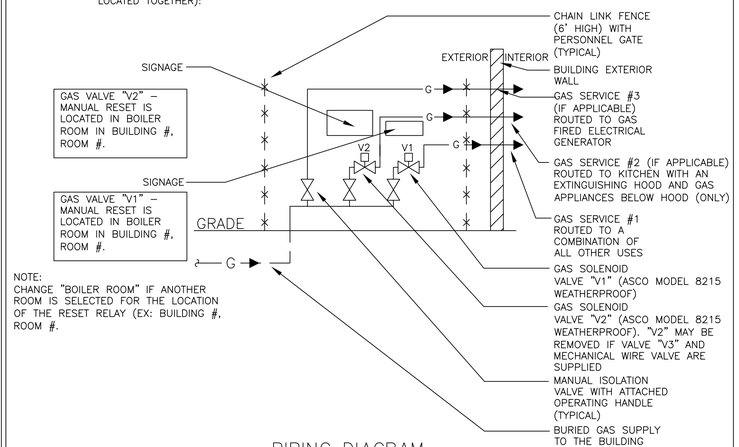
2 OPERATION:
- A IF THE KITCHEN HOOD EXTINGUISHING SYSTEM RELEASES, SOLENOID VALVE "V2" CLOSES STOPPING GAS. THE VALVE DOES NOT CLOSE UPON BUILDING FIRE ALARM ACTIVATION.
- B REFER TO SECTION 5 GAS SUPPLY TO KITCHEN WITH KITCHEN HOOD EXTINGUISHING SYSTEM FOLLOWING.

3 SIGNAGE:
- A WALL PLATE MOUNTED ADJACENT TO RESET RELAY AND CONSTRUCTED AS ENGRAVED WHITE 1/2" HIGH LETTERS ON A RED BACKGROUND. SIGNAGE READS "RESET RELAY "RR2" CONTROLS OUTDOOR GAS VALVE "V2". LIGHT ON MEANS GAS VALVE IS OPEN AND FLOWING GAS. HPO: PUSH MANUAL RESET ONLY AFTER FIRE ALARM IS CLEARED AND STANDING GAS PILOT LIGHTS ARE EACH MANUALLY TURNED OFF.
- B WALL PLATE MOUNTED ADJACENT TO OUTSIDE GAS VALVE "V2" IS CONSTRUCTED THE SAME AS THE RESET RELAY BUT THE SIGNAGE READS "GAS VALVE "V2" – MANUAL RESET IN BOILER ROOM IN BUILDING #, ROOM #.

4 GAS SERVICE ENTRANCE TO A BUILDING:

A SCENARIO 4A: MULTIPLE GAS USES IN A BUILDING:

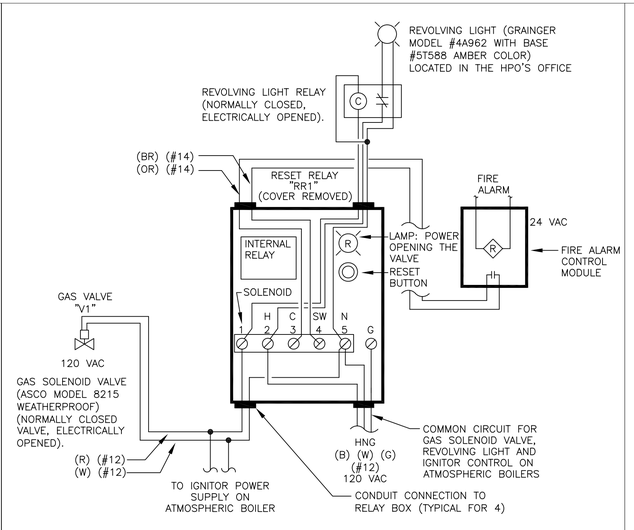
1 PIPING DIAGRAM (UP TO 3 GAS SERVICE ENTRANCES LOCATED TOGETHER):



NOTE:
CHANGE "BOILER ROOM" IF ANOTHER ROOM IS SELECTED FOR THE LOCATION OF THE RESET RELAY (EX: BUILDING #, ROOM #.

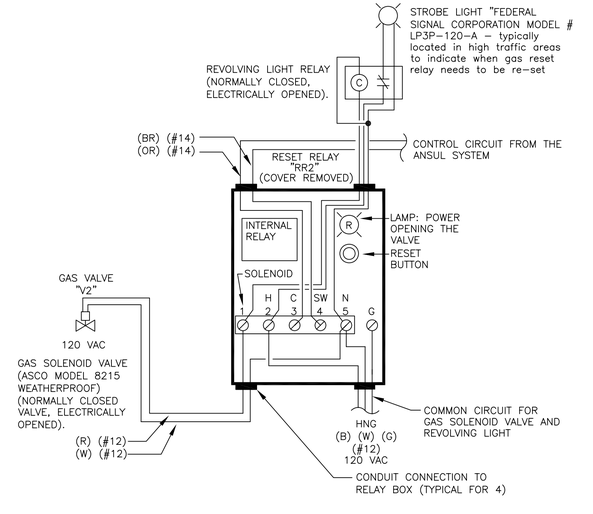
PIPING DIAGRAM

SCALE: NONE



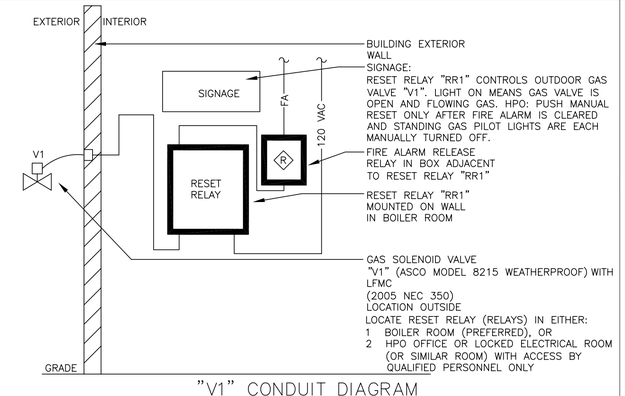
"V1" RESET RELAY WIRING DIAGRAM

SCALE: NONE



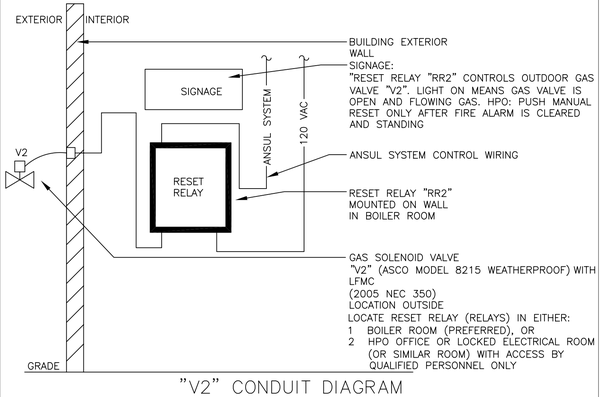
"V2" RESET RELAY WIRING DIAGRAM

SCALE: NONE



"V1" CONDUIT DIAGRAM

SCALE: NONE



"V2" CONDUIT DIAGRAM

SCALE: NONE

23 11 23.01 Appendix A Gas Valve Detail

REVISIONS: 12/03/2007

DATE: 12/30/2004
PROJ. NO.:
DRAWN:
CHECKED:
WORK ORDER #

COUNTYWIDE GAS VALVE STANDARDIZED DESIGN ARRANGEMENT

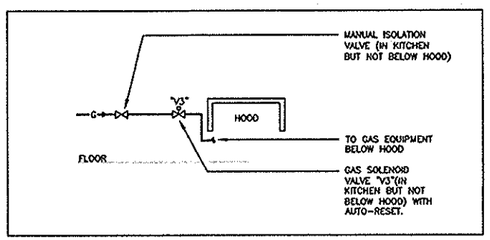
THE SCHOOL BOARD OF PINELLAS COUNTY, FLORIDA

DRAWING NUMBER: GV-1

(5) GAS SUPPLY TO THE KITCHEN WITH KITCHEN HOOD EXTINGUISHING SYSTEM AND GAS APPLIANCES BELOW HOOD (ONLY):

A SCENARIO 5A: GAS VALVE AT HOOD

1 PIPING DIAGRAM:



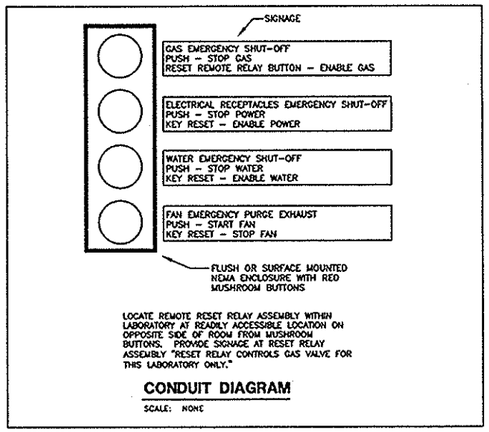
PIPING DIAGRAM

SCALE: NONE

2 WIRING DIAGRAM:

A SAME AS VALVE "V1" WIRING DIAGRAM, EXCEPT WITHOUT FIRE ALARM RELAY.

3 CONDUIT DIAGRAM.



CONDUIT DIAGRAM

SCALE: NONE

4 NARRATIVE

A GAS SERVICE #2 WITH GAS SOLENOID VALVE "V3".

1 CODES
- A 2001 NFPA 96 8.2.3:
  - * KITCHEN HOOD EXHAUST FAN SHALL CONTINUE TO OPERATE AFTER EXTINGUISHING SYSTEM HAS ACTIVATED, UNLESS ITS TESTING REQUIRES A DIFFERENT SEQUENCE.
- B 2001 NFPA 96 8.3.3.2:
  - * WHEN THE KITCHEN HOOD EXTINGUISHING SYSTEM ACTIVATES, SUPPLY AIR SYSTEMS THAT DISCHARGE INTERNALLY INTO THE HOOD SHALL BE SHUT OFF.
- C EXHAUST FAN OPERATION AND GAS FLOW FBC FG 506.3.5(b) (2004 EDITION WITH 2006 REVISIONS).
  - * HOOD EXHAUST MUST OPERATE FOR GAS TO FLOW BELOW HOOD.

2 OPERATION:

A A SINGLE WALL SWITCH (WITH LABEL "KITCHEN HOOD OPERATION" OPERATES THE KITCHEN HOOD SUPPLY AND EXHAUST FANS. A CT (RIB: RELAY-IN-A-BOX WITH HOA HAND-OFF-AUTOMATIC MANUAL MAINTENANCE SWITCH AT RIB – LEAVE IN AUTO POSITION) MONITORS ONE PHASE LEG OF THE EXHAUST FAN (OR MULTIPLE EXHAUST FANS WITH RIB'S IN SERIES) TO INDICATE EXHAUST FAN OPERATION. AFTER THE EXHAUST FANS OPERATE, A MULTIPLE POLE CONTACTOR IS ENABLED AND A SEPARATE 120/1/60 GAS SOLENOID VALVE "V3" (WITHOUT RESET RELAY) IS ENERGIZED AND OPENS ALLOWING GAS FLOW TO EQUIPMENT BELOW THE HOOD. LOCATE THE CONVENTIONAL SOLENOID VALVE "V3" IN THE KITCHEN AREA BUT NOT BELOW THE KITCHEN HOOD. THE MULTIPLE POLE CONTACTOR ALSO OPERATES THE COIL OPERATED SHUNT TRIP CIRCUIT BREAKER (IF ALL LOCATED IN ONE PANEL) OR CIRCUIT BREAKERS IF MULTIPLE BRANCH CIRCUITS ARE USED. CONFIRM SHUNT TRIP CIRCUIT BREAKERS ARE RATED FOR SWITCHING DUTY. WHEN THE HOOD FANS ARE TURNED OFF, THE CONTACTOR OPENS ITS CIRCUITS; GAS VALVE "V3" CLOSES STOPPING GAS FLOW; AND ELECTRICAL POWER BELOW THE HOOD STOPS.

B THE SHUTOFF GAS VALVE "V2" IS CONTROLLED BY THE HOOD EXTINGUISHING SYSTEM AND HAS THE SAME COMPONENTS AND OPERATION AS SHUTOFF GAS VALVE "V1".

C NOTE THAT GAS VALVE "V3" TURNS ON AND OFF WHEN THE KITCHEN HOOD SYSTEM OPERATES BUT GAS VALVE "V2" ONLY OPERATES WITH THE KITCHEN HOOD EXTINGUISHING SYSTEM (NOT THE FIRE ALARM SYSTEM). CONFIRM ALL KITCHEN EQUIPMENT USE ELECTRIC IGNITION PILOTS ONLY (NO STANDING PILOTS).

D WHEN THE KITCHEN HOOD EXTINGUISHING SYSTEM OPERATES, AN INITIATION FIRE ALARM MODULE IS ACTIVATED OPERATING THE GENERAL ALARM FOR THIS BUILDING. THE FIRE ALARM SYSTEM CLOSES GAS VALVE "V1" (STOPPING GAS) WHEN THE BUILDING GOES INTO ALARM.

3 SIGNAGE:

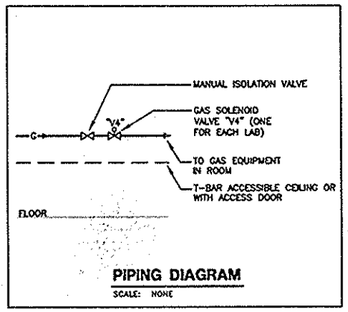
A KITCHEN HOOD WALL SWITCH FOR FANS "KITCHEN HOOD OPERATION."

B "GAS SOLENOID VALVE "V3" CONTROLLED FROM KITCHEN HOOD MULTIPLE POLE CONTACTOR AND EXHAUST FANS."

(6) GAS SUPPLY TO A LABORATORY ROOM OR A HOME ECONOMICS ROOM:

A SCENARIO 6A: GAS VALVE TO LABORATORY

1 PIPING DIAGRAM:



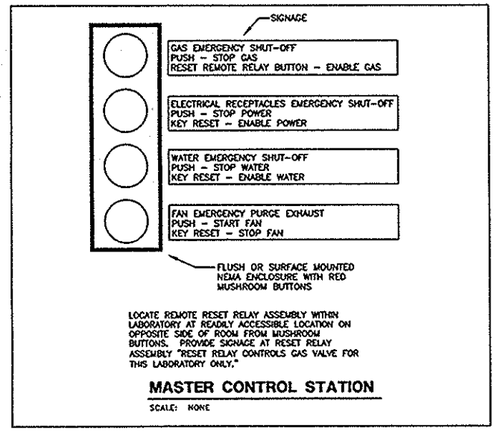
PIPING DIAGRAM

SCALE: NONE

2 WIRING DIAGRAM:

A LABORATORY RESET RELAY CONTROL THE SAME AS FOR VALVE "V1", EXCEPT WITHOUT FIRE ALARM RELAY.

3 CONDUIT DIAGRAM:



MASTER CONTROL STATION

SCALE: NONE

4 NARRATIVE:

A GAS SERVICE #1 WITH SEPARATE GAS VALVE "V4" (ONE FOR EACH LABORATORY).

1 CODES
- A SHUT-OFF GAS VALVE ADJACENT TO LABORATORY DOOR OR WITHIN 15 FEET OF INSTRUCTOR'S STATION (FBC 423.14.1, 2004 WITH 2006 REVISIONS).
- B ELECTRIC RECEPTACLES ADJACENT TO LABORATORY DOOR OR WITHIN 15 FEET OF INSTRUCTOR'S STATION (FBC 423.14.1, 2004 WITH 2006 REVISIONS).
  AND (FBC 423.17.4, 2004 WITH 2006 REVISIONS).
- C EMERGENCY EXHAUST (PURGE) SYSTEM (1999 SRD 5.(14).(p).4).

2 OPERATION
- A MANUAL SHUTDOWN OF GAS, ELECTRIC RECEPTACLES, WATER VALVES, AND COMPRESSED AIR OUTLETS (IF APPLICABLE) IS AVAILABLE FOR LOCAL USE.
- B THE RESET RELAY BOX IN THE CLASSROOM (REMOTELY LOCATED FROM THE PUSH BUTTONS) AND WITH ITS OWN SIGNAGE, IS USED TO MANUALLY ENABLE GAS AFTER GAS OUTLETS ARE MANUALLY TURNED OFF.
- C THE FIRE ALARM SYSTEM IS NOT ACTIVATED BY ONLY LOCAL LABORATORY CONTROL.
- D THE EMERGENCY EXHAUST (PURGE) FAN SYSTEM WILL OPERATE BEST WITH THE MANUAL OPENING OF WINDOWS FOR OPTIMUM MAKE-UP OUTSIDE AIR DURING A LABORATORY PURGE EXHAUST.

3 SIGNAGE
- A EMERGENCY PUSH BUTTON SIGNS, AS INDICATED.
- B RESET RELAY SIGN, AS INDICATED.

REVISIONS:

DATE: 12/30/2004
PROJ. NO.:
DRAWN:
CHECKED:
WORK ORDER #

COUNTYWIDE GAS VALVE

STANDARDIZED DESIGN ARRANGEMENT
THE SCHOOL BOARD OF
PINELLAS COUNTY, FLORIDA

DRAWING NUMBER:
GV-2