Environmental Consultants
and Contractors

6601 Koll Center Parkway
Suite 140
Pleasanton, CA 94566

925 426-0080
FAX 925 426-0707
www.scsengineers.com

SCS ENGINEERS

November 23, 2009
File No. 07194062.00

Mr. Reeve Battle
City of Berkeley Department of Public Works
Engineering Division
1947 Center St., 4th Floor
Berkeley, CA 94704

SUBJECT: Engineer Certification and As-Built Plans, Combustible Gas Monitoring System, DoubleTree Hotel, 200 Marina Boulevard, Berkeley, California

Dear Mr. Battle:

On September 30, 2009, SCS Engineers (SCS) observed the completed installation of the combustible gas monitoring system at the DoubleTree Hotel located at 200 Marina Boulevard in Berkeley, California. The completed system was inspected by the City of Berkeley Planning and Development Department, Building and Safety Division on the same date and includes nine individual, stand-alone automated, continuous combustible gas monitoring sensors (First Alert GC01CN Plug-In Explosive Gas and Carbon Monoxide Alarm with Battery Back-up and Silence Feature) in ground-floor levels of Buildings 1, 2, 5, and the lobby of Building 7. The alarm units were installed in accordance with the intent of the plans and specifications provided in the Revised Combustible Gas Monitoring Plan and Inspection Protocol (SCS, May 2009), approved by the California Integrated Waste Management Board (CIWMB) in a letter to the City dated May 13, 2009.

On October 6, 2009, SCS also conducted initial testing on each of the alarm units to verify proper function. The testing was performed in accordance with the procedures outlined in the Combustible Gas Monitoring Plan and Inspection Protocol and the manufacturer's recommendations and included an AC power check, back-up power battery check, malfunctioning unit test, and simulated alarm test. SCS also performed a methane response bench test on two of the alarm units using span gas to verify that the alarm units respond properly to the target gas (methane).

Based on the construction observation and testing, we herby certify that the combustible gas monitoring system has been installed in accordance with the intent of the plans and specifications provided in the Revised Combustible Gas Monitoring Plan and Inspection and the alarm units are fully functional.

Included as ***Attachment 1*** are as-built plans for the combustible gas monitoring system, prepared by SCS and dated November 20, 2009, and a copy of the Building and Safety Division's Electrical Permit and final inspection job card. The as-built plans are based on mark-ups of the design drawings provided by McIntire Electric, the licensed electrical contractor who installed the system under subcontract to SCS.

Attachment 2 contains an Operations and Maintenance (O&M) Manual for the combustible gas alarm units, prepared by SCS in accordance with the Revised Combustible Gas Monitoring Plan and Inspection Protocol. The O&M Manual will be used as a reference guide during the initial training of the hotel staff and during ongoing operation, testing, maintenance, and monitoring of the alarm units. The O&M Manual includes as-built locations of the alarms, the First Alert Alarm Product Specification and User's Manual, inspection schedule, inspection and corrective action log sheets, and emergency response procedures and notification requirements.

Please contact either of the undersigned at (925) 426-0080 if you have any questions.

Very truly yours,

Dilan Roe, P.E., LEED® AP
Project Manager
SCS ENGINEERS

Joseph J. Miller, P.E.
Vice President
SCS ENGINEERS

Attachments

Attachment 1: As-Built Plans and Electrical Permit
Attachment 2: Operations and Maintenance Manual

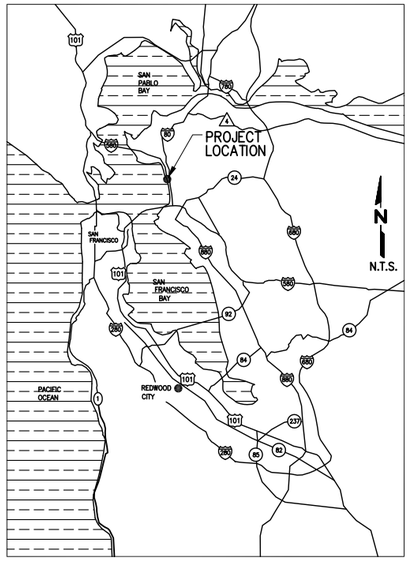
cc: Tadese Gebrehawariat, CIWMB
Zane Poulsen, CIWMB
Patrick Birmingham: DoubleTree Hotel
Donna McCracken: Berkeley Fire Department
Art Jones: SCS-Field Services

ATTACHMENT 1

AS-BUILT PLANS AND ELECTRICAL PERMIT

AS-BUILT PLANS
COMBUSTIBLE GAS MONITORING SYSTEM
DOUBLETREE HOTEL
200 MARINA BOULEVARD BERKELEY, CA

LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

INDEX OF SHEETS

PREPARED FOR:
CITY OF BERKELEY
PUBLIC WORKS DEPARTMENT

1947 CENTER STREET, 4th FLOOR
BERKELEY, CALIFORNIA 94704

NO.	REVISION	DATE

SHEET TITLE: TITLE SHEET– LOCATION MAP

PROJECT TITLE: AS–BUILT PLANS
COMBUSTIBLE GAS MONITORING SYSTEM
DOUBLETREE HOTEL
200 MARINA BOULEVARD, BERKELEY, CA

City of Berkeley
California

BERKELEY

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
6601 KOLL CENTER PKWY, SUITE 140
PLEASANTON, CA 94566
PH. (925) 426-0080 FAX. (925) 426-0707

PROJ. NO. 01794062.00 | DWN. BY: ATV | ACAD FILE: SHT–1
DSN. BY: DR | CHK. BY: JJM | APP. BY: JJM

DATE: 11–23–2009

SCALE: NOT APPLICABLE

DRAWING NO. 1

PROPERTY LINE

MARINA

SHORE LINE

SHORE LINE

BLDG 3
GUEST SUITES
3 STORIES

BLDG 9
FITNESS PAVILLION & POOL
1 STORY

BLDG 4
GUEST SUITES
4 STORIES

BLDG 2
GUEST SUITES
LAUNDRY
ENGINEERING & MAINTENANCE SHOP
3 STORIES

BLDG 5
BUSINESS CENTER
4 STORIES

BLDG 8
POOL
1 STORY

BLDG 1
GUEST SUITES
3 STORIES

BLDG 6
RESTAURANT
QUATERDECK AND LOUNGE
BALLROOMS
KITCHEN
2 STORIES

BLDG 7
LOBBY & RECEPTION
2 STORIES

PROPERTY LINE

SERVICE ENTRANCE

MARINA BOULEVARD

SCALE IN FEET

80 0 80

GRAPHIC SCALE

LEGEND

BUILDINGS WITH ALARM UNITS

BASE MAP: PERKOWITZ + RUTH ARCHITECT, NOVEMBER 2007

NO.	REVISION	DATE

SHEET TITLE
SITE PLAN – DOUBLETREE HOTEL

PROJECT TITLE
AS-BUILT PLANS
COMBUSTIBLE GAS MONITORING SYSTEM
DOUBLETREE HOTEL
200 MARINA BOULEVARD, BERKELEY, CA

City of Berkeley
California

BERKELEY

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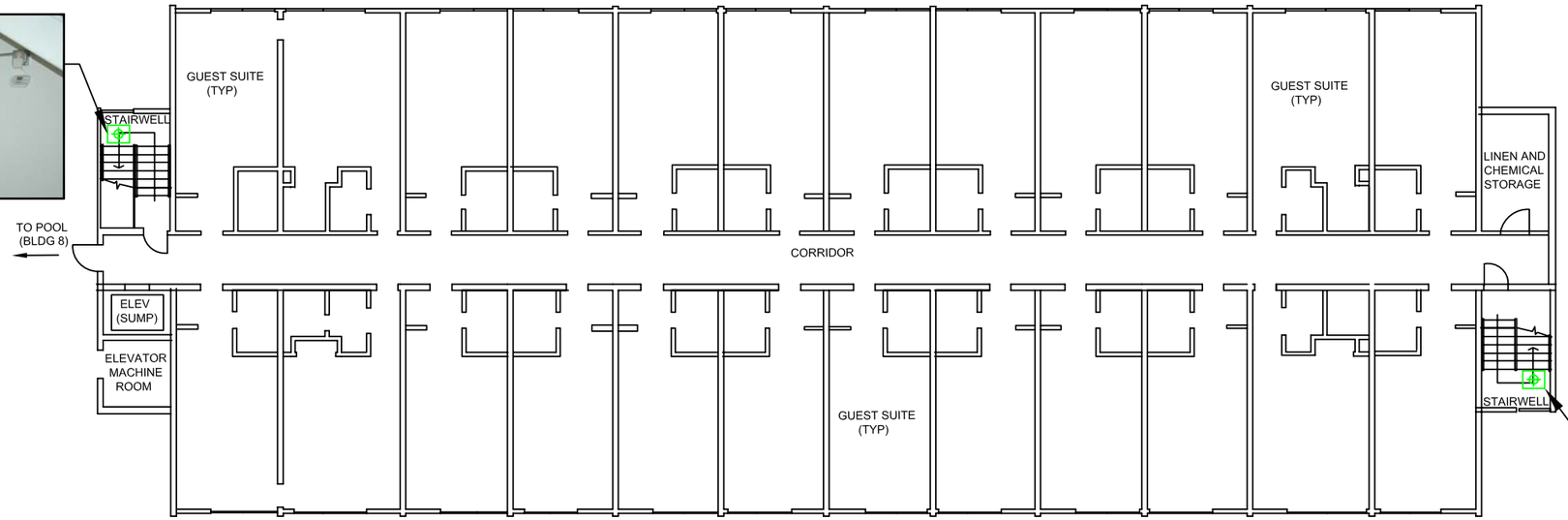
PLEASANTON, CA 94566
PH. (925) 426-0080 FAX. (925) 426-0707

PROJ. NO. 0794062.00 | DWN. BY: ATV | ACAD FILE: SHT-2
DSN. BY: DR | CHK. BY: JJM | APP. BY: JJM

DATE: 11-23-2009

SCALE: GRAPHIC SCALE

DRAWING NO. 2



SCALE IN FEET

16 0 16

GRAPHIC SCALE

LEGEND

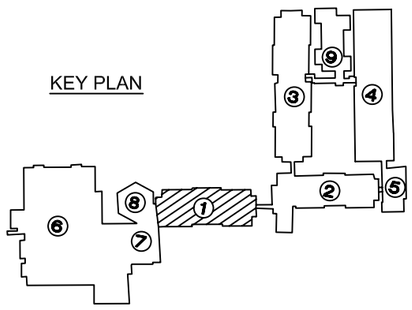
① BUILDING DESIGNATION

COMBUSTIBLE GAS SENSOR LOCATION

NOTES:

1. SENSORS INSTALLED IN ALCOVES LOCATED BENEATH THE FIRST LANDING OF STAIRS ON THE FIRST FLOOR
2. LOCATION OF COMBUSTIBLE GAS SENSOR IN SOUTH STAIRWELL MAY BE SENSITIVE TO INTERFERENCE FROM CHEMICALS IN ADJACENT POOL BUILDING

KEY PLAN



BASE MAP: PHILIP WASSERSTROM ARCHITECT, SEPTEMBER 1970

NO.	REVISION	DATE

SHEET TITLE
BUILDING 1 (GUEST SUITES)
FIRST FLOOR COMBUSTIBLE GAS SENSOR PLAN

PROJECT TITLE
AS-BUILT PLANS
COMBUSTIBLE GAS MONITORING SYSTEM
DOUBLETREE HOTEL
200 MARINA BOULEVARD, BERKELEY, CA

City of Berkeley
California

BERKELEY

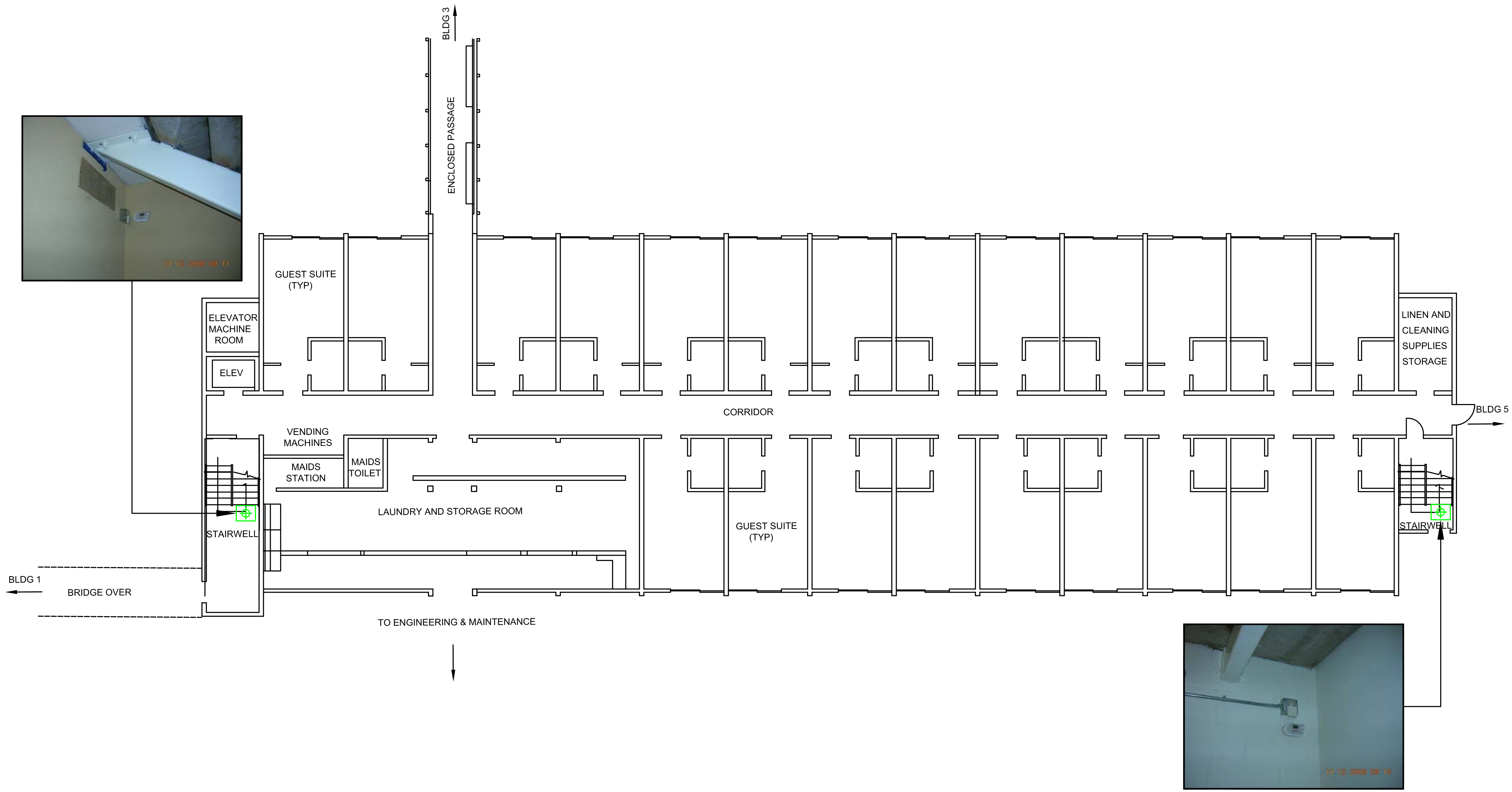
SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
660 KOLL CENTER PKWY, SUITE 140
PLEASANTON, CA 94566
PH. (925) 426-0080 FAX. (925) 426-0707

PROJ. NO. 01704082.00 | DSN. BY: DR | DWN. BY: LCF | CHK. BY: JJM | ACAD FILE: SHT-3 | APP. BY: JJM

DATE: 11-23-2009

SCALE: GRAPHIC SCALE

DRAWING NO. 3



SCALE IN FEET

16 0 16

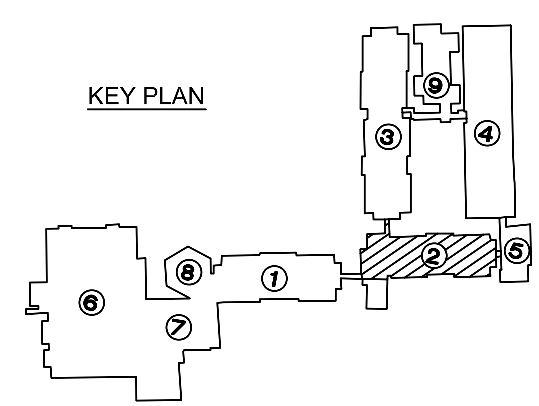
GRAPHIC SCALE

LEGEND

① BUILDING DESIGNATION

COMBUSTIBLE GAS SENSOR LOCATION

KEY PLAN



NOTES:

1. SENSORS INSTALLED IN ALCOVES LOCATED BENEATH THE FIRST LANDING OF STAIRS ON THE FIRST FLOOR

BASE MAP: PHILIP WASSERSTROM ARCHITECT, 1970

NO.	REVISION	DATE

SHEET TITLE
BUILDING 2 (GUEST SUITES ? LAUNDRY)
FIRST FLOOR COMBUSTIBLE GAS SENSOR PLAN

PROJECT TITLE
AS-BUILT PLANS
COMBUSTIBLE GAS MONITORING SYSTEM
DOUBLETREE HOTEL
200 MARINA BOULEVARD, BERKELEY, CA

City of Berkeley
California

BERKELEY

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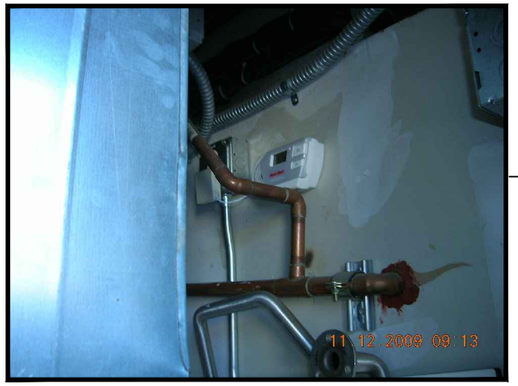
6601 KOLL CENTER PKWY, SUITE 140
PLEASANTON, CA 94566
PH. (925) 426-0080 FAX. (925) 426-0707

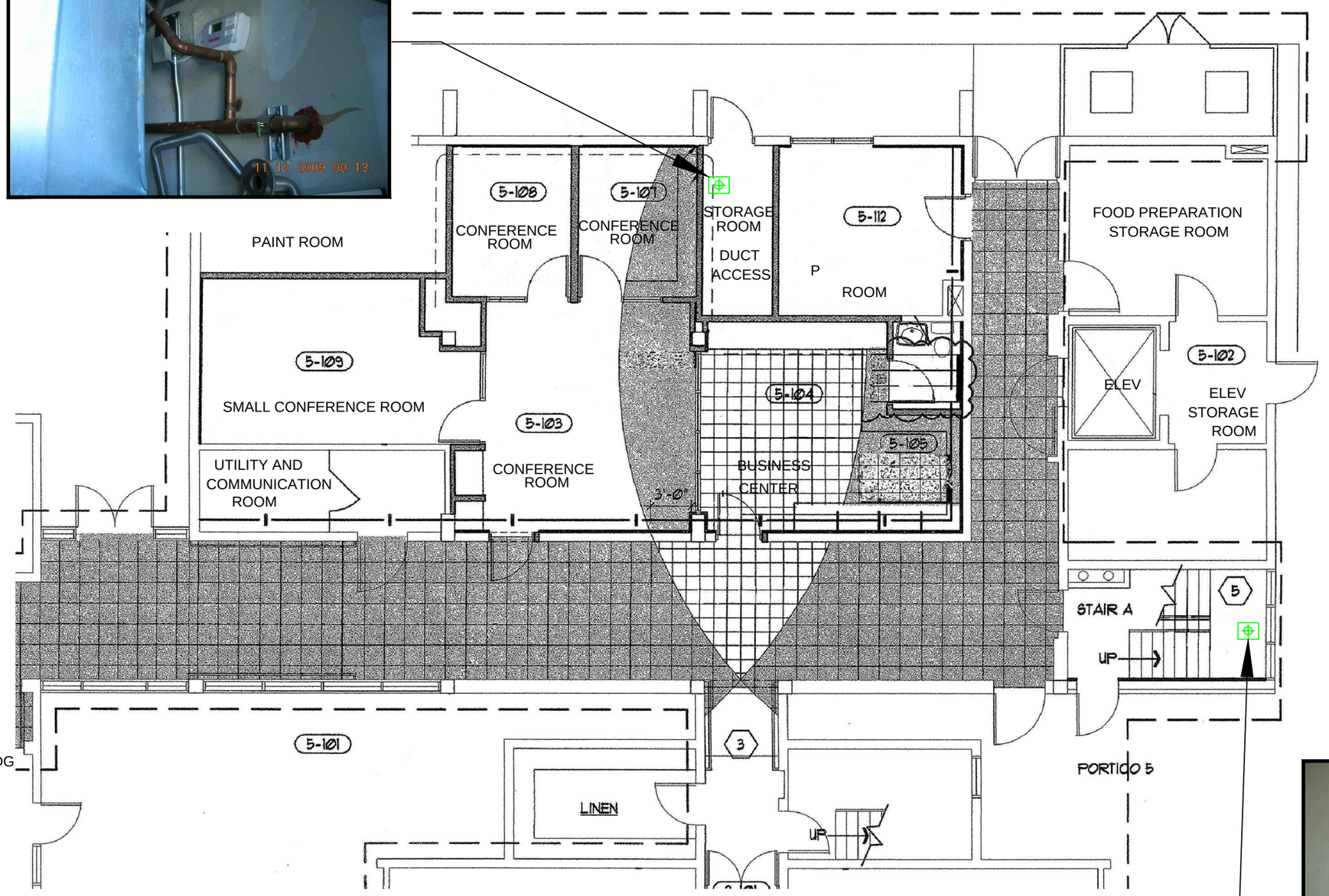
PROJ. NO. 07940062.00
DWN. BY: LCF
ACAD FILE: SHT-4
DSN. BY: DR
CHK. BY: JJM
APP. BY: JJM

DATE: 11-23-2009

SCALE: GRAPHIC SCALE

DRAWING NO. 4





SCALE IN FEET

16 0 16

GRAPHIC SCALE

LEGEND

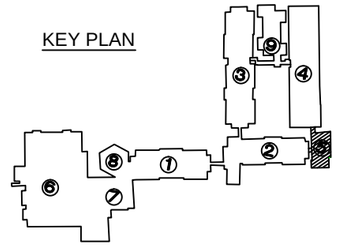
① BUILDING DESIGNATION

COMBUSTIBLE GAS SENSOR LOCATION

NOTES:

1. SENSOR IN STAIRWELL INSTALLED IN THE ALCOVE LOCATED BENEATH THE FIRST LANDING OF STAIRS ON THE FIRST FLOOR

KEY PLAN



BASE MAP: HOCHHEISER ROSS DESIGN GROUP, 2002

NO.	REVISION	DATE

SHEET TITLE: BUILDING 5 (BUSINESS CENTER) FIRST FLOOR COMBUSTIBLE GAS SENSOR PLAN

PROJECT TITLE: AS-BUILT PLANS COMBUSTIBLE GAS MONITORING SYSTEM DOUBLETREE HOTEL 200 MARINA BOULEVARD, BERKELEY, CA

City of Berkeley
California

BERKELEY

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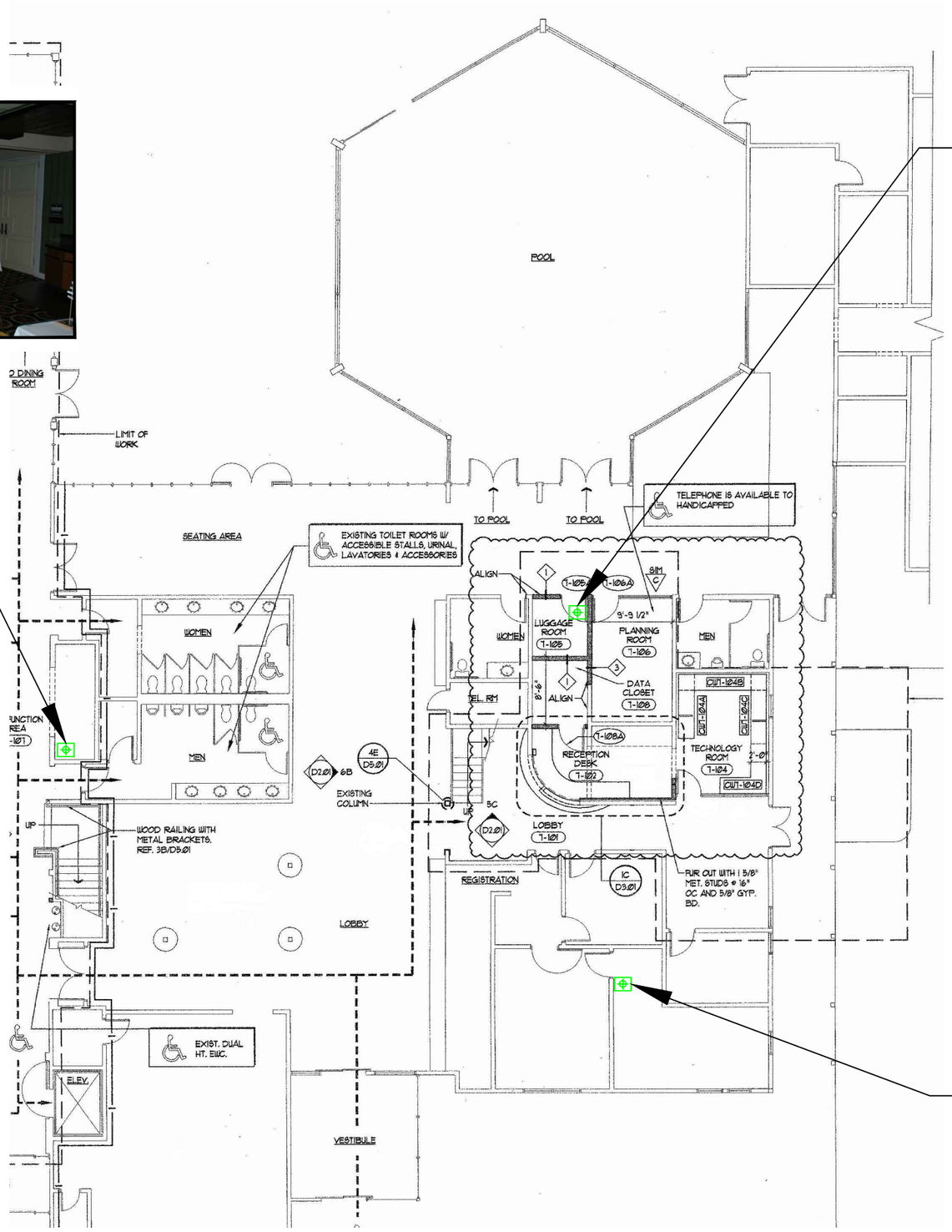
ENVIRONMENTAL CONSULTANTS
6601 KOLL CENTER PKWY, SUITE 140
PLEASANTON, CA 94566
PH. (925) 426-0080 FAX. (925) 426-0707

DSN. BY:	PROJ. NO.	DWN. BY:	CHK. BY:	ACAD FILE:	APP. BY:
DR	07940082.00	LCF	JAM	SHT-5	JAM

DATE: 11-23-2009

SCALE: GRAPHIC SCALE

DRAWING NO. 5



TO BUILDING 1

TO BUILDING 6

SCALE IN FEET

16 0 16

GRAPHIC SCALE

LEGEND

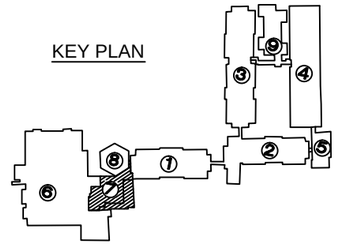
① BUILDING DESIGNATION

COMBUSTIBLE GAS SENSOR LOCATION

NOTES:

1. SENSORS TO BE LOCATED ON CEILINGS OR ON THE WALL NEAR THE WALL/CEILING LINE

KEY PLAN



BASE MAP: HOCHHEISER ROSS DESIGN GROUP, 2002

NO.	REVISION	DATE

SHEET TITLE
BUILDING 7 (LOBBY AND RECEPTION AREA)
FIRST FLOOR COMBUSTIBLE GAS SENSOR PLAN

PROJECT TITLE
AS-BUILT PLANS
COMBUSTIBLE GAS MONITORING SYSTEM
DOUBLETREE HOTEL
200 MARINA BOULEVARD, BERKELEY, CA

City of Berkeley
California

BERKELEY

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
6601 KOLL CENTER PKWY, SUITE 140
PLEASANTON, CA 94566
PH. (925) 426-0080 FAX. (925) 426-0707

PROJ. NO.	DWN. BY:	ACAD FILE:
07040020.00	LGF	SHT-6
DSN. BY:	CHK. BY:	APP. BY:
DR	JJM	JJM

DATE: 11-23-2009

SCALE: GRAPHIC SCALE

DRAWING NO. 6

CITY OF BERKELEY

Permit Service Center

Planning and Development Department

2120 Milvia Street
Berkeley, California 94704

Building and Safety	981-7440	Fire Prevention	981-7447
Engineering Permits	981-7500	Toxics	981-7460
Health Department	981-5310	Land Use (ZONING)	981-7410

PLEASE NOTE:
Review "Work Description Information" (below) for Permit details.
Electrical, Mechanical, & Plumbing work requires separate Applications.
Obtain required permits prior to requesting inspections.
See PSC staff if you have questions.

To Arrange **Building Inspections** and/or **Public Works Inspections** Call (510) 981-7444 • **Fire Inspections** Call (510) 981-5585
Telecommunications Device for the Deaf (510) 981-7474• **FAX** (510) 981-7505

Application Number . . . . . 09-3649 Date 9/23/09
Property Address . . . . . 200 MARINA BLVD
Parcel Number . . . . . 060- -2528-007-01
Application type description ELECTRICAL PERMIT EL-0 EXPRESS
Property Use . . . . . EXEMPT PUBLIC AGENCIES
Application valuation 0
Inspection Area 1

Owner
Double Tree Hotel
870 Creek Drive
Gerald Loughran
BOULDER CREEK CA 95006
(510) 548-7920

Contractor
MCINTIRE ELECTRIC
870 CREEK DRIVE
BOULDER CREEK CA 95006
(831) 338-4730

Applicant
Maxwell McIntire
870 Creek Drive
BOULDER CREEK CA 95006
(510) 338-4730

IF AN INSPECTION OF THIS PERMITTED WORK IS NOT CONDUCTED WITHIN 60 DAYS OF RECEIVING THE REQUEST THE PERMITEE MAY BE ENTITLED TO REIMBURSEMENT OF THE PERMIT FEE. CALIFORNIA HEALTH & SAFETY CODE § 17951(d)

Structure Information 000 000 ELECTRICAL
Construction Type . . . . . TYPE VB
Occupancy Type . . . . . DWELLING/TOWNHOUSE/CON<16

Permit . . . . . ELECTRICAL PERMIT
Additional desc . .
Phone Access Code . 1357649
Permit Fee . . . . 94.00 Plan Check Fee . . .00
Issue Date . . . . 9/23/09 Valuation 0
Expiration Date . . 9/23/10

Qty	Unit Charge	Per		Extension
			BASE FEE	46.20
9.00	2.5500	EA	EL21-RECEPTACLE	22.95
1.00	24.8500	CHA	EL24-ALTER WIRING, EA. CHANGE	24.85

Special Notes and Comments
Installation of 9 receptacles for gas detectors in stairwell on exisiting circuits

Other Fees	FILING FEE - ELECTRICAL	21.00
	TECHNOLOGY FEE ELEC PMT	4.70

Fee summary	Charged	Paid	Credited	Due

NOTE: This permit does not become valid until signed by the Building Official or his deputy and fees are paid, and receipt is acknowledged in the space provided.

Signature of Deputy: _____

APPLICATION APPROVAL STATEMENT

CITY OF BERKELEY

Permit Service Center

Planning and Development Department

2120 Milvia Street
Berkeley, California 94704

Building and Safety	981-7440	Fire Prevention	981-7447
Engineering Permits	981-7500	Toxics	981-7460
Health Department	981-5310	Land Use (ZONING)	981-7410

PLEASE NOTE:
Review "Work Description Information" (below) for Permit details.
Electrical, Mechanical, & Plumbing work requires separate Applications.
Obtain required permits prior to requesting inspections.
See PSC staff if you have questions.

To Arrange **Building Inspections** and/or **Public Works Inspections** Call (510) 981-7444 • **Fire Inspections** Call (510) 981-5585
Telecommunications Device for the Deaf (510) 981-7474• **FAX** (510) 981-7505

Application Number	09-3649			Date	9/23/09
Permit Fee Total	94.00	94.00	.00		.00
Plan Check Total	.00	.00	.00		.00
Other Fee Total	25.70	25.70	.00		.00
Grand Total	119.70	119.70	.00		.00

NOTE: This permit does not become valid until signed by the Building Official or his deputy and fees are paid, and receipt is acknowledged in the space provided.

Signature of Deputy:

APPLICATION APPROVAL STATEMENT

Planning Department
Building and Safety Division

JOB CARD

Permit No. 09-3649

	Date	Inspector	Comment
Set back/lot coverage			
Foundation forms/depth/size			
Steel			
Anchor bolts			
Holddowns			
UFER			
Underfloor electric			
Underfloor mechanical			
Underfloor plumbing			
Underfloor insulation			
Floor frame			
Slab			
DO NOT COVER UNTIL ABOVE IS SIGNED			
Frame electric - rough			
Frame mechanical – rough			
Frame plumbing – rough			
Frame			
Shear walls			
Framing insulation			
DO NOT COVER UNTIL ABOVE IS SIGNED			
Lath – exterior			
Lath – Drywall – Interior			
FIRE DEPARTMENT APPROVALS			
Sprinkler system			
Hood Extinguishing system			
Extinguishing system			
Fire alarm system			
Assembly Permit			
Standpipe installation			
Underground sprinkler			
PUBLIC WORKS/ENGINEERING APPROVALS			
Public Right-of-Way			
Sewer			
Drain			
FINALS-DIVISION/DEPARTMENT			
Fire Department			
Hazardous Materials			
Health Department			
Public Works			
Planning/Zoning			
Traffic			
Final Gas Test			
Gas release to PG & E			
Electrical release to PG & E			
Building and Safety Division			
Final – Electrical	9-30-09	SM	
Final – Plumbing			
Final – Mechanical			
Final – Building			
Final – Sewer			
CERTIFICATE OF OCCUPANCY			

INSPECTION CONFIRMATION # 00370089
INSPECT 09/30/09 CANCEL 00370089
00370011

Planning Department
PERMIT SERVICE CENTER
APPROVED FOR ISSUANCE, By
SEP 23 2009

This JOB CARD must be kept on the job at all times. It is unlawful to make any changes or alterations on same without written permit from the City of Berkeley Building & Safety Division.

CITY OF BERKELEY
Planning and Development Department
BUILDING AND SAFETY DIVISION

JOB CARD

INSPECTION REQUEST LINE
(510) 981-7444
(Building, Electrical, Mechanical, Plumbing, Public Works/Engineering)

Fire Inspections
981-5585

PHONE NUMBERS

Building & Safety
(510) 981-7440
Land Use Planning
(510) 981-7410

OFFICE HOURS:

The Building and Safety Division is open Monday, Tuesday, Thursday and Friday 8:00 a.m. to 5:00 p.m.; Wednesday's 9:00 a.m. to 5:00 p.m.

BUILDING INSPECTOR'S HOURS:

Monday-Friday, 8:00 a.m. to 9:00 a.m. and 4:30 p.m. to 5:00 p.m.

JOB ADDRESS: 200 Marina **PERMIT NO.** 09-3649 e

WORK PERMITTED UNDER THIS BUILDING PERMIT NUMBER MUST BE COMPLETED WITHIN ONE (1) YEAR OF THE ISSUE DATE.

EXTENSION OF TIME TO COMPLETE WORK MAYBE GRANTED UPON WRITTEN REQUEST PRIOR TO EXPIRATION OF THIS PERMIT.
The application is available on the City's website:
http://www.ci.berkeley.ca.us/onlineservice/planning/Form%20for%20Extension%20Request.pdf

PLEASE VISIT OUR WEBSITE FOR INFORMATION ON THE PERMIT PROCESS, BUILDING PLANS REVIEW, LAND USE PLANNING ISSUES AND OTHER FREQUENTELY ASKED QUESTIONS:
http://www.ci.berkeley.ca.us/buildingandsafety/

ELECTRICAL, MECHANICAL & PLUMBING WORK MUST HAVE PERMITS SEPARATE FROM A BUILDING PERMIT.

- **KEEP THIS CARD POSTED IN A CONSPICUOUS PLACE ON THE JOB SITE AT ALL TIMES.**
- **PLANS AND PERMIT DOCUMENTS SHALL ALSO BE ON THE JOB SITE AT ALL TIMES WHEN WORK IS IN PROGRESS.**
- **AFTER COMPLETION OF WORK, RETAIN THIS CARD FOR YOUR RECORDS.**

ATTACHMENT 2

OPERATIONS AND MAINTENANCE MANUAL

SCS ENGINEERS

Operation and Maintenance Manual
Combustible Gas
Monitoring System
DoubleTree Hotel
200 Marina Boulevard
Berkeley, California

Prepared for:

City of Berkeley
Department of Public Works
1947 Center St., 4th Floor
Berkeley, California 94704

Prepared by:

SCS ENGINEERS
6601 Koll Center Parkway
Suite 140
Pleasanton, California 94566
925-426-0080

November 23, 2009
File No. 07194062.00 Task 14

OPERATION AND MAINTENANCE PLAN
COMBUSTIBLE GAS MONITORING SYSTEM
DOUBLETREE HOTEL
200 MARINA BOULEVARD
BERKELEY, CALIFORNIA

Prepared for:

City of Berkeley
Department of Public Works
1947 Center St., 4th Floor
Berkeley, California 94704

Prepared by:

SCS ENGINEERS
6601 Koll Center Parkway, Suite 140
Pleasanton, California 94566
925-426-0080

November 23, 2009
File No. 07194062.00 Task 14

Table of Contents

Section **Page**

Attachments

No.

CERTIFICATION

This ***Operation and Maintenance Manual, Combustible Gas Monitoring System, DoubleTree Hotel, 200 Marina Boulevard, Berkeley, California***, dated November 20, 2009, was prepared under our direct supervision. We are California Professional Engineers, pursuant to Section 6762 of the Business and Professional Code.

In accordance with the Standard Provisions and Reporting Requirements, we certify under penalty of law that this document and all attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Dilan Roe, P.E., LEED®AP
Civil – No. C73703

REGISTERED PROFESSIONAL ENGINEER
DILAN ROE
C 73703
Exp. 3/31/10
CIVIL
STATE OF CALIFORNIA

Joe Miller, P.E.
Civil – No. C042598

REGISTERED PROFESSIONAL ENGINEER
JOSEPH J. MILLER
C 042598
Exp. 3/31/10
CIVIL
STATE OF CALIFORNIA

1 INTRODUCTION

1.1 PURPOSE OF MANUAL

This manual provides procedures specific to the operation and maintenance (O&M) for the combustible gas monitoring system at the DoubleTree Hotel, located at 200 Marina Boulevard in Berkeley, California. The purpose of this O&M Manual is to provide instructions to the DoubleTree Hotel engineering and maintenance personnel for the proper operation, testing, monitoring, and maintenance of the combustible gas monitoring system in order to ensure safety of the occupants at 200 Marina Boulevard. This O&M manual shall be kept on-site and made accessible to individuals trained in conducting the O&M activities.

1.2 BACKGROUND

Location and Site History

The DoubleTree Hotel is located within the Berkeley Marina on a man made peninsula in the San Francisco Bay. The Marina forms the southern part of the peninsula and is adjacent to the closed City of Berkeley Landfill (Landfill), currently developed as a public park (Cesar Chavez Park), which forms the northern part of the peninsula. The City of Berkeley (City) is the owner of the Berkeley Landfill and the Berkeley Marina properties; the DoubleTree Hotel operates their facility under a lease arrangement with the City.

The DoubleTree Hotel complex (former Radisson Hotel and Marriott Hotel) was constructed in 1971 and expanded in the mid-1980s and consists of two single story buildings and seven multi-level buildings. A site location map and a site plan of the hotel facility are included in ***Attachment 1***, as Drawing Nos. 1 and 2, respectively.

Regulatory Requirements

The Landfill was closed in the late 1980's and is undergoing post-closure monitoring and maintenance through various programs administered by Regional Water Quality Control Board, the California Integrated Waste Management Board (CIWMB), and the Bay Area Air Quality Management District. The CIWMB considers the whole man made peninsula regulated under the requirements of Title 27 of the California Code of Regulations (CCR Title 27) even though the Berkeley Marina and DoubleTree Hotel site were never operated as a permitted municipal waste landfill that accepted organic waste materials. As such, the CIWMB has spelled out specific requirements for monitoring of combustible gas at the DoubleTree Hotel in accordance with CCR Title 27, Division 2, Subdivision 1, Chapter 3, Subchapter 4, Article 6 – Structure Monitoring. The requirements include:

- Equipping Buildings 1, 2, 5 and near the lobby of Building 7 with continuous combustible gas monitoring devices.

- Certification by a Registered Professional Engineer in the State of California that the system was installed per the CIWMB approved Revised Combustible Gas Monitoring Plan and Inspection Protocol (SCS, May 2009).

- Preparation of an O&M Manual describing the combustible gas monitoring system, O&M activities, and response protocols in case of alarm event.

- Conducting O&M activities in accordance with the procedures provided in the O&M Manual.

Scope of Manual

This O&M Manual describes the combustible gas monitoring system installed at the DoubleTree Hotel Complex in September 2009. This Manual provides instructions on the proper operation, maintenance and monitoring of the system and includes the following attachments:

- As-built drawings showing the locations of the combustible gas alarm units (***Attachment 1***);

- Manufacturer's Product Specifications/User's Manual for the combustible gas alarm units (***Attachment 2***);

- Alarm unit inspection and maintenance schedule and log sheets (***Attachment 3***);

- Emergency response plan and contact list of parties responsible for the combustible gas maintenance and monitoring and emergency responders **(*Attachment 4*)**.

O&M Manual Updates

The contents of this document are based on the conditions observed at the DoubleTree Hotel during initial system installation and testing of the combustible gas monitoring system in October 2009 and as documented in the as-built drawings included as ***Attachment 1***. Hotel management staff shall inform the City of proposed changes to the hotel complex facilities that may affect the operation, maintenance, monitoring or configuration of the combustible gas monitoring system. Upon such notification, the City shall inform the CIWMB in writing of any proposed changes to the combustible gas monitoring system configuration and/or monitoring protocol. If the requested changes are authorized by the CIWMB, this O&M Manual shall be updated as necessary to reflect the new configuration. The as-built configuration of the combustible gas monitoring system documented in this O&M Manual **shall not be modified** prior to receiving approval from the CIWMB.

The O&M Manual shall also be updated as necessary to keep the contact list of responsible parties (included as ***Attachment 4***) current.

2 COMBUSTIBLE GAS MONITORING SYSTEM DESCRIPTION

Per CIWMB directive, stand-alone, automated, continuous combustible gas monitoring sensors (First Alert GC01CN Plug-In Explosive Gas and Carbon Monoxide Alarm with Battery Back-up and Silence Feature) have been installed in ground-floor levels of Buildings 1, 2, 5, and the lobby of Building 7. Initial testing of the alarm units and certification that the alarm units were operating properly was performed by SCS in October 2009. A description of the alarm units, building layouts and rationale for alarm locations is presented below.

FIRST ALERT GC01CN ALARM UNITS

The alarm units utilize electrochemical sensors to monitor explosive gas (methane and propane) and carbon monoxide (CO). The plug-in units meet Underwriters Laboratories, Inc. (UL) standards UL1484 and UL 2034 and are designed to operate continuously (i.e., 24 hours per day, 7 days per week), powered by a 24-hour standard, unswitched, 120-volt(V) alternating current (AC) circuit, with 9V battery back-up for emergency power during power outages. The units detect combustible gas as a priority over CO and will trigger an 85 decibel alarm when 25 percent of the lower explosive limit (LEL) of either methane or propane is detected (i.e., 12,500 parts per million by volume [ppmv]). CO has multiple alarm triggers based on levels recorded over a period of specified time interval and include: 400 ppmv (4 to 15 minutes), 150 ppmv (10 to 50 minutes), 70 ppmv (1 to 4 hours). Further details on the alarm specifications are contained in the Product Specifications/User's Manual included as ***Attachment 2***.

ALARM UNIT LOCATIONS

Individual alarms were installed in each structure in areas that may be susceptible to methane gas intrusion or accumulation in accordance with the CIWMB approved Revised Combustible Gas Monitoring Plan and Inspection Protocol and manufacturer's instructions specified in the Product Specifications/User Manual (***Attachment 2***). Alarm unit locations were selected based on an inspection of the building interiors by SCS, City, CIWMB, and the DoubleTree Hotel staff, and on the manufacturer's recommendations to not install alarms units in areas: (1) that are extremely dusty, dirty, or greasy; (2) where interference gas sources may be present; or (3), that may expose the alarm unit sensor to substances that could damage or contaminate it and lead to nuisance alarms. The locations were also selected based on their accessibility both to the hotel and maintenance staff, as well as City staff and their contractors, and the recommendation to keep the alarms outside of individual hotel suites or hallways to prevent tampering and in consideration of privacy concerns.

The alarm units are installed in the ground floor level of Buildings 1, 2, 5, and the lobby of Building 7 in the locations shown in the drawings (***Attachment 1***) and as summarized in the table below. As methane is much lighter than air and will rise rapidly in air, the alarm units were mounted in the locations shown on the drawings either on ceilings or on the wall near the wall/ceiling line, or in the case of stairwells, located in the alcove under the first landing of the staircase.

Building Number	1st Floor Building Functions	Number of Sensors	Sensor Locations
1	Guest Suites	2	Stairwells
2	Guest Suites and Hotel Laundry	2	Stairwells
5	Business Center	2	Stairwell, Storage Room
7	Lobby & Reception Area	3	Pre-Function Area Alcove, Manager's Office/Registration Area, Luggage Room

3 INSPECTION AND MAINTENANCE

The alarm units shall be operated and maintained in accordance with this O&M Manual and the manufacturer's Product Specifications/User Manual recommendations included as ***Attachment 2***. The alarm units are capable of continuous unmanned operation with minimal maintenance personnel involvement. However, the alarm units must be periodically inspected and maintained by trained personnel who are familiar with their operation in accordance with the schedule provided in ***Attachment 3*** and as summarized below. If an alarm unit needs to be replaced, the DoubleTree Hotel staff shall contact the City for replacement of the unit.

WEEKLY ACTIVITIES

- **AC Power Check.** Under normal AC powered alarm unit operation, the LED indicator light will be green and the battery level icon will be displayed. If the alarm is being powered by the battery back-up power, the green indicator light will flash once every 45 seconds. If the green light is flashing or is not illuminated, the AC power connections shall be checked. If the connections are correct and the green power indicator light is not continuously illuminated, the alarm unit shall be replaced..

- **Alarm Test.** A simulated alarm test shall be activated by pressing and holding the test button until the alarm sounds. In a properly functioning unit, a loud, repeating horn pattern will be issued in sync with a red flashing LED indicator light. The signal indicating the presence of explosive gas will be triggered first (one beep per second), followed by the signal for carbon monoxide (4 beeps, pause, 4 beeps). During the simulated gas alarm "GAS" will be displayed along with a full alarm level. During the simulated CO alarm, "CO" will be displayed with an increasing parts per million number. If the alarm unit does not test properly, the AC power connections shall be checked and the unit tested again. If the alarm is still not working properly, the unit shall be replaced.

- **Back-up Power Battery Check.** The battery shall be replaced if the display indicates an empty battery icon and a chirp is issued from the horn approximately every minute (low battery warning).

- **Malfunctioning Unit Check.** An alarm unit shall be replaced if the green LED indicator light is flashing in sync with 3 rapid chirps issued from the horn every minute (alarm malfunction warning). The warning is based on a self-diagnostic test detecting a fault or that the alarm has reached its end-of-life, 5 years.

MONTHLY ACTIVITIES

In addition to the weekly maintenance activities, the alarm units shall be cleaned at least once a month by gently vacuuming the outside of the unit using a vacuum a soft brush attachment of a household vacuum cleaner. The use of water, cleaner, solvents, insecticide sprays or paint shall not be used directly on or near the alarms as they may damage the units.

INSPECTION AND MAINTENANCE LOG

A log book shall be maintained on-site which records the weekly and monthly inspection and maintenance activities. The log book shall be kept with this O&M Manual. This will enable a quick reference for maintenance personal and the oversight agencies. A sample log sheet, including the date, time and location of inspection and maintenance activities is provided in ***Attachment 3***.

EQUIPMENT SPECIFICATIONS AND USER MANAUL

The alarm unit specifications and user's manual are provided as ***Attachment 2.*** Building maintenance personnel and others involved with the combustible gas alarm unit operation should refer to the specifications listed in the manual when performing routine inspection and maintenance activities.

4 RESPONSES TO ALARM EVENTS

As stated above, the alarm units will automatically signal an audible alarm if elevated levels of combustible gas (methane or propane) or CO are detected in the building interior. Specific responses for alarm events are described below and summarized in a table in ***Attachment 4***. An emergency response contact list and a sample corrective action log sheet are also provided in ***Attachment 4***.

If an alarm is triggered, follow-up testing with field instruments shall be performed immediately upon notice to confirm whether a hazardous condition exists. A gas reading using a hand-held combustible gas meter shall be taken to verify the alarm at the location of the unit. The meter and an individual trained to use the meter shall be present onsite at all times. Testing shall be performed to rule out possible alarm unit malfunction and interference gas sources. If testing indicates a false alarm, the units shall be reset in accordance with the manufacturer's instructions. If an alarm unit sounds frequent alarms, even though no high levels of gas or CO are revealed in the investigation, the unit shall be replaced as conditions may have changed during the time interval when the alarm unit was activated and the alarm noticed. If the new sensor continues to alarm, the DoubleTree hotel staff shall notify the City. The City shall notify the CIWMB and arrange to have the unit relocated or removed from the monitoring network if it is determined that the sensor is being triggered by interference gas sources or other conditions resulting in nuisance alarms.

If testing results in verifying a potentially hazardous condition, emergency response measures shall be implemented as appropriate including notification of the City and the Berkeley Fire Department and if necessary, evacuation of the affected area or ventilation of the area (to be determined by the Fire Department). The DoubleTree Hotel staff will respond to the alarm events and notify the City. The City will notify the CIWMB via email or telephone within 24 hours, and maintain a written log including any corrective actions taken. A sample log sheet is included in ***Attachment 4***.

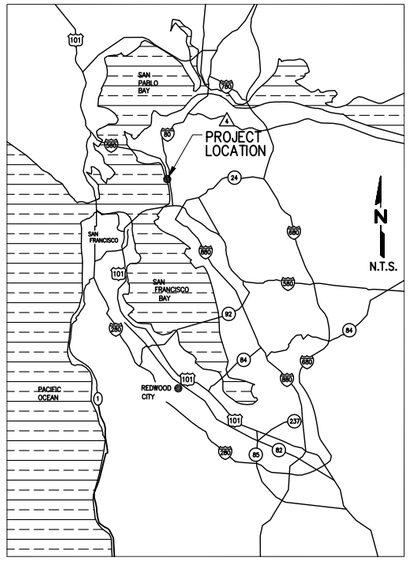
If the results of alarm monitoring show evidence of combustible gas infiltration into the building structures (as verified by follow-up testing), the DoubleTree Hotel shall implement interim measures as necessary, such as ventilating the area through the use of portable fans and/or by turning on the HVAC system, until the appropriate remedial measures, specific to the problem have been identified. Remedial measures will be designed or approved by a licensed civil engineer familiar with subsurface combustible gas hazards. These measures could include modifications or repairs to existing subfloor passive vent systems in Building Nos. 4 or 5 (will require physical investigation of existing components), sealing of structure conduit slab penetrations, modifications to the existing subsurface gas control system, or upgrades to building HVAC systems.

ATTACHMENT 1

AS-BUILT PLANS
COMBUSTIBLE GAS MONITORING SYSTEM

AS-BUILT PLANS
COMBUSTIBLE GAS MONITORING SYSTEM
DOUBLETREE HOTEL
200 MARINA BOULEVARD BERKELEY, CA

LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

INDEX OF SHEETS

PREPARED FOR:
CITY OF BERKELEY
PUBLIC WORKS DEPARTMENT

1947 CENTER STREET, 4th FLOOR
BERKELEY, CALIFORNIA 94704

NO.	REVISION	DATE

SHEET TITLE: TITLE SHEET– LOCATION MAP

PROJECT TITLE: AS–BUILT PLANS
COMBUSTIBLE GAS MONITORING SYSTEM
DOUBLETREE HOTEL
200 MARINA BOULEVARD, BERKELEY, CA

City of Berkeley
California

BERKELEY

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
6601 KOLL CENTER PKWY, SUITE 140
PLEASANTON, CA 94566
PH. (925) 426-0080 FAX. (925) 426-0707

PROJ. NO. 01794062.00 | DWN. BY: ATV | ACAD FILE: SHT–1
DSN. BY: DR | CHK. BY: JJM | APP. BY: JJM

DATE: 11–23–2009

SCALE: NOT APPLICABLE

DRAWING NO. 1

PROPERTY LINE

MARINA

SHORE LINE

SHORE LINE

BLDG 3
GUEST SUITES
3 STORIES

BLDG 9
FITNESS PAVILLION & POOL
1 STORY

BLDG 4
GUEST SUITES
4 STORIES

BLDG 2
GUEST SUITES
LAUNDRY
ENGINEERING & MAINTENANCE SHOP
3 STORIES

BLDG 5
BUSINESS CENTER
4 STORIES

BLDG 8
POOL
1 STORY

BLDG 1
GUEST SUITES
3 STORIES

BLDG 6
RESTAURANT
QUATERDECK AND LOUNGE
BALLROOMS
KITCHEN
2 STORIES

BLDG 7
LOBBY & RECEPTION
2 STORIES

PROPERTY LINE

SERVICE ENTRANCE

MARINA BOULEVARD

SCALE IN FEET

80 0 80

GRAPHIC SCALE

LEGEND

BUILDINGS WITH ALARM UNITS

BASE MAP: PERKOWITZ + RUTH ARCHITECT, NOVEMBER 2007

NO.	REVISION	DATE

SHEET TITLE
SITE PLAN – DOUBLETREE HOTEL

PROJECT TITLE
AS-BUILT PLANS
COMBUSTIBLE GAS MONITORING SYSTEM
DOUBLETREE HOTEL
200 MARINA BOULEVARD, BERKELEY, CA

City of Berkeley
California

BERKELEY

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PROJ. NO. 0794062.00 | DWN. BY: ATV | ACAD FILE: SHT-2
DSN. BY: DR | CHK. BY: JJM | APP. BY: JJM

DATE: 11-23-2009

SCALE: GRAPHIC SCALE

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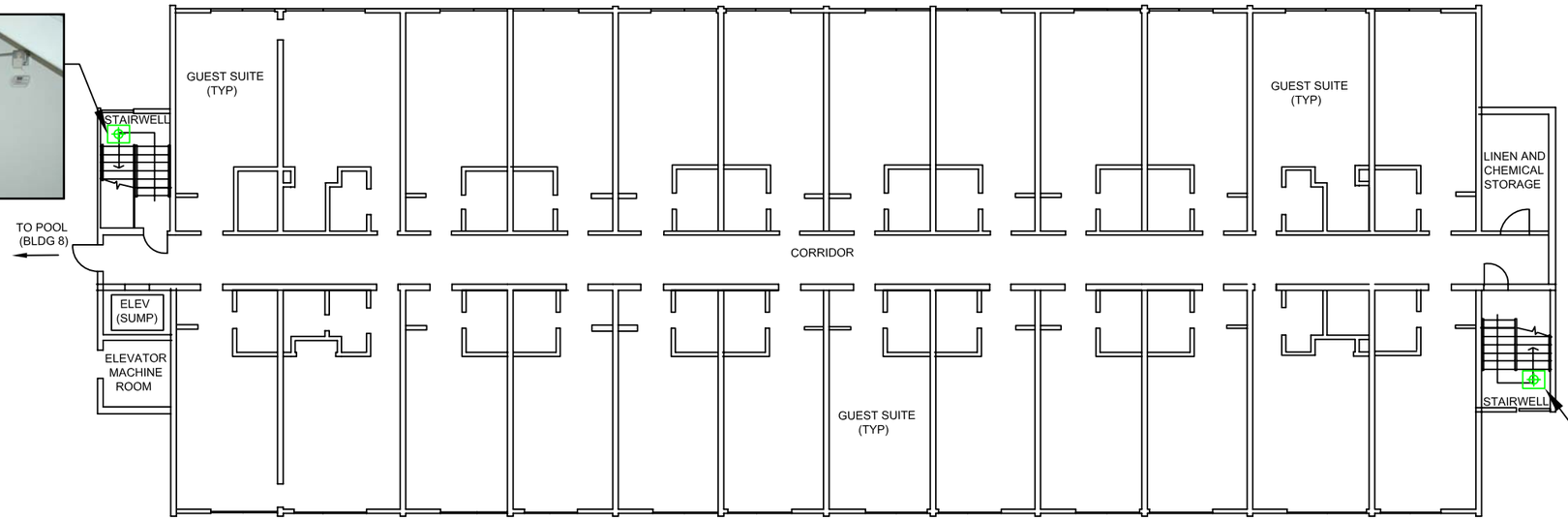


SCALE IN FEET

16 0 16

GRAPHIC SCALE

LEGEND

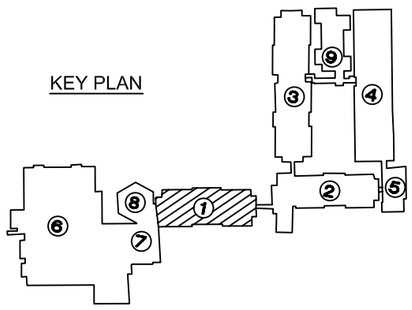
① BUILDING DESIGNATION

COMBUSTIBLE GAS SENSOR LOCATION

NOTES:

1. SENSORS INSTALLED IN ALCOVES LOCATED BENEATH THE FIRST LANDING OF STAIRS ON THE FIRST FLOOR
2. LOCATION OF COMBUSTIBLE GAS SENSOR IN SOUTH STAIRWELL MAY BE SENSITIVE TO INTERFERENCE FROM CHEMICALS IN ADJACENT POOL BUILDING

KEY PLAN



BASE MAP: PHILIP WASSERSTROM ARCHITECT, SEPTEMBER 1970

NO.	REVISION	DATE

SHEET TITLE
BUILDING 1 (GUEST SUITES)
FIRST FLOOR COMBUSTIBLE GAS SENSOR PLAN

PROJECT TITLE
AS-BUILT PLANS
COMBUSTIBLE GAS MONITORING SYSTEM
DOUBLETREE HOTEL
200 MARINA BOULEVARD, BERKELEY, CA

City of Berkeley
California

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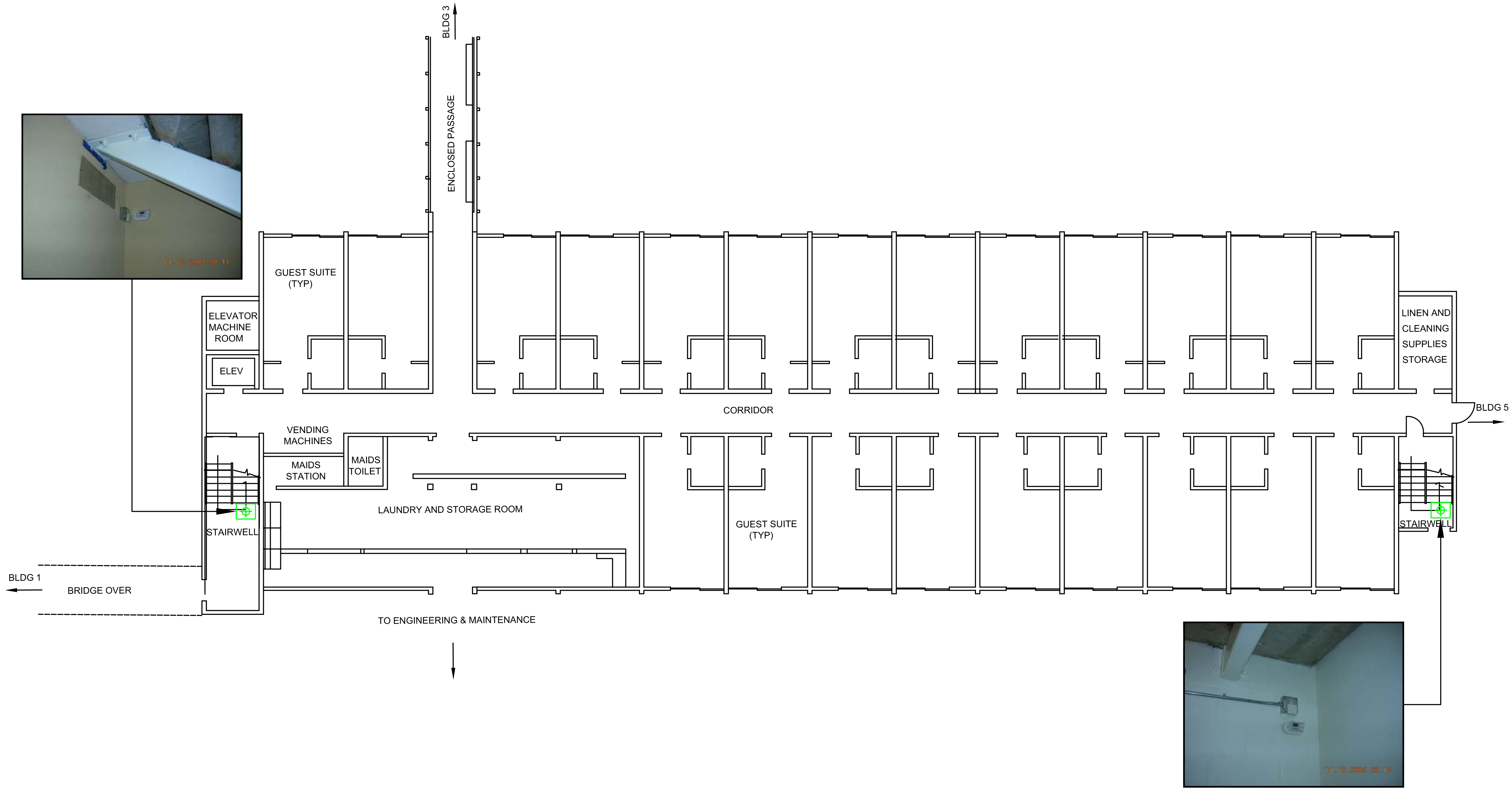
PROJ. NO. 01704082.00 | DSN. BY: DR | DWN. BY: LCF | CHK. BY: JJM | ACAD FILE: SHT-3 | APP. BY: JJM

DATE: 11-23-2009

SCALE: GRAPHIC SCALE

DRAWING NO. 3



SCALE IN FEET

16 0 16

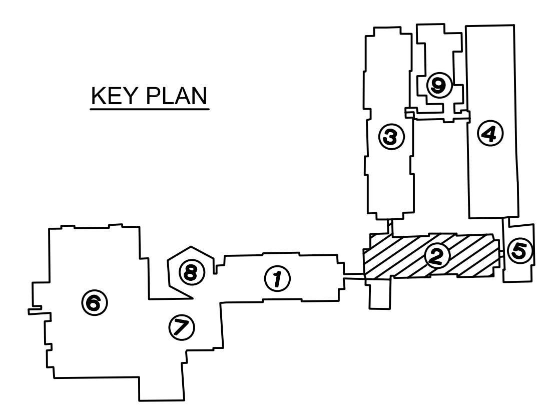
GRAPHIC SCALE

LEGEND

① BUILDING DESIGNATION

⌖ COMBUSTIBLE GAS SENSOR LOCATION

KEY PLAN



NOTES:

1. SENSORS INSTALLED IN ALCOVES LOCATED BENEATH THE FIRST LANDING OF STAIRS ON THE FIRST FLOOR

BASE MAP: PHILIP WASSERSTROM ARCHITECT, 1970

NO.	REVISION	DATE

SHEET TITLE
BUILDING 2 (GUEST SUITES ? LAUNDRY) FIRST FLOOR COMBUSTIBLE GAS SENSOR PLAN

PROJECT TITLE
AS-BUILT PLANS
COMBUSTIBLE GAS MONITORING SYSTEM
DOUBLETREE HOTEL
200 MARINA BOULEVARD, BERKELEY, CA

City of Berkeley
California

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PROJ. NO. 07940082.00 | DWN. BY: LCF | ACAD FILE: SHT-4
DSN. BY: DR | CHK. BY: JJM | APP. BY: JJM

DATE: 11-23-2009

SCALE: GRAPHIC SCALE

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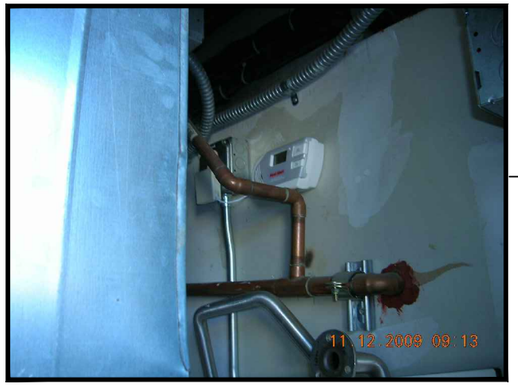
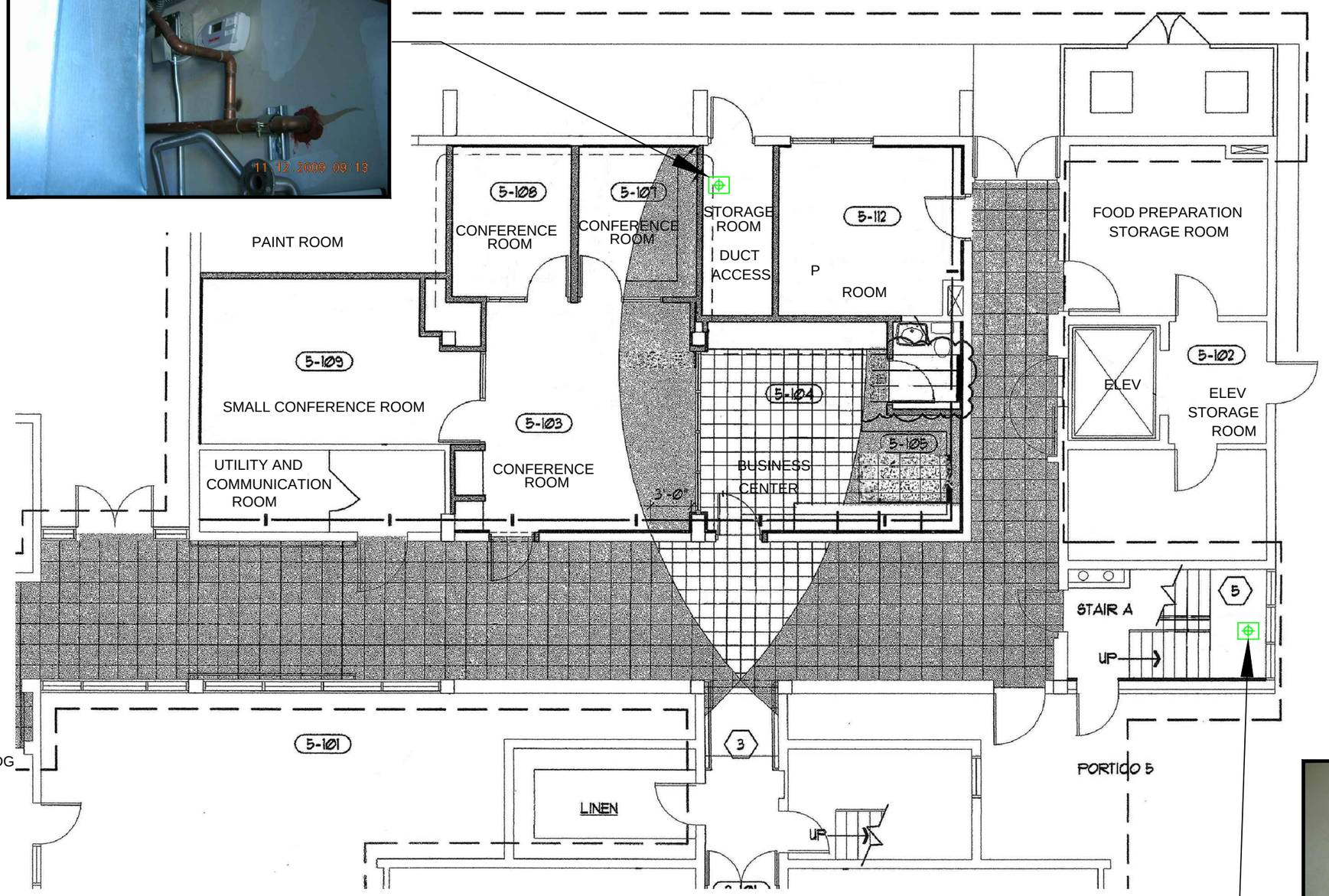




SCALE IN FEET

16 0 16

GRAPHIC SCALE

LEGEND

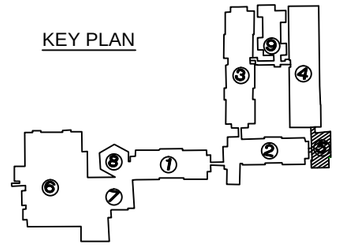
① BUILDING DESIGNATION

COMBUSTIBLE GAS SENSOR LOCATION

NOTES:

1. SENSOR IN STAIRWELL INSTALLED IN THE ALCOVE LOCATED BENEATH THE FIRST LANDING OF STAIRS ON THE FIRST FLOOR

KEY PLAN



BASE MAP: HOCHHEISER ROSS DESIGN GROUP, 2002

NO.	REVISION	DATE

SHEET TITLE: BUILDING 5 (BUSINESS CENTER) FIRST FLOOR COMBUSTIBLE GAS SENSOR PLAN

PROJECT TITLE: AS-BUILT PLANS COMBUSTIBLE GAS MONITORING SYSTEM DOUBLETREE HOTEL 200 MARINA BOULEVARD, BERKELEY, CA

City of Berkeley
California

BERKELEY

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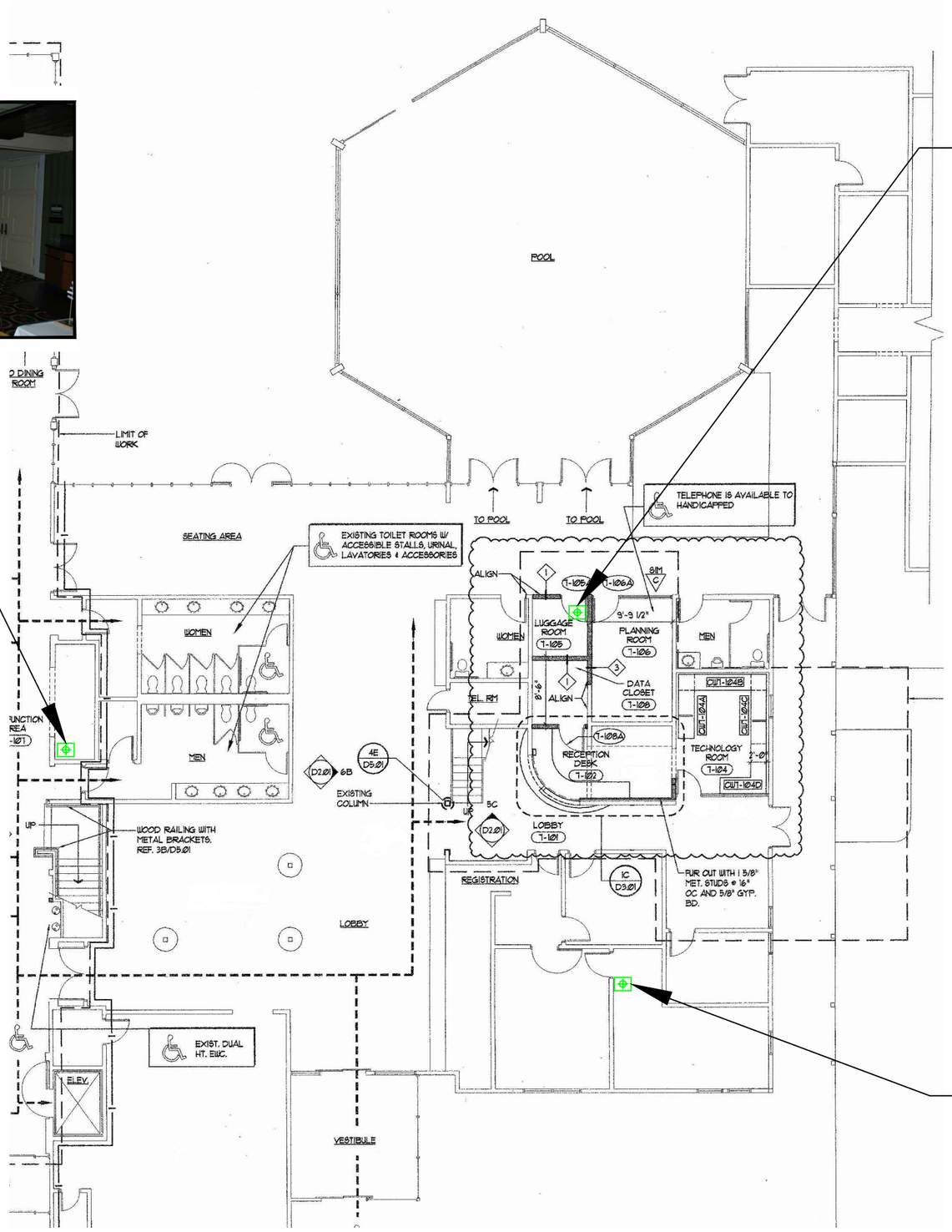
DSN. BY:	PROJ. NO.	DWN. BY:	CHK. BY:	ACAD FILE:	APP. BY:
DR	07940082.00	LCF	JAM	SHT-5	JAM

DATE: 11-23-2009

SCALE: GRAPHIC SCALE

DRAWING NO. 5



TO BUILDING 1

TO BUILDING 6

SCALE IN FEET

16 0 16

GRAPHIC SCALE

LEGEND

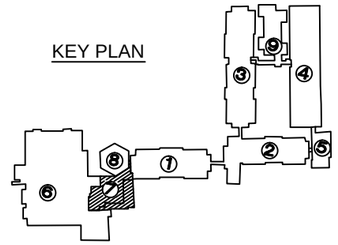
① BUILDING DESIGNATION

COMBUSTIBLE GAS SENSOR LOCATION

NOTES:

1. SENSORS TO BE LOCATED ON CEILINGS OR ON THE WALL NEAR THE WALL/CEILING LINE

KEY PLAN



BASE MAP: HOCHHEISER ROSS DESIGN GROUP, 2002

NO.	REVISION	DATE

SHEET TITLE
BUILDING 7 (LOBBY AND RECEPTION AREA)
FIRST FLOOR COMBUSTIBLE GAS SENSOR PLAN

PROJECT TITLE
AS-BUILT PLANS
COMBUSTIBLE GAS MONITORING SYSTEM
DOUBLETREE HOTEL
200 MARINA BOULEVARD, BERKELEY, CA

City of Berkeley
California

BERKELEY

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PROJ. NO.	DWN. BY:	ACAD FILE:
07040020.00	LGF	SHT-6
DSN. BY:	CHK. BY:	APP. BY:
DR	JJM	JJM

DATE: 11-23-2009

SCALE: GRAPHIC SCALE

DRAWING NO. 6

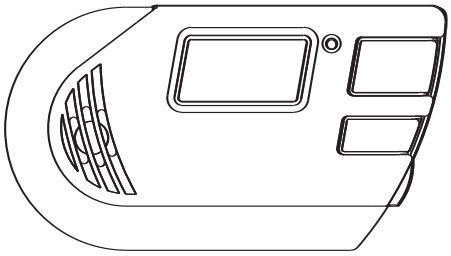
ATTACHMENT 2

FIRST ALERT PLUG-IN EXPLOSIVE GAS AND CARBON MONOXIDE ALARM PRODUCT SPECIFICATIONS/USER'S MANUAL

First Alert®

USER'S MANUAL

PLUG-IN EXPLOSIVE GAS AND CARBON MONOXIDE ALARM WITH BATTERY BACK-UP AND SILENCE FEATURE



120VAC ~ 60Hz, 0.25 A

IMPORTANT! PLEASE READ CAREFULLY AND SAVE.

This unit was shipped with a user's manual that contains important information about its operation. If you are installing this unit for use by others, you must leave this manual—or a copy of it—with the end user.

Printed in Mexico
M08-0123-002 **Q** 01/08

LISTED TO
UL 1484
AND
UL 2034

Model GCO1

BASIC SAFETY INFORMATION

IMPORTANT!

- **Dangers, Warnings, and Cautions alert you to important operating instructions or to potentially hazardous situations. Pay special attention to these items.**

⚠CAUTION!

- **This combination Explosive Gas/Carbon Monoxide Alarm has two separate alarms. The CO Alarm is not designed to detect fire or any other gas. It will only indicate the presence of carbon monoxide gas at the sensor. Carbon monoxide gas may be present in other areas. The Explosive Gas Alarm will only indicate the presence of explosive gas that reaches the sensor. The Explosive Gas Alarm is not designed to sense smoke, heat or flames.**
- **Do not stand too close to the unit when the alarm is sounding. It is loud to wake you in an emergency. Exposure to the horn at close range may harm your hearing.**
- **Do not paint over the unit. Paint may clog the openings to the sensing chambers and prevent the unit from operating properly.**

⚠WARNING!

- **This unit must be powered by a 24-hour circuit. Be sure the circuit cannot be turned off by a switch, dimmer, or ground fault circuit interrupter. Failure to connect this unit to a 24-hour circuit may prevent it from providing constant protection.**
- **This Alarm must have AC or battery power to operate. If AC power fails and the battery is dead or missing, the alarm cannot operate.**
- **The Alarm will check for the presence of explosive gas at the sensor less frequently when powered by the back-up battery. Explosive gas could be present during the period between checks without going into alarm, especially during a condition that results in a rapid buildup of explosive gas.**
- **Test the Alarm once a week. If the Alarm ever fails to test correctly, have it replaced immediately! If the Alarm is not working properly, it cannot alert you to a problem.**
- **This combination Carbon Monoxide and Explosive Gas Alarm is intended for residential use and is not suitable for use in hazardous locations as defined in the National Electrical Code.**
- **This product is intended for use in ordinary indoor locations of family living units. It is not designed to measure CO levels in compliance with Occupational Safety and Health Administration (OSHA) commercial or industrial standards. Individuals with medical conditions that may make them more sensitive to carbon monoxide may consider using warning devices which provide audible and visual signals for carbon monoxide concentrations under 30 ppm. For additional information on carbon monoxide and your medical condition contact your physician.**

TABLE OF CONTENTS

INSTALLATION

WHERE TO INSTALL THIS ALARM

For Gas Alarms, mounting depends on the type of explosive gas you intend to detect.

Natural Gas (methane) is typically supplied through a main utility line connected to your home. If you do not live in a rural area you are likely to be a user of natural gas. Natural gas is a fossil fuel consisting mainly of Methane. Methane is much lighter than air and will rise rapidly in air. If you are a user of natural gas, the Alarm should be mounted between 6 and 12 inches (152mm and 305 mm) away from the ceiling (using cord feature) to ensure the earliest opportunity to detect a leak.

Propane is typically supplied to homes by delivery truck in liquid form and stored near the home in propane tanks. Propane is used by homes in rural areas that do not have natural gas service. Since propane is the most commonly used Liquefied Petroleum Gas (LPG), ***propane*** and ***LP-Gas*** are often used synonymously. Unlike natural gas, propane is heavier than air and will collect at lower levels. If you are a user of propane, the Alarm should be mounted near the floor (using the direct plug-in feature) to ensure the earliest opportunity to detect a leak.

Both propane and natural gas are colorless and odorless. For safety reasons, an ordorant (Mercaptan) is added so that any leak can be detected by smell. The common detection threshold for smelling the gases is around 20% of the **Lower Explosion Limit (LEL).** This can vary greatly depending on the individuals sense of smell and how long they have been exposed to it. The LEL of each of these gases defines the bottom range of flammability for the gas. Your Alarm is calibrated to sound before 25% of the LEL of either gas detected.

Therefore, it is possible that you may smell gas before the Alarm is activated. If you are not sure which gas your home uses, contact your utility company.

For CO Alarms, the National Fire Protection Association (NFPA) recommends that a CO Alarm should be centrally located outside of each separate sleeping area in the immediate vicinity of the bedrooms. For added protection, install additional CO Alarms in each separate bedroom, and on every level of your home.

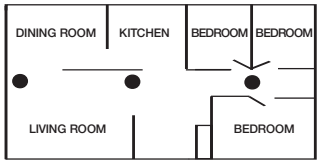
In general, install combination Explosive Gas and Carbon Monoxide Alarms:

- **WHERE YOU CAN HEAR THE ALARM FROM ALL SLEEPING AREAS**
- In or near bedrooms and living areas or wherever you suspect a gas or CO exposure is likely.
- On each level of a multi-level home.

IMPORTANT!

Improper location can affect the sensitive electronic components in this Alarm. Please see "Where this Alarm Should Not Be Installed".

Recommended Placement



Continued...

See “Avoiding Dead Air Spaces” for more information.

NOTE: For any location, make sure no door or other obstruction could keep carbon monoxide or gas from reaching the Alarm.

⚠WARNING!

This unit should receive continuous electrical power. (The battery is meant for emergency back-up only). Choose an outlet where it can’t be accidentally unplugged or switched off by children. Keep small children away from the unit. Teach them not to play with it or unplug it. Explain what the alarms mean.

WHERE THIS ALARM SHOULD NOT BE INSTALLED

To avoid causing damage to the unit, to provide optimum protection, and to prevent unnecessary alarms, Do NOT locate this Alarm:

- In garages, kitchens, crawl spaces and unfinished attics. Avoid extremely dusty, dirty or greasy areas. Installation in these areas could lead to nuisance alarms, may expose the sensor to substances that could damage or contaminate it, or the Alarm may not be heard by persons in other areas of the home, especially if they are sleeping.
- In the garage, vehicle exhaust can contain some carbon monoxide. These levels are higher when the engine is first started. Within hours of starting a vehicle and backing it out of the garage, the levels present over time can activate the Alarm and become a nuisance.
- In the kitchen, some gas appliances can emit a short burst of CO or gas upon start-up. This is normal. If your Explosive Gas/CO Alarm is installed too close to these appliances, it may alarm often and become a nuisance.
- Keep units at least 20 feet (6 meters) from the sources of combustion particles (stove, furnace, water heater, space heater) if possible. In areas where a 20-foot (6m) distance is not possible – in modular, mobile, or smaller homes, for example – it is recommended the Alarm be placed as far from these fuel-burning sources as possible. The placement recommendations are intended to keep these Alarms at a reasonable distance from a fuel-burning source, and thus reduce “unwanted” alarms. Unwanted alarms can occur if an Alarm is placed directly next to a fuel-burning source. Ventilate these areas as much as possible. **If you must install the Alarm near a cooking or heating appliance, install at least 5 feet (1.5 meters) from appliance.**
- In extremely humid areas. This Alarm should be at least 10 feet (3 meters) from a shower, sauna, humidifier, vaporizer, dishwasher, laundry room, utility room, or other source of high humidity.
- In direct sunlight.
- In turbulent air, like near ceiling fans or open windows. Blowing air may prevent CO or gas from reaching the sensors.
- In areas where temperature is colder than 40˚ F (4˚ C) or hotter than 100˚ F (38˚ C). These areas include non-airconditioned crawl spaces, unfinished attics, uninsulated or poorly insulated ceilings, porches, and garages.
- Less than 12 inches (305 mm) away from fluorescent lights. Electrical “noise” can interfere with the sensor.
- In “dead air” spaces. See “Avoiding Dead Air Spaces”.

AVOIDING DEAD AIR SPACES

“Dead air” spaces may prevent gas from reaching the Alarm. To avoid dead air spaces, follow installation recommendations below.

On ceilings, install Alarms as close to the center of the ceiling as possible. If this is not possible, install the Alarm at least 4 inches (102 mm) from the wall or corner.

For wall mounting, the top edge of Alarms should be placed between 6 inches (152 mm) and 12 inches (305 mm) from the wall/ceiling line.

On a peaked, gabled, or cathedral ceiling, install Alarm within 3 feet (0.9 meters) of the peak of the ceiling, measured horizontally.

BEFORE YOU BEGIN INSTALLATION

Since CO generally mixes well with air, mounting the Alarm will depend on the type of explosive gas you intend to detect. If you are not certain which type of gas you are using in your home, please read about natural gas and propane in “Where to Install this Alarm”.

⚠WARNING!

- **Make sure the alarm is not receiving excessively noisy power. Examples of noisy power could be major appliances on the same circuit, power from a generator or solar power, light dimmer on the same circuit or mounted near fluorescent lighting. Excessively noisy power may cause damage to your Alarm.**

Find the pair of self-adhesive labels included with this Gas/CO Alarm.

- On each label write in the phone number of your emergency responder (like 911) and a qualified appliance technician.
- Place one label near the Gas/CO Alarm, and the other label in the “fresh air” location you plan to go if the alarm sounds.

HOW TO INSTALL THIS GAS/CO ALARM

IMPORTANT! Read all instructions before using this product.
Tools you will need: Screwdriver, drill.

1. Determine the best location for your Gas/CO Alarm.
2. Your Alarm is equipped to be mounted as a corded unit (recommended for natural gas detection), a direct plug unit (recommended for propane gas detection). The unit can be plugged directly into a wall outlet. If your outlets are mounted horizontally, refer to “If Outlet is Mounted Horizontally (Sideways)”.

   If the adapter is taken out of the unit, the Alarm can be installed high on the wall, while the adapter is plugged into a wall outlet. The explosive gas you use will determine if the Alarm should be installed high on the wall (AC cord option) or low on the wall (direct plug option).

ACTIVATING THE BATTERY BACK-UP

IMPORTANT!

Activate the battery back-up by installing the battery. **The battery is for back-up only and is not intended to power the Alarm for an extended period of time in the absence of AC.**

The Alarm will light-up the display briefly to indicate the unit is receiving power.

DIRECT PLUG ALARM INTO AN OUTLET (for Propane Detection)

IMPORTANT!

This Alarm can be plugged directly into a wall outlet located close to the floor. This is the recommended configuration for detecting propane.

1. Choose a standard UNSWITCHED 120V AC outlet.
2. Plug Alarm in.

IF OUTLET IS MOUNTED HORIZONTALLY (SIDEWAYS)

If you are going to use your Alarm as a direct plug into an outlet that is mounted horizontally (sideways), you may want **to rotate the adapter 90º,** as follows:

1. With back of unit facing you (AC blades on your left), place your left thumb on adapter release and grab AC blades with your right hand to release the left side.
2. Repeat for the other side adapter thumb release. This will allow adapter to slide out.
3. Remove adapter.
4. Rotate the adapter 90º and snap firmly back into place.
5. Plug Alarm into AC outlet.

WALL MOUNTED ALARM (for Natural Gas Detection)

IMPORTANT!

Installation tips for power cord models: The power cord option provides more flexibility in mounting locations and allows the Alarm to be easily installed at or above eye level.

NOTE: If you mount the Alarm high on a wall, make sure it is **between 6 to 12 inches (152-305 mm) down from the ceiling.** Any higher than this, it will be in “dead air” space and carbon monoxide or natural gas may not reach the sensors.

NOTE: Do not cover the Alarm with a curtain.

To install for a wall-mount, you will need to pull out the removable adapter and power cord, as follows:

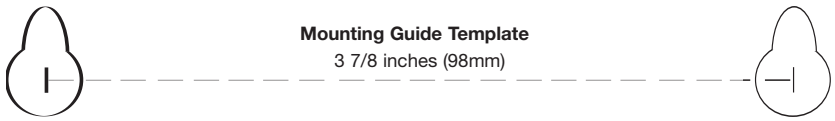
1. Repeat steps 1 to 3 as described above in **“to rotate the adapter”**.
2. With adapter out, pull out power cord and unwrap it.
3. Insert the screws provided until head is approx. 1/8 inch (3 mm) from wall (if mounting in plaster board or drywall, drill 3/16 inch (5 mm) hole and use plastic anchor provided). Use mounting guide template to locate holes as shown in diagram below.
4. Hook the Alarm over the screw onto the keyhole in back of unit.
5. Plug power cord into AC outlet.

SECURING THE POWER CORD TO AN OUTLET

⚠WARNING!

DISCONNECT POWER TO THE OUTLET TO AVOID ELECTRICAL SHOCK.

1. Remove the wallplate screw from the outlet and hold the wallplate in position.
2. Plug the power cord into the wall outlet so that the screw hole lines up with the wallplate screw hole.
3. Insert the screw through the power cord screw hole and into the wallplate screw hole.
4. Tighten screw in place and restore power to the outlet.



Mounting Guide Template
3 7/8 inches (98mm)

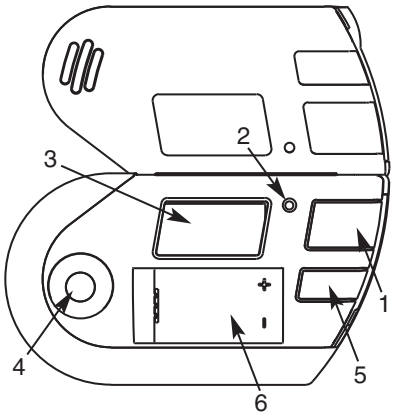
TEST THE ALARM

1. Make sure the Alarm is receiving AC power. Under normal operation, the Green indicator light will shine continuously. If the Green power indicator light does not light, recheck connections. If connections are correct and the Green power indicator still does not light, the unit should be replaced immediately.
2. Press and hold the test button until the alarm sounds. You will hear the signal that indicates the presence of explosive gas followed by the signal for carbon monoxide.

   When testing the Alarm, have someone else check that the Alarm can be heard easily from the sleeping areas. The unit should be located where it can wake you if it alarms at night.

HOW YOUR ALARM WORKS

THE COVER OF YOUR ALARM



1. Test/Silence Button: Press and hold to activate test, or to silence the alarm.
2. POWER Light (GREEN)
3. Display
4. (Behind the Cover) Alarm Horn: 85dB audible alarm for test, alarm, and unit malfunction warning.
5. Display Button: Press to recall highest CO level recorded
6. Battery Compartment

IF YOUR GAS/CO ALARM SOUNDS

WHAT TO DO IF CARBON MONOXIDE IS DETECTED

⚠WARNING!

Actuation of your CO Alarm indicates the presence of carbon monoxide (CO) which can kill you. In other words, when your CO Alarm sounds, you must not ignore it!

IF THE CO ALARM SOUNDS:

1. Operate the Test/Silence button.
2. Call your emergency services, fire department or 911. Write down the number of your local emergency service here:

   _____

3. Immediately move to fresh air—outdoors or by an open door or window. Do a head count to check that all persons are accounted for. Do not re-enter the premises, or move away from the open door or window until the emergency services responder has arrived, the premises have been aired out, and your CO Alarm remains in its normal condition.
4. After following steps 1-3, if your CO Alarm reactivates within a 24-hour period, repeat steps 1-3 and call a qualified appliance technician to investigate for sources of CO from fuel-burning equipment and appliances, and inspect for proper operation of this equipment. If problems are identified during this inspection have the equipment serviced immediately. Note any combustion equipment not inspected by the technician, and consult the manufacturers' instructions, or contact the manufacturers directly, for more information about CO safety and this equipment. Make sure that motor vehicles are not, and have not, been operating in an attached garage or adjacent to the residence. Write down the number of a qualified appliance technician here:

   _____

WHAT TO DO IF EXPLOSIVE GAS IS DETECTED

If you hear the alarm horn sound one beep per second, gas has been detected. The word GAS will be displayed. Evacuate everyone from the building.

1. Leave the house immediately, opening doors and windows as you leave.
2. Do not use your telephone or appliances. Do not turn any light switches off or on. Any spark or flame could ignite the gas.
3. Call 911 and your gas company from a phone that is away from your home.
4. Do not re-enter the area until the source of the leak is found and corrected.

⚠WARNING!

- **If the unit alarms and you are not testing the unit, it is warning you of a potentially dangerous situation that requires your immediate attention. NEVER ignore any alarm. Ignoring the alarm may result in injury or death.**
- **Never disconnect the power to quiet an unwanted alarm. Disconnecting the power disables the Alarm. This will remove your protection.**

⚠WARNING!

Alarms have various limitations. See "General Limitations of Gas/CO Alarms" for details.

USING THE SILENCE FEATURE

⚠WARNING!

NEVER disconnect the power to your Alarm to silence the horn—use the Silence Feature. Disconnecting the Alarm removes your protection!

- The Silence Feature is intended to temporarily silence the horn while you identify and correct the problem.
- To use the Silence Feature, press the Test/Silence button until the horn is silent.
- If the Test/Silence button is pressed while the Alarm is in the silence mode, the alarm will start sounding again.

WHEN THE GAS ALARM IS SILENCED...

The Alarm will remain silent for approximately 2 minutes and then return to normal operation. If the gas has not cleared within the silence period, the unit will go back into alarm.

WHEN THE CO ALARM IS SILENCED...

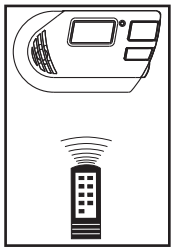
The CO Alarm will remain silent for up to 4 minutes. While the Alarm is silenced, it will continue to monitor the air for CO. After 4 minutes, if CO levels remain potentially dangerous the horn will start sounding again.

IMPORTANT!

The Silence Feature is intended to temporarily silence the Alarm horn. It will not correct a CO or gas problem.

USING THE REMOTE CONTROL TEST/SILENCE FEATURE

Using the VOLUME or CHANNEL buttons on most remote controls, you can test or silence this gas/CO Alarm from up to 12 feet (3.6 meters) away.



To Test or Silence the Alarm:

1. Make sure you have a clear path between you and the Alarm, free of any obstructions.
2. Point the remote at the front of the Alarm.
3. Press the VOLUME or CHANNEL button for at least 5 seconds.

If the Alarm does not respond to your remote control:

- You may be standing too far away.
- Your remote may not be compatible.
- You did not hold the button on your remote for at least 5 seconds.
- AC power must be present to Silence the low battery chirp.

SILENCING THE LOW BATTERY WARNING

This Silence Feature can temporarily quiet the low battery warning “chirp” for up to 8 hours if AC power is present. You can silence the low battery warning “chirp” two ways:

1. **Manually:** Press the Test/Silence button on the Alarm cover until you see the Green LED flicker, acknowledging the button-press.
2. **Using Your Remote Control:** Standing no further than 12 feet (3.6 meters) away from the Gas/CO Alarm, aim your IR remote at the Alarm and press the CHANNEL or VOLUME button for at least 3-5 seconds.

The display will flash “SILENCE” for 8 hours while the low battery warning “chirp” silence feature is activated. After 8 hours, the low battery “chirp” will resume. The Alarm will continue to operate as long as AC power is supplied. However, **replace the battery as soon as possible,** to maintain protection in event of a power outage.

USING THE PEAK CO MEMORY

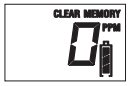
The CO Memory Feature lets you check the highest level of CO recorded.

To check CO Memory:

1. Press the Display button until the peak CO level is displayed.

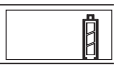
To clear CO Memory:

1. While checking CO memory, press or hold the Display button until “CLEAR” is displayed.
2. Press or hold the Display button until the CO Memory is cleared.



NOTE: The highest CO level will be saved, even after a power interruption, until you clear it. DO NOT clear the CO Memory reading if you plan to call someone to investigate a CO problem! Clear the CO Memory reading only after the investigator has checked your home.

UNDERSTANDING THE LIGHT, HORN, AND DISPLAY PATTERNS

Condition	LED	Horn	Display
NORMAL AC POWER	LED is Green.	Silent	All segments of display are turned on for a short time upon initial power. Then the battery level icon is displayed. 
BATTERY BACK-UP POWER	LED is Off, flashing Green once every 45 seconds	Silent	All segments of display are turned On for a short time upon initial power. Then the battery level icon is displayed flashing.
DURING TESTING	LED flashes Red in sync with the horn, simulating an Alarm condition: first gas then CO	First, the horn pattern for gas alarm (1 beep every second) is issued, and then the CO alarm horn pattern (4 beeps, pause, 4 beeps) is issued.	During the simulated gas alarm, “GAS” is displayed along with a full alarm level.  During the simulated CO alarm, “CO” is displayed along with a full alarm level.  Several ppm CO levels are also displayed and the alarm level is shown increasing. 
LOW OR MISSING BATTERY	Normal	A chirp is issued about every minute.	Battery icon will show an empty icon. 
GAS ALARM CONDITION	LED flashes Red in sync with horn	Repeating 1 beep every second	“GAS”, a full level, and “EVACUATE”.
CARBON MONOXIDE ALARM	LED flashes Red in sync with horn	Repeating 4 beeps, pause	“CO” alternating with the ppm number, a full level, and “EVACUATE”. 
PRE-ALARM CONDITION CO IS PRESENT	Normal	Normal	“CO” alternating with the ppm number. The level will indicate relative CO exposure level.
MALFUNCTION	LED flashing Green 3 times in sync with 3 rapid chirps	3 rapid chirps every minute	“ERROR” is displayed.
LOW BATTERY SILENCE	LED is Green.	Silent	“SILENCE” is displayed.

WEEKLY TESTING

⚠WARNING!

- **NEVER use an open flame of any kind to test this unit. You might accidentally damage or set fire to the unit or to your home. The built-in test switch accurately tests the unit's operation as required by Underwriters Laboratories, Inc. (UL). NEVER use vehicle exhaust! Exhaust may cause permanent damage and voids your warranty.**
- **DO NOT stand close to the Alarm when the horn is sounding. Exposure at close range may be harmful to your hearing. When testing, step away when horn starts sounding.**

⚠CAUTION!

It is important to test this unit every week to make sure it is working properly. You can test this Gas/CO Alarm two ways:

1. **Manually:** Press the Test/Silence button on the Alarm cover until alarm sounds.
2. **Remote Control:** Aim your remote control at the Alarm and press the CHANNEL or VOLUME button.

During testing, you will hear a loud, repeating horn pattern: 1 beep every second, while the Red LED flashes and the display shows "GAS". Then you will hear a loud, repeating horn pattern: 4 beeps, pause, 4 beeps, pause, while the Red LED flashes and the display shows "CO" with an increasing CO ppm number.

If the Alarm does not test properly:

1. Make sure the AC power is applied and battery is fresh and installed correctly.
2. Test the unit again.

If the Alarm is still not working properly, replace it immediately. Refer to the "Limited Warranty" at the end of this manual.

⚠WARNING!

If there is still a problem, do not try to fix the Alarm yourself. This will void your warranty!

REGULAR MAINTENANCE

⚠WARNING!

Use only the replacement batteries listed below. The unit may not operate properly with other batteries. Never use rechargeable batteries since they may not provide a constant charge.

This unit has been designed to be as maintenance-free as possible, but there are a few simple things you must do to keep it working properly:

- Test it at least once a week.
- Clean the Alarm at least once a month; gently vacuum the outside of the Alarm using your household vacuum's soft brush attachment. Test the Alarm. Never use water, cleaners or solvents since they may damage the unit.
- Relocate the unit if it sounds frequent unwanted alarms. See "Where This Alarm Should Not Be Installed" for details.
- When the battery back-up becomes weak, the Alarm will "chirp" about once a minute (the low battery warning). You should replace the battery immediately to continue your protection. **This Alarm must have AC or battery power to operate. If AC power fails, and the battery is dead or missing, the Alarm cannot operate.**

⚠WARNING!

DO NOT spray cleaning chemicals or insect sprays directly on or near the Alarm. DO NOT paint over the Alarm. Doing so may permanently damage the Alarm.

CHOOSING A REPLACEMENT BATTERY:

Your Alarm requires one standard 9V alkaline battery. The following batteries are acceptable as replacements: Duracell #MN1604, (Ultra) #MX1604; Eveready (Energizer) #522. **These batteries are available at many local retail stores.**

IMPORTANT!

Actual battery service life depends on the Alarm and the environment in which it is installed. All the batteries specified above are acceptable replacement batteries for this unit. Regardless of the manufacturer's suggested battery life, you MUST replace the battery immediately once the unit starts "chirping" (the "low battery warning").

WHAT YOU NEED TO KNOW ABOUT CO

WHAT IS CO?

CO is an invisible, odorless, tasteless gas produced when fossil fuels do not burn completely, or are exposed to heat (usually fire). Electrical appliances typically do not produce CO.

These fuels include: Wood, coal, charcoal, oil, natural gas, gasoline, kerosene, and propane.

Common appliances are often sources of CO. If they are not properly maintained, are improperly ventilated, or malfunction, CO levels can rise quickly. CO is a real danger now that homes are more energy efficient. "Air-tight" homes with added insulation, sealed windows, and other weatherproofing can "trap" CO inside.

SYMPTOMS OF CO POISONING

These symptoms are related to CO POISONING and should be discussed with ALL household members.

Mild Exposure: Slight headache, nausea, vomiting, fatigue ("flu-like" symptoms).

Medium Exposure: Throbbing headache, drowsiness, confusion, fast heart rate.

Extreme Exposure: Convulsions, unconsciousness, heart and lung failure. Exposure to Carbon Monoxide can cause brain damage, death.

⚠WARNING!

Some individuals are more sensitive to CO than others, including people with cardiac or respiratory problems, infants, unborn babies, pregnant mothers, or elderly people can be more quickly and severely affected by CO. Members of sensitive populations should consult their doctors for advice on taking additional precautions.

FINDING THE SOURCE OF CO AFTER AN ALARM

Carbon monoxide is an odorless, invisible gas, which often makes it difficult to locate the source of CO after an alarm. These are a few of the factors that can make it difficult to locate sources of CO:

- House well ventilated before the investigator arrives.
- Problem caused by "backdrafting."
- Transient CO problem caused by special circumstances.

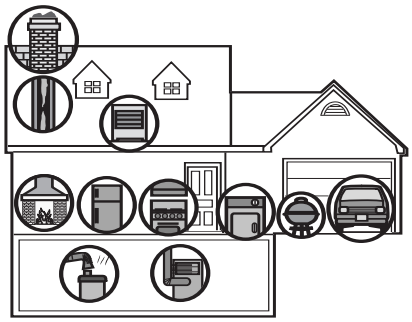
Because CO may dissipate by the time an investigator arrives, it may be difficult to locate the source of CO. **BRK Brands, Inc. shall not be obligated to pay for any carbon monoxide investigation or service call.**

POTENTIAL SOURCES OF CO IN THE HOME

Fuel-burning appliances like: portable heater, gas or wood burning fireplace, gas kitchen range or cooktop, gas clothes dryer.

Damaged or insufficient venting: corroded or disconnected water heater vent pipe, leaking chimney pipe or flue, or cracked heat exchanger, blocked or clogged chimney opening.

Improper use of appliance/ device: operating a barbecue grill or vehicle in an enclosed area (like a garage or screened porch).



Transient CO Problems: "transient" or on-again-off-again CO problems can be caused by outdoor conditions and other special circumstances.

The following conditions can result in transient CO situations:

1. Excessive spillage or reverse venting of fuel appliances caused by outdoor conditions such as:
   - Wind direction and/or velocity, including high, gusty winds. Heavy air in the vent pipes (cold/humid air with extended periods between cycles).
   - Negative pressure differential resulting from the use of exhaust fans.
   - Several appliances running at the same time competing for limited fresh air.
   - Vent pipe connections vibrating loose from clothes dryers, furnaces, or water heaters.
   - Obstructions in or unconventional vent pipe designs which can amplify the above situations.
2. Extended operation of unvented fuel burning devices (range, oven, fireplace).
3. Temperature inversions, which can trap exhaust close to the ground.
4. Car idling in an open or closed attached garage, or near a home.

These conditions are dangerous because they can trap exhaust in your home. Since these conditions can come and go, they are also hard to recreate during a CO investigation.

HOW CAN I PROTECT MY FAMILY FROM CO POISONING?

A Gas/CO Alarm is an excellent means of protection. It monitors the air and sounds a loud alarm before Carbon Monoxide levels become threatening for average, healthy adults.

A Gas/CO Alarm is not a substitute for proper maintenance of home appliances.

To help prevent CO problems and reduce the risk of CO poisoning:

- Clean chimneys and flues yearly. Keep them free of debris, leaves, and nests for proper air flow. Also, have a professional check for rust and corrosion, cracks, or separations. These conditions can prevent proper air movement and cause backdrafting. Never “cap” or cover a chimney in any way that would block air flow.
- Test and maintain all fuel-burning equipment annually. Many local gas or oil companies and HVAC companies offer appliance inspections for a nominal fee.
- Make regular visual inspections of all fuel-burning appliances. Check appliances for excessive rust and scaling. Also check the flame on the burner and pilot lights. The flame should be blue. A yellow flame means fuel is not being burned completely and CO may be present. Keep the blower door on the furnace closed. Use vents or fans when they are available on all fuel-burning appliances. Make sure appliances are vented to the outside. Do not grill or barbecue indoors, or in garages or on screen porches.
- Check for exhaust backflow from CO sources. Check the draft hood on an operating furnace for a backdraft. Look for cracks on furnace heat exchangers.
- Check the house or garage on the other side of shared wall.
- Keep windows and doors open slightly. If you suspect that CO is escaping into your home, open a window or a door. Opening windows and doors can significantly decrease CO levels.

In addition, familiarize yourself with all enclosed materials. Read this manual in its entirety, and make sure you understand what to do if your Gas/CO Alarm sounds.

REGULATORY INFORMATION FOR EXPLOSIVE GAS/CO ALARMS

REGULATORY INFORMATION FOR CO ALARMS UNDERWRITERS LABORATORIES INC. UL2034

WHAT LEVELS OF CO CAUSE AN ALARM?

Underwriters Laboratories Inc. Standard UL2034 requires residential CO Alarms to sound when exposed to levels of CO and exposure times as described below. They are measured in parts per million (ppm) of CO over time (in minutes).

UL2034 Required Alarm Points*:

- If the alarm is exposed to 400 ppm of CO, IT MUST ALARM BETWEEN 4 and 15 MINUTES.
- If the alarm is exposed to 150 ppm of CO, IT MUST ALARM BETWEEN 10 and 50 MINUTES.
- If the alarm is exposed to 70 ppm if CO, IT MUST ALARM BETWEEN 60 and 240 MINUTES.

* Approximately 10% COHb exposure at levels of 10% to 95% Relative Humidity (RH).

The unit is designed not to alarm when exposed to a constant level of 30 ppm for 30 days.

IMPORTANT!

CO Alarms are designed to alarm before there is an immediate life threat. Since you cannot see or smell CO, never assume it’s not present.

- An exposure to 100 ppm of CO for 20 minutes may not affect average, healthy adults, but after 4 hours the same level may cause headaches.
- An exposure to 400 ppm of CO may cause headaches in average, healthy adults after 35 minutes, but can cause death after 2 hours.

IMPORTANT!

This CO Alarm measures exposure to CO over time. It alarms if CO levels are extremely high in a short period of time, or if CO levels reach a certain minimum over a long period of time. The CO Alarm generally sounds an alarm before the onset of symptoms in average, healthy adults.

Why is this important? Because you need to be warned of a potential CO problem while you can still react in time. In many reported cases of CO exposure, victims may be aware that they are not feeling well, but become disoriented and can no longer react well enough to exit the building or get help. Also, young children and pets may be the first affected. The average healthy adult might not feel any symptoms when the CO Alarm sounds. However, people with cardiac or respiratory problems, infants, unborn babies, pregnant mothers, or elderly people can be more quickly and severely affected by CO. If you experience even mild symptoms of CO poisoning, consult your doctor immediately!

Continued...

Standards: Underwriters Laboratories Inc. Single and Multiple Station carbon monoxide alarms UL2034.

According to Underwriters Laboratories Inc. UL2034, Section 1-1.2: “Carbon monoxide alarms covered by these requirements are intended to respond to the presence of carbon monoxide from sources such as, but not limited to, exhaust from internal-combustion engines, abnormal operation of fuel-fired appliances, and fireplaces. CO Alarms are intended to alarm at carbon monoxide levels below those that could cause a loss of ability to react to the dangers of Carbon Monoxide exposure.” This CO Alarm monitors the air at the Alarm, and is designed to alarm before CO levels become life threatening. This allows you precious time to leave the house and correct the problem. This is only possible if Alarms are located, installed, and maintained as described in this manual.

Gas Detection at Typical Temperature and Humidity Ranges:
The CO Alarm is not formulated to detect CO levels below 30 ppm typically. UL tested for false alarm resistance to Methane (500 ppm), Butane (300 ppm), Heptane (500 ppm), Ethyl Acetate (200 ppm), Isopropyl Alcohol (200 ppm) and Carbon Dioxide (5000 ppm). Values measure gas and vapor concentrations in parts per million.

Audible Alarm: 85 dB minimum at 10 feet (3 meters).

REGULATORY INFORMATION FOR EXPLOSIVE GAS ALARMS

Standards: Underwriters Laboratories Inc. UL1484.

According to Underwriters Laboratories Inc. UL1484, this unit meets the alarm response time for gas as follows: This unit shall alarm before 25% of the LEL of either natural gas or propane is detected. In all cases, the unit will detect gas as a priority over carbon monoxide. If the device is detecting CO, then detects an amount of gas to cause an alarm, the device will stop alarming for CO and begin to alarm for gas.

GENERAL LIMITATIONS OF EXPLOSIVE GAS/CO ALARMS

This Gas/CO Alarm is intended for residential use. It is not intended for use in industrial applications where Occupational Safety and Health Administration (OSHA) requirements for Carbon Monoxide Alarms must be met. This device is not intended to alert hearing impaired residents.

Gas/CO Alarms may not waken all individuals. If children or others do not readily waken to the sound of the Gas/CO Alarm, or if there are infants or family members with mobility limitations, make sure that someone is assigned to assist them in the event of an emergency.

This Gas/CO Alarm will not sense gas or CO that does not reach the sensors. It will only sense gas or CO at the sensor. Gas or CO may be present in other areas. Doors or other obstructions may affect the rate at which CO or gas reaches the sensors.

Gas/CO Alarms may not be heard. The alarm horn loudness meets or exceeds current UL standards of 85 dB at 10 feet (3 meters). However, if the Gas/CO Alarm is installed outside the bedroom, it may not wake up a sound sleeper or one who has recently used drugs or has been drinking alcoholic beverages. This is especially true if the door is closed or only partly open. Even persons who are awake may not hear the alarm horn if the sound is blocked by distance or closed doors. Noise from traffic, stereo, radio, television, air conditioner, or other appliances may also prevent alert persons from hearing the alarm horn. This Gas/CO Alarm is not intended for people who are hearing impaired.

This Gas/CO Alarm is not a substitute for life insurance. Though this Gas/CO Alarm warns against increasing CO levels or the presence of gas, BRK Brands, Inc. does not warrant or imply in any way that they will protect lives. Homeowners and renters must still insure their lives.

This Gas/CO Alarm is not foolproof. Like all other electronic devices, this Gas/CO Alarm has limitations. It can only detect gas or CO that reaches the sensors. It may not give early warning of the source of gas or CO is in a remote part of the home, away from the alarm device.

This Gas/CO Alarm has a limited life. Although this Gas/CO Alarm and all of its parts have passed many stringent tests and are designed to be as reliable as possible, any of these parts could fail at any time. Therefore, you must test this device weekly. The unit should be replaced immediately if it is not operating properly.

TROUBLESHOOTING GUIDE

If your Alarm does this...	It means...	You should...
Green light is OFF. Unit will not alarm when you press the Test/Silence button.	Unit may not be receiving any power.	Check the AC power supply. Make sure a fresh 9V battery is installed to power the battery back-up*.
Green light flashes ON, once a minute (horn is silent).	Alarm is not receiving AC power. Unit is operating on battery back-up.	Check the AC power supply.
The horn “chirps” once a minute.	Low battery warning. Battery is low or missing.	Replace the battery. Avoid interrupting AC power.
Once a minute, the alarm sounds 3 quick “chirps”, and the green light flashes quickly three times.	Unit malfunction. Unit needs to be replaced. Based on self-diagnostic tests, the unit has detected a fault or the Alarm has reached its end-of-life, 5 years.	Units under warranty should be returned to manufacturer for replacement. See “Limited Warranty” for details.
The horn sounds constantly with no pattern and cannot be silenced.	Unit malfunction. Unit needs to be replaced.	Units under warranty should be returned to manufacturer for replacement. See “Limited Warranty” for details.
Alarm goes back into alarm after you pressed the Test/Silence button to silence an alarm.	Gas and/or CO levels are still potentially dangerous.	Refer to “If Your Gas/CO Alarm Sounds” for details on how to respond to an alarm. If anyone is feeling ill, EVACUATE your home immediately and call 911.
Alarm sounds frequently even though no high levels of gas or CO are revealed in an investigation.	The Alarm may be improperly located. Refer to “Where to Install This Alarm.”	Relocate your alarm. If frequent alarms continue, have home rechecked for potential problems. You may be experiencing an intermittent gas or CO problem.

*For a list of acceptable replacement batteries, see “Regular Maintenance.”

If you have any questions that cannot be answered by reading this manual, call Consumer Affairs: 1-800-323-9005.

LIMITED WARRANTY

BRK Brands, Inc., ("BRK") the maker of First Alert® brand products warrants that for a period of five years from the date of purchase, this product will be free from defects in material and workmanship. BRK, at its option, will repair or replace this product or any component of the product found to be defective during the warranty period. Replacement will be made with a new or remanufactured product or component. If the product is no longer available, replacement may be made with a similar product of equal or greater value. This is your exclusive warranty.

This warranty is valid for the original retail purchaser from the date of initial retail purchase and is not transferable. Keep the original sales receipt. Proof of purchase is required to obtain warranty performance. BRK dealers, service centers, or retail stores selling BRK products do not have the right to alter, modify or any way change the terms and conditions of this warranty.

This warranty does not cover normal wear of parts or damage resulting from any of the following: negligent use or misuse of the product, use on improper voltage or current, use contrary to the operating instructions, disassembly, repair or alteration by anyone other than BRK or an authorized service center. Further, the warranty does not cover Acts of God, such as fire, flood, hurricanes and tornadoes or any batteries that are included with this unit.

BRK shall not be liable for any incidental or consequential damages caused by the breach of any express or implied warranty. Except to the extent prohibited by applicable law, any implied warranty of merchantability or fitness for a particular purpose is limited in duration to the duration of the above warranty. Some states, provinces or jurisdictions do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitations or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state or province to province.

How to Obtain Warranty Service

Service: If service is required, do not return the product to your retailer. In order to obtain warranty service, contact the Consumer Affairs Division at 1-800-323-9005, 7:30 AM - 5:00 PM Central Standard Time, Monday through Friday. To assist us in serving you, please have the model number and date of purchase available when calling. 25 Spur Drive, El Paso TX 79906

Battery: BRK Brands, Inc. make no warranty, express or implied, written or oral, including that of merchantability or fitness for any particular purpose with respect to battery.

For your records, please record:

Date Purchased: _____

Where Purchased: _____

Date Installed: _____/_____**Month/Year**

Replacement date is five years after installation:_____/_____
Month/Year

NOTE: End of Life Signal — Once the unit reaches the end of its lifecycle, the malfunction signal will sound once a minute to indicate the need to immediately replace the Alarm.

Printed in Mexico M08-0123-002 **Q** 01/08

ATTACHMENT 3

ALARM UNIT INSPECTION AND MAINTENANCE SCHEDULE

DOUBLETREE HOTEL COMBUSTIBLE GAS ALARM UNIT INSPECTION AND MAINTENANCE SCHEDULE

Activity	Frequency
AC Power Check. Under normal AC powered alarm unit operation, the LED indicator light will be green and the battery level icon will be displayed. If the alarm is being powered by the battery back-up power, the green indicator light will flash once every 45 seconds. If the green light is flashing or is not illuminated, the AC power connections shall be checked. If the connections are correct and the green power indicator light is not continuously illuminated, the alarm unit shall be replaced.	Weekly
Alarm Test. A simulated alarm test shall be activated by pressing and holding the test button until the alarm sounds. In a properly functioning unit, a loud, repeating horn pattern will be issued in sync with a red flashing LED indicator light. The signal indicating the presence of explosive gas will be triggered first (one beep per second), followed by the signal for carbon monoxide (4 beeps, pause, 4 beeps). During the simulated gas alarm "GAS" will be displayed along with a full alarm level. During the simulated CO alarm, "CO" will be displayed with an increasing parts per million number. If the alarm unit does not test properly, the AC power connections shall be checked and the unit tested again. If the alarm is still not working properly, the unit shall be replaced.	Weekly
Back-up Power Battery Check. The battery shall be replaced if the display indicates an empty battery icon and a chirp is issued from the horn approximately every minute (low battery warning).	Weekly
Malfunctioning Unit Check. An alarm unit shall be replaced if the green LED indicator light is flashing in sync with 3 rapid chirps issued from the horn every minute (alarm malfunction warning). The warning is based on a self-diagnostic test detecting a fault or that the alarm has reached its end-of-life, 5 years.	Weekly
Cleaning. The alarm units shall be cleaned at least once a month by gently vacuuming the outside of the unit using a vacuum a soft brush attachment of a household vacuum cleaner. The use of water, cleaner, solvents, insecticide sprays or paint shall not be used directly on or near the alarms as they may damage the units.	Monthly

MAINTENANCE AND INSPECTION SCHEDULE

DOUBLETREE HOTEL COMBUSTIBLE GAS MONITORING SYSTEM

DATE	TIME	ALARM UNIT LOCATION	MAINTENANCE ACTIVITIES	MAINTENANCE STAFF

ATTACHMENT 4

EMERGENCY RESPONSE PLAN AND CONTACT LIST

EMERGENCY RESPONSE CONTACT LIST

In the event of an emergency the following persons shall be contacted:

DoubleTree Hotel

Ludyn Campos	Office	(510) 548-7920
	Cell	(510) 812-5881

City of Berkeley

Reeve Battle	Office	(510) 981-6336
	Cell	(510) 697-7343
Lorin Jensen	Office	(510) 981-6411
	Cell	(510) 774-2290

Berkeley Fire Department

911

California Integrated Waste Management Board

Tadese Gebrehawariat	Office	(916) 341-6402
Zane Poulsen	Office	(916) 341-6337

This list of Emergency Contacts shall also be posted at the DoubleTree Hotel. The O&M Manual shall also be updated as necessary to keep the contact list of responsible parties current.

COMBUSTIBLE GAS ALARM TRIGGER LEVELS, SEQUENCE OF OPERATIONS, AND RESPONSES TO ALARM EVENTS

Gas Level at Alarm Unit (%LEL)	Gas Detection Alarm Sequence of Events	Site Personnel Responses to Alarm Events	
	Alarm Unit Response	**Responsible Party**	**Response Activity**
Combustible Gas (methane and propane) 0 to 19 %	Under normal AC powered alarm unit operation, the LED indicator light will be green and the battery level icon will be displayed. If the alarm is being powered by the battery back-up power, the green indicator light will flash once every 45 seconds.	DoubleTree Hotel Staff	No action If the green light is flashing or is not illuminated, check the AC power connections. If the connections are correct and the green power indicator light is not continuously illuminated, contact the City to replace the unit.

COMBUSTIBLE GAS ALARM TRIGGER LEVELS, SEQUENCE OF OPERATIONS, AND RESPONSES TO ALARM EVENTS

Gas Level at Alarm Unit (%LEL)	Gas Detection Alarm Sequence of Events	Site Personnel Responses to Alarm Events	
Combustible Gas (methane and propane) 25% & above	A loud (85 decibel), repeating horn pattern (one beep per second) will be issued in sync with a red flashing LED indicator light displaying "GAS" and a full alarm level.	DoubleTree Hotel Staff	Immediately perform testing to rule out possible alarm unit malfunction and interference gas sources and confirm that a hazardous condition exists. Take a gas reading using a hand-held combustible gas meter to verify the alarm at the location of the unit. The meter and an individual trained to use the meter shall be present onsite at all times. • If testing indicates a false alarm, reset the unit in accordance with the manufacturer's instructions. • If an alarm unit sounds frequent alarms, even though no high levels of gas or CO are revealed during testing, notify the City. • If the results of alarm monitoring show evidence of combustible gas infiltration into the building structures (as verified by follow-up testing), notify the City and the Berkeley Fire Department and implement interim emergency response measures as necessary, such as ventilating the area through the use of portable fans and/or by turning on the HVAC system, until the appropriate remedial measures, specific to the problem have been identified by the Berkeley Fire Department.
		Berkeley Fire Department	If testing results in verifying a potentially hazardous condition, emergency response measures shall be implemented as appropriate including evacuation of the affected area.
		City	Notify the CIWMB via email or telephone within 24 hours, and maintain a written log including any corrective actions taken. Arrange to have units replaced, relocated or removed from the monitoring network if it is determined that the sensor is being triggered by interference gas sources or other conditions resulting in nuisance alarms.

COMBUSTIBLE GAS ALARM TRIGGER LEVELS, SEQUENCE OF OPERATIONS, AND RESPONSES TO ALARM EVENTS			
Gas Level at Alarm Unit (%LEL)	**Gas Detection Alarm Sequence of Events**	**Site Personnel Responses to Alarm Events**	
Carbon Monoxide	A loud, repeating horn pattern (4 beeps, pause, 4 beeps) will be issued in sync with a red flashing LED indicator light displaying "CO" and an increasing parts per million number.	DoubleTree Hotel Staff	Investigate and respond as appropriate. CO has multiple alarm triggers based on levels recorded over a period of specified time interval and include: 400 ppmv (4 to 15 minutes), 150 ppmv (10 to 50 minutes), 70 ppmv (1 to 4 hours).

Notes:
% = percent
LEL = Lower Explosive Limit
ppmv = parts per million by volume
HVAC = Heating, Ventilation and Cooling
CO = Carbon Monoxide
CIWMB = California Integrated Waste Management Board

CORRECTIVE ACTION LOG SHEET

DOUBLETREE HOTEL COMBUSTIBLE GAS MONITORING SYSTEM

DATE	TIME	ALARM UNIT LOCATION	CORRECTIVE ACTION ACTIVITIES	RESPONDERS