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Health and Safety Programs

Sandburg Garage Indoor Air Quality Survey

Purpose:

Evaluation of carbon monoxide (CO) and general hydrocarbon levels in the Sandburg Parking Garage during move-in day, September 2, 2000.



Placement of fan (left) near north tower staging area.

Methods:

- GasTec Passive Dosimeters (length of stain tubes)
- MSA Passport 5-Star Multi-gas Monitor
- Brüel & Kjær Type 1302 Photoacoustic Gas Analyzer

Occupational Exposure Limits and Hygienic Values (2000): Carbon Monoxide:

[OSHA:](#)

OSHA PEL-TWA (8-hour): 35 ppm (1990 limit, vacated)

OSHA PEL-TWA (8-hour): 50 ppm (2000)

NIOSH

NIOSH REL (8-hour): 35 ppm

NIOSH "Ceiling" (15 minute exposure): 200 ppm


IDLH: 1,200 ppm

ACGIH

ACGIH TLV: 25 ppm

Odor Threshold: NA

Results:

- [Graph of exhaust levels near north-tower staging area](#) 
- The time-weighted average CO level near the north tower staging area (CB1R) was 6 ppm; the average general hydrocarbon level was 3 ppm.
- Dosimeter Tube Results:
 - 5 ppm near fan in southeast corner (CB1T)
 - 6 ppm near southwest corner (CB1S)
 - 4 ppm near ramp to lower level
 - 9 ppm near north tower parking meter (CB1R)
- Peak reading with MSA Passport was 159 ppm, near north staging area during heavy traffic.

Summary/Recommendations:

- Time weighted average (TWA) values for CO were below

the ACGIH hygienic level of 25 ppm.

- CO levels around the perimeter of the garage were in the range of 0 to 10 ppm; CO and exhaust levels in the interior spaces were higher.
- Exhaust levels were largely dependent on the volume of traffic at any given time. Exhaust and CO levels tend to be higher when cars leave the garage (i.e., from a cold start), opposed to when vehicles enter the facility and are working at normal operating temperature.
- Exhaust values dropped significantly when a fan was relocated near the north staging area (see [graph](#)). This helped to dilute the exhaust, as well as providing some cooling-effect to those waiting in line. For future move-in days, we recommend placement of the fans in the interior spaces opposed to along the perimeter areas. Optimization of dilution of the exhaust may largely be due to trial and error.
- Removal of the temporary east wall at the completion of the east tower construction should significantly increase flow-through ventilation and reduce exhaust levels below those recorded on 9/2/2000.

Updated September 12, 2005 by [SAK](#)

University of Wisconsin - Milwaukee
P.O. Box 413
3209 N. Maryland Avenue
Milwaukee, WI 53201-0413
(414) 229-6339 (phone)
(414) 229-6729 (fax)



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Webmaster: Sue Kerns <kerns@uwm.edu>