

INDOOR AIR QUALITY ASSESSMENT REPORT

**ENVIRONMENTAL INVESTIGATION
OFFICE OF MILITARY COMMISSIONS
CAMP JUSTICE — NAVAL STATION GUANTANAMO BAY, CUBA**

Revision: 1

Prepared for:



**Department of the Navy
Naval Facilities Engineering Command Southeast
Building 135 North, P.O. Box 30
Jacksonville, Florida 32212-0030**

12 January 2016

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List of Acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
AOP	Area of Operation Patriot
ASHRAE	American Society for Heating, Refrigerating, and Air-Conditioning Engineers
CLO	Chief Liaison Officer
CO	carbon monoxide
CO ₂	carbon dioxide
ELC	Expeditionary Legal Complex
°F	degrees Fahrenheit
FPM	feet per minute
ft ²	square feet
GTMO	Guantanamo Bay
HVAC	heating, ventilating, and air conditioning
IAQ	Indoor Air Quality
mg/m ³	milligrams per cubic meter
NAVFAC SE NS	Naval Facilities Engineering Command, Southeast Naval Station
O&M	Operations and Maintenance
OMC	Office of Military Commissions
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PID	photoionization detector
PM	particulate matter
ppm	part(s) per million
TWA	time-weighted average
VOCs	volatile organic compounds
VSMG	visible suspect microbial growth

EXECUTIVE SUMMARY

Resolution Consultants performed an Indoor Air Quality (IAQ) Assessment 26-28 September 2015, within Area of Operation Patriot (AOP) at Naval Station (NS) Guantanamo Bay (GTMO), Cuba. AOP includes Camp Justice, the Expeditionary Legal Complex, and Office of Military Commissions. The assessment was requested by Naval Facilities Engineering Command, Southeast (NAVFAC SE) in response to a Navy and Marine Corps Public Health Center, Public Health Review Report of Camp Justice dated 21 August 2015.

Resolution Consultants, in consultation with NAVFAC SE, developed a work plan for the IAQ Assessment that included the following tasks:

- Perform visual observations and note those conditions having the potential to negatively impact IAQ.
- Observe the condition of asbestos-containing material (ACM) and lead-based paint identified in prior building assessments.
- Perform real-time environmental monitoring throughout a representative sample of occupied buildings.
- Perform a limited inspection above drop ceilings where accessible within Buildings AV34 and AV29.

Resolution Consultants observed the following conditions during the IAQ Assessment.

- The buildings were not occupied but were in use.
- The floor tile on the second floor west mezzanine of Building AV32 was in poor condition with many broken tiles, and tile chips observed. These floor tiles were previously identified as non-friable ACM (Harmon Engineering Associates [Harmon] 1991).
- Paint chips were observed on the floor of AV32. Paint was scaling off the ceiling and accessible wall surfaces. Based on NS GTMO Public Works Department lead sampling in 2003, the observed paint chips are assumed to contain lead.
- The observed condition of the vinyl floor tile in the second floor west mezzanine of AV32 indicates that the Operations and Maintenance (O&M) plan recommended by Harmon has not been fully implemented.

- Measured IAQ indicators were generally within the ranges specified by the American Society for Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), and recommendations from the Occupational Safety and Health Administration (OSHA) and the American Conference of Governmental Industrial Hygienists. Relative humidity measurements in AV29 and approximately half the rooms in AV34 exceeded OSHA recommendations.
- Water-stained ceiling tiles were observed in Room 10 of AV34.
- Condensation was observed on some plastic ceiling light covers in AV29 and AV34 offices indicating excessive moisture in those areas.
- Visible suspected microbial growth (VSMG) was observed in the first floor utility closet in AV29, on the ceiling and wall in the room adjacent to Courtroom I in AV34, and in the light fixture in the Command Liaison Officer (CLO) Director's Office in AV34.
- Rooms on the first floor of AV29 generally had higher measurements of relative humidity than rooms on the second floor.

Resolution Consultants recommends the following actions.

- Perform airborne asbestos sampling in AV32. Due to the condition of the floor tile on the second floor west mezzanine, airborne asbestos sampling should be performed to determine if the asbestos is properly contained and managed.
- Review the O&M plan for the previously identified asbestos floor tile present in AV32. The observed condition of the vinyl floor tile indicates that the O&M plan recommended by Harmon has not been fully implemented.
- Discard and replace water-stained ceiling tiles in Room 10 in AV34. Ceiling tile replacement should be conducted concurrent with identification and elimination of water intrusion sources (i.e., pipe and roof leaks).
- Remove and clean the plastic ceiling light covers in AV34. Evaluate whether the moisture build-up could be due to a vapor barrier being created by the insulation used above the drop ceiling.

- Clean the VSMG observed in the first-floor utility closet in AV29, on the ceiling and wall in the room adjacent to Courtroom I in AV34, and in the light fixture in the CLO Director's Office in AV34 with water and a detergent solution, then vacuum with high-efficiency particulate arresting filtered equipment once the areas are dry.
- Check the drainage system for the AV29 first floor air handler to verify that it is functioning correctly. The high average relative humidity measured on the first floor of AV29 indicates that the first floor air handler may not be draining condensate efficiently.
- Inspect the central heating, ventilating, and air conditioning (HVAC) systems in AV29 and ensure there is a good balance of supply and return air. Good supply and return air balance will ensure system efficiency and help relieve areas of low air flow.
- Have a licensed HVAC technician inspect, service, and clean (if needed) AV29 and AV34 HVAC units to ensure they are properly sized and configured, and working as originally designed to maintain relative humidity levels within ASHRAE guidelines.

1.0 INTRODUCTION AND BACKGROUND

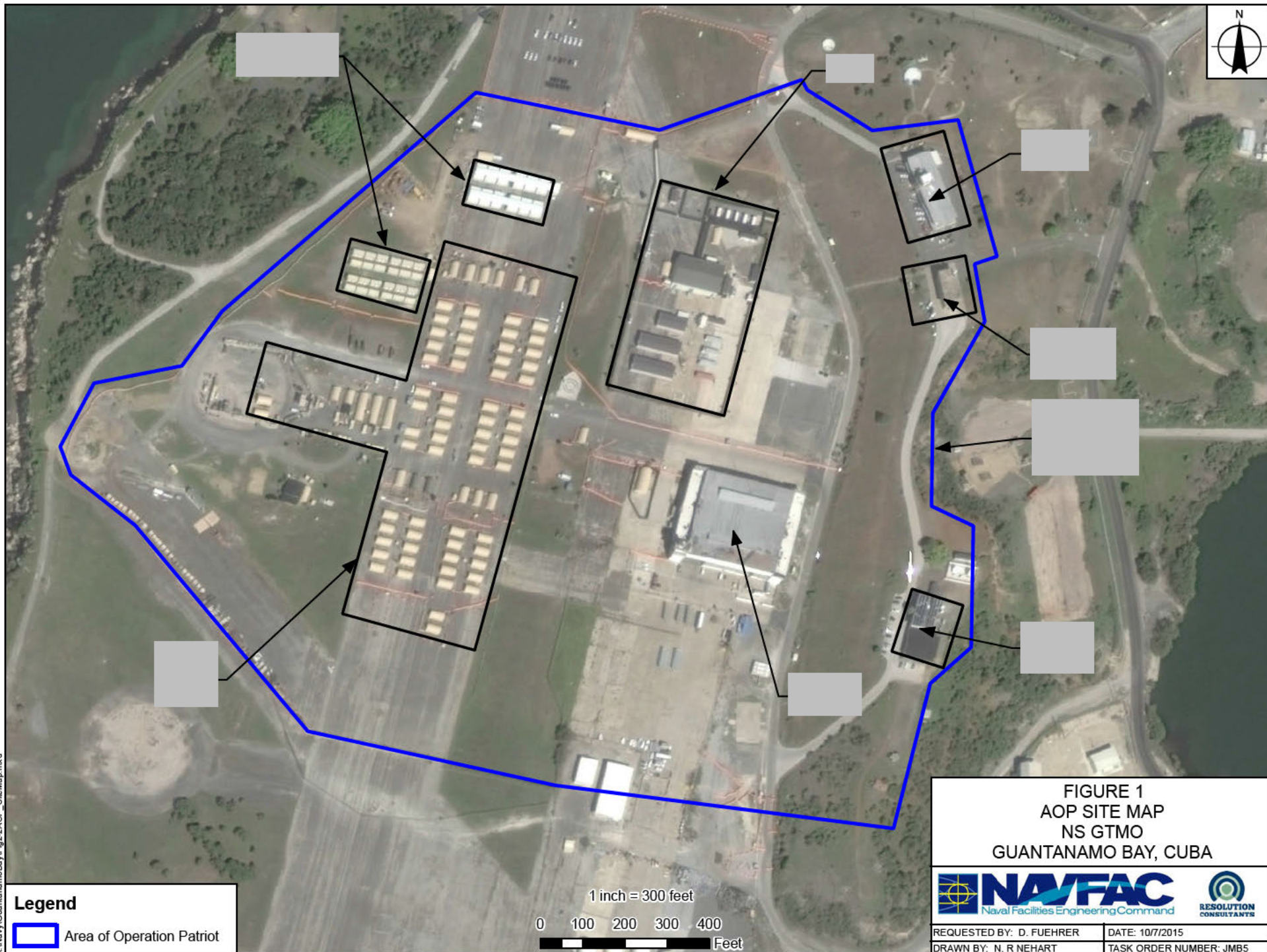
Requesting Company: Naval Facilities Engineering Command, Southeast
Assessment Date: 26-28 September 2015
Location: Area of Operation Patriot
Naval Station Guantanamo Bay, Cuba
Activities: Visual observations, real-time indoor air quality monitoring, and limited inspection of accessible ceiling cavities in Buildings AV34 and AV29

Resolution Consultants has prepared the following Indoor Air Quality (IAQ) Assessment report for Statement of Work Number SCSR1501 under Comprehensive Long-term Environmental Action Navy Contract No. N62470-11-D-8013, Contract Task Order JMB5, at the request of the Naval Facilities Engineering Command, Southeast (NAVFAC SE). Resolution Consultants, in consultation with NAVFAC SE, developed a work plan for the IAQ Assessment that included the following tasks.

- Perform visual observations and note those conditions having the potential to negatively impact IAQ.
- Observe the condition of asbestos-containing material and lead-based paint identified in prior building assessments.
- Perform real-time environmental monitoring throughout a representative sample of occupied subject buildings.
- Perform a limited inspection above drop ceilings where accessible within Buildings AV34 and AV29.

The subject buildings are a mixture of fixed structures, manufactured housing, and expeditionary tents located in and around Area of Operation Patriot (AOP) at the former McCalla Airfield, Naval Station (NS) Guantanamo Bay (GTMO), Cuba. AOP includes Camp Justice, the Expeditionary Legal Complex (ELC), and Office of Military Commissions (OMC). The subject buildings are used as offices, conference rooms, judicial hearing rooms, berthing quarters, latrine, showers, and laundry facilities supporting the OMC (Figure 1). Further descriptions of the structures are as follows.

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Building AV32

AV32 is a former hangar built in 1941. It has an approximate floor area of 65,000 square feet (ft²). The building is divided by a chain-link fence. The west half of the building is used as storage and warehouse space. Other than a couple of locked offices, this area was unoccupied and the open offices appeared to be uninhabited. The east half of the building contains three modular office structures on the hangar floor with additional offices and media rooms along the east wall. Two of the modular structures on the hangar floor appeared to be of similar construction and size (20 feet by 40 feet) and appeared to share power and heating, ventilating, and air conditioning (HVAC) units. The third structure, also approximately 20 feet by 40 feet, adjoined the other two but did not share power and had a dedicated HVAC unit attached to its exterior. All three modular structure interiors had carpeting and typical wall and ceiling finishes. The media rooms located along the east wall of AV32 were carpeted and contained desks and workstations. The air in those rooms was conditioned by re-circulating wall-mounted air conditioning units.

Building AV29

AV29 is a fixed structure built in 1942 with a floor area of approximately 10,000 ft². The building is a two-level, permanent wood structure with concrete slab-on-grade construction. The building formerly housed a dental clinic. All but one of the sink and water connections servicing the dental clinic had been capped. This building has two HVAC units providing central air conditioning. One unit was located in a mechanical space on the second floor, and another unit was located outside of the rear of the structure. The air supply and returns to these HVAC units are ducted through openings in the ceilings of each floor. Supplemental through-the-wall air conditioners were observed in some rooms. The floors in some rooms were carpeted, with other rooms and hallways tiled. The walls were painted plaster, and many spaces had drop ceilings though a few offices had glued ceiling tiles.

Building AV34

AV34 is a fixed structure built in 1942 with floor area of approximately 16,000 ft². The building is a three-level permanent wood structure built on a foundation with a crawl space. [REDACTED]

[REDACTED] The HVAC in this building is provided by different methods including window-/wall-mounted air conditioning units with exterior access, wall-mounted air conditioning units without exterior access, and ceiling-mounted air conditioning units. The interior finishes included a mixture of carpeting, vinyl floor tile, drop ceilings, and tiled ceilings.

Cuzcos

Cuzcos are manufactured residential housing units arranged adjacent to each other and share water, waste, and electric utilities. Each unit has two rooms that are approximately 11 feet by 10 feet and contain a sink, refrigerator, bed, television, desk, window, and through-the-wall air conditioning unit with local controls. The two rooms share one centrally located bathroom (with toilet and stand-up shower). The structures are arranged in groups of eight to twelve joined by a covered wood walkway.

Expeditionary Tents

Expeditionary tents are stand-alone, semi-circle frame structures built on wood flooring with a door at one end, covered with synthetic material. The tents also have a synthetic liner that follows the contour of the frame. Some of the tents were sub-divided into sleeping quarters or offices with plywood partitions. Other tents used fabric curtains to demarcate individual sleeping quarters. The tents had electricity but no water or waste utility connections. The tents used as showers, latrines, and laundry facilities were not on wood flooring but were on vinyl sheets or directly on the ground surface. Each tent had a dedicated HVAC unit that conditioned and recirculated the air.

ELC Area

The ELC area contains a large, sheet metal structure (ELC 1) containing Courtroom II and office areas. The interior furnishings included carpet, chairs, and wooden desks. ELC 1 has a drop ceiling with sheetrock walls, and is equipped with a central HVAC system. The ELC area also includes three manufactured trailers (ELC-3, ELC-4, and ELC-5) that serve as office space. The trailers are subdivided into offices and conference room spaces and included a mixture of vinyl and carpeted floors in each trailer. In addition, male and female latrines are located in separate trailers. CONEX boxes (ELC-8, ELC-9, and ELC-10) [REDACTED] were also observed. Each CONEX box has a dedicated HVAC unit.

2.0 OBSERVATIONS

The following sections describe observations made by Resolution Consultants during the 26-28 September 2015 IAQ assessment. A photograph log is provided in Appendix A.

2.1 Building AV32

Resolution Consultants observed conditions within the interior of the building and within the three modular structures on the hangar floor. Resolution Consultants observed floor tile in poor condition on the mezzanine hallway along the west side of the building. Some of the tiles were loose with broken fragments observed. This floor tile was previously described as non-friable asbestos-containing material (Harmon Engineering Associates [Harmon] 1991. Other observations, including vermin droppings, dirt, and debris on the floor in the accessible offices, indicated poor housekeeping. The mezzanine hallway and accessible offices on the east side of the building had painted concrete floors in good condition. Housekeeping appeared to be adequate in those rooms.

Resolution Consultants also observed paint chips on the hangar floor and paint scaling from the ceiling and some accessible wall surfaces. These painted surfaces were in poor condition, and reportedly contain lead (NS GTMO Public Works Department 2003).

The interiors of the three modular structures within the hangar and the media rooms on the first floor appeared to be in good condition with no readily observed moisture stains or mold on the ceiling or wall surfaces. The floors were carpeted, limiting general observations of the floor substrate and condition. Subsequent to the IAQ Assessment visit, Resolution Consultants learned that rain from Hurricane Joaquin entered AV32 causing some water damage to the media rooms and one of the modular structures.

2.2 Building AV29

Resolution Consultants observed the accessible portions of the central air conditioning units at AV29. The interior unit that services the second floor had a maintenance tag affixed that indicated the filter had been changed within the past three months. A similar tag was not observed on the outdoor unit that services the first floor. The air supply was ducted to registers in the ceiling near the center of the offices with air returns in the hallway ceiling. Access above the dropped ceiling was obtained on the first and second floor. Resolution Consultants did not observe water stains or excessive dust buildup on the ceiling tiles. Visible suspect microbial growth (VSMG) was observed in the first floor utility closet.

The vinyl floor tile appeared to be in good condition in the offices and hallways where visible. Some rooms were carpeted and the floor substrate could not be observed. This floor tile was previously described as non-friable asbestos-containing material (Harmon 1991).

2.3 Building AV34

Resolution Consultants observed condensate in the ceiling light covers in the room adjacent to Courtroom I. A musty odor was noted, and the floor felt spongy in that area. Access above the drop ceiling revealed an approximately 3-inch layer of fiberglass insulation across the top of the 1-inch fiberglass drop ceiling material. An additional 3 inches of insulation were observed stapled to the underside of the second floor, approximately 2 feet above the drop ceiling. VSMG was observed on the upper wall of the room adjacent to Courtroom I and in the light fixture in Room 200. Condensate was also observed on the ceiling light cover in the Command Liaison Officer (CLO) Director's Office. Three water-stained ceiling tiles were observed in the detainee room on the north side of the building.

The vinyl floor tile appeared to be in good condition in the offices and hallways where the tile was visible. Some rooms were carpeted and the floor substrate could not be observed.

2.4 Cuzcos, Tents, and Expeditionary Legal Complex Area

Indications of compromised IAQ such as water stains, odors, or mold were not observed during the walkthroughs of the Cuzcos, expeditionary tents, and ELC structures. The observed wall, ceiling, and floor surfaces appeared to be in good condition.

3.0 SAMPLING

Resolution Consultants utilized industry standard methods for assessing IAQ. A TSI Q-trak Plus (Model 7565 with IAQ probe, calibrated 21 September 2015) was used to measure temperature (degrees Fahrenheit [°F]), relative humidity (percent), carbon monoxide (CO), and carbon dioxide (CO₂). A MiniRAE 3000 photoionization detector (PID) with a 10.6 electron volt lamp was used to detect airborne volatile organic compounds (VOCs). A TSI VelociCalc (Model 9555) was used to detect and measure air velocity. A TSI Dust Trak II Aerosol Monitor (Model 8532) was used to detect the mass concentration of airborne particles in the diameter range of 0.4 to 10 microns. The following sections describe sample collection procedures and the sample results. Samples were collected in occupied rooms of Buildings AV32, AV34, and AV29, and in representative numbers of expeditionary tents and Cuzcos.

3.1 Indoor Air Quality Indicators

The results for temperature, relative humidity, CO, and CO₂ were compared with the recommendations from the American Society for Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) and recommendations from the Occupational Safety and Health Administration (OSHA). Airborne VOCs and airborne dust concentrations were compared with outdoor background concentrations, and with the American Conference of Governmental Industrial Hygienists (ACGIH) recommended occupational exposure limits. Air velocity measurements were used as an indicator of air movement into and out of rooms through doors, window seals, or other penetrations.

Carbon Monoxide: The OSHA Permissible Exposure Limit (PEL) for CO is 50 parts per million (ppm) as an 8-hour time-weighted average (TWA).

Carbon Dioxide: ASHRAE acknowledges that maintaining a steady-state CO₂ concentration in an indoor space no greater than approximately 700 ppm above the outdoor air concentration will likely generate conditions that satisfy a substantial majority of occupants with respect to human bioeffluents (i.e., body odor) (ASHRAE Standard 62.1-2010: *Ventilation for Acceptable Indoor Air Quality*).

Thermal Comfort: ASHRAE acknowledges that it is difficult to create an indoor environment that is thermally comfortable for all occupants. ASHRAE Standard 55-2010: *Thermal Environmental Conditions for Human Occupancy* identifies the following six primary factors that contribute to thermal comfort: metabolic rate, clothing insulation, air temperature, radiant temperature, air speed, and humidity. OSHA recommends that indoor temperatures be maintained at comfortable levels, which it describes as 68–78°F (OSHA *Indoor Air Quality in Commercial and Institutional Buildings*).

Relative Humidity: OSHA recommends maintaining relative humidity levels between 30 and 60 percent to minimize the potential for mold growth.

Airborne Dust: The OSHA PEL for inert airborne dust is 15 milligrams per cubic meter (mg/m³), and the ACGIH recommends maintaining 8-hour TWA of inert airborne dusts below 10 mg/m³.

Volatile Organic Compounds: The MiniRAE 3000 PID was used to screen for VOCs as a broad class of airborne contaminants. The results were compared to outdoor background levels of VOCs.

3.2 Indoor Air Quality Indicator Results

Table 3-1 summarizes IAQ measurements collected during the assessment; environmental monitoring data sheets and supporting field data are in Appendices B and C, respectively.

Table 3-1 Summary Table of Indoor Air Quality Measurements Naval Station Guantanamo Bay, Cuba 26-28 September 2015									
Location			Temperature °F	% Relative Humidity	CO ₂ (ppm)	CO (ppm)	VOCs (ppm)	PM ₁₀ (mg/m ³)	Air Velocity (FPM)
AV34	Range	Min	62.5	41.1	285.0	0	0.0	0.007	0.0
		Max	77.5	79.6	884.0	0	0.3	0.0290	0.4
	Average		72.9	57.6	562.6	0	0.0	0.048	0.2
AV29	Range	Min	67.5	48.4	283.0	0	0.0	0.010	0.0
		Max	76.1	79.7	412.0	0	0.1	0.054	3.0
	Average		71.0	70.1	342.9	0	0.0	0.016	0.4
AV32	Range	Min	71.5	48.0	250.0	0	0.0	0.015	0.1
		Max	80.0	63.2	1,170.0	0	0.0	0.039	0.2
	Average		74.9	54.5	499.3	0	0.0	0.027	0.1
Cuzcos	Range	Min	72.5	48.0	297.0	0	0.0	0.018	0.5
		Max	79.0	79.0	566.0	0	2.3	0.033	10.6
	Average		76.4	65.0	371.4	0	1.1	0.025	3.4
Tents	Range	Min	76.0	30.0	289.0	0	0.0	0.011	0.7
		Max	103.0	66.5	540.0	0	0.4	0.032	11.8
	Average		85.2	42.1	377.8	0	0.1	0.018	6.0
Expeditionary Legal Complex	Range	Min	65.1	37.1	203.0	0	0.0	0.007	0.0
		Max	91.3	66.0	551.0	0	0.0	0.067	2.2
	Average		74.4	48.7	349.7	0	0.0	0.026	0.3

Notes:

°F	=	degrees Fahrenheit	VOCs	=	volatile organic compounds
CO ₂	=	carbon dioxide	mg/m ³	=	milligrams per cubic meter
ppm	=	Part(s) per million	PM ₁₀	=	particulate matter < 10 micrometers in diameter
CO	=	carbon monoxide	FPM	=	feet per minute

3.2.1 Building AV32

Carbon Monoxide

The CO concentration was measured as 0.0 ppm throughout the rooms.

Carbon Dioxide

The CO₂ levels measured in the rooms ranged from 250 to 1,170 ppm. The outdoor CO₂ concentration was 223 ppm. The CO₂ concentrations were generally below the ASHRAE guideline. The CO₂ concentration of 1,170 ppm in one room was likely due to its occupancy by five adults immediately prior to monitoring.

Thermal Comfort

The temperatures measured inside the rooms ranged from 71.5°F to 80°F. The temperature inside the hangar but outside the rooms was approximately 81°F. The outdoor temperature was approximately 91°F. The indoor air temperatures recorded during the assessment were generally within the OSHA recommendations with media room 1 slightly exceeding the recommended temperature.

Relative Humidity

The relative humidity ranged from 48.0 to 63.2 percent throughout the rooms. Relative humidity measurements were generally within OSHA recommendations with a slightly elevated result of 63.2 percent in media room 5. Air velocity measurements indicated some air movement within the rooms from the fans within the HVAC units servicing the rooms.

Airborne Dust

The dust levels ranged from 0.015 to 0.039 mg/m³ and were well below the OSHA PEL and ACGIH-recommended levels, and were comparable to the background range of 0.010 to 0.056 mg/m³ measured outdoors.

Volatile Organic Compounds

The VOC concentration was measured as 0.0 ppm throughout the rooms.

3.2.2 Building AV29

Carbon Monoxide

The CO concentration was measured as 0.0 ppm throughout the rooms.

Carbon Dioxide

The CO₂ levels measured in the rooms ranged from 283 to 412 ppm. The outdoor CO₂ concentration was 223 ppm. The CO₂ concentrations were below the ASHRAE guideline.

Thermal Comfort

The temperatures measured inside the rooms ranged from 67.5°F to 76.1°F. The outdoor temperature measured at approximately the same time was 81°F. The indoor air temperatures measured during the assessment were within OSHA recommendations.

Relative Humidity

The relative humidity readings ranged from 48.4 to 79.7 percent throughout the rooms. Relative humidity measurements exceeded OSHA recommendations except for the Privilege Room. Also, relative humidity measurements on the first floor exceeded those on the second floor by approximately 10 percent. Air velocity measurements indicated some air movement within the rooms from the fans within the HVAC units servicing the rooms.

Airborne Dust

The dust levels ranged from 0.010 to 0.054 mg/m³ and were well below the OSHA PEL and ACGIH-recommended levels, and were comparable to the background range of 0.010 to 0.056 mg/m³ measured outdoors.

Volatile Organic Compounds

The VOC concentrations recorded were 0.0 to 0.1 ppm throughout the rooms.

3.2.3 Building AV34**Carbon Monoxide**

The CO concentration was measured as 0.0 ppm throughout the rooms.

Carbon Dioxide

The CO₂ levels measured in the rooms ranged from 285 to 884 ppm. The outdoor CO₂ concentration was 208 ppm. The CO₂ concentrations were below the ASHRAE guideline.

Thermal Comfort

The temperatures measured inside the rooms ranged from 62.5°F to 77.5°F. The outdoor temperature measured at approximately the same time was 88.4°F. The indoor air temperatures measured during the assessment were generally within OSHA recommendations.

Relative Humidity

The relative humidity ranged from 41.1 to 79.6 percent throughout the rooms. Relative humidity measurements exceeded OSHA recommendations in about half of the rooms. Air velocity measurements indicated some air movement within the rooms from the fans within the HVAC units servicing the rooms.

Airborne Dust

The dust levels ranged from 0.007 to 0.0290 mg/m³ and were well below the OSHA PEL and ACGIH-recommended levels and were comparable to the background range of 0.010 to 0.056 mg/m³ measured outdoors.

Volatile Organic Compounds

The VOC concentrations recorded were 0.0 to 0.3 ppm throughout the rooms.

3.2.4 Cuzcos

Carbon Monoxide

The CO concentration was measured as 0.0 ppm throughout the Cuzcos.

Carbon Dioxide

The CO₂ levels measured in the Cuzcos ranged from 297 to 566 ppm. The outdoor CO₂ concentration was 290 ppm. The CO₂ concentrations were below the ASHRAE guideline.

Thermal Comfort

The temperatures measured inside the Cuzcos ranged from 72.5°F to 79.0°F. The outdoor temperature measured at approximately the same time was 82.2°F. The indoor air temperatures recorded during the assessment were generally within the OSHA recommendations.

Relative Humidity

The relative humidity ranged from 48.0 to 79.0 percent throughout the Cuzcos. Relative humidity measurements were generally within OSHA recommendations. Air velocity measurements indicated good air movement within the rooms from the fans within the HVAC units, located in the walls of each Cuzco lodging room.

Airborne Dust

The dust levels ranged from 0.018 to 0.033 mg/m³ and were well below the OSHA PEL and ACGIH-recommended levels, and were comparable to the background range of 0.010 to 0.056 mg/m³ measured outdoors.

Volatile Organic Compounds

The VOC concentrations measured were 0.0 to 2.3 ppm in the Cuzcos. The higher VOC measurements collected from the Cuzcos are not reliable due to the frequent movement of the PID into and out of air-conditioned spaces, which formed condensation on the lamp causing the meter to drift out of calibration during the sampling period.

3.2.5 Expeditionary Tents

Carbon Monoxide

The CO concentration was measured as 0.0 ppm throughout the tents.

Carbon Dioxide

The CO₂ levels measured throughout the tents ranged from 289 to 540 ppm. The outdoor CO₂ concentration was 270 ppm. The CO₂ concentrations were below the ASHRAE guideline.

Thermal Comfort

The temperatures measured inside the air-conditioned tents ranged from 76.0°F to 89.0°F. For comparison purposes, temperatures of 100°F and 103°F were measured in tents without air conditioning. The outdoor temperature measured at the same approximate time was 87.0°F. The indoor air temperatures of the air-conditioned tents generally exceeded OSHA recommendations.

Relative Humidity

The relative humidity ranged from 30.0 to 66.5 percent in the tents. Relative humidity measurements were within OSHA recommendations in the normally habitable tents. The two humidity measurements that exceeded the OSHA recommendation were in the Laundry tent and in one tent without air conditioning. Air velocity measurements indicated significant air movement within the tents from the large fans within the HVAC units pushing air through a distribution duct at the center of the ceiling of the tents.

Airborne Dust

The dust levels ranged from 0.011 to 0.032 mg/m³ and were well below the OSHA PEL and ACGIH-recommended levels, and were comparable to the background range of 0.010 to 0.056 mg/m³ measured outdoors.

Volatile Organic Compounds

The VOC concentrations measured were 0.0 to 0.4 ppm throughout the tents.

3.2.6 Expeditionary Legal Complex Area

Carbon Monoxide

The CO concentration was measured as 0.0 ppm in the rooms.

Carbon Dioxide

The CO₂ levels measured in the rooms ranged from 203 to 551 ppm. The outdoor CO₂ concentration was 203 ppm. The CO₂ concentrations were below the ASHRAE guideline.

Thermal Comfort

The temperatures measured inside the rooms ranged from 65.1°F to 85.7°F. The outdoor temperature was approximately 91.3°F. The indoor air temperatures recorded during the assessment were generally within the OSHA recommendations except for ELC 12, ELC 8, and ELC 5, which were slightly above the recommended temperature range.

Relative Humidity

The relative humidity ranged from 37.1 to 66.0 percent throughout the rooms. Relative humidity measurements were generally within OSHA recommendations except for the Judge's Chamber adjacent to Courtroom II. Air velocity measurements indicated some air movement within the rooms from the fans within the HVAC units servicing the rooms.

Airborne Dust

The dust levels ranged from 0.007 to 0.067 mg/m³ and were well below the OSHA PEL and ACGIH-recommended levels, and were comparable to the background range of 0.010 to 0.056 mg/m³ measured outdoors.

Volatile Organic Compounds

The VOC concentration was measured as 0.0 ppm throughout the rooms.

4.0 RECOMMENDATIONS

Resolution Consultant's recommendations are based on limited observations and sampling events that represent a snapshot of the conditions inside the buildings at the time of the assessment. Interior building conditions are subject to change based upon occupancy, weather conditions, and other factors.

Resolution Consultants recommends the following actions.

- Perform airborne asbestos sampling in AV32. Due to the condition of the floor tile on the second floor west mezzanine, airborne asbestos sampling should be performed to determine if the asbestos is properly contained and managed.
- Review the O&M plan for the previously identified asbestos floor tile present in AV32. The observed condition of the vinyl floor tile indicates that the O&M plan recommended by Harmon has not been fully implemented.
- Discard and replace water-stained ceiling tiles in Room 10 of AV34. Ceiling tile replacement should be conducted concurrent with identification and elimination of water intrusion sources (i.e., pipe and roof leaks).
- Remove and clean the plastic ceiling light covers in AV34. Evaluate whether the moisture buildup could be due to a vapor barrier being created by the insulation used above the drop ceiling.
- Clean the VSMG observed in the first-floor utility closet in AV29, on the ceiling and wall in the room adjacent to Courtroom I in AV34, and in the light fixture in the CLO Director's Office in AV34 with water and a detergent solution, then vacuum with high-efficiency particulate arresting filtered equipment after the areas dry.
- Check the drainage system for the AV29 first floor air handler to verify that it is functioning correctly. The high average relative humidity measured on the first floor of AV29 indicates that the first floor air handler may not be draining condensate efficiently.
- Inspect the central HVAC systems in AV29 and ensure there is a good balance of supply and return air. Good supply and return air balance will ensure system efficiency and help relieve areas of low air flow.

- Have a licensed HVAC technician inspect, service, and clean (if needed) the AV29 and AV34 HVAC units to ensure they are properly sized and configured, and working as originally designed to maintain relative humidity levels within ASHRAE guidelines.

5.0 DISCLAIMER

This report is for the sole use of NAVFAC SE. Use of this report by any other party will be at such party's sole risk, and Resolution Consultants disclaims liability for any such use or reliance by third parties. The results presented in this report are indicative of conditions at the time of the assessment. This assessment does not purport to include every safety or health hazard at this location, and only those areas specifically mentioned were evaluated. Resolution Consultants prepared this report based upon the direction and information provided by NAVFAC SE, and shall not assume responsibility for misinformation that Resolution Consultants could not reasonably determine was incorrect at the time of the performance of work.

6.0 REFERENCES

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Appendix A
Photograph Documentation

Photograph Log
Indoor Air Quality Assessment
Camp Justice, NS GTMO, Cuba
September 2015



Photograph 1: Scaling paint on AV32 ceiling.



Photograph 2: AV32, west 2nd floor mezzanine. Tile chips and debris.

Photograph Log
Indoor Air Quality Assessment
Camp Justice, NS GTMO, Cuba
September 2015



Photograph 3: AV32 mezzanine-pile of loose paint chips and other debris.



Photograph 4: AV29 first floor air handling unit.

Photograph Log
Indoor Air Quality Assessment
Camp Justice, NS GTMO, Cuba
September 2015



Photograph 5: Visible suspect microbial growth in ceiling light cover in AV29.



Photograph 6: Condensation in ceiling light cover in AV34.

Photograph Log
Indoor Air Quality Assessment
Camp Justice, NS GTMO, Cuba
September 2015



Photograph 7: Visible suspect microbial growth in AV34 ceiling area.



Photograph 8: Visible suspect microbial growth in AV29 closet

Photograph Log
Indoor Air Quality Assessment
Camp Justice, NS GTMO, Cuba
September 2015



Photograph 9: Cuzcos.



Photograph 10: Cuzco interior.

Photograph Log
Indoor Air Quality Assessment
Camp Justice, NS GTMO, Cuba
September 2015



Photograph 11: Expeditionary tent



Photograph 12: Shower tent interior.

Appendix B
Environmental Monitoring Datasheets

Environmental Monitoring Datasheet
Building AV34
NS GTMO
27 September 2015



No.	Time	Location (Bldg., Rm., etc.)	Temp. F°	% Relative Humidity	CO ₂ (PPM)	CO (PPM)	VOC (PPM)	Particulate (mg/m3) PM ₁₀	Air Velocity (FPM)
1	10:31	Courtroom AV - 34	77.2	42.4	590	0	0	0.029	
2	10:36		68.4	47.7	700	0	0		0.23
3	10:38	Media	62.5	51	630	0	0		0.33
4	11:03	Deliberation Room	70.9	68.4	650	0	0	0.011	0.34
5	11:10	AV Room	72.7	64.3	884	0	0	0.009	0.15
6	11:12	Military Judges Office	72.5	48.7	675	0	0.1	0.013	0.15
7	11:15	Court Recorder	70.5	41.1	823	0	0.2	0.03	0.23
8	11:17	Data Room 14	72.7	60.6	669	0	0	0.012	0.44
9	11:20	IT Room J - 06	73.66	49.2	633	0	0.2	0.012	0.15
10	11:25		73.6	48.6	671	0	0.3	0.026	0.23
11	11:30		75.7	67.1	290	0	0	0.011	0.1
12	11:33	Room 205 Defense	74.1	47.6	674	0	0	0.016	0.42
13	11:35	Room 202	75	48.1	716	0	0.1	0.016	0.22
14	11:40	Ro 203	75.6	55.8	691	0	0	0.012	0.19
15	11:41	Room 204	77.5	58.1	774	0	0	0.014	0.09
16	11:48	Room 201	75.9	62.7	711	0	0	0.013	0.22
17	11:46	Room 200	74.7	61.3	769	0	0	0.014	0.15
18	11:50	Room 208	72.6	60	585	0	0	0.013	0.22
19	11:53	Room 209	70.5	61	671	0	0	0.013	0.2
20	12:00	Clo Dr	71.5	57.1	290	0	0	0.025	0.08
21	12:01	Trans Room B	71.6	68.9	336	0	0	0.012	0.29
22	12:02	Trans Room A	70.6	79.6	332	0	0	0.013	0.13
23	12:03	Room 214	71.3	69.5	349	0	0	0.011	0.19
24	12:04	Room 210	72.5	62.7	302	0	0	0.015	0.18
25	12:06	Room 210 B	73.4	54.6	477	0	0	0.015	0.17
26	12:08	Room 213 B	71.6	60	324	0	0	0.014	0.16
27	12:10	Room 213 A	74.1	63.1	285	0	0	0.014	
28	12:15	Room 211 A	73.3	63.6	380	0	0	0.015	0
29	12:17	Crows Nest	77	56.1	456	0	0	0.022	0.28
30	12:30	Outside	88.4	62.1	208	0	0		
31	13:45	Room 7	75.3	48.5	540	0		0.007	0.15
32	13:55	Basement						0.651	

Environmental Monitoring Datasheet
Building AV29
NS GTMO
27 September 2015



No.	Time	Location (Bldg., Rm., etc.)	Temp. F°	% Relative Humidity	CO ₂ (PPM)	CO (PPM)	VOC (PPM)	Particulate (mg/m ³) PM ₁₀	Air Velocity (FPM)
1	8:35	Room 31, 2nd Floor	74.5	63.9	412	0	0ppm	0.017	
2	8:37	Room 30, 2nd Floor	74.1	64	373	0	0	0.015	
3	8:38	Room 29, 2nd Floor	73.9	65	338	0	0	0.017	0.05
4	8:39	Room 28, 2nd Floor	73.9	65.8	379	0	0	0.017	0.01
5	8:41	Room 17	73.2	60.7	373	0	0.1	0.014	0.1
6	8:43	Room 34B	72.2	64.2	354	0	0	0.017	0.71
7	8:45	Room 34A	71.9	65	406	0	0	0.015	
8	8:48	Room 33B	71.1	63.3	372	0	0	0.014	0.26
9	8:50	Room 33A	70.5	63.4	363	0	0	0.014	0.26
10	8:52	Room 32	70.8	65.4	373	0	0	0.014	0.14
11	9:01	Room 23	70.3	72.1	353	0	0	0.012	0.7
12	9:05	Room 24/25/26	68.9	76.9	388	0	0	0.01	0.2
13	9:08	Room 4	68.6	78.6	340	0	0	0.038	0.24
14	9:12	Room 3	68.6	78.9	340	0	0	0.021	0.31
15	9:14	Room 2	68.4	78.2	283	0	0	0.012	0.18
16	9:17	Room 17	67.5	78.7	291	0	0	0.011	0.49
17	9:20	Room 22	69.4	79.7	311	0	0	0.011	0.1
18	9:22	Room 5	69.5	77.8	319	0	0	0.012	
19	9:35	Room 8	71.1	72.6	313	0	0	0.01	0.01
20	9:40	Room 9	71.4	70.4	365	0	0	0.01	0.05
21	9:44	Room 20	72	70.6	362	0	0	0.011	0.11
22	9:47	Room 19	74	66.4	354	0		0.017	0.5
23	9:50	Room 18	72	65.8	313	0		0.012	
24	9:55	Room 11	69.5	73	390	0		0.012	0.55
25	9:57	Room 2	68.8	74.6	285	0		0.01	0.24
26	9:59	Room 13	69	75	312	0		0.02	0.18
27	10:01	Room 14	69.4	75.5	304	0		0.054	0.25
28	10:04	Room 15	70.3	73.6	311	0		0.015	0.08
29	10:05	Room 17	69.7	72.6	284	0		0.018	0.4
30	10:08	Room 16	69.8	74.5	343	0		0.011	0.26
31	10:15	Outdoor	81	88.6	223	0		0.01	
32	13:30	Privilege Room	76.1	48.4	325		0	0.015	0.23

Environmental Monitoring Datasheet
Building AV32
NS GTMO
27 September 2015



No.	Time	Location (Bldg., Rm., etc.)	Temp. F°	% Relative Humidity	CO ₂ (PPM)	CO (PPM)	VOC (PPM)	Particulate (mg/m3) PM ₁₀	Air Velocity (FPM)
1	4:15	Media Center 7-8 Workstations	80	49	478	0	0	0.039	0.11
2	4:18	Media Ops Room 2	76.5	50	462	0	0	0.015	0.11
3	4:21	Media Multipurpose	74	48	1170	0	0	0.028	0.11
4	4:24	Media Room 5	75	63.2	346	0	0	0.025	0.24
5	4:27	Media Room 4 > Joined	72.4	58.8	250	0	0	0.033	0.15
6	4:30	Media Room 3	71.5	57.8	290	0	0	0.024	
7									
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Environmental Monitoring Datasheet
Cuzco's
NS GTMO
28 September 2015



No.	Time	Location (Bldg., Rm., etc.)	Temp. F°	% Relative Humidity	CO ₂ (PPM)	CO (PPM)	VOC (PPM)	Particulate (mg/m3) PM ₁₀	Air Velocity (FPM)
1	7:55	Outside	82.2	81.2	290	0	0	0.056	
2	8:01	13B	76.9	62	301	0	0	0.024	10.6
3	8:04	11A	74.3	74	490	0	0	0.023	2.2
4	8:11	7A	72.5	67.4	389	0	0	0.028	1.8
5	8:15	2A	76.8	79	355	0	0	0.022	8.08
6	8:18	4B	77.6	68	370	0	0	0.024	6.93
7	8:20	8B	76	68.5	353	0	0	0.024	3.34
8	8:23	12B	75.3	69.5	308	0	0	0.023	2.79
9	8:31	25B	78	63	359	0		0.028	
10	8:40	24B	76.8	57.7	442	0	0.6	0.031	3.63
11	8:43	19A	76	68.6	363	0	0.7	0.025	2.59
12	8:45	15A	76	66.3	404	0	0.8	0.031	0.76
13	8:50	14A	76	55	359	0	1	0.026	2.7
14	8:53	16B	76	61.5	417	0	1.1	0.033	0.89
15	8:56	20B	75	74	409	0	1.1	0.029	5.1
16	8:58	24B	75	75.3	566	0	1.2	0.033	1.17
17	9:18	28A	77.8	68.3	449	0	1.4	0.025	0.71
18	9:20	30B	76.5	58.1	347	0	1.6	0.027	1.6
19	9:23	34A	75.7	74	438	0	1.3	0.025	3.6
20	9:25	38A	78	53	333	0	2.3	0.02	1.66
21	9:29	35B	78	48	389	0	2	0.024	0.94
22	9:33	31B	79	55	323	0	1.7	0.029	0.5
23	9:37	29A	77	64	380	0	1.5	0.018	2.92
24	9:40	27A	76.4	61.2	337	0	1.7	0.024	6.06
25	9:43	40A	78	55.2	378	0	1.5	0.019	6.5
26	9:45	44A	78	68	297	0	1.5	0.02	3.12
27	9:47	46A	77	64	319	0	1.6	0.019	1.02
28	9:49	48A	75	71	298	0	1.5	0.025	3.3
29	9:51	50B	77	67	305	0	1.6	0.024	7.06
30	9:52	49B	77	67	328	0	1.6	0.024	3.5
31	9:55	45B	76	66	362	0	1.5	0.021	2.21
32	9:58	41B	74	66	345	0	1.7	0.026	4.93

Environmental Monitoring Datasheet
Tents
NS GTMO
28 September 2015



No.	Time	Location (Bldg., Rm., etc.)	Temp. F°	% Relative Humidity	CO ₂ (PPM)	CO (PPM)	VOC (PPM)	Particulate (mg/m3) PM ₁₀	Air Velocity (FPM)
1	10:10	Outside	87	70	270	0	PID	0.024	
2	10:18	Female Shower	77	30	414	0	0.1	0.032	2.86
3	10:20	Male Shower	76	41.5	329	0	0.1	0.022	9.14
4	10:22	Laundry	78	66.5	406	0	0	0.014	11.8
5	10:23	Male Latrine	76	42.4	289	0	0	0.028	8.13
6	10:35	A4 - Engineering	80	35.3	473	0	0	0.016	7.92
7	10:37	NGO-Male Sleeps 8	84	41.2	300	0	0	0.011	9.4
8	10:41	B - 9	84	37.2	362	0	0	0.021	3.27
9	10:46	BD - 3	89	35	419	0	0.1	0.014	1.8
10	11:15	C - 7 - No AC	100	60	540	0	0.4	0.029	0.69
11	11:20	A - 10 No AC	103	53	492	0	0	0.016	0.67
12	11:22	Media Female A - 12	87	38	294	0	0	0.011	8.72
13	11:24	B - 12	87	41	351	0	0	0.012	6.9
14	11:28	C - 13 Male Barracks	85	31.9	314	0	0	0.012	8.53
15	11:30	D - 13 Male Barracks	87	36	306	0	0	0.012	3.64
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Environmental Monitoring Datasheet
ELC Area
NS GTMO
27 September 2015



No.	Time	Location (Bldg., Rm., etc.)	Temp. F°	% Relative Humidity	CO ₂ (PPM)	CO (PPM)	VOC (PPM)	Particulate (mg/m3) PM ₁₀	Air Velocity (FPM)
1	2:40	Courtroom	66.6	45	245	0	0	0.007	0.18
2	2:50	Judges Chamber	65.1	66	224	0	0	0.039	0.1
3	2:55	Witness Staging	66.3	53.5	313	0	0	0.051	
4	2:58	AV Room	66.7	56.7	417	0	0	0.013	
5	3:03	ELC 12	79.5	49.1	323	0	0	0.029	
6	3:12	ELC3 107	77.1	42.8	274	0	0	0.028	0.011
7	3:15	103	76	50.9	377	0	0	0.015	0.07
8	3:16	104	73.3	46.8	323	0	0	0.017	0.23
9	3:17	102	70.9	50.5	447	0	0	0.014	0.18
10	3:20	105	72.8	49	483	0	0	0.026	0.16
11	3:22	101	73.7	45.8	340	0	0	0.015	0.23
12	3:25	104	72.9	48	551	0	0	0.048	0.12
13	3:27	100	71.9	47.3	358	0	0	0.055	0.11
14	3:31	ELC - 8 (6 + Occupants)	76.5	49.2	348	0	0	0.019	0.13
15	3:35	Outdoor	91.3	62	203	0	0		
16	3:38	ELC 4 - Large Room (6)	81.7	38.4	299	0	0	0.067	0.13
17	3:42	102	77.8	40.3	337	0	0	0.012	
18	3:44	104A	75.2	45.6	369	0	0	0.013	0.22
19	3:46	104B 1 Person Office	73.6	47.6	311	0	0	0.012	
20	3:48	101 5 Person 2 vent	70.9	50.2	412	0	0	0.013	2.18
21	3:55	ELC 5 2-3 Staff	79.1	37.1	390	0	0	0.022	
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Appendix C
Field Notes and Data

Name: G/TMO Bldg AU-29

Project:

Date: 9/27/15 unoccupied at time

Environmental Monitoring Datasheet

No.	Time	Location (Bldg., Rm., etc.)	Temp. F°	% Relative Humidity	CO ₂ (PPM)	CO (PPM)	P-Trak UFP (nm)	Particulate (mg/m ³)				Photo No.	Return air flow
								PM ₁	PM _{2.5}	Respirable	PM ₁₀		
1	8:35	Rm 31, 2 nd floor	74.5	63.9	226	0	0 ppm				.017	2.5 cfm	
2	8:37	Rm 30 " "	74.1	64	373	0	0				.015	3 cfm	(.25) ambient .05
3	8:38	Rm 29 " "	73.9	65	338	0	0				.017	.05 cfm	
4	8:39	Rm 28 " "	73.9	65.8	319	0	0				.017	.01	
5	8:41	Rm 27	73.2	66.7	313	0	0.1				.024	0.1	
6	8:43	Rm 34B	72.2	64.2	354	0	0				.017	0.71 cfm	
7	8:45	Rm 34A	71.9	65	406	0	0				.015		
8	8:48	Rm 33B	71.1	63.3	372	0	0				.014	.26 cfm	
9	8:50	Rm 33A	70.5	63.4	363	0	0				.014	.26 cfm	
10	8:52	Rm 32	70.8	65.4	373	0	0				.014	.14 cfm	
11	9:01	Rm 23	70.3	70.1	353	0	0				.012	.7 cfm	
12	9:05	Rm 24/25/26	68.9	76.9	388	0	0				.010	6.2	
13	9:08	Rm 4	68.6	78.6	340	0	0				.038	.24	
14	9:12	Rm 3	68.6	78.9	340	0	0				.021	0.31 cfm	
15	9:14	Rm 2	68.4	78.2	283	0	0				.012	0.18 cfm	
16	9:17	Rm 1	67.5	78.7	291	0	0				.011	.19 cfm	
17	9:20	Rm 22	69.4	79.7	311	0	0				.011	0.1 cfm	
18	9:22	Rm 5	69.5	77.8	319	0	0				.012	0.07 cfm	
19	9:38	Rm 8	71.1	72.6	313	0	0				.010	0.01 cfm	
20	9:40	Rm 9	71.4	70.4	365	0	0				.010	0.05 cfm	
21	9:44	Rm 20	72	70.6	362	0	0				.011	0.11	
22	9:47	Rm 19	74	66.4	354	0					.017	0.5	
23	9:50	Rm 18	72	65.8	313	0					.012		
24	9:55	Rm 11	69.5	73.0	390	0					.012	0.55	
25	9:57	Rm 12	68.8	74.6	285	0					.010	0.24	
26	9:59	Rm 13	69	75	312	0					.020	0.18	
27	10:01	Rm 14	69.4	75.5	304	0					.054	0.25	
28	10:04	Rm 15	70.3	73.6	311	0					.015	0.08	
29	10:05	Rm 17	69.7	72.6	284	0					.018	0.4	
30	10:08	Rm 16	69.8	74.5	343	0					.011	0.26	
31	10:15	Outdoor	81.0	88.6	223	0					.010		
32	11:30	Privilege room	76.1	48.4	325		0				.015	0.23	

Name: *Gitmo*
 Project:
 Date: *9/27/15*

ELC Area -

Environmental Monitoring Datasheet

No.	Time	Location (Bldg., Rm., etc.)	Temp. F°	% Relative Humidity	CO ₂ (PPM)	CO (PPM)	P-Trak UFP (nm)	Particulate (mg/m ³)				Photo No.
								PM ₁	PM _{2.5}	Respirable	PM ₁₀	
1	2:40	Courthouse	66.6	45	245	0	0				.007	0.18
2	2:50	Judges Chamber	65.1	66.0	224	0	0				.039	0.10
3	2:55	Witness Staging	66.3	53.5	313	0	0				.051	
4	2:58	AU Room	66.7	56.7	417	0	0				.013	
5	3:03	ELC 12	79.5	49.1	323	0	0				.029	
6	3:12	ELC 107	77.1	42.8	274	0	0				.028	0.011
7	3:15	103	76.0	50.9	371	0	0				.015	.070
8	3:16	104	73.3	46.8	323	0	0				.017	0.23
9	3:17	102	70.9	56.5	447	0	0				.014	0.18
10	3:20	105	72.8	49.0	483	0	0				.026	0.16
11	3:22	101	73.7	45.8	340	0	0				.015	0.23
12	3:25	104 <i>corridor</i>	72.9	48.0	551	0	0				.048	0.12
13	3:27	100	71.9	47.3	358	0	0				.055	0.11
14	3:31	ELC-8 (6+occupants)	76.5	49.2	348	0	0				.019	0.13
15	3:35	Outdoor	91.3	62.0	203	0	0					
16	3:38	ELC 4 - large room (6)	89.7	38.4	299	0	0				.067	0.13
17	3:42	102	77.8	50.3	337	0	0				.012	
18	3:44	104A	75.2	45.6	369	0	0				.013	0.22
19	3:46	104B 1 person office	73.6	47.4	311	0	0				.012	
20	3:48	101 5 person 2 amb	70.9	50.2	412	0	0				.013	0.18
21	3:55	ELC 5 2-3 staff	79.1	37.1	390	0	0				.022	
22												
23	4:15	Media Center 7-8 Workshop	80	49	478	0	0				.039	0.11
24	4:18	Media Ops Rm 2	76.5	50	462	0	0				.015	0.11
25		Media multi purpose	74	48	1120	0	0				.028	0.11
26		Media Rm 5	75	63.2	346	0	0				.025	0.24
27		Media Rm 4 → joined	72.4	58.8	250	0	0				.033	0.15
28	4:30	Media Rm 3	71.5	57.8	290	0	0				.024	
29												
30												
31												
32												

fm

AU 32

Name: G. I. mo
Project:
Date: 9/27/15

B/AU-34

Environmental Monitoring Datasheet

No.	Time	Location (Bldg., Rm., etc.)	Temp. F°	% Relative Humidity	CO ₂ (PPM)	CO (PPM)	P-Trak UFP (nm)	Particulate (mg/m ³)				Photo No.
								PM ₁	PM _{2.5}	Respirable	PM ₁₀	
1	10:31	Courtroom AU-34	77.2	42.4	590	0	9				.009	
2	10:36		68.4	47.7	700	0						0.23
3	10:38	Media	68.5	51	630	0						0.33
4	11:03	Deliberations Rm	70.9	68.4	839	0					.011	0.34
5	11:10	AV Room	72.7	64.3	884	0	✓				.009	0.15
6	11:12	Military Judges office	72.5	48.7	675	0	0.1				.009	0.15
7	11:15	Court Recorder	70.5	41.1	823	0	0.2				.013	0.23
8	11:17	Data room 14	72.7	60.6	689	0	0				.012	0.44
9	11:20	IT Rm J-06	73.6	49.2	633	0	0.2				.012	0.15
10	11:25		73.6	48.6	641	0	0.3				.026	0.28
11	11:30		75.7	67.1	731	0	0				.011	0.1
12	11:33	Rm 205 Defense	74.1	47.6	674	0	0				.016	0.42
13	11:35	Rm 202	75.0	48.1	716	0	0.1				.016	0.22
14	11:40	Rm 203	75.6	55.8	691	0	0				.012	0.19
15	11:41	Rm 204	77.5	58.1	774	0	0				.014	0.09
16	11:48	Rm 201	75.9	62.7	711	0	0				.013	0.22
17	11:46	Rm 200	74.7	61.3	769	0	0				.014	0.15
18	11:50	Rm 208	72.6	60.0	585	0	0				.013	0.22
19	11:53	Rm 209	70.5	61.0	671	0	0				.013	0.20
20	12:00	Clo Dr	71.5	57.1	290	0	0				.025	0.08
21	12:01	Trans Room B	71.6	68.9	336	0	0				.012	0.29
22	12:02	Trans Room A	70.6	74.6	332	0	0				.013	0.13
23	12:03	Rm 214	71.3	69.5	349	0	0				.011	0.19
24	12:04	Rm 210	72.5	62.7	302	0	0				.015	0.18
25	12:06	Rm 210 B	73.4	54.6	477	0	0				.015	0.17
26	12:08	Rm 213 B	71.6	60.0	324	0	0				.014	0.16
27	12:10	Rm 213 A	74.1	63.1	285	0	0				.014	
28	12:15	Rm 211 A	73.3	63.6	380	0	0				.015	0.
29	12:17	Crows nest	77.0	56.1	456	0	0				.022	0.28
30	12:30	Outside	88.4	62.1	208	0	0				.004	
31	1:45	Rm 7	78.3	48.5	355	0					.004	0.15
32	1:55	Basement	-	-	-						.651	

Name: *Cuzco's / Fents*
 Project: *G. Jms*
 Date: *9/28/15*

10,000 BTU/hr
11 x 10 x 8 room size w/ AC unit

Environmental Monitoring Datasheet

2.5m

*Black A
Presents*

*Defence
Black B*

C-black

D-black

No.	Time	Location (Bldg., Rm., etc.)	Temp. F°	% Relative Humidity	CO ₂ (PPM)	CO (PPM)	P-Trak UFP (nm)	Particulate (mg/m ³)				Photo No.
								PM ₁	PM _{2.5}	Respirable	PM ₁₀	
1	7:55	Outside	82.2	81.2	290	0	0				.056	
2	8:01	13B	76.9	62	301	0	0				.024	10.0 2.5m
3	8:04	11A	74.3	74	490	0	0				.023	2.2
4	8:11	7A	72.5	67.4	389	0	0				.028	1.8
5	8:15	2A	76.8	79	355	0	0				.022	8.08
6	8:18	4B	77.6	68	370	0	0				.024	6.93
7	8:20	8B	76	68.5	353	0	0				.024	3.38
8	8:23	12B	75.3	69.5	305	0	0				.023	2.79
9	8:31	25B	78	63	359	0					.028	
10	8:40	24B	76.8	57.7	442	0	0.6				.031	3.63
11	8:43	19A	76	68.6	363	0	0.7				.025	2.59
12	8:45	15A	76	66.3	404	0	0.8				.031	0.76
13	8:50	14A	76	55	359	0	1.0				.026	2.70
14	8:53	10B	76	61.5	417	0	1.1				.033	1.89
15	8:56	20B	75	74	409	0	1.1				.029	5.1
16	8:58	24B	75.0	75.3	566	0	1.2				.033	6.17
17	9:18	28A	77.8	68.3	449	0	1.4				.025	0.71
18	9:20	30B	76.5	58.1	347	0	1.6				.027	1.6
19	9:23	34A	75.7	74	439	0	1.3				.025	3.6
20	9:25	38A	78	53	333	0	2.3 - near air return				.020	0.66
21	9:29	35B	78	48	389	0	2.0				.024	0.94
22	9:33	31B	79	55	323	0	1.7				.029	0.50
23	9:37	29A	77	64	380	0	1.5				.018	2.92
24	9:40	27A	76.4	61.2	337	0	1.7				.024	6.06
25	9:43	40A	78	55.2	378	0	1.5				.019	6.58
26	9:45	44A	78	68	297	0	1.5				.020	3.12
27	9:47	46A	77	64	319	0	1.6				.019	1.02
28	9:49	48A	75	71	298	0	1.5				.025	3.30
29	9:51	50B	77	67	365	0	1.6				.024	2.06
30	9:52	49B	77	67	328	0	1.6				.024	3.5
31	9:55	45B	76	66	362	0	1.5				.021	2.21
32	9:58	41B	74	66	345	0	1.7				.026	4.93

Name: *Tents*
 Project: *G. fmo*
 Date: *9/28/15*

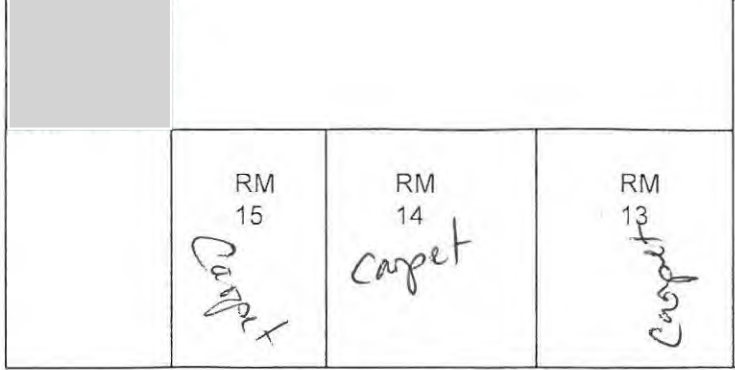
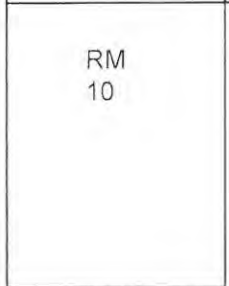
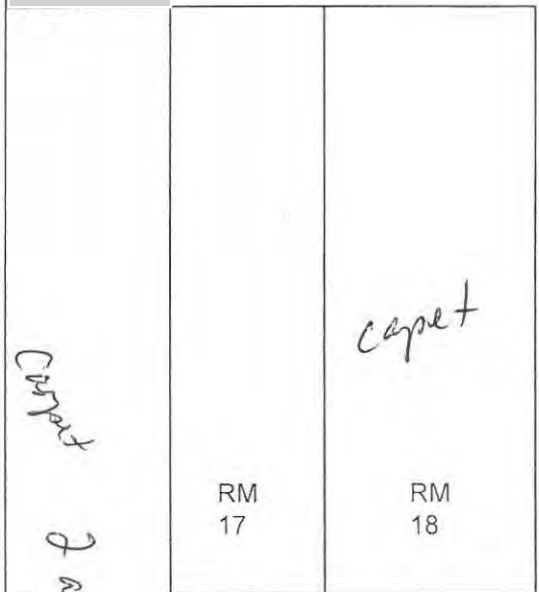
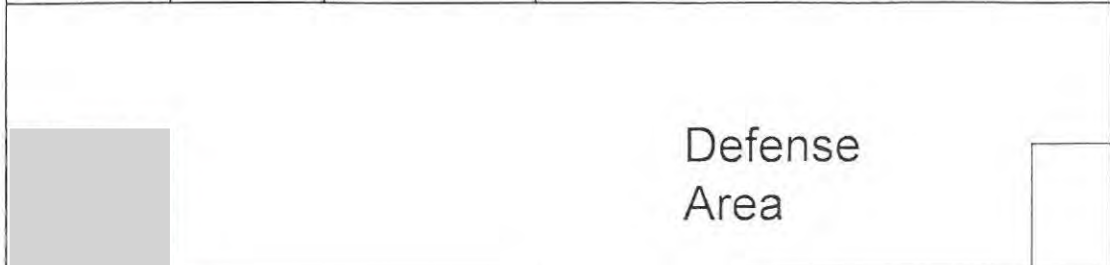
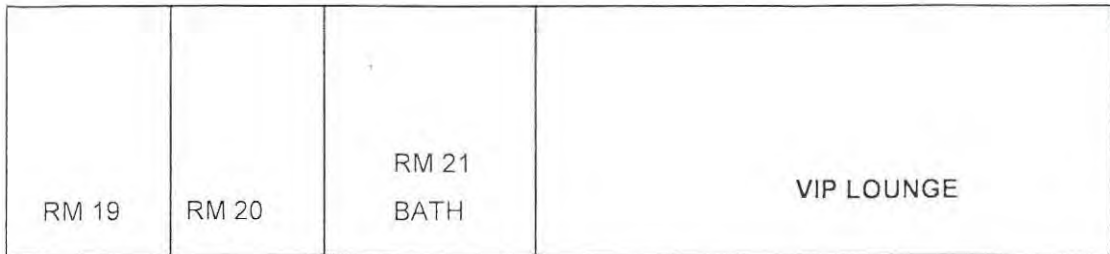
Environmental Monitoring Datasheet

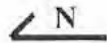
No.	Time	Location (Bldg., Rm., etc.)	Temp. F°	% Relative Humidity	CO ₂ (PPM)	CO (PPM)	P-Trak UFP (nm)	Particulate (mg/m ³)				Photo No.
								PM ₁	PM _{2.5}	Respirable	PM ₁₀	
1	10:10	Outside	87	70	270	0	PID				.024	
2	10:18	Female shower	77	30	414	0	0.1				.032	2.84
3	10:20	Male shower	76	41.5	329	0	0.1				.022	9.14
4	10:22	Laundry	78	66.5	406	0	0				.014	11.80
5	10:23	Male latrine	76	42.4	289	0	0				.038	8.13
6	10:35	A4- Engineering	80	35.3	473	0	0				.016	7.92
7	10:37	UGO- Male Steps 8	84	41.2	300	0	0				.011	9.4
8	10:41	B-9	84	37.2	362	0	0				.021	3.27
9	10:46	D-3	89	35	419	0	0.1				.014	6.8
10	11:15	C-7 - no AC	100	40	540	0	0.4				.029	4.69
11	11:20	A-10 no AC	103	53	492	0	0.0				.016	8.67
12	11:22	Media female A-12	87	38	294	0	0.0				.011	8.72
13	11:27	B-12	87	41	351	0	0				.012	6.91
14	11:28	C-13 Male Barracks	85	31.9	314	0	0				.012	8.53
15	11:30	D-13 " "	87	36	306	0	0				.012	3.64
16												
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32												

RM 32 Conference Room <i>2 air returns</i>		RM 33A	RM 33B	RM 34A Bathroom <i>Air supply w/ visible black dust</i>	RM 34B Air Handler
<div></div>					
1 RM 31	2 RM 30	★	3 RM 29 <i>partially blocked air supply</i>	<i>copier room</i> RM 28 <i>no air supply</i>	RM 27



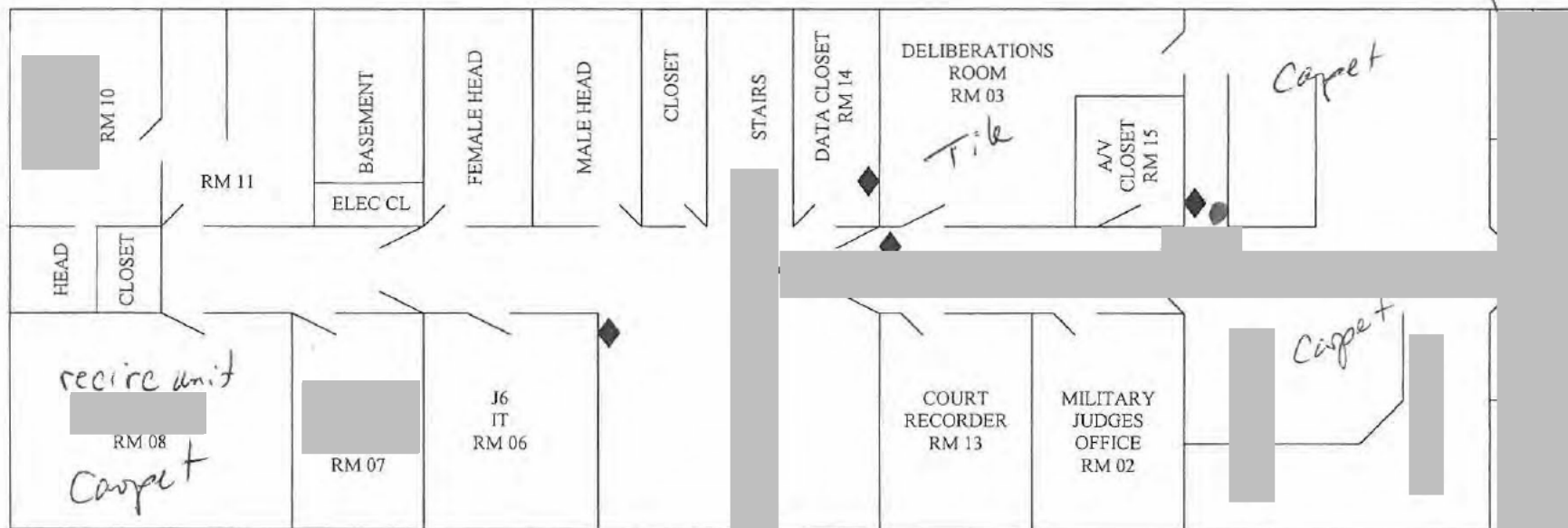
RM 1	RM 2	RM 3	RM 4	RM 5	RM 6	RM 7
IT Closet	drop ceiling	tile drop ceiling temp office	carpet drop ceiling doc storage	3 person office drop ceiling		
3 air returns RM 24/25/26			 RM 23 ceiling return	drop ceiling RM 22		





YOU ARE HERE: ●
FIRE EXTINGUISHERS: ◆

insulated drop ceiling with 3" of insulation on underneath



AV-34

		COURT REPORTER	PRESIDING OFFICER		ROOM 14		DEFENSE WITNESS ROOM 5
							CLOSET
		ROOM 15	DELIBERATION ROOM	J6 ROOM 14		CLOSET	HEAD
						HEAD	ELECTRICT CLOSET
							ROOM 11
							↓↓↓ EXIT

2 AC wall
drop ceiling units

ROOM 213A Drop ceiling 1 AC	ROOM 213B Drop ceil. wall AC	PAO 214 web skene	TRANSLATOR ROOM soundproofing A B wall AC	DV LOUNGE C/O Tir. Drop ceil carpet	ROOM 200	ROOM 201 1 AC drop ceiling	ROOM 202 Drop ceiling 2 AC wall units	ROOM 203 Asbestos tile ceiling 2 AC units		
ROOM 211B	ROOM 211A	ROOM 210B	ROOM 209	ROOM 208 Drop ceiling 2 AC	CLOSET		HEAD	HEAD	ROOM 205 2 wall AC	ROOM 204 1 wall AC