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DRAFT

AMBIENT AIR AND DUST SAMPLING PROTOCOL

FOR

P.S. / I.S. 89 MANHATTAN

The New York City Board of Education (BOE) in an effort to address concerns regarding Indoor Air Quality (IAQ) and potential asbestos contamination of the ambient air at Stuyvesant High School following the World Trade Center (WTC) tragedy and associated clean up work had established the following IAQ and ambient air monitoring/assessment protocol:

ASBESTOS

To address the concerns regarding the potential of asbestos contamination of the ambient air, daily air testing and analysis shall be performed, including Saturdays and Sundays, inside and outside the school building as follows:

Inside the school building

The total of 10 ambient air samples shall be collected from inside the school building each day as follows:

- First floor hallway outside cafeteria – 2 samples (one sample from 8am-12pm & one from 12pm-4pm)
- Cafeteria – one sample during the school day
- Gymnasium – one sample during the school day
- Auditorium – one sample during the school day
- Classroom with north side unit ventilators – one sample immediately after the last class
- Classroom with east side unit ventilators – one sample immediately after the last class
- Classroom with south side unit ventilators – one sample immediately after the last class
- Second floor Hallways south end – one samples immediately after the last class.
- Fourth floor Hallways south end – one samples immediately after the last class

Outside the school building

The total of 6 ambient air samples shall be collected from outside the school building each day as follows:

- Inside playground, north side – 2 samples (one sample from 8am-12pm & one from 12pm-4pm)

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- Inside Playground south side – 2 samples (one sample from 8am-12pm & one from 12pm-4pm)
- Fifth floor roof – 2 samples (one sample from 8am-12pm & one from 12pm-4pm)

The duration of all ambient air sample shall be approximately 4 hours. The total air volume sampled at each location shall be approximately 1800 liters.

All ambient air samples collected shall be analyzed via Transmission Electron Microscopy (TEM) in accordance with the methodology of the AHERA Final Rule.

Results from samples collected each day shall be reported verbally, no later than 8am the next day, to BOE, UFT, School Principal and the PA consultant. A written report shall be delivered or faxed by the end of the day. Unsatisfactory results (>70 s/mm^2) shall be reported immediately.

In the event that any one sample result exceed 70 s/mm^2 BOE will immediately notify the UFT, the school principal, the school custodian and the PA consultant. The said parties will assess the situation and implement the appropriate response action(s).

INDOOR AIR QUALITY

To address IAQ concerns, each day from Monday through Friday, the following shall be performed:

- A visual inspection to assess conditions present in the school at the time of the site visit.
- Collect approximately 80 real-time environmental measurements of temperature (T)
- Collect approximately 80 real-time environmental measurements of relative humidity (RH)
- Collect approximately 80 real-time environmental measurements of carbon dioxide (CO_2)
- Collect approximately 80 real-time environmental measurements of carbon monoxide (CO)
- Collect approximately 80 real-time environmental measurements of total volatile organic compounds (TVOCs)
- Collect approximately 80 real-time environmental measurements of respirable particulates (PM2.5).

Evaluation Criteria:

Since, there are no regulatory standards for indoor air quality in non-industrial buildings, such as offices and schools at this time, for the real-time data collected, the commonly accepted guidelines cited in the following publications and table below shall be utilized:

- *Ventilation for Acceptable Indoor Air Quality (ASHRAE 62-1999)*, American Society of

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Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE);

- *Thermal Environmental Conditions for Human Occupancy (ASHRAE 55-1992);*
- *Industrial Hygienists Guide to Indoor Air Quality Investigations* (1993), American Industrial Hygiene Association (AIHA).

TARGET GUIDELINES FOR INDOOR AIR QUALITY PARAMETERS EVALUATED

PARAMETER	TARGET LEVEL	AGENCY OR ORGANIZATION
Temperature (T)	Summer: 73-79°F at 50% RH Winter: 68-75°F at 50% RH	ASHRAE 55
Relative Humidity (RH)	30 – 60 %	ASHRAE 55
Carbon Dioxide (CO_2)	<700 parts per million (ppm) above background level	ASHRAE 62
Carbon Monoxide (CO)	9 ppm	USEPA NPAAQS (as cited in ASHRAE 62)
Total Volatile Organic Compounds (TVOC)	1 ppm	AIHA
Respirable Particulates ($PM_{2.5}$)	65 micrograms per cubic meter of air ($\mu g/m^3$)	USEPA NPAAQS

USEPA = United States Environmental Protection Agency
NPAAQS = National Primary Ambient-Air Quality Standard
AIHA = American Industrial Hygiene Association
ASHRAE = American Society of Heating, Refrigerating, and Air-Conditioning Engineers

Results from samples collected each day shall be reported verbally, no later than 8am the next day, to BOE, UFT, School Principal and the PA consultant. A written report shall be delivered or faxed by the end of the day.

In the event that real-time measurements of Temperature, Relative Humidity, and/or CO_2 exceed the cited Target Guidelines, the following actions are to be taken:

1. Building engineering controls shall be adjusted and/or implemented to improve conditions.

In the event, that real-time measurements of respirable particulates exceed the cited Target Guidelines, BOE will immediately notify the UFT, the school principal, the school custodian and the PA consultant. The said parties will assess the situation and implement the appropriate response action(s).

In the event, that CO inside the school measured above the cited Target Guidelines (9ppm), BOE will immediately notify the UFT, the school principal, the school custodian and the PA consultant. The said parties will assess the situation and implement the appropriate response action(s).

In the event that real-time measurement(s) of CO inside the school is/are greater than 5ppm and less than 9ppm, BOE will identify the source and assess the situation.

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In the event that real-time measurement(s) of TVOC inside the school is/are above the cited Target Guidelines (1ppm), BOE will immediately notify the UFT, the school principal, the school custodian and the PA consultant. The said parties will assess the situation and implement the appropriate response action(s).

In the event that real-time measurement(s) of 0.5 ppm of TVOC are obtained inside the school BOE will notify the UFT, the school principal, the school custodian and the PA consultant. The said parties will assess the situation and implement the appropriate response action(s)

ADDITIONAL TESTING

In addition to the above, once per week, preferably on Thursday, sampling settled dust for fiberglass, lead, and silica; wipe sampling for dioxin and PCB and air sampling, for heavy metals, and TVOCs shall be performed as follows:

SETTLED FIBERGLASS

- First floor hallway outside cafeteria – 2 samples.
- Cafeteria – one sample.
- Gymnasium – one sample.
- Auditorium – one sample.
- Classroom with north side unit ventilators – one sample immediately after the last class.
- Classroom with east side unit ventilators – one sample immediately after the last class.
- Classroom with south side unit ventilators – one sample immediately after the last class.
- Second floor Hallways south end – one samples immediately after the last class.
- Fourth floor Hallways south end – one samples immediately after the last class.

Dust bulk samples will be collected at the aforementioned locations and analyzed via Polarized Light Microscopy (PLM). In the event that in any of the above locations there is not sufficient amount of dust for bulk sampling and/or analysis will be noted as Not Sufficient Amount of Material for Testing (NSAMT)

In the event that any of PLM analysis detect more than 1% by weight of fiberglass, BOE will immediately notify the UFT, the school principal, the school custodian and the PA consultant. The said parties will assess the situation and implement the appropriate response action(s).

LEAD SURFACE DUST

- First floor hallway outside cafeteria – 2 samples.

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- Cafeteria – one sample.
- Gymnasium – one sample.
- Auditorium – one sample.
- Classroom with north side unit ventilators – one sample immediately after the last class.
- Classroom with east side unit ventilators – one sample immediately after the last class.
- Classroom with south side unit ventilators – one sample immediately after the last class.
- Second floor Hallways south end – one samples immediately after the last class.
- Fourth floor Hallways south end – one samples immediately after the last class.

All dust wipe samples taken shall be analyzed in accordance with EPA7082 method via Flame Atomic Absorption (FAA).

Dust wipe results shall be considered satisfactory when the levels obtained are below the EPA new levels for clearing a work area for re-occupancy after an EPA defined lead abatement is performed, as specified in 40 CFR §745.227(e)(8)(viii).

Floors:	40 micrograms of lead per square foot
Window Sills:	250 micrograms of lead per square foot

Dust wipe results shall be considered unsatisfactory when the levels obtained are greater than the EPA new levels for clearing a work area for re-occupancy after an EPA defined lead abatement is performed, as specified in 40 CFR §745.227(e)(8)(viii).

Floors:	40 micrograms of lead per square foot
Window Sills:	250 micrograms of lead per square foot

Results from samples collected shall be reported to BOE, UFT, School Principal and the PA consultant within 24 hours.

In the event that unsatisfactory results are obtained, the following actions are to be implemented:

1. Perform general dust clean up of all areas/classrooms with unsatisfactory results.
2. Lead specific cleaner shall be utilized.
3. Re-test said areas following clean up.
4. Floor mats and/or other dust control devises shall be placed at points of entry.

Actions 1,2 and 3 shall be repeated until satisfactory results are obtained.

SILICA

- First floor hallway outside cafeteria – 2 samples.

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- Cafeteria – one sample.
- Gymnasium – one sample.
- Auditorium – one sample.
- Classroom with north side unit ventilators – one sample immediately after the last class.
- Classroom with east side unit ventilators – one sample immediately after the last class.
- Classroom with south side unit ventilators – one sample immediately after the last class.
- Second floor Hallways south end – one samples immediately after the last class.

Fourth floor Hallways south end – one samples immediately after the last class.
All sample collected shall be analyzed utilizing the NIOSH 7500 method for respirable silica.

Since, there are no regulatory standards for Mineral Dust in non-industrial buildings, such as offices and schools at this time, the OSHA standard 1910.1000 TABLE Z-3 shall be utilized (per the request of PA consultant).

Results from samples collected shall be reported to BOE, UFT, School Principal and the PA consultant within 72 hours from the collection day.

In the event that unsatisfactory results are obtained, the following actions are to be implemented:

1. Perform general dust clean up of all areas/classrooms with unsatisfactory results.
2. Re-test said areas following clean up.
3. Floor mats and/or other dust control devises shall be placed at points of entry.

Actions 1,2 shall be repeated until satisfactory results are obtained.

DIOXIN WIPE SAMPLES

- First floor hallway, near north entrance – one sample.
- First floor hallway, near south entrance – one sample.
- Second floor hallway, near staircase – one sample.

All sample collected shall be analyzed utilizing the EPA 8290 PCDD/DF Dioxin Furan method.

Results from samples collected shall be reported to BOE, UFT, School Principal and the PA consultant in 15 business days from the day of sampling.

In the event that any one sample result is unsatisfactory BOE will immediately notify the UFT, the school principal, the school custodian and the PA consultant. The said parties will assess the situation and implement the appropriate response action(s).

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PCB WIPE SAMPLES

- First floor hallway, near north entrance – one sample.
- First floor hallway, near south entrance – one sample.
- Second floor hallway, near staircase – one sample.

All sample collected shall be analyzed utilizing the EPA 8081 method.

Results from samples collected shall be reported to BOE, UFT, School Principal and the PA consultant in 4 days from the day of sampling.

In the event that any one sample result is unsatisfactory BOE will immediately notify the UFT, the school principal, the school custodian and the PA consultant. The said parties will assess the situation and implement the appropriate response action(s).

HEAVY METAL AIR SAMPLES

- First floor hallway, outside cafeteria – one sample.
- Inside playground, north side – one sample.
- Inside playground south side – one sample.
- Fifth floor roof – one sample.

All sample collected shall be analyzed utilizing NIOSH 7300 method for Al, Cd, Cr, Co, Cu, Fe, Mg, Mn, Mo, Ni, Zn and NIOSH 6009 method for Hg.

Results from samples collected shall be reported to BOE, UFT, School Principal and the PA consultant in 4 days from the day of sampling.

In the event that any one sample result is unsatisfactory BOE will immediately notify the UFT, the school principal, the school custodian and the PA consultant. The said parties will assess the situation and implement the appropriate response action(s).

TVOCs AIR SAMPLES

- First floor hallway, outside cafeteria – one sample.
- Inside playground, north side – one sample.
- Inside playground south side – one sample.
- Fifth floor roof – one sample.

All sample collected shall be analyzed utilizing Hydrocarbon Scan (16+A&B) OSHA 7 method.

Results from samples collected shall be reported to BOE, UFT, School Principal and the PA consultant in 4 days from the day of sampling.

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In the event that any one sample result is unsatisfactory BOE will immediately notify the UFT, the school principal, the school custodian and the PA consultant. The said parties will assess the situation and implement the appropriate response action(s).

NOTE: Please note that this protocol established to address the environmental concerns due to the WTC tragedy. Therefore, this document will be constantly reviewed and modified as the environmental conditions in Lower Manhattan are changing.

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