

## ATTACHMENT 7

Crandlemere and Associates Asbestos-Containing Materials  
Document Review & Evaluation

R. W. CRANDLEMERE & ASSOCIATES, INC.  
PROTECTING BUSINESS AND THE ENVIRONMENT

ASBESTOS-CONTAINING MATERIALS  
DOCUMENT REVIEW AND EVALUATION  
TWO WORLD TRADE CENTER, SOUTH TOWER  
NEW YORK CITY, NY 10081

Project #000095

Merritt & Harris, Inc. #20-251E

User:

Merritt & Harris, Inc.  
Attn: Mr. Robert G. Weiland, V. P.  
110 East 42<sup>nd</sup> Street, 12<sup>th</sup> Floor  
New York City, NY 10017-5685

Date Issued: November 7, 2000

The Asbestos-Containing Materials Document Review and Evaluation described herein was conducted by the undersigned, of R. W. Crandlemere & Associates, Inc. (CRANDLEMERE & ASSOCIATES). CRANDLEMERE & ASSOCIATES assessment consisted solely of the activities described in the Introduction of this report. The assessment was conducted in accordance with the Scope of Work in our Proposal No. 00-090. It is subject to the Limitations and Service Constraints as provided in Appendix A of our ASTM Phase I Environmental Site Assessment report prepared as part of this Project. See Appendix F of that report for ASTM definitions of terms in italics in this report.

Report Prepared by:



R. Wayne Crandlemere  
President

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## 1.0 INTRODUCTION

R. W. Crandlemere & Associates, Inc. (CRANDLEMERE & ASSOCIATES) was retained by Merritt & Harris, Inc. (the *user*) to conduct an ASTM E1527-97 Phase I *Environmental Site Assessment* (ESA) of One, Two, Four and Five World Trade Center, located in the Borough of Manhattan, New York City, New York, 10081.

It is our understanding that Merritt & Harris, Inc. is providing this information in conjunction with, and as part of, a larger assessment of the *property* and has named The Port Authority of New York and New Jersey as an *additional user* as defined by the ASTM Standard E1527-97 Section 3.3.39. As an *additional user*, The Port Authority of New York and New Jersey may rely on the information presented in this report.

This report presents CRANDLEMERE & ASSOCIATES' professional opinion, and no warranty, expressed or implied, is made. The Port Authority of New York and New Jersey has the right to reproduce in full and provide copies of this report to interested parties. All reports, both verbal and written, are for the benefit of The Port Authority of New York and New Jersey and its' agents, employees, participates, and assigns.

On September 26, 27, 28 and 29 and October 10 and 11, 2000 Mr. R. Wayne Crandlemere of CRANDLEMERE & ASSOCIATES conducted a *Site visit* to identify *recognized environmental conditions* at the Site. In addition, CRANDLEMERE & ASSOCIATES' assessment included reconnaissance of adjacent properties, background research, and review of available local, state and federal regulatory records regarding the presence of petroleum products or hazardous materials at or in the vicinity of the Site.

The results of our work regarding the ASTM Standard for a Phase I Environmental Site Assessment of the Site is provided in a separate Phase I ESA report.

This report addresses the asbestos-containing materials (ACM) related to the Two World Trade Center, South Tower (including elevator, façade, and asbestos issues for this building). See the separate reports specifically related to the One World Trade Center, Four World Trade Center, Five World Trade Center, Retail Mall and Plaza, Central Services and Subgrade for ACM information specific to those buildings and facility areas.

### 1.1 Background

The World Trade Center was constructed between 1966 and 1970 when asbestos was used in buildings as a fire retardant. According to the World Trade Center Property Book (see Section 3.4), "sprayed on asbestos is present within the 6<sup>th</sup> floor catwalks, mezzanine substructure, elevator shafts and machine rooms, interior core pipe chases, and electric and phone closets of the Twin Tower buildings. Additionally, asbestos-containing thermal system pipe insulation is present in pipe chases, the Concourse ceiling plenum and in MERs [mechanical equipment rooms], while vinyl asbestos floor tiles are present throughout the complex. The Port Authority has removed a large portion of the asbestos material typically located on the structural columns and on pipe insulation from tenant

floors in One World Trade Center, and has removed much of the pipe wrap insulation found in the Subgrade. The practice of containment has not been implemented at the World Trade Center."

"In addition to full-scale abatement projects, the World Trade Center has instituted an ongoing operations and maintenance program whereby specific individuals on the staff are trained as certified ACM handlers and can respond with appropriate equipment and procedures to manage incidental ACM incidents. Tenants whose space may contain ACM have been formally notified."

## 1.2 Scope of Work

Beyond the Scope of Work for the ASTM Standard for a Phase I Environmental Site Assessment, but as required by the *user*, summaries of readily available information (provided by and apparently prepared by the Port Authority of New York and New Jersey) pertaining to the presence of asbestos-containing building materials (ACBM) and documentation of the work done to abate ACBM was evaluated. No sampling or analysis was included and this is not to be interpreted as a complete asbestos survey.

Please note: There is reported litigation in progress for cost-recovery of money related to ACM abatement and/or management. This litigation was not evaluated as part of this assessment and the *user* should consider a detailed review of the on-going litigation and make their own determination as to the impact, if any, on their use of this report and/or future impact of the litigation on their decision making process related to the World Trade Center. Further, the information presented in this report is based at least in part on a somewhat arbitrary separation of areas of the complex that may or may not have any basis in the current operation of the Complex as it is currently managed as one facility. The *user* should consider this report as a good faith effort to present ACM related information to the subject area, however, the *user* is encouraged to review the ACM related Section of the Phase I Environmental Site Assessment (ESA) report which provides a summary of all ACM related information provided by the *owner*. Included in Appendix H-7 of the ESA report are copies of the asbestos program highlights as presented in the World Trade Center Environmental Programs 1999 Year End report. This includes a summary of 1999 Asbestos Projects, World Trade Center Asbestos Disclosure, World Trade Center Elevator Shaft Asbestos Assessment, and World Trade Center Asbestos Contract Administration procedures. Portions of those documents are included in this report. Additionally, the *user* should consider an independent review of the information provided.

It should also be noted that certain materials such as fire doors were not included in the materials suspected to be asbestos-containing and have not been tested or otherwise investigated. It was reported that testing of spline ceilings, hung ceilings, wallboard and wallboard joint compound determined that they were not ACM throughout the facility. A review of test results was not performed and we cannot verify the adequacy of such testing. The *user* may wish to further investigate such materials.

There have been significant on-going asbestos abatement projects and cost estimates provided by the *owner* indicate the following estimated removal costs:

<u>Material</u>	<u>Removal Cost</u>
Vinyl asbestos Tile (VAT)	\$ 5-6/square foot
Sprayed-on Fireproofing	\$20-25/square foot
Thermal System Insulation (TSI)	\$15/linear foot

The actual costs for VAT removal for 1999 projects are provided in Appendix H-7 of the Phase I ESA report.

Documentation regarding the presence of ACM in elevator shafts is presented by shaft designation. It is unclear where the shafts are located within the facility and the *user* should consider cross-referencing the shaft locations to the area under consideration. Mr. Taylor reported that there are forty (40) shafts that contain ACM within the Center.

### 3.0 SUMMARY OF REVIEW OF DOCUMENTS

Materials known to be present in Two World Trade Center (excluding mechanical equipment rooms, truck dock and subgrade locations) appear to include:

Material	Amount
Spray-on fireproofing	64,440 square feet
Cementitious insulation behind convector units	90 square feet
Thermal system insulation (TSI)	1,430 linear feet
Exhaust duct insulation	1,000 linear feet
Elevator pits and shafts	As noted in documents
Vinyl asbestos tile (VAT)	1,734,032 square feet

Additionally, the following ACM was reported:

Mechanical equipment rooms	25,000 square feet spray-on fireproofing and unknown quantities of TSI
Roof	Could contain asbestos



## APPENDIX A

## 2 WTC

## Excluding MERs, Truckdock, Subgrades, and Elevator Shafts

<u>Location</u>	<u>Floors</u>	<u>Amount</u>
Floors with less than 160 sqft* of sprayed-on fireproofing:	9 Floors	1,440 sqft
<u>TOTAL:</u>		<u>1,440 sqft</u>

\* Classified as "Random Locations On Floor" in WTC Disclosure Memorandum

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Floors with less than 10 sqft of cementitious insulation behind convector units*:	9 Floors	90 sqft
<u>TOTAL:</u>		<u>90 sqft</u>

\* Classified as "Convector Units" in the WTC Disclosure Memorandum

## Full Floor Locations:

Floor locations with sprayed-on fireproofing:	4 Floors	20,000 sqft
6 <sup>th</sup> Floor Plus Catwalk	1 Floor	35,000 sqft
<u>TOTAL:</u>		<u>56,530 sqft</u>

\* Classified as "Full Floor Locations" in the WTC Disclosure Memorandum

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Tenant Kitchen Exhaust Duct	2 Floors	1,000 lnft
Suspect Thermal System Insulation On Vertical Steam Line:	B6 - 108 <sup>th</sup> Floor	1,430 lnft
<u>TOTAL:</u>		<u>2,430 lnft</u>

WILL INCLUDE VAT FIGURES

THE PORT AUTHORITY OF NY & NJ

Memorandum

TO: Abraham Friedman  
FROM: Joe Amatuuccio  
DATE: September 27, 2000

SUBJECT: ASBESTOS DISCLOSURE:  
Two World Trade Center: 27<sup>th</sup> Floor.

COPY: A. Burton, J. Ciccolello, T. Lynch, E. Monteverde, P. Taylor,  
F. Varriano, L. Zucchi

Regarding your inquiry as to the presence of asbestos-containing building materials present on the 27<sup>th</sup> floor in Two World Trade Center, our site survey and bulk sampling data base indicates the following:

On the 27<sup>th</sup> floor, there is no asbestos-containing sprayed-on fireproofing or thermal system insulation material present, as defined by the U.S. Environmental Protection Agency standard 40 CFR Part 61: National Emissions Standard For Hazardous Air Pollutants; Asbestos – Final Rule and the U.S. Occupational Safety and Health Administration standard 29 CFR 1910.1001: Asbestos, within the leasehold area. Asbestos-containing sprayed-on fireproofing is however present behind the core walls, but not the within the core's plenum. Vinyl asbestos floor tiles have been identified on the west, east, and south quadrants of the floor.

Should you have any questions, please contact me at x 2704.

Joe Amatuuccio  
Manager,  
Operations & Maintenance Management

THE PORT AUTHORITY OF NY & NJ

MEMORANDUM

TO: Joseph Amatuccio, Carla Bonacci, Jerrold Dinkels,  
Frank DiMartini, Eric Hauser, Louis Menno,  
Edwin Monteverde, Francis Riccardelli, Nancy Seliga

FROM: John Castaldo

DATE: September 19, 2000

SUBJECT: ASBESTOS POSITIVE LOCATIONS AT THE  
WORLD TRADE CENTER: UPDATE.

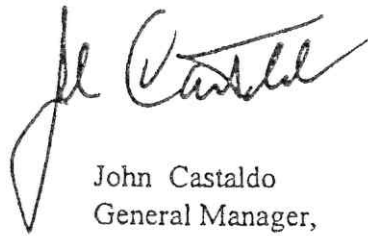
REFERENCE: J. Castaldo to Addressees; Memorandums Dated 5/4/98  
and 12/21/99; Same Subject.

COPY: L. Ardizzone, S. Benjamin, I. Chachkes, J. Connors,  
W. Devlin, M. Finegold, M. Hurley, M. Jakubek,  
M. Kirshner, T. Lynch, U. Mehta, G. Meyer, R. Muessig,  
C. Nanninga, A. Reiss, E. Strauss, G. Tabek, P. Taylor,  
F. Varriano, L. Zucchi, Operations Control Desk, S-4's

Attached please find an update to my initial May, 1998 memorandum wherein the known asbestos locations at the World Trade Center were disclosed. The information provided in this disclosure is a compilation of available bulk sampling and analytical results from both the World Trade and Engineering Departments' data bases.

In compliance with the disclosure requirements of the U.S. Occupational Safety and Health Administration's asbestos standard, I am requesting that this information be distributed to all World Trade Department, Engineering Department, PA Office Space, and Leasing Division property managers, project managers, construction managers, construction inspectors, operations supervisors, security supervisors, facility maintenance supervisors, and leasing agents associated with the allocation of space, and the design and implementation of World Trade Center projects. Additionally, please forward this information to those contractors under your administration. If there are questions as to the presence of asbestos-containing materials at a particular location, or if the scope of demolition and/or renovation work may impact asbestos-containing materials, please contact Art Burton, Assistant Environmental Coordinator, at 435-8364.

Those on the copyline are requested to contact this office for the appropriate response action if asbestos-containing materials may be impacted by work under your jurisdiction. The Port Authority complies with Industrial Code Rule #56 relative to worker certifications, contractor licensing, and work procedures if asbestos is going to be disturbed or impacted. Please contact me at 435-8518 should you have any questions.

A handwritten signature in black ink, appearing to read "John Castaldo". The signature is stylized with a large, looped initial "J" and a cursive "Castaldo".

John Castaldo  
General Manager,  
Base Building Services

# World Trade Center Elevator Shafts With Asbestos-Containing Surfacing Insulation Material

## One World Trade Center

### Pits and Shafts

1 / 2	39 / 40 / 41
3 / 4	42 / 43 / 44
5 / 48	45 / 46 / 47
8 / 9	51 / 52 / 53
16 / 17	54 / 55 / 56
49	57 / 58 / 59
18 / 19	60 / 61 / 62
20 / 21	63 / 64 / 65
22 / 23	66 / 67 / 68
50	69 / 70 / 71
24 / 25 / 26	72 / 73 / 74
27 / 28 / 29	
30 / 31 / 32	
33 / 34 / 35	
36 / 37 / 38	

## Two World Trade Center

### Pits and Shafts

5 / 48	36 / 37 / 38
10 / 11	39 / 40 / 41
14 / 15	42 / 43 / 44
24 / 25 / 26	45 / 46 / 47
27 / 28 / 29	54 / 55 / 56
30 / 31 / 32	57 / 58 / 59
33 / 34 / 35	63 / 64 / 65

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There is no asbestos-containing surfacing insulation material in the J and K elevator cars in 1 and 2 WTC.

There is no asbestos-containing surfacing insulation material with the elevator shafts in 4 and 5 WTC.

**Asbestos-Containing Surfacing And/Or Thermal System Insulation Materials Located In  
One World Trade Center - Exclusive Of Elevator Shafts**

<u>Full Floor Locations</u>	<u>Random Locations On Floor</u>	<u>Subgrades</u>	<u>Convactor Units</u>
- Lobby Mezzanine	- 43 <sup>rd</sup> / 44 <sup>th</sup> Floor PA	- B1 Level:	- 77 <sup>th</sup> Floor
- 1 <sup>st</sup> - 6 <sup>th</sup> Floors: Core	Exhaust Duct	- Core, N/E Quadrant	- 79 <sup>th</sup> Floor
- 6 <sup>th</sup> Floor Catwalk	- 82 <sup>nd</sup> Floor	- B6 Level	- 88 <sup>th</sup> Floor
- 7 <sup>th</sup> / 8 <sup>th</sup> Floor MER	- 104 <sup>th</sup> Floor		- 101 <sup>st</sup> Floor
- 41 <sup>st</sup> / 42 <sup>nd</sup> Floor MER	- Core Electric Closets		- 103 <sup>rd</sup> Floor
- 75 <sup>th</sup> / 76 <sup>th</sup> Floor MER	On The 1 <sup>st</sup> - 40 <sup>th</sup> floors		- 105 <sup>th</sup> floor
- 108 <sup>th</sup> / 109 <sup>th</sup> Floor MER	- Perimeter Electric Closets On The		-
	30 <sup>th</sup> Floor		

**Asbestos-Containing Surfacing And/Or Thermal System Insulation Materials Located In  
Two World Trade Center - Exclusive Of Elevator Shafts**

<u>Full Floor Locations</u>	<u>Random Locations On Floor</u>	<u>Quadrant Location</u>	<u>Convactor Units</u>
- 6 <sup>th</sup> Floor Catwalk	- Lobby Mezzanine	- S/W, 43rd Floor	- 22 <sup>nd</sup> Floor
- 10 <sup>th</sup> - 13 <sup>th</sup> Floors	- 7 <sup>th</sup> / 8 <sup>th</sup> Floor MER	Kitchen Exhaust Duct	- 24 <sup>th</sup> Floor
(Bell Atlantic)	- 9 <sup>th</sup> Floor		- 59 <sup>th</sup> Floor
- 41 <sup>st</sup> / 42 <sup>nd</sup> Floor MER	- 19 <sup>th</sup> Floor		- 72 <sup>nd</sup> Floor
	- 20 <sup>th</sup> Floor		- 79 <sup>th</sup> Floor
	- 26 <sup>th</sup> Floor		- 81 <sup>st</sup> Floor
	- 33 <sup>rd</sup> Floor		- 84 <sup>th</sup> Floor
	- 71 <sup>st</sup> Floor		- 86 <sup>th</sup> Floor
	- 75 <sup>th</sup> / 76 <sup>th</sup> Floor MER		- 87 <sup>th</sup> Floor

Asbestos-Containing Surfacing And/Or Thermal System Insulation Materials Located In  
Four And Five World Trade Center

There is no asbestos-containing sprayed-on fireproofing in Four and Five World Trade Center.  
A cementitious patch has been identified on a beam in the south wing of the southwest portion on the 5<sup>th</sup> floor in 5 WTC.  
Thermal system insulation is present in the form of pipe saddles.

Asbestos-Containing Surfacing And/Or Thermal System Insulation Materials Located On  
The Concourse

There is no asbestos-containing sprayed-on fireproofing in the plenum of the Concourse.  
Thermal system insulation material is present.

ACM

Asbestos-Containing Surfacing And/Or Thermal System Insulation Materials Located On  
The B1 Level And The Truckdock

Asbestos-containing sprayed-on fireproofing and thermal system insulation material is present.

Miscellaneous Asbestos-Containing Materials At The World Trade Center

Base building flooring throughout the facility is vinyl asbestos floor tile (VAT).



Asbestos-Containing Surfacing And Thermal System Insulation Materials Located In  
One World Trade Center - Exclusive Of Elevator Shafts

<u>Full Floor Locations</u>	<u>Quadrant Location</u>	<u>Random Locations On Floor</u>	<u>Subgrades</u>
Lobby Mezzanine 1st, 6th Floors: Core 6th Floor Catwalk		43 / 44 Floor Exhaust Duct 72nd Floor 82nd Floor	B1 Level: Core, North/ West/East Quadrant,
7 / 8 Floor MER 41 / 42 Floor MER 75 / 76 Floor MER 108 / 109 Floor MER		Core Electric Closets On The 1st - 40th Floors Perimeter Electric Closet On The 30th Floors	B2 Level: Old Locksmith And B6 Level

Asbestos-Containing Surfacing And Thermal System Insulation Materials Located In  
Two World Trade Center - Exclusive Of Elevator Shafts

<u>Full Floor Locations</u>	<u>Random Locations On Floor</u>	<u>Quadrant Location</u>
6th Floor Catwalk 10th - 13th Floors 41 / 42 Floor MER	Lobby Mezzanine 7 / 8 Floor MER 9th Floor 19th Floor 20th Floor 26th Floor 33rd Floor 71st Floor 75 / 76 Floor MER	S/W, 43rd Floor

Asbestos-Containing Surfacing And Thermal System Insulation Materials Located In  
Four And Five World Trade Center

There is no asbestos-containing sprayed-on fireproofing in Four and Five World Trade Center.  
Thermal system insulation is present in the form of pipe saddles.

Asbestos-Containing Surfacing And Thermal System Insulation Materials Located On  
The Concourse

There is no asbestos-containing sprayed-on fireproofing in the plenum of the Concourse.  
There is thermal system insulation material present.

ACM

Asbestos-Containing Surfacing And Thermal System Insulation Materials Located On  
The B1 Level And The Truckdock

Asbestos-containing sprayed-on fireproofing and thermal system insulation material is present.

Miscellaneous Asbestos-Containing Materials At The World Trade Center

Base building flooring throughout the facility is vinyl asbestos floor tile (VAT).

ACBM is located behind the convector units at the following locations:

1 WTC; 77, 79, 88, 101, 103 and 105.

2 WTC; 22, 24, 59, 72, 79, 81, 84, 86 and 87.

## World Trade Center Elevator Shafts With Asbestos-Containing Insulation Material

### One World Trade Center

Shafts 1 - 5:	Elevator Pit to EMR
8 - 9:	Elevator Pit to EMR
16 - 21:	Elevator Pit to 32nd Floor
22 - 23:	Elevator Pit to EMR
48:	Elevator Pit to EMR
49:	Elevator Pit to 32nd Floor
50:	Elevator Pit to 31st Floor
24 - 29:	Elevator Pit to EMR
30 - 35:	Elevator Pit to EMR
36 - 41:	Elevator Pit to EMR
42 - 47:	Elevator Pit to EMR
51 - 56:	Elevator Pit to EMR
57 - 62:	Elevator Pit to EMR
63 - 68:	Elevator Pit to EMR
69 - 74:	Elevator Pit to EMR

### Two World Trade Center

Shafts 5 & 48:	Elevator Pit to EMR
10 & 11:	Elevator Pit to EMR
14 & 15:	Elevator Pit to EMR
24 - 29:	Elevator Pit to EMR
30 - 35:	Elevator Pit to EMR
36 - 41:	Elevator Pit to EMR
42 - 47:	Elevator Pit to EMR
51 - 56:	Elevator Pit to EMR
57 - 62:	Elevator Pit to EMR
63 - 68:	Elevator Pit to EMR
69 - 74:	Elevator Pit to EMR

There is no asbestos-containing insulation material in the J and K elevator cars in 1 and 2 WTC.

There is no asbestos-containing insulation material with the elevator shafts in 4 and 5 WTC.