#### MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION

#### **ENGINEERING DIVISION**

#### **MEMORANDUM**

DATE: August 22, 2016 *Updated 07/10/2017-Updated June 19, 2018* 

TO: Ben Markert- Transportation Systems Management Division

Randy Dunsey - Transportation Systems Management Division Alfred Erives - Permitting, Construction, and Inspection Division

Steve Wilcox - Engineering Division

FROM: Joe Pinto - Environmental Program Branch Managero

**Engineering Division** 

SUBJECT: MC85: 95th Avenue to 75th Avenue; MC85 at 79th Avenue Traffic Signal

W.O. Number: TT0345 & TT0553

**Environmental Clearance – Re-Evaluation** 

The Environmental Program Branch has *re-evaluated* this project for environmental impacts and has determined that this project will not adversely affect the surrounding environment. No further environmental evaluation is required.

If there is a change in project termini or work is to be added outside of the original project scope or limits, MCDOT's Environmental Program Branch must be contacted to evaluate potential impacts.

The following mitigation measures will need to be followed and included in the Project Final Plans and Specifications:

#### Maricopa County Department of Transportation Responsibilities

- 1. The Maricopa County Department of Transportation Project Manager will contact the Maricopa County Department of Transportation Environmental Program Branch between sixty (60) and ninety (90) calendar days prior to Construction Notice to Proceed to ensure the Environmental Clearance is still valid.
- 2. All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction will be stabilized by an approved method.

- 3. The Engineer will ensure a Stormwater Pollution Prevention Plan is prepared to meet the requirements of the Arizona Pollutant Discharge Elimination System Construction General Permit.
- 4. The Engineer will prepare and submit a Notice of Intent for the project to the Arizona Department of Environmental Quality.
- 5. The Engineer will prepare and submit a Notice of Termination upon achieving final stabilization for the project to the Arizona Department of Environmental Quality.
- 6. The Maricopa County Department of Transportation Environmental Program Branch Hazardous Materials Specialist will review the National Emission Standard for Hazardous Air Pollutants documentation, completed by the contractor, five (5) working days prior to being submitted to the regulatory agency [-ies].
- 7. Asphalt Rubber Concrete pavement will be used to provide noise abatement for the area residents.
- 8. The Engineer will notify the Maricopa County Department of Transportation Environmental Program Branch Manager (602.506.8068) at least sixty (60) days prior to the beginning of construction to schedule a burrowing owl survey.
- 9. The Maricopa Department of Transportation Environmental Program Branch will arrange for a qualified biologist to conduct a pre-construction survey for burrowing owls within thirty (30) days of construction. The biologist shall possess a burrowing owl survey protocol training certificate issued by the Arizona Game and Fish Department.
- 10. If burrowing owls are found during the survey, the Maricopa County Department of Transportation Environmental Program Branch will arrange for a licensed wildlife rehabilitator to remove all burrowing owls, nestlings, or eggs that will be impacted by construction and have the contractor avoid construction activities within one hundred (100) feet of active burrows.
- 11. The Maricopa County Department of Transportation Environmental Program Branch recommends the Maricopa County Department of Transportation Communications Branch provide English-Spanish bi-lingual public announcements and notifications based on the percentage of local Hispanic resident population and potential Linguistically Isolated Households. The population percentages for both these categories exceed thresholds set for implementation of Maricopa County Department of Transportation Title VI Plan compliance measures.
- 12. Traffic control measures will be communicated with the public, local officials, and the media prior to and during construction activities. Communication may

include, but is not limited to, media alerts, direct mailings to area businesses and property owners, information on variable message signs, and paid newspaper notices.

13. A construction notice will be provided to residents and businesses in the general project area at least fourteen (14) calendar days prior to construction.

#### **Contractor Responsibilities**

- 1. The contractor shall prepare and implement a Stormwater Pollution Prevention Plan that meets the requirements of the Arizona Pollutant Discharge Elimination System Construction General Permit, including sampling and analysis plan, as necessary.
- 2. Following review of the Stormwater Pollution Prevention Plan by the Engineer, the contractor shall prepare and submit a Notice of Intent for the project, and shall provide the Stormwater Pollution Prevention Plan and sampling and analysis plan, as necessary, to the Arizona Department of Environmental Quality. The contractor shall provide copies of the final Stormwater Pollution Prevention Plan and the contractor's Notice of Intent and Notice of Termination to the Maricopa County Department of Transportation.
- 3. The contractor shall prepare and submit a Notice of Termination upon approval from the Engineer for the project to the Arizona Department of Environmental Quality.
- 4. The contractor shall submit a copy of the authorization to discharge letter from the Arizona Department of Environmental Quality to the Maricopa County Stormwater Program, the City of Phoenix and the City of Tolleson, as regulated Municipal Separate Storm Sewer System operators and comply with their requirements.
- 5. The contractor shall have a copy of the Asbestos Building Material Survey Report (Dated February 26, 2018) on-site at all times.
- 6. Because measurable levels of lead were detected in the yellow and white road striping, the Occupational Safety and Health Administration Lead in Construction Standard (29 CFR 1926.62) shall apply to any construction work (including renovation and demolition) that may disturb the painted components or lead materials. The contractor shall notify their employees prior to any disturbance where lead is present and make the US Department of Labor Occupational Safety and Health Administration Lead in Construction Publication (OSHA 3142-12R 2004) available to workers. Link: http://www.osha.gov/Publications/osha3142.pdf
- 7. The Lead Based Paint identified during this survey is considered non-hazardous for purposes of disposal and can be disposed as regular construction waste.

- 8. The contractor shall complete a National Emissions Standards for Hazardous Air Pollutants notification for work associated with the headwall removals and submit it to the Engineer. The Engineer will send it to the Maricopa County Department of Transportation Environmental Program Branch Hazardous Materials Specialist for review five (5) working days prior to being submitted to the regulatory agency [-ies].
- 9. After Maricopa County Department of Transportation Environmental Program Branch Hazardous Materials Specialist review, the contractor shall file the National Emissions Standards for Hazardous Air Pollutants notification with Arizona Division of Occupational Safety and Health and the Maricopa County Air Quality Department at least ten (10) working days prior to demolition/renovation associated with the headwall removals.
- 10. The contractor cannot start work associated with the headwall removals until ten (10) working days have passed since the submittal of the National Emissions Standards for Hazardous Air Pollutants notification to the regulatory agency [-ies].
- 11. A copy of the submitted National Emissions Standards for Hazardous Air Pollutants notification shall be sent to the Engineer. The Engineer will send it to the Maricopa County Department of Transportation Environmental Program Branch Hazardous Materials Specialist.
- 12. The dumped material located on the south side of MC85 and 79<sup>th</sup> Avenue will be impacted by the project. The contractor shall hire a licensed hazardous materials contractor to inspect the dumped material for potential hazardous waste, and if present, test and remove the hazardous wastes from the site in accordance to all applicable federal, state, and local codes and regulations.
- 13. Well abandonment and closures shall comply with the Arizona Department of Water Resources Well Abandonment Handbook dated September 2008. Link: <a href="http://www.azwater.gov/azdwr/WaterManagement/NOI/documents/Abandonme">http://www.azwater.gov/azdwr/WaterManagement/NOI/documents/Abandonme</a> ntHandbook2008.pdf
- 14. The soil staining around the well to be abandoned on the southwest corner of MC85 and 91st Avenue shall be analyzed for the presence of hazardous substances by a licensed hazardous materials contractor and, if present, impacted soils shall be disposed of in accordance to all applicable federal, state, and local codes and regulations.
- 15. If the dumped material located on the south side of MC85 and 79<sup>th</sup> Avenue, and/or the soil staining around the well to be abandoned on the southwest corner of MC85 and 91<sup>st</sup> Avenue exceeds federal, state, and local codes and regulations for specific hazardous substances, a licensed abatement contractor shall provide

- a Removal and Disposal Plan to be reviewed by the Maricopa County Department of Transportation Environmental Program Branch Hazardous Materials Specialist five (5) working days prior to implementation and removal.
- 16. A copy of any analysis conducted by the licensed hazardous materials contractor shall be submitted to the Engineer. The Engineer will send it to the Maricopa County Department of Transportation Environmental Program Branch Hazardous Materials Specialist.
- 17. The contractor shall comply with the Occupational Safety and Health Administration Respirable Crystalline Silica Standard for Construction. Link: https://www.osha.gov/Publications/OSHA3681.pdf
- 18. Avoidance or proper regulatory closure of unreported or undiscovered wells located within the project limits that may be impacted by construction is required.
- 19. If suspected hazardous materials are encountered during construction, work shall cease at that location and the contractor shall notify the Engineer. The Engineer will notify the Maricopa County Department of Transportation Hazardous Materials Specialist (602.506.0001) immediately to arrange for the proper assessment, treatment, or disposal of those materials.
- 20. If previously unidentified archaeological, historical, or paleontological features are encountered during activity related to the construction of the project, the contractor shall stop work immediately at that location, take all reasonable steps to secure the preservation of those resources, and notify the Engineer. The Engineer will notify the Maricopa County Department of Transportation Cultural Resources Manager (602.506.8082) to evaluate the significance of the resources and determine the appropriate next action.
- 21. All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction shall be stabilized by an approved method.
- 22. To prevent the introduction of invasive species seeds, all construction equipment shall be washed at the contractor's storage facility prior to entering the construction site.
- 23. To prevent invasive species seeds from leaving the site, the contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.
- 24. The contractor shall arrange for a qualified biologist to conduct a bird nest search of the grasses, shrubs, trees, and/or limbs to determine the presence/absence of active bird nests if vegetation removal activities will occur

- between February 1<sup>st</sup> and August 31<sup>st</sup>. The survey shall be conducted within ten (10) calendar days of vegetation removal.
- 25. If active bird nests are found during the bird nest survey, the contractor shall notify the Engineer. The Engineer will contact the Maricopa County Department of Transportation Environmental Program Branch to arrange for a licensed wildlife rehabilitator to remove any eggs or nestlings from active nests, or have the contractor avoid vegetation removal or pruning near the active bird nest(s) to comply with provisions of the Migratory Bird Treaty Act.
- 26. If active bird nests are found during the bird nest survey, the contractor shall avoid vegetation removal or pruning near active bird nest(s) until the Maricopa County Department of Transportation Environmental Program Branch Manager authorizes the contractor to proceed.
- 27. The contractor shall not remove any trees or large tree limbs or conduct vegetation removal activities such as grubbing or shrub clearing between February 1<sup>st</sup> and August 31<sup>st</sup> until a biologist has conducted a bird nest search of the grasses, shrubs, trees, and/or tree limbs and has determined that no active bird nests are present. Vegetation may be mowed or removed if it has been surveyed within ten (10) calendar days prior to removal as long as only inactive bird nests, if any, are present. Between September 1<sup>st</sup> and January 31<sup>st</sup>, grubbing, shrub clearing, and tree/limb removal activities are not subject to restriction.
- 28. If any burrowing owls are found during the pre-construction survey, the contractor shall avoid construction activities within one hundred (100) feet of active burrows until the Maricopa County Department of Transportation Environmental Program Branch Manager authorizes the contractor to proceed.
- 29. If any burrowing owls are located during work activities, the contractor shall cease work within one hundred (100) feet of any area occupied by burrowing owls and contact the Engineer. The Engineer will contact the Maricopa County Department of Transportation Environmental Program Branch Manager (602.506.8068) to arrange for removal of all burrowing owls, nestlings, or eggs that will be impacted by construction.
- 30. Construction of the project shall comply with The Maricopa County Air Quality Department's Rule 310—Fugitive Dust from Dust-Generating Operations and any required air quality permits. Link to the Dust Abatement Handbook: <a href="https://www.maricopa.gov/DocumentCenter/View/5167/Rule-310---Dust-Abatement-Handbook-PDF">https://www.maricopa.gov/DocumentCenter/View/5167/Rule-310---Dust-Abatement-Handbook-PDF</a>
- 31. Construction impacts such as equipment noise, dust, and fumes shall be monitored and controlled. The contractor is required to observe and comply

- with all air pollution ordinances and regulations from those agencies having jurisdiction.
- 32. The contractor shall contact local emergency services (hospital, fire, police, and ambulance services) at least fourteen (14) calendar days in advance of construction to notify the emergency service of potential construction-related delays.
- 33. The contractor shall notify the public, business owners, and emergency services (hospital, fire, police, and ambulance services) of any temporary access change or road closures during construction at least fourteen (14) calendar days in advance of the change.
- 34. The contractor shall provide copies of all emergency service notifications to the Maricopa County Department of Transportation on the same day the notifications are made.
- 35. At least fourteen (14) calendar days prior to construction, the contractor shall place advance-warning signs at locations designated by the Engineer to notify motorists, pedestrians, and bicyclists of construction-related delays and closures.
- 36. With the exception of temporary, short-term closures (less than 4 hours) of driveways, the contractor shall maintain driveway access throughout construction. If a given property has multiple driveways, at least one shall remain open at all times.

#### **Attachment:**

• Asbestos Building Material Survey Report (Dated February 26, 2018)



#### MARICOPA COUNTY RISK MANAGEMENT

Asbestos Building Material Survey

Maricopa County Department of Transportation (MCDOT)

Project Number: TT0345

MC85 at 83<sup>rd</sup> Avenue and Center Lane Expansion

Buckeye, Arizona

Survey Conducted February 20, 2018

Report Prepared February 26, 2018

By:

Chris McAbee
Environmental/IH Consultant
Maricopa County Risk Management - Environmental Division
222 N. Central Avenue, Suite 1100
Phoenix, Arizona 85004
602-506-2891 - office

# LIMITED ASBESTOS SURVEY MCDOT Project Number: TT0345

## MC85 at 83<sup>rd</sup> Avenue and Center Lane Expansion Buckeye, Arizona

#### 1.0 INTRODUCTION

On February 20, 2018, Mr. Chris McAbee, Environmental/IH Consultant with the Maricopa County Risk Management (MCRM) Environmental Division was on site at a roadway stretch between 75th Avenue and 97th Avenue on MC85/Buckeye Road in Buckeye, Arizona which is owned and maintained by the Maricopa County Department of Transportation (MCDOT). MCDOT requested an inspection of suspect asbestos building materials slated for disturbance during upcoming renovation activities on the roadway between 75th Avenue and 97th Avenue on MC85/Buckeye Road. MCDOT provided information regarding location and specific materials slated for disturbance to MCRM. The purpose of the survey was to collect bulk samples of suspect asbestos-containing materials at the intersection prior to planned renovation activities. A previous MCRM survey was conducted on June 22, 2016 and it updated during this current survey. A total of one-hundred fourteen (114) bulk samples were collected during the June 2016 survey. MCRM also conducted a survey of the intersection of 79th Avenue and MC85 on March 7, 2017 under the MCDOT project TT0553 and collected nine (9) bulk samples. MCRM collected an additional twelve (12) bulk samples during the February 20, 2018 site survey. Additionally, limited bulk sampling data from a previous survey conducted in this same project area by Aztec Environmental in January of 2013 was utilized.

MCRM's update survey and sampling was conducted by Mr. McAbee, an Asbestos Hazard Emergency Response Act (AHERA) certified asbestos building inspector. A total of twelve (12) additional bulk samples were collected during this update survey. Samples were analyzed by Fiberquant Analytical Services in Phoenix, Arizona. Fiberquant is fully accredited by the EPA-required National Voluntary Laboratory Accreditation Program (NVLAP) for analysis of asbestos bulk samples using polarized light microscopy, and is also an American Industrial Hygiene Association (AIHA) accredited laboratory.

Laboratory analysis indicates that all building materials sampled were shown to be negative for asbestos content.

#### 2.0 DESCRIPTION OF INSPECTED AREA

MCDOT owns and maintained the area where the sampling was conducted located between 75<sup>th</sup> Avenue and 97th Avenue on MC85/Buckeye Road and the crossroads of 83<sup>rd</sup> and 91<sup>st</sup> Avenues in Buckeye, Arizona. The roadway sections slated for disturbance were concrete, paint and asphaltic mastic based. With the exception of the original concrete roadway underneath the existing asphalt on MC85, it is unknown if any of the suspect building materials had been previously sampled for asbestos content. The original concrete roadway below the existing asphalt on MC85were sampled previously by Aztec Environmental in January 2013 and the materials were identified to be negative for asbestos. The survey focused on all visually and physically accessible building materials at the roadway identified by MCDOT and slated for renovation activities.

#### 3.0 SURVEY PROCEDURES

All functional spaces within the affected areas were visually inspected for the presence of suspect asbestos-containing materials. Each suspect material was sampled and analyzed for asbestos content, and assessed for damage and friability. As required by EPA, the inspector determined friability by touching each suspect material. Each suspect ACM was designated as a distinct homogeneous area. A homogeneous area is defined as a single material, uniform in texture and appearance, installed at one time, and unlikely to consist of more than one type or formulation of material. A sufficient number of samples were collected of each material to satisfy OSHA and NESHAP regulations for the determination

of asbestos content. A total of one-hundred thirty-five (135) samples were collected during the two MCRM surveys.

Fiberquant Analytical Services is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP) for bulk-asbestos sample analysis conducted by the National Institute of Standards and Technology. Although it is required by the NESHAP to initially analyze samples using PLM analysis with visual estimation, the EPA has determined that this method can inaccurately estimate the amount of asbestos in a bulk sample, especially at low asbestos concentrations. For this reason, the NESHAP imposes an additional requirement for materials determined by visual estimation to contain a detectable quantity of asbestos at less than or equal to one- percent concentrations. The additional requirement is that the facility owner must either (1) have the pertinent samples reanalyzed using point-counting PLM, or (2) assume the materials to be ACBM and treat them as such. Materials determined by visual estimation to not have a detectable concentration of asbestos, or to have a concentration of one percent asbestos or greater, do not have to be reanalyzed by the point counting method. A description of the samples taken and their locations are located in Table 1. The official asbestos laboratory results are included in Appendix A.

#### 4.0 SURVEY FINDINGS

The functional space locations identified in the table below incorporate the coordinates listed in the "Maricopa County Department of Transportation plans for the construction of MC85 center lane expansion (MC85: 97<sup>th</sup> Avenue to 75<sup>th</sup> Avenue)" which is located in Appendix C of this report. The R# listed correlates to the "Summary of Estimated Quantities" table on page G15 of G34 within the project plans. The results of MCRM's asbestos survey are as follows:

## Table 1:

Asbestos Survey Results MCDOT Project – TT0345 MC85 at 83<sup>rd</sup> Avenue and Center Lane Expansion Buckeye, Arizona February 20, 2018

		Functional	NESHAP			Quantity
HA#	Material	Spaces	Category	ACM	Condition	Affected
A-1	White Roadway Paint	MC85 between 75th and	Category II	No	Good	
	Striping	97 <sup>th</sup> Avenue	Non-Friable			
A-2	Yellow Roadway Paint	MC85 between 75 <sup>th</sup> and	Category II	No	Good	
	Striping	97 <sup>th</sup> Avenue	Non-Friable			
A-3	Black Asphaltic Seam	MC85 between 75 <sup>th</sup> and	Category I	No	Good	
	Mastic	97 <sup>th</sup> Avenue	Non-Friable			
A-4	Concrete Curbing	MC85 at R1-R8 North	Category II	No	Good	
		Side	Non-Friable			
A-5	Concrete Irrigation Ditch	MC85 at R3 South Side	Category II	No	Good	
	Lining		Non-Friable			
A-6	Concrete Headwall	MC85 at R3 South Side	Category II	No	Good	
			Non-Friable			
A-7	Concrete Irrigation Ditch	MC85 at R4-8 South	Category II	No	Good	
	Lining	Side	Non-Friable			
A-8	Concrete Headwall	MC85 at R4 South Side	Category II	No	Good	
			Non-Friable			

Asbestos Survey MCDOT Project TT345

		Functional	NESHAP			Quantity
HA #	Material	Spaces	Category	ACM	Condition	Affected
A-9	Concrete Drain Pipe	MC85 at R3 South Side	Category II Non-Friable	No	Good	
A-10	Concrete Drain Pipe	MC85 at R3 South Side	Category II Non-Friable	No	Good	
A-11	Concrete Irrigation Ditch Patch	MC85 at R4 South Side	Category II Non-Friable	No	Good	
A-12	Concrete Headwall	MC85 at R8 South Side	Category II Non-Friable	No	Good	
A-13	Concrete Irrigation Ditch Add-On	MC85 at R4-8 South of HA# A-7	Category II Non-Friable	No	Good	
A-14	Concrete Irrigation Ditch Add-On Patch	MC85 at R4-8 South of HA# A-7	Category II Non-Friable	No	Good	
A-15	Concrete Irrigation Box	SW Corner of MC85 and 83 <sup>rd</sup> Avenue	Category II Non-Friable	No	Good	
A-16	Concrete Wall	MC85 at R4-8 South of HA#7	Category II Non-Friable	No	Good	
A-17	Concrete Irrigation Ditch Lining	91st Avenue at R30-33 West Side	Category II Non-Friable	No	Good	
A-18	Concrete Headwall	91st Avenue at R33 West Side	Category II Non-Friable	No	Good	
A-19	Concrete Headwall	91st Avenue at R32 West Side	Category II Non-Friable	No	Good	
A-20	Concrete Headwall	91st Avenue at R31 at Pima West Side	Category II Non-Friable	No	Good	
A-21	Concrete Headwall	MC85 at R11 North Side JBS Driveway	Category II Non-Friable	No	Good	
A-22	Concrete Ditch Lining	MC85 at R11 North Side JBS Driveway	Category II Non-Friable	No	Good	
A-23	Concrete Irrigation Ditch Lining	MC85 at R20-24 South Side	Category II Non-Friable	No	Good	
A-24	Concrete Headwalls	MC85 at R20-24 South Side	Category II Non-Friable	No	Good	
A-25	Concrete Drain Pipes in Ditch	MC85 at R20-24 South Side	Category II Non-Friable	No	Good	
A-26	Concrete Irrigation Ditch Lining Patch	MC85 at R20-24 South Side	Category II Non-Friable	No	Good	
A-27	Concrete Base at Metal Grate	MC85 at R22 North Side Driveway	Category II Non-Friable	No	Good	
A-28	Concrete Headwall	MC85 at R20 North Side	Category II Non-Friable	No	Good	
A-29	Concrete Headwall	MC85 at R22 North Side	Category II Non-Friable	No	Good	
A-30	Concrete Curbing and Gutter	Intersection at MC85 and 91st Avenue	Category II Non-Friable	No	Good	
A-31	Concrete Traffic Light Pole Base	Intersection at MC85 and 91st Avenue	Category II Non-Friable	No	Good	
A-32	Concrete Cabinet Box Base	Intersection at MC85 and 91st Avenue	Category II Non-Friable	No	Good	

		Functional	NESHAP			Quantity
HA#	Material	Spaces	Category	ACM	Condition	Affected
A-33	Concrete Sidewalk and	83 <sup>rd</sup> Avenue on North	Category II	No	Good	
	Ramp	Side of MC85	Non-Friable			
A-34	Concrete Traffic Light	Intersection at MC85	Category II	No	Good	
	Pole Base	and 83rd Avenue	Non-Friable			
A-35	Concrete Sidewalk	NW Corner of MC85	Category II	No	Good	
		and 91st Avenue	Non-Friable			
A-36	Concrete Drain Pipe	MC85 at R91st Avenue	Category II	No	Good	
		at HA# A-19	Non-Friable			
A-37	Concrete and Yellow	83 <sup>rd</sup> Avenue Median	Category II	No	Good	
	Paint	South of MC85	Non-Friable			
A-38	Concrete Manhole Cover	SE Corner of 83 <sup>rd</sup>	Category II	No	Good	
	Base	Avenue and MC85	Non-Friable			
A-39	Original Concrete	Below Existing Asphalt	Category II	No	Good	
	Roadway	Roadway on MC85	Non-Friable			
		From				
A-40	Concrete Curb	83 <sup>rd</sup> Avenue and MC85	Category II	No	Good	
			Non-Friable			
A-41	Concrete Red Walkway	83 <sup>rd</sup> Avenue and MC85	Category II	No	Good	
	Platform		Non-Friable			
A-42	Yellow Paint on Well	SW Corner of 91st	Category II	No	Good	
	Structures	Avenue and MC85	Non-Friable			
A-43	Concrete Base Below	SW Corner of 91st	Category II	No	Good	
	Well Structures	Avenue and MC85	Non-Friable			
A-44	Concrete Sidewalk	79 <sup>th</sup> Avenue and MC85	Category II	No	Good	
			Non-Friable			
A-45	Yellow Concrete Step	79 <sup>th</sup> Avenue and MC85	Category II	No	Good	
			Non-Friable			
A-46	Concrete Headwall	79 <sup>th</sup> Avenue and MC85	Category II	No	Good	
			Non-Friable			

Laboratory analysis indicates that all building materials sampled were shown to be negative for asbestos content. A copy of this inspection report should be kept in an accessible location at the facility and jobsite at all times. The contents of the report and finding should be provided to all building maintenance personnel and any outside contractors that conduct work at the facility that may damage or disturb building materials. In the event of the entire or partial demolition of this building material, this report should be provided to all demolition and construction contractors and kept on-site during construction activities. Because no building materials were identified to be asbestos containing there is no requirement to submit a NESHAPs notification for asbestos. This survey information detailed in this report are valid for 12 months from the inspection date and must be updated after that date in accordance to NESHAP requirements. Please contact MCRM with any questions regarding this survey and laboratory data.

#### 5.0 PROJECT LIMITATIONS

This Project was performed using, as a minimum, practices consistent with standards acceptable within the industry at this time, and a level of diligence typically exercised by industrial hygiene and environmental consultants performing similar services. The procedures used in this investigation attempt to establish a balance between the competing goals of limiting investigative and reporting costs and time, and reducing the uncertainty about unknown conditions. Therefore, because the findings of this report

were derived from the scope, costs, time, and other limitations, the conclusions should not be construed as a guarantee that all environmental or occupational hazards have been identified and fully evaluated. Where sample collection and testing have been performed, MCRM's professional opinions are based in part on the interpretation of data from discrete sampling locations that may not represent conditions at non-sampled locations. MCRM assumes no responsibility for omissions or errors resulting from the potential for hidden/inaccessible building materials not identified, inaccurate information, or data, provided by sources outside of MCRM or from omissions or errors in public records.

Asbestos Survey
MCDOT Project TT345

## APPENDIX A

Laboratory Results



#### Polarized Light Microscope (PLM) Analysis for Asbestos in Bulk Sample

JobNumber:

201702445

**Client:** 

MARICOPA COUNTY RISK MGMT

222 N CENTRAL #1110

PHOENIX, AZ 85004-0000 Office Phone: (602) 506-2891 (602) 506-5939

# Samples: PLM **Rec:** 3/8/2017 **Method:** EPA 600/R-93/116 The "New" Method; see below

Client Job: MCDOT-TT0553-79th Avenue

FAX:

**Report Date:** 3/8/2017 **Date Analyzed:** 3/8/2017 Routing Number: Pinto, Joe

**Fiberquant Internal SOP: Method and Analysis Information:** PI Mn

Each bulk sample is first dissected under a 7-30x magnification stereo-microscope. This examination is used to determine the general type of sample, how many and what type of layers it has, and initial estimates of fiber types and quantities. Second, liquid media mounts are made of each layer - such mounts may be of selected fibers (used solely for identification purposes) or may be representative of the layer as a whole (used for quantitation purposes). The mounts may be made in a synthetic Canadian balsam, one of several solvents, or in refractive index oils (media of known refractive index). Generally, a variety of different mounts are made: some optimized for fiber visibility, some optimized for fiber identification, and some optimized for fiber quantitation. The mounted slides are then examined at 50-400x magnification on a Nikon Labphot-pol microscope. Optical characteristics are used to identify each observed fiber type; the optical data are contained for each sample on its detail analysis sheet, attached.

PO Number: 170000003048

Current EPA and NESHAP regulations designate a result of <=1 % asbestos as "negative" and >1 % asbestos as "positive". Samples containing layers that have been determined to be "positive" may have to be handled differently during a renovation or demolition than samples whose layers have been determined to be "negative."

The method of fiber identification and quantitation is the "Standard Operating Procedures for the Analysis of Asbestos in Bulk Samples using Polarized Light Microscopy", Chapter 7 of the Quality Assurance and Management Manual. This SOP and its associated reporting have been designed to satisfy all requirements in both EPA Method 600/M4-82-020 (The Interim Method) and EPA Method 600/R-93/116 (The New Method). The Interim Method is the required method for AHERA (US EPA 40 CFR Pt. 763), but this method calls for the reporting of composited results of multi-layered samples that is no longer an acceptable reporting practice in most circumstances. Current EPA rules, such as NESHAP (US EPA 40CFT Pt. 61), as well as NVLAP accreditation policies, call for separate reporting for each layer of multi-layered samples. The New Method contains the same procedures for identification and quantification of asbestos as does the Interim Method, except that multi-layered samples are reported to comply with the latest US EPA rule. Fiberquant not only reports the asbestos content of each layer of multi-layered samples separately (satisfying current EPA and NVLAP reporting requirements), but Fiberquant also reports what percentage of the sample each layer comprises. Therefore, the results may be arithmetically composited to satisfy the reporting requirements of the Interim Method. The method of fiber quantitation is an estimation technique in which the analysts quantitation is routinely calibrated by reference quantitation standards, and which has been shown to be equivalent in precision and accuracy to point counting. Friability is estimated for the purposes of deciding when to point count. Friabilities determined in the field take precedence over those determined in the laboratory. Those sample layers which are friable and estimated by the analyst to contain <= 1% asbestos are point counted using 400 points. Such point counting is required by NESHAP (National Emission Standards for Hazardous Air Polutants, Nov. 1990) in order to rely on analytical results that are <= 1%. The coefficient of variation for the estimation quantitation technique is 100% in the range 0-5%. This means that PLM analysis is not capable of conclusively determining whether a layer containing close to 1% asbestos is actually "positive" or "negative". For this reason, Fiberguant refers to results where asbestos was detected but <= 1% as "borderline negative", and results where asbestos was >1 % but <= 2% as "borderline positive" to indicate the uncertainty in assigning a "positive" or "negative" label. In the sample summary, "ND" means that no asbestos was detected during the analysis. A "Tr" or "Trace" of asbestos reported is defined for our purposes as the detection of several asbestos fibers during the analysis; this level would be right at the limit of detection for the method. Trace is only reported on the analysis detail - in the summary a trace would be reported as <=1%. The limit of detection (the smallest % of asbestos that can be detected) varies greatly depending on the matrix in which the asbestos is found. As little as 0.001% asbestos can be detected in favorable samples, while detection in unfavorable samples may approach the detection limit of 1% stated in the method. During the analysis, the analyst, for Fiberquant identification purposes only, determines the "apparent sample type" and "apparent layer types." It must be emphasized that these types are only what is apparent. Often, different materials appear similar or identical after sampling, so the analyst may assign a type other than what was sampled.

Floor tiles present a special problem for PLM asbestos analysis. Floor tile can contain chrysotile fibers so thin that they cannot be resolved by optical methods. In such a case, we may observe a percentage of asbestos which is lower than the actual percentage, or not observe asbestos at all when some is present. For this reason, floor tiles reported as negative should be confirmed to be negative using transmission electron microscope (TEM) analysis. Likewise, vermiculite insulation materials containing traces of asbestiform asbestos present a problem for routine PLM analysis - the amphiboles are sometimes present in trace amounts inhomogeneously distributed. For this reason, loose vermiculite samples reported as negative should be confirmed to contain no amphibole using hydroseparation techniques.

The samples were analyzed under the following ongoing quality assurance program: Blank samples are routinely analyzed to maintain contamination-free materials. Each analyst has at least a bachelor's degree in physical science, and has also completed extensive training specific to asbestos analysis for 1-3 months before being allowed to analyze client samples. Qualitative reference samples are routinely analyzed to assure that analysts can identify asbestos and asbestos-look-alike fibers. Quantitative reference samples are routinely analyzed to calibrate and characterize the

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Page 1 of 6 Fiberquant, Inc. estimation procedure. Microscope alignment is checked each day. Refractive index oils are calibrated at least quarterly. At least 10% of client samples are re-analyzed from scratch by a different analyst than the original, and any discrepancies are resolved for the sample and similar sample types before the results are reported. All quality checks performed for these samples were in control except as detailed in the "Analytical Notes" below. All analysts participate in interlab round robins and proficiency testing to assure competence. Fiberquant is accredited by NVLAP (Lab code #101031) for the analysis of bulk samples for asbestos using PLM. Accreditation does not imply endorsement by the EPA, any other United States governmental agency or any private agency or association. Each lab analysis refers only to the sample tested, and may not, due to the sampling process, be representative of the material sampled. This report may not be reproduced except in full, without the approval of Fiberquant Analytical Services.

MCDOT-TT0553-79th Avenue

Some results may have been calculated using client supplied data, such as volume or area sampled, for which Fiberquant assumes no liability for accuracy.

#### **Job Analysis Notes:**

PLM Analysis Summary:	Job Number:	201702445
-----------------------	-------------	-----------

Samp	Sample Number		Lab Number	Apparent Sample Type *	Positive Layer Yes or No
Layer	Color	Apparent Layer T	ype * A	Asbestos Results	
Sample # 1A			2017-02445- 1	Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no	asbestos detected	
Sample # 2A			2017-02445- 2	2 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no	asbestos detected	
Sample # 3A			2017-02445- 3	3 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no	asbestos detected	
Sample # 4A			2017-02445- 4	1 Cementitious	Positive Layer? No
Layer # 1	yellow	concrete	no	asbestos detected	
Sample # <u>5A</u>			2017-02445- 5	5 Cementitious	Positive Layer? No
Layer # 1	yellow	concrete	no	asbestos detected	
Sample # 6A			2017-02445- 6	5 Cementitious	Positive Layer? No
Layer # 1	yellow	concrete	no	asbestos detected	
Sample # 7A			2017-02445- 7	7 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no	asbestos detected	
Sample # 8A			2017-02445- 8	3 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no	asbestos detected	
Sample # 9A			2017-02445- 9	9 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no	asbestos detected	

<sup>\*</sup> Apparent Sample Types and Apparent Layer Types are as they appeared to the analyst. Since many types of materials appear similar after sampling damage, the apparent type of material may not be the actual type of material.

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Job Number:

none

201702445

MCDOT-TT0553-79th Avenue

Sample 1A

**Lab Number** 2017-02445- 1

Sampled: 3/7/2017

Condition: acceptable

Analyzed By DMS

3/8/2017

An? OK Apparent Smp Type Cementitious Non-fibrous Solid

Homogeneous Yes # Layers 1 Pos Layer? No Non-Fibrous Components (in approx. decreasing order): powder, rock,

L	ayers						Percents o	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

			Refractive Index Determinations										
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Sample 2A

**Lab Number** 2017-02445- 2

Sampled: 3/7/2017

Condition: acceptable

Analyzed By DMS

3/8/2017

An? OK

Fiber Identification:

Apparent Smp Type Cementitious

Non-fibrous Solid

Homogeneous Yes

# Layers 1

Pos Layer? No

Non-Fibrous Components (in approx. decreasing order): powder, rock,

Lay	/ers						Percents of	f Each Fiber		-
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-
	Fiber Identification:				none					1

			Refractive Index Determinations										
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Sample 3A

**Lab Number** 2017-02445-3

**Sampled:** 3/7/2017

Condition: acceptable

Analyzed By DMS

3/8/2017

An? OK

Apparent Smp Type Cementitious

Non-fibrous Solid

Homogeneous Yes

Pos Layer? No

# Layers 1

Non-Fibrous Components (in approx. decreasing order): powder, rock,

L	ayers						Percents o	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-
	Fiber Identification:			none						

	<del></del>		Refractive Index Determinations										
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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201702445

Job Number:

MCDOT-TT0553-79th Avenue

Sample 4A Lab Number 2017-02445-4 **Sampled:** 3/7/2017 Condition: acceptable Analyzed By DMS 3/8/2017 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No Non-Fibrous Components (in approx. decreasing order): polymer, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 yellow n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Oil Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. **Lab Number** 2017-02445- 5 Sampled: 3/7/2017 Condition: acceptable Analyzed By DMS 3/8/2017 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No Non-Fibrous Components (in approx. decreasing order): polymer, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 vellow n.d 1 Total % 100 Overall % n.d Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 6A Lab Number 2017-02445-6 **Sampled:** 3/7/2017 Condition: acceptable Analyzed By DMS 3/8/2017 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No Non-Fibrous Components (in approx. decreasing order): polymer, rock, Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 yellow n.d 100 Overall % Total % n.d Fiber Identification: none **Refractive Index Determinations** Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Elg Ext none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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201702445

Job Number:

MCDOT-TT0553-79th Avenue

Sample 7A Lab Number 2017-02445-7 **Sampled:** 3/7/2017 Condition: acceptable Analyzed By DMS 3/8/2017 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Color Friability Fib 2 Fib 3 Fib 5 % Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. **Lab Number** 2017-02445-8 Sampled: 3/7/2017 Condition: acceptable Analyzed By DMS 3/8/2017 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 9A Lab Number 2017-02445- 9 **Sampled:** 3/7/2017 Condition: acceptable Analyzed By DMS 3/8/2017 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No Non-Fibrous Components (in approx. decreasing order): powder, rock, Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d Fiber Identification: none **Refractive Index Determinations** Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Elg Ext none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Fr=Friability: 1=very non-friable; 2= non-friable; 3=friable; 4=highly friable

Colors: B=black; BL=blue; BR=brown; CL=clear; G=Green; CY=gray; OR=orange; OW=off-white; PN=pink; PU=purple; R=red; TN=tan; W=white; Y=yellow; V=various PN=pink; PU=purple; PN=pink; PN=Fiber Morphology: A=fine fibers/bundles, white, sinewy, flexible; B=fine fibers/bundles, w-br, straight, broomed ends; C=fine fibers/bundles, blue, straight, broomed ends; D=fine to coarse fibers, CL-B, brittle; E=coarse fibers,CL or dyed, striated; F=coarse fibers or splinters, W-BR, ribbon-like; G=lath-like or shards, low aspect ratio, may taper

Job Number:

Iso=isotropism - may be yes or no; Pleo=pleochroism - may be yes or no; Bi=birefringence - may be None, Low, Medium or High Elg=sign of elongation - may be +, - or B (both); Ext=extinction - may be Parallel, Oblique, None or Undulating; Oil=medium used to for dispersion staining Col Par=dispersion staining colors parallel to the fiber (fiber/halo): b/w=black/white; dg/py=dark gray/pale yellow; vg/y=violet gray/yellow; db/ly=dark blue/lemon yellow; vb/g= vivid blue/gold; sb/o=sky blue/orange; pb/r=pàle blue/red; gb/dr=gray blue/dark red; w/b=white/black. Col Perp=same only perpendicular to fiber. RI Par=refractive index parallel to fiber; RI Perp=refractive index perpendicular to fiber

Printed: 08-Mar-17

Original Print Date: 08-Mar-17

Approved Accreditation Signatory

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Page 6 of 6 Fiberquant, Inc.

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PO Number Ja	e Pinto 17000000 304	<b>Other</b>				Call		Call	
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4) 4A	Concrete Step (	Yellow)							
5) 5A									
6) <b>6 A</b>	, 1	. 1							
7) 7A	Concrete Headra	4							
8) <b>8 A</b>									
9) 9A	7		1	I					
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Time:

Note: Data completed by client (including number and identity of samples) is assumed to be correct until it is verified at time of sample preparation.

7Time:

18) 19)



### Polarized Light Microscope (PLM) Analysis for Asbestos in Bulk Sample

JobNumber:

201606402

**Client:** 

MARICOPA COUNTY RISK MGMT

222 N CENTRAL #1110

FAX:

PLM

PHOENIX, AZ 85004-0000 Office Phone: (602) 506-2891

# Samples: 114 **Rec:** 6/24/2016 **Method:** EPA 600/R-93/116 The "New" Method; see below PO Number: Hugh Davidson Client Job: MCDOT-TT345-75th-97th Ave MC85

**Report Date:** 6/29/2016 Date Analyzed: 6/27/2016 Routing Number: -

(602) 506-5939

**Method and Analysis Information: Fiberquant Internal SOP:** PI Mn

Each bulk sample is first dissected under a 7-30x magnification stereo-microscope. This examination is used to determine the general type of sample, how many and what type of layers it has, and initial estimates of fiber types and quantities. Second, liquid media mounts are made of each layer - such mounts may be of selected fibers (used solely for identification purposes) or may be representative of the layer as a whole (used for quantitation purposes). The mounts may be made in a synthetic Canadian balsam, one of several solvents, or in refractive index oils (media of known refractive index). Generally, a variety of different mounts are made: some optimized for fiber visibility, some optimized for fiber identification, and some optimized for fiber quantitation. The mounted slides are then examined at 50-400x magnification on a Nikon Labphot-pol microscope. Optical characteristics are used to identify each observed fiber type; the optical data are contained for each sample on its detail analysis sheet, attached.

Current EPA and NESHAP regulations designate a result of <=1 % asbestos as "negative" and >1 % asbestos as "positive". Samples containing layers that have been determined to be "positive" may have to be handled differently during a renovation or demolition than samples whose layers have been determined to be "negative.'

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The samples were analyzed under the following ongoing quality assurance program: Blank samples are routinely analyzed to maintain contamination-free materials. Each analyst has at least a bachelor's degree in physical science, and has also completed extensive training specific to asbestos analysis for 1-3 months before being allowed to analyze client samples. Qualitative reference samples are routinely analyzed to assure that analysts can identify asbestos and asbestos-look-alike fibers. Quantitative reference samples are routinely analyzed to calibrate and characterize the

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Page 1 of 44 Fiberquant, Inc. estimation procedure. Microscope alignment is checked each day. Refractive index oils are calibrated at least quarterly. At least 10% of client samples are re-analyzed from scratch by a different analyst than the original, and any discrepancies are resolved for the sample and similar sample types before the results are reported. All quality checks performed for these samples were in control except as detailed in the "Analytical Notes" below. All analysts participate in interlab round robins and proficiency testing to assure competence. Fiberquant is accredited by NVLAP (Lab #101031) for the analysis of bulk samples for asbestos using PLM. Accreditation does not imply endorsement by the EPA, any other United States governmental agency or any private agency or association. Each lab analysis refers only to the sample tested, and may not, due to the sampling process, be representative of the material sampled. This report may not be reproduced except in full, without the approval of Fiberquant Analytical Services.

Some results may have been calculated using client supplied data, such as volume or area sampled, for which Fiberquant assumes no liability for accuracy.

#### **Job Analysis Notes:**

#### PLM Analysis Summary: Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85

Samp	ole Number		Lab Number Apparent Sample Type *	Positive Layer Yes or No
Layer	Color	Apparent Layer T	ype * Asbestos Results	·
Sample # <b>1A</b>			2016-06402- 1 Miscellaneous	Positive Layer? No
Layer # 1	off-white	paint, textured	no asbestos detected	. Sold to Edyor. 110
Layer # 2	black	asphalt	no asbestos detected	
ample # <b>2A</b>			2016-06402- 2 Miscellaneous	Positive Layer? No
Layer # 1	off-white	paint, textured	no asbestos detected	,
Layer # 2	black	asphalt	no asbestos detected	
ample # <b>3A</b>			2016-06402- 3 Miscellaneous	Positive Layer? No
Layer # 1	off-white	paint, textured	no asbestos detected	
Layer # 2	black	asphalt	no asbestos detected	
ample # <u><b>4A</b></u>			2016-06402- 4 Miscellaneous	Positive Layer? No
Layer # 1	yellow	paint, textured	no asbestos detected	
Layer # 2	black	asphalt	no asbestos detected	
ample # <u><b>5A</b></u>			2016-06402- 5 Miscellaneous	Positive Layer? No
Layer # 1	yellow	paint, textured	no asbestos detected	
Layer # 2	black	asphalt	no asbestos detected	
ample # <u><b>6A</b></u>			2016-06402- 6 Miscellaneous	Positive Layer? No
Layer # 1	yellow	paint, textured	no asbestos detected	
Layer # 2	black	asphalt	no asbestos detected	
ample # <u><b>7A</b></u>			2016-06402- 7 Adhesive/caulk	Positive Layer? No
Layer # 1	black	mastic	no asbestos detected	
Sample # <u><b>8A</b></u>			2016-06402- 8 Adhesive/caulk	Positive Layer? No
Layer # 1	black	mastic	no asbestos detected	
Sample # <u>9A</u>			2016-06402- 9 Adhesive/caulk	Positive Layer? No
Layer # 1	black	mastic	no asbestos detected	
ample # <u>10A</u>			2016-06402- 10 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
ample # 11A			2016-06402- 11 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
ample # 12A			2016-06402- 12 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	5 ··· 1 2 N
ample # <u>13A</u>			2016-06402- 13 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	5 ··· 1 · 2 N
iample # 14A			2016-06402- 14 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	5
ample # <u>15A</u>			2016-06402- 15 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Desition Level 2. No
Sample # <u>16A</u>			2016-06402- 16 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Decitive Lever2 No
Sample # 17A		aanavat-	2016-06402- 17 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Positive Lavor? No
Sample # 18A	grav.	concrete	2016-06402- 18 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Positivo Lavora No
ample # 19A	arav	concrete	2016-06402- 19 Cementitious no asbestos detected	Positive Layer? No
Layer # 1 ample # <b>20A</b>	gray	concrete	2016-06402- 20 Cementitious	Positive Layer? No
ample # <u><b>20A</b></u> Layer # 1	gray	concrete	no asbestos detected	rositive Layer: 190
	gray	concrete	2016-06402- 21 Cementitious	Positive Layer? No
ample # 21A Layer # 1	gray	concrete	no asbestos detected	rositive Layer: 110
ample # 22A	gray	concrete	2016-06402- 22 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	rositive Layer: NO
	gray	concrete	2016-06402- 23 Cementitious	Positivo Lavora No
Sample # 23A	arav	concrete		Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Positive Laver No
Sample # 24A	a=0.7	concrete	2016-06402- 24 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Docitive Lever No
Sample # 25A		aanarat-	2016-06402- 25 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	

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Sample # <b>26A</b>			2016-06402- 26 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	•
Sample # <u>27A</u> Layer # 1	gray	concrete	2016-06402- 27 Cementitious no asbestos detected	Positive Layer? No
Sample # <b>28A</b>	giuy	concrete	2016-06402- 28	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # <b>29A</b> Layer # 1	gray	concrete	2016-06402- 29 Cementitious no asbestos detected	Positive Layer? No
Sample # <b>30A</b>	9.47	001101 010	2016-06402- 30 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Desirius Leves 2 No
Sample # 31A Layer # 1	gray	concrete	2016-06402- 31 Cementitious no asbestos detected	Positive Layer? No
Sample # 32A	<i>3</i> ,		2016-06402- 32 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected 2016-06402- 33 Cementitious	Positivo Lavor? No
Sample # <u>33A</u> Layer # 1	gray	concrete	no asbestos detected	Positive Layer? No
Sample # <b>34A</b>			2016-06402- 34 Cementitious	Positive Layer? No
Layer # 1 Sample # <b>35A</b>	gray	concrete	no asbestos detected 2016-06402- 35 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	rositive Layer. No
Sample # 36A			2016-06402- 36 Cementitious	Positive Layer? No
Layer # 1 Sample # <b>37A</b>	gray	concrete	no asbestos detected 2016-06402- 37 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	. 00.0.00 20,0.0
Sample # <u>38A</u> Layer # 1	arav	concrete	2016-06402- 38 Cementitious no asbestos detected	Positive Layer? No
Sample # 39A	gray	concrete	2016-06402- 39 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # <u><b>40A</b></u> Layer # 1	gray	concrete	2016-06402- 40 Cementitious no asbestos detected	Positive Layer? No
Sample # <b>41A</b>	3 - 7		2016-06402- 41 Cementitious	Positive Layer? No
Layer # 1 Sample # <b>42A</b>	gray	concrete	no asbestos detected 2016-06402- 42 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	rositive Layer: No
Sample # 43A			2016-06402- 43 Cementitious	Positive Layer? No
Layer # 1 Sample # <b>44A</b>	gray	concrete	no asbestos detected 2016-06402- 44 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	. 00.0.00 20,000 110
Sample # <u>45A</u> Layer # 1	gray	concrete	2016-06402- 45 Cementitious no asbestos detected	Positive Layer? No
Sample # 46A	9.47	001101 010	2016-06402- 46 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Desitive Laver? No
Sample # <u>47A</u> Layer # 1	gray	concrete	2016-06402- 47 Cementitious no asbestos detected	Positive Layer? No
Sample # 48A			2016-06402- 48 Cementitious	Positive Layer? No
Layer # 1 Sample # <b>49A</b>	gray	concrete	no asbestos detected 2016-06402- 49 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	rositive Layer: 140
Sample # <b>50A</b>			2016-06402- 50 Cementitious	Positive Layer? No
Sample # 51A	gray	concrete	no asbestos detected 2016-06402- 51 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	•
Sample # <u><b>52A</b></u> Layer # 1	gray	block	2016-06402- 52 Miscellaneous no asbestos detected	Positive Layer? No
Layer # 2	gray	mortar	no asbestos detected	
Sample # <b>53A</b>			2016-06402- 53 Miscellaneous	Positive Layer? No
Layer # 1 Layer # 2	gray gray	block mortar	no asbestos detected no asbestos detected	
Sample # <b>54A</b>	<i>3</i> ,		2016-06402- 54 Miscellaneous	Positive Layer? No
Layer # 1 Layer # 2	gray gray	block mortar	no asbestos detected no asbestos detected	
Sample # <b>55A</b>	giuy	mortar	2016-06402- 55 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Decitive Lavara Ma
Sample # <u><b>56A</b></u> Layer # 1	gray	concrete	2016-06402- 56 Cementitious no asbestos detected	Positive Layer? No
Sample # <u><b>57A</b></u>			2016-06402- 57 Cementitious	Positive Layer? No
Layer # 1 Sample # <b>58A</b>	gray	concrete	no asbestos detected 2016-06402- 58 Miscellaneous	Positive Layer? No
Layer # 1	gray	block	no asbestos detected	. John Ve Layer: NO
Layer # 2	gray	mortar	no asbestos detected	Decitive Lavara Ma
Sample # <b>59A</b> Layer # 1	gray	block	2016-06402- 59 Miscellaneous no asbestos detected	Positive Layer? No
Layer # 2	gray	mortar	no asbestos detected	

Sample # 60A			2016-06402- 60 Miscellaneous	Positive Layer? No
Layer # 1	gray	block	no asbestos detected	
Layer # 2 Sample # <b>61A</b>	gray	mortar	no asbestos detected 2016-06402- 61 Miscellaneous	Positive Layer? No
Layer # 1	gray	block	no asbestos detected	
Layer # 2	gray	mortar	no asbestos detected	D 1 2 N
Sample # <u><b>62A</b></u> Layer # 1	gray	concrete	2016-06402- 62 Cementitious  no asbestos detected	Positive Layer? No
Sample # <b>63A</b>	gray	concrete	2016-06402- 63 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	•
Sample # <u>64A</u>	G#51/	aanawata	2016-06402- 64 Cementitious no asbestos detected	Positive Layer? No
Layer # 1 Sample # <b>65A</b>	gray	concrete	2016-06402- 65 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # <u><b>66A</b></u>			2016-06402- 66 Cementitious	Positive Layer? No
Layer # 1 Sample # <b>67A</b>	gray	concrete	no asbestos detected 2016-06402- 67 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # 68A			2016-06402- 68	Positive Layer? No
Layer # 1 Sample # <b>69A</b>	gray	concrete	no asbestos detected 2016-06402- 69 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	rositive Edyer: 140
Sample # <b>70A</b>			2016-06402- 70 Cementitious	Positive Layer? No
Layer # 1 Sample # <b>71A</b>	gray	concrete	no asbestos detected 2016-06402- 71 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	rositive Layer: No
Sample # <b>72A</b>			2016-06402- 72 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Docitivo Lavora No
Sample # <b>73A</b> Layer # 1	gray	concrete	2016-06402- 73 Cementitious no asbestos detected	Positive Layer? No
Sample # <b>74A</b>	<i>3</i> ,		2016-06402- 74 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Desirius Laure 2. Na
Sample # <u><b>75A</b></u> Layer # 1	gray	concrete	2016-06402- 75 Cementitious no asbestos detected	Positive Layer? No
Sample # <b>76A</b>	5 - 7		2016-06402- 76 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Desirius Laure 2. Na
Sample # <u><b>77A</b></u> Layer # 1	gray	concrete	2016-06402- 77 Cementitious no asbestos detected	Positive Layer? No
Sample # <b>78A</b>	5 - 7		2016-06402- 78 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Danition Lauraya Na
Sample # <b>79A</b> Layer # 1	gray	concrete	2016-06402- 79 Cementitious  no asbestos detected	Positive Layer? No
Sample # 80A	5 - 7		2016-06402- 80 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Danition Lauraya Na
Sample # <b>81A</b> Layer # 1	gray	concrete	2016-06402- 81 Cementitious no asbestos detected	Positive Layer? No
Sample # <b>82A</b>	5 7		2016-06402- 82	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	D 1 2 N
Sample # <b>83A</b> Layer # 1	gray	concrete	2016-06402- 83 Cementitious no asbestos detected	Positive Layer? No
Sample # <b>84A</b>	9.47	201101 222	2016-06402- 84	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Desirius Laure 2. Na
Sample # <b>85A</b> Layer # 1	gray	concrete	2016-06402- 85 Cementitious no asbestos detected	Positive Layer? No
Sample # <b>86A</b>	J· = 1		2016-06402- 86 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	D 1 2 N
Sample # <b>87A</b> Layer # 1	gray	concrete	2016-06402- 87 Cementitious  no asbestos detected	Positive Layer? No
Sample # <b>88A</b>	gruy	concrete	2016-06402- 88	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # <b>89A</b> Layer # 1	gray	concrete	2016-06402- 89 Cementitious no asbestos detected	Positive Layer? No
Sample # <b>90A</b>	g. ~,		2016-06402- 90 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	<b>.</b>
Sample # <b>91A</b> Layer # 1	gray	concrete	2016-06402- 91 Cementitious no asbestos detected	Positive Layer? No
Sample # <b>92A</b>	5.~1	300.000	2016-06402- 92 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	•
Sample # <b>93A</b> Layer # 1	gray	concrete	2016-06402- 93 Cementitious no asbestos detected	Positive Layer? No
Sample # <b>94A</b>	g. ~,		2016-06402- 94 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	•
Sample # <b>95A</b> Layer # 1	gray	concrete	2016-06402- 95 Cementitious no asbestos detected	Positive Layer? No
20,0 1	J1			

Sample # <b>96A</b>			2016-06402- 96 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # <u><b>97A</b></u>			2016-06402- 97 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # 98A			2016-06402- 98         Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # <b>99A</b>			2016-06402- 99	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # <b>100A</b>			2016-06402- 100 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # <b>101A</b>			2016-06402- 101 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # <b>102A</b>			2016-06402- 102 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # <b>103A</b>			2016-06402- 103 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	•
Sample # <b>104A</b>			2016-06402- 104 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	•
Sample # <b>105A</b>	<i>3</i> ,		2016-06402- 105 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # <b>106A</b>	5 - 7		2016-06402- 106 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	. 05.6.70 20,0.1 110
Sample # <b>107A</b>	57		2016-06402- 107 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	rositive Layer. 140
Sample # <b>108A</b>	9.47	201121212	2016-06402- 108     Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	Tositive Layer: No
Sample # <b>109A</b>	gruy	concrete	2016-06402- 109 Miscellaneous	Positive Layer? No
Layer # 1	yellow	paint	no asbestos detected	rositive Layer: No
Layer # 2	gray	concrete	no asbestos detected	
Sample # <b>110A</b>	gray	concrete	2016-06402- 110 Miscellaneous	Positive Layer? No
	velleur	nnint		Positive Layer? No
Layer # 1	yellow	paint	no asbestos detected	
Layer # 2	gray	concrete	no asbestos detected	Desitive Lever2 No
Sample # <b>111A</b>			2016-06402- 111 Miscellaneous	Positive Layer? No
Layer # 1	yellow	paint	no asbestos detected	
Layer # 2	gray	concrete	no asbestos detected	
Sample # <b>112A</b>			2016-06402- 112 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # <b>113A</b>			2016-06402- 113 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
Sample # <b>114A</b>			2016-06402- 114 Cementitious	Positive Layer? No
Layer # 1	gray	concrete	no asbestos detected	
	•			

<sup>\*</sup> Apparent Sample Types and Apparent Layer Types are as they appeared to the analyst. Since many types of materials appear similar after sampling damage, the apparent type of material may not be the actual type of material.

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Job Number:

201606402

MCDOT-TT345-75th-97th Ave MC85

Sample 1A

**Lab Number** 2016-06402- 1

Sampled: 6/22/2016

Condition: acceptable

Analyzed By MCJ Homogeneous No

# Layers 2

6/28/2016

Apparent Smp Type Miscellaneous Pos Layer? No

Non-fibrous Solid # Sub-Samples 6

Non-Fibrous Components (in approx. decreasing order): powder, rock,

L	ayers				Percents of Each Fiber							
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6		
1	paint, textured	65	off-white	1	n.d.	-	-	-	-	-		
2	asphalt	35	black	1	n.d.	-	-	-	-	-		
	Total %	100		Overall %	n.d.	-	-	-	-	-		

none

Fiber Identification:

An? OK

									R	efractive I			
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

Sample 2A Analyzed By MCJ

6/28/2016

**Lab Number** 2016-06402- 2

Sampled: 6/22/2016

Condition: acceptable

Homogeneous No

An? OK # Layers 2

Apparent Smp Type Miscellaneous Pos Layer? No

Non-fibrous Solid # Sub-Samples 6

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	ayers				Percents of Each Fiber						
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6	
1	paint, textured	75	off-white	1	n.d.	-	-	-	-	-	
2	asphalt	25	black	1	n.d.	-	-	-	-	-	
	Total %	100	]	Overall %	n.d.	-	-	-	-	-	

Fiber Identification:

_	<del></del>		=	-	=		_		R	efractive I	ndex Dete	mination	ıs
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

**Lab Number** 2016-06402-3

none

Sampled: 6/22/2016

Condition: acceptable

Analyzed By MCJ

6/28/2016

An? OK

Apparent Smp Type Miscellaneous

Non-fibrous Solid

Homogeneous No

# Layers 2

Pos Layer? No

# Sub-Samples 6

Non-Fibrous Components (in approx. decreasing order): powder, rock,

Layers Layer Type Color Friability paint, textured 75 off-white asphalt 25 black Total % 100 Overall %

	Percents of Each Fiber											
Fib 1	Fib 2	Fib 4	Fib 5	Fib 6								
n.d.	-	-	-	-	-							
n.d.	-	-	-	-	-							
n.d.	-	-	-	-	-							

Fiber Identification:

none

								Refractive Index Determinations					
	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per	
none													

Fibers

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

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201606402

MCDOT-TT345-75th-97th Ave MC85

Sample 4A Lab Number 2016-06402-4 **Sampled:** 6/22/2016 Condition: acceptable

6/28/2016 Non-fibrous Solid Analyzed By MCJ An? OK Apparent Smp Type Miscellaneous

none

Pos Layer? No  $\textbf{Non-Fibrous Components (in approx. decreasing order):} \quad \text{powder, rock,}$ 

# Layers 2

	Layers			
#	Layer Type	%	Color	Friability
1	paint, textured	85	yellow	1
2	asphalt	15	black	1
	Total %	100	]	Overall %

Percents of Each Fiber										
	Fib 1	Fib 5	Fib 6							
	n.d.	-	-	-	-	-				
	n.d.	-	-	-	-	-				
	n.d.	-		-	-	-				

# Sub-Samples 6

Fiber Identification:

1									R		ndex Dete		
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													i

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

Sample 5A Lab Number 2016-06402-5 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Miscellaneous Non-fibrous Solid

Homogeneous No # Layers 2 Pos Layer? No # Sub-Samples 6

Non-Fibrous Components (in approx. decreasing order): powder, rock,

Lä	ayers						Percents of	Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	paint, textured	85	yellow	1	n.d.	-	-	-	-	-
2	asphalt	15	black	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification: none

									R	efractive I			
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

Sample 6A **Lab Number** 2016-06402- 6 **Sampled:** 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Miscellaneous Non-fibrous Solid

Homogeneous No # Layers 2 Pos Layer? No # Sub-Samples 6

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	ayers						Percents of	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	paint, textured	95	yellow	1	n.d.	-	-	-	-	-
2	asphalt	5	black	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification:	none			
-----------------------	------	--	--	--

						R	efractive I	ndex Detei	mination	IS			
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 7A Lab Number 2016-06402-7 **Sampled:** 6/22/2016 Condition: acceptable Apparent Smp Type Adhesive/caulk Analyzed By MCJ 6/28/2016 An? OK Non-fibrous Solid # Sub-Samples 3 Homogeneous Yes # Layers 1 Pos Layer? No Non-Fibrous Components (in approx. decreasing order): filler, polymer, Layers Percents of Each Fiber Friability Fib 3 Fib 5 **Layer Type** % Color Fib 1 Fib 2 Fib 4 Fib 6 mastic 100 black n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using solvent. Lab Number 2016-06402-8 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Adhesive/caulk Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): filler, polymer, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 100 mastic black n.d 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using solvent. Sample 9A Lab Number 2016-06402-9 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Adhesive/caulk Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): filler, polymer, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 mastic 100 black n.d 100 Overall % Total % n.d. Fiber Identification: none

										enactive 1				
	Fibers		Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1		none												
2														
3														
4														
5														
6														

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using solvent.

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					K	erractive 1	naex Deter	minatior	IS				
<u> </u>	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Sample 12A Lab Number 2016-06402-12 Sampled: 6/22/2016

Analyzed By MCJ Non-fibrous Solid 6/28/2016 An? OK Apparent Smp Type Cementitious

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

Lay	yers						Percents of	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-
			Fiber I	dentification:	none					

Condition: acceptable

									R		ndex Deter		
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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				R	efractive I	ndex Detei	rminatior	าร				
Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
none												
	none	Color	сою міріі	Color Miph 150	Color Pripri 150 Free	Color Might 150 Pied Bi	Color Miph Iso Pieo Bi Eig	Color Miph Iso Flee Bi Eig Ext	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per	COIOI PII ISO PIEO BI EIG EXT OII COI PAI COI PEI RI PAI

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 16A Lab Number 2016-06402-16 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2016-06402-17 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Oil Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 18A Lab Number 2016-06402- 18 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. Fiber Identification: none

<del></del>				R	efractive I	ndex Detei	mination	15				
Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
none												
	none	Color	Color Miph	Color Miph 150	Color Pripri 150 Free	Color Pripri 150 Pred Bi	Color Might 150 Pied Bi Eig	Color Miph 150 Fied Bi Eig Ext	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per	COLO MIDI ISO PIEO BI EIG EXT OII COI PAI COI PEI KI PAI

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 19A Lab Number 2016-06402- 19 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2016-06402- 20 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Oil Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 21A Lab Number 2016-06402-21 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. none Fiber Identification:

										Refractive Index Determinations						
Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per				
none																
	none	Color	Color Miph	Color Miph 150	Color Pripri 150 Free	Color Pripri 150 Pred Bi	Color Miph Iso Pieo Bi Eig	Color Miph Iso Flee Bi Eig Ext	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per RI Par				

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 22A Lab Number 2016-06402-22 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 3 Fib 5 % Color Fib 1 Fib 2 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. **Lab Number** 2016-06402-23 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Elg Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 24A Lab Number 2016-06402- 24 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. Fiber Identification: none

											Refractive Index Determinations							
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per					
1	none																	
2																		
3																		
4																		
5																		
6																		
													L					

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 25A Lab Number 2016-06402- 25 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. **Lab Number** 2016-06402- 26 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 27A Lab Number 2016-06402-27 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. none Fiber Identification:

										Refractive Index Determinations						
Щ	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per			
1	none															
2																
3																
4																
5																
6																

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 28A Lab Number 2016-06402-28 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2016-06402- 29 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Oil Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 30A Lab Number 2016-06402-30 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. Fiber Identification: none

			Refractive Index Determinations										
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													
					•	•				•	•		

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 31A Lab Number 2016-06402-31 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. **Lab Number** 2016-06402- 32 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 33A Lab Number 2016-06402-33 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. Fiber Identification: none

				R	efractive I	ndex Dete	mination	15				
Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
none												
	none	Color	сою міріі	Coloi Mipii 150	Color Pripri 150 Pred	Color Might 150 Pied Bi	Color Miph Iso Pieo Bi Eig	Color Pripri 1so Pieo Bi Eig Ext	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per	Color Miphi 150 Pieo Bi Eig Ext On Col Pai Col Pei RI Pai

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 34A Lab Number 2016-06402-34 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2016-06402-35 Sampled: 6/22/2016 Condition: Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 100 concrete n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Oil Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 36A Lab Number 2016-06402-36 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d

100 Overall % Total % n.d.

none Fiber Identification:

					K		ndex Detei						
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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				R	efractive I	ndex Dete	rminatior	ns					
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 40A Lab Number 2016-06402-40 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2016-06402-41 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 100 concrete n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 42A Lab Number 2016-06402-42 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ Non-fibrous Solid 6/28/2016 An? OK Apparent Smp Type Cementitious Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layer Type % Color Friability

# Layer Type % Color Friability Fib 1

1 concrete 100 gray 1 n.d.

Total % 100 Overall % n.d.

		Percents of	FEach Fiber		
Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
n.d.	-	-	-	-	-
n.d.	-	-	-	-	-

									R	efractive I	ndex Detei	rminatior	ıs
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Fiber Identification:

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Sample 43A Lab Number 2016-06402-43 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	ayers						Percents of	Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification:

		re											
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Sample 44A Lab Number 2016-06402- 44 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid

none

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

L	ayers						Percents o	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification: none

_	<del></del>				R	efractive I	ndex Deter	mination	IS				
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3	]												ı
4													
5	]												
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Sample 45A Lab Number 2016-06402- 45 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid

none

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	ayers						Percents of	F Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification:

	<del></del>								R	efractive I			
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 46A Lab Number 2016-06402-46 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2016-06402-47 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 48A Lab Number 2016-06402-48 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. Fiber Identification: none

				R	efractive I	ndex Dete	mination	15				
Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
none												
	none	Color	сою міріі	Coloi Mipii 150	Color Pripri 150 Free	Color Might 150 Pied Bi	Color Miph Iso Pieo Bi Eig	Color Pripri 1so Pieo Bi Eig Ext	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per	Color Miphi 150 Pieo Bi Eig Ext On Col Pai Col Pei RI Pai

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 49A Lab Number 2016-06402-49 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 3 Fib 5 % Color Fib 1 Fib 2 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. **Lab Number** 2016-06402-50 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 51A **Lab Number** 2016-06402-51 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d

Fiber Identification: none

**Refractive Index Determinations** Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Elg Ext none 2 3 4 5 6

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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MCDOT-TT345-75th-97th Ave MC85

Sample 52A Lab Number 2016-06402- 52 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Miscellaneous Non-fibrous Solid

none

Homogeneous No # Layers 2 Pos Layer? No # Sub-Samples 6

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	ayers						Percents o	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	block	85	gray	1	n.d.	-	-	-	-	-
2	mortar	15	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification:

									R	efractive I	ndex Dete	mination	15
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

Sample 53A Lab Number 2016-06402-53 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Miscellaneous Non-fibrous Solid

Homogeneous No #Layers 2 Pos Layer? No #Sub-Samples 6

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	yers						Percents of	FEach Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	block	85	gray	1	n.d.	-	-	-	-	-
2	mortar	15	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification: none

		Eihara							Refractive Index Determinations					
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per	
1	none													
2														
3														
4														
5														
6														

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

Sample 54A Lab Number 2016-06402- 54 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Miscellaneous Non-fibrous Solid

none

Homogeneous No # Layers 2 Pos Layer? No # Sub-Samples 6

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	yers						Percents of	Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	block	85	gray	1	n.d.	-	-	-	-	-
2	mortar	15	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification:

		1								R	efractive I	ndex Deter	mination	ıs
	Fibers		Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1		none												
2														
3														
4														
5														
6														

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 55A Lab Number 2016-06402-55 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. **Lab Number** 2016-06402- 56 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Oil Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 57A Lab Number 2016-06402-57 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. none Fiber Identification:

									Refractive Index Determinations				
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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MCDOT-TT345-75th-97th Ave MC85

Sample 58A Lab Number 2016-06402- 58 Sampled: 6/22/2016 Condition: acceptable

Analyzed ByMCJ6/28/2016An? OKApparent Smp TypeMiscellaneousNon-fibrous SolidHomogeneousNo# Layers2Pos Layer? No# Sub-Samples 6

none

Non-Fibrous Components (in approx. decreasing order): powder, rock,

	ayers			
#	Layer Type	%	Color	Friability
1	block	75	gray	1
2	mortar	25	gray	1
	Total %	100	]	Overall %

		Percents of	Each Fiber		
Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
n.d.	-	-	-	-	-
n.d.	-	-	-	-	-
n.d.	-	-	-	-	-

Fiber Identification:

									R	efractive I			
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

Sample 59A Lab Number 2016-06402-59 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Miscellaneous Non-fibrous Solid

Homogeneous No #Layers 2 Pos Layer? No #Sub-Samples 6

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	yers			[			Percents o	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	block	75	gray	1	n.d.	-	-	-	-	-
2	mortar	25	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	_	_	-	_	_

Fiber Identification: none

		Eihara							Refractive Index Determinations					
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per	
1	none													
2														
3														
4														
5														
6														

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

Sample 60A Lab Number 2016-06402- 60 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Miscellaneous Non-fibrous Solid

none

Homogeneous No # Layers 2 Pos Layer? No # Sub-Samples 6

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	yers						Percents of	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	block	75	gray	1	n.d.	-	-	-	-	-
2	mortar	25	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification:

									R	efractive I	ndex Dete	rminatior	ıs
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													ı

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

Homogeneous No

Job Number:

201606402

MCDOT-TT345-75th-97th Ave MC85

Sample 61A Lab Number 2016-06402-61 **Sampled:** 6/22/2016 Condition: acceptable

6/28/2016 Non-fibrous Solid Analyzed By MCJ An? OK Apparent Smp Type Miscellaneous # Layers 2

none

Pos Layer? No Non-Fibrous Components (in approx. decreasing order): powder, rock,

L	ayers			
#	Layer Type	%	Color	Friability
1	block	75	gray	1
2	mortar	25	gray	1
	Total %	100		Overall %

		Percents of	FEach Fiber		
Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
n.d.	-	-	-	-	-
n.d.	-	-	-	-	-
n.d.	-	-	-	-	-

# Sub-Samples 6

Fiber Identification:

								R	efractive I	ndex Deter	mination	ıs
Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
none												
	none	Color	Color Miph	Color Pripri 150	Color Miph 150 Pred	Coloi Mipii 150 Pieo Bi	Color Pripri 150 Pieo Bi Erg	Color Pripri Iso Pred Bi Erg Ext	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per RI Par

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

Sample 62A Lab Number 2016-06402-62 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	yers						Percents of	Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification: none

		urs .											ıs
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Sample 63A **Lab Number** 2016-06402-63 Condition: acceptable **Sampled:** 6/22/2016

Non-fibrous Solid Analyzed By MCJ 6/28/2016 An? OK **Apparent Smp Type** Cementitious

none

# Layers 1 # Sub-Samples 3 Homogeneous Yes Pos Layer? No

Non-Fibrous Components (in approx. decreasing order): powder, rock,

L	ayers						Percents of	Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification:

_	<del></del>	are l											ıs
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 64A Lab Number 2016-06402-64 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2016-06402-65 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/28/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Elg Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 66A Lab Number 2016-06402-66 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. none Fiber Identification:

_										efractive I			
Щ.	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 67A Lab Number 2016-06402-67 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 3 Fib 5 % Color Fib 1 Fib 2 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2016-06402-68 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Elg Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 69A Lab Number 2016-06402-69 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. Fiber Identification: none

<del></del>								R				
Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
none												
	none	COIDI	Color Miph	Color Miph 150	Color Pripri 150 Free	Coloi Miphi Iso Pieo Bi	Color Pripri Iso Preo Bi Erg	Color Miph Iso Pieo Bi Eig Ext	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per	Coloi Mipii 150 Fied Bi Eig EAL Oil Col Fai Col Fei KI Fai

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 70A Lab Number 2016-06402-70 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2016-06402-71 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Oil Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 72A Lab Number 2016-06402-72 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. none Fiber Identification:

	<del></del>								R	efractive I	ndex Detei	rminatior	าร
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 73A Lab Number 2016-06402-73 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2016-06402-74 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 75A Lab Number 2016-06402-75 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. none Fiber Identification:

								R	efractive I	ndex Detei	rminatior	าร
Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
none												
	none	Color	сою міріі	Color Miph 150	Color Pripri 150 Free	Color Might 150 Pied Bi	Color Miph Iso Pieo Bi Eig	Color Miph Iso Flee Bi Eig Ext	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per	COIOI PII ISO PIEO BI EIG EXT OII COI PAI COI PEI RI PAI

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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MCDOT-TT345-75th-97th Ave MC85

Sample 76A Lab Number 2016-06402- 76 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid

none

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

L	ayers						Percents of	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification:

	<del></del>								R	efractive I	ndex Dete	rminatior	ıs
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

**Sample Analytical Note** 

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Sample 77A Lab Number 2016-06402-77 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid

none

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

Lay	yers						Percents of	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification:

	<del></del>								R	efractive I	ndex Detei	mination	15
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

 Sample
 78A
 Lab Number
 2016-06402-78
 Sampled:
 6/22/2016
 Condition: acceptable

Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid

none

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

L	ayers						Percents of	Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification:

	<del></del>								Refractive Index Determinations					
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per	
1	none													
2														
3														
4														
5														
6														

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 79A Lab Number 2016-06402-79 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2016-06402-80 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Oil Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 81A Lab Number 2016-06402-81 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. none Fiber Identification:

	<del></del>								R	efractive I	ndex Detei	rminatior	าร
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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MCDOT-TT345-75th-97th Ave MC85

Sample 82A Lab Number 2016-06402- 82 Sampled: 6/22/2016 Condition: acceptable
Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid
Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

L	ayers						Percents of	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification	1:
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	<del></del>								R	efractive I	ndex Deter	mination	iS
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Sample 83A Lab Number 2016-06402-83 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid

none

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

L	ayers						Percents o	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification: none

	<del></del>								R	efractive I	ndex Detei	mination	15
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Sample 84A Lab Number 2016-06402- 84 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid

cellulose fiber

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

L	Layers			[			Percents of	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	2-5%	-	-	-	-	-
	Total %	100		Overall %	2-5%	-	-	-	-	-

Fiber Identification:

									R	efractive I	ndex Detei	mination	15
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	cellulose fiber	W	F	N	N	Н	+	U					
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Sample 85A Lab Number 2016-06402-85 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 3 Fib 5 % Color Fib 1 Fib 2 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2016-06402-86 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Elg Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 87A Lab Number 2016-06402-87 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. Fiber Identification: none

												nuex Deter		
	Fibers		Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1		none												
2														
3														
4														
5														
6														
				•		•	•					•	•	

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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									К	etractive 1			
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													
		•					•						

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 91A Lab Number 2016-06402-91 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 3 Fib 5 % Color Fib 1 Fib 2 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. **Lab Number** 2016-06402- 92 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Elg Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 93A Lab Number 2016-06402-93 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. Fiber Identification: none

<del></del>								R				
Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
none												
	none	COIDI	Color Miph	Color Miph 150	Color Pripri 150 Free	Coloi Miphi Iso Pieo Bi	Color Pripri Iso Preo Bi Erg	Color Miph Iso Pieo Bi Eig Ext	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par	Fibers Color Mrph Iso Pleo Bi Elg Ext Oil Col Par Col Per	Coloi Mipii 150 Fied Bi Eig EAL Oil Col Fai Col Fei KI Fai

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Sample 94A Lab Number 2016-06402-94 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 3 Fib 5 % Color Fib 1 Fib 2 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. **Lab Number** 2016-06402- 95 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 96A Lab Number 2016-06402-96 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d Fiber Identification: none **Refractive Index Determinations** Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Elg Ext none 2 3 4

Sample Analytical Note

5 6

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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Page 37 of 44 Fiberquant, Inc. PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 97A Lab Number 2016-06402-97 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 2 Fib 3 Fib 5 % Color Fib 1 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext Oil none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2016-06402- 98 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Oil Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 99A Lab Number 2016-06402-99 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. Fiber Identification: none

										erractive 1			
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													
					•	•				•	•		

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 100A Lab Number 2016-06402- 100 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 5 % Color Fib 1 Fib 2 Fib 3 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Iso Pleo Bi Ela Ext Oil Mrph none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 101A **Lab Number** 2016-06402- 101 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 102A **Lab Number** 2016-06402- 102 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. none Fiber Identification:

_										efractive I			
Щ.	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 103A Lab Number 2016-06402- 103 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 5 % Color Fib 1 Fib 2 Fib 3 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Iso Pleo Bi Ela Ext Oil Mrph none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 104A **Lab Number** 2016-06402- 104 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 105A Lab Number 2016-06402- 105 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. none Fiber Identification:

_										efractive I			
Щ.	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 106A Lab Number 2016-06402- 106 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 5 % Color Fib 1 Fib 2 Fib 3 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Iso Pleo Bi Ela Ext Mrph none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 107A **Lab Number** 2016-06402- 107 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Elg Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 108A Lab Number 2016-06402- 108 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. Fiber Identification: none **Refractive Index Determinations** 

	Fibers		Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RT Par	RT Per
=	1			in pii	100			9		<u> </u>	corrai	001101	IX. I G.	112 1 01
		none												
2														
3														
4														
5														
6														

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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201606402

MCDOT-TT345-75th-97th Ave MC85

Sample 109A Lab Number 2016-06402- 109 Sampled: 6/22/2016 Condition: acceptable

Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Miscellaneous Non-fibrous Solid

none

Homogeneous No # Layers 2 Pos Layer? No # Sub-Samples 6

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	yers						Percents of	Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	paint	5	yellow	1	n.d.	-	-	-	-	-
2	concrete	95	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification:

	<del></del>								R	efractive I	ndex Dete	rmination	าร
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													į.
3													į.
4													į.
5													į.
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

 Sample
 110A
 Lab Number
 2016-06402- 110
 Sampled: 6/22/2016
 6/22/2016
 Condition: acceptable

Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Miscellaneous Non-fibrous Solid

Homogeneous No #Layers 2 Pos Layer? No #Sub-Samples 6

Non-Fibrous Components (in approx. decreasing order): powder, rock,

Li	ayers						Percents o	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	paint	5	yellow	1	n.d.	-	-	-	-	-
2	concrete	95	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification: none

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	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

none

 Sample
 111A
 Lab Number
 2016-06402-111
 Sampled: 6/22/2016
 6/22/2016
 Condition: acceptable

Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Miscellaneous Non-fibrous Solid

Homogeneous No # Layers 2 Pos Layer? No # Sub-Samples 6

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	ayers						Percents o	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	paint	5	yellow	1	n.d.	-	-	-	-	-
2	concrete	95	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification:

		1								R	efractive I	ndex Deter	mination	15
	Fibers	ļ ļ	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
		none												
_														

Sample Analytical Note

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Procedure: tweased apart using forceps. Procedure: dissolution of cementitious components using acid.

PLM Analysis Details Job Number: 201606402 MCDOT-TT345-75th-97th Ave MC85 Sample 112A **Lab Number** 2016-06402- 112 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 3 Fib 5 % Color Fib 1 Fib 2 Fib 4 Fib 6 **Layer Type** concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Col Par Col Per RI Par RI Per Color Iso Pleo Bi Ela Ext Oil Mrph none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 113A **Lab Number** 2016-06402- 113 **Sampled:** 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d gray 1 Total % 100 Overall % n.d. Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Elg Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample 114A **Lab Number** 2016-06402- 114 Sampled: 6/22/2016 Condition: acceptable Analyzed By MCJ 6/29/2016 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, **Percents of Each Fiber** Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d 100 Overall % Total % n.d. Fiber Identification: none

									R	efractive I			
<u> </u>	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													
6													_

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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Fr=Friability: 1=very non-friable; 2= non-friable; 3=friable; 4=highly friable Colors: B=black; BL=blue; BR=brown; CL=clear; G=Green; GY=gray; OR=orange; OW=off-white; PN=pink; PU=purple; R=red; TN=tan; W=white; Y=yellow; V=various PN=pink; PU=purple; PN=pink; PN=Fiber Morphology: A=fine fibers/bundles, white, sinewy, flexible; B=fine fibers/bundles, w-br, straight, broomed ends; C=fine fibers/bundles, blue, straight, broomed ends; Define to coarse fibers, CL-B, brittle; E=coarse fibers, CL or dyed, striated; F=coarse fibers or splinters, W-BR, ribbon-like; G=lath-like or shards, low aspect ratio, may taper Iso=isotropism - may be yes or no; Pleo=pleochroism - may be yes or no; Bi=birefringence - may be None, Low, Medium or High Elg=sign of elongation - may be +, - or B (both); Ext=extinction - may be Parallel, Oblique, None or Undulating; Oil=medium used to for dispersion staining Col Par=dispersion staining colors parallel to the fiber (fiber/halo): b/w=black/white; dg/py=dark gray/pale yellow; vg/y=violet gray/yellow; db/ly=dark blue/lemon yellow; vb/g= vivid blue/gold; sb/o=sky blue/orange; pb/r=pale blue/red; gb/dr=gray blue/dark red; w/b=white/black. Col Perp=same only perpendicular to fiber.

Job Number:

MARK C. JEFFERSON

Printed: 29-Jun-16 Original Print Date: 29-Jun-16

Approved Accreditation Signatory

RI Par=refractive index parallel to fiber; RI Perp=refractive index perpendicular to fiber

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Fiberquant Analytical Services	5025 S. 33™ St.:	Asbestos	Analyze >		2 or Interim □ 2 or ATPF □	Urg. *	1 ( S	15-30 days
Phoenix, AZ 85040; Phone: 602-276-6139; FAX: 60		by PLM			or by Sample	⊲m /	*	7 0
info@fiberquant.com					Yes 🔲 or No 🔲		<b>'</b> \	
Analysis Request/Chain-of-Cu		Fibers	Method > 7400	(Area)	ORM (Personal)	<4 hr	24hr	<del>                                     </del>
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		Asbestos	in Water* >	Water	Studge 🔲	1-2d	3-54	N/A
city, State, Zip Code Phoenix, AZ 85004		by <b>TEM</b>	in Bulk (Annex	2) > Chatf	ield Full Quant	_	1 -	
Phone 602-506-2891 FAX			in Dust > V	acuum Du	st (ASTM D-5755)	3-5d	5-10d	N/A
Email mcabeem@mail.maricopa.ge	ov							
		}		Pb 🔲 Filter > 1	Other   MCE	<6 hrs	2-3 days	N/A
Invoice to (Company) MCDOT - Accounts P	avable	Db. b			by Area (mg/cm2)			
	<u> </u>	Pb by FLAA	Matrix >		y Weight (ppm)			
Address 2222 S. 27 <sup>th</sup> Avenue c/o T	eny Enwanger		_	ioil >				
City, State, Zip Code Phoenix, AZ 85009				Vipe > rtifving win	es used are ASTM			
Phone 602-506-8645 FAX			E1792 complia	nt 🗆				
1100 002 000 00 10 17A		ļ	Air Sample >	+	Aller Oth O	<6 hrs		N/A
Contact (print) Chris McAbee		Fungi	Bulk >	Sample	Swab C	_	days	
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Sampled by (signature)	- MC 85	5			Optical	<6 hrs		s N/A
Joby Hamber of Project Name TT345 - 7	5-16 -17 1 A.	Soot	ASTM D6602-0		Optical & TEM	1-2 days	3-5day	s N/A
	-	Other					<del>                                     </del>	<del> </del>
PO Number Hugh Davids	2n	Other				Call	Call	
Sample # (1 per line)	escription/Location		Sample	Date	Sample Tin	ne V	ol. or Ar	ea
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2) 2A /	J. J	1	1					
3) 3A		7						
	Roading Parks	t - MC85		1				
5) EA 1	,	1					·	
6) <b>L</b> A	1							
	eam Mustic	-MC85		1				
8) <b>S</b> A	1			1		$\neg \vdash$		
9) aA J				1				
	Cuch - (R1-R	28 N				_		
11) [[A	6. Her			T			<del></del>	
12) 12A		_						
	Ditch Lyning	1(83)5		1				
14) 414	1							
15) 15A	1 1			$\mathbb{L}^{-}$				
16) 6A Concrete	Headwall (	(R3) 5						
17) 17A I					<u> </u>			
18) 18A J	7	_						
19)								
2ρλ								
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2) Received by Charles Bate 74	10 1-00	4)Received by:	Eleanus = 4		Date:	Time		4
* TEM/Water: Sanipler's name Required by State of Arizona Print Name	DIB		Fiberquant Job	Number:	20160	264	02	-

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Review of Analysis Request (Initials):

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ANALYTICAL SERVICES			·			Ru		Nom	Ex
Fiberquant Analytical Services 5025 S. 33rd St.; Phoenix, AZ 85040; Phone: 602-276-6139; FAX: 602-276-4558; info@iberquant.com	(	Asbestos by PLM		Al n > by Laye	or Interim  or ATPF  or ATPF  or Sample  Yes  or No	Urg. Rush ⊲hrs	X	(3 qg/s	) 15.4 day
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Cây, State, Zip Code Phoenix, AZ 85004		Asbestos by <b>TEM</b>	in Water*>		er 🔲 Sludge 🗆	1:2		350	N/
Phone 602-506-2891 FAX			<u>.</u>		tfield Full Quant	2.5		5-10d	N/A
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Invoice to (Company) MCDOT - Accounts Payable  Address 2222 S. 27 <sup>th</sup> Avenue c/o Terry Ellwanger		Pb by FLAA	Matrix >	Filter > Paint > Soil >	MCE D by Area (mg/cm2) D by Weight (ppm) D		) 	days	
City, State, Zip Code Phoenix, AZ 85009  Phone 602-506-8645 FAX			E1792 comp	Wipe > certifying with the certifying with the certifying with the certified with the cer	pes used are ASTM				
Contact (print) Chris McAbee		Fungi	Air Sample : Bulk > Tape Lift >	Sample Qualita	Aller   Oth	<b>6</b> h		days	N/A
Sampted by (signature) MC	85				Optical	<6h		1-2 days	N/A
John Merger Police Name TT345 - 751h 1977 1	Aug	Soot	ASTM D660	2-038	Optical & TEM	1-2 da		3-5days	N/A
PO Number Hugh Davidson		Other				Cal	1	Call	
Sample # (1 per line) Description/Location	<u> </u>		- Comp	e Date	Comple Tir		1/-1	. 8	
1) 19A Concrete Ditch Line		24-8) (	<u> </u>	-22-	<u>'</u>	ne	VOI.	or Are	<b>a</b>
2) 20#	<del>My Cr</del>	(1-0/)	6.	<u>- کمیکر- ا</u>	<u>6</u>	+			$\dashv$
3) 2(A	}			+					$\dashv$
	adwal	V(RH)	·	<del>                                     </del>		$\dashv$			$\dashv$
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6) 244	$\exists$			+		+			┪
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8) 26A	~	د		1					$\dashv$
9) 27A J				1					$\exists$
10) 28A Concrete Prain Pipe #	=21	R3)5		<b> </b>	1				$\exists$
11) 294				1					
12) 30 A				7	1				٦
13) 314 Concrete Ditch Patch	7R4	) s	-	Π				-	٦
14) 32A		•							7
15) 33 A									7
16) 34A Consite Headwall	(R8)	١ ٢							٦
17) 35 R						$\neg  $	•		$\neg$
18) 36 A			7			$\neg$			7
19)									٦
20)									$\neg$
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Review of Analysis Request (Initials):

MC 85

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	ANALYTICAL SEI	RVICES	<u> </u>	I UNE P	EINUU	per COC	Rush		
info@fiberquant.com	602-276-6139; FAX: 602-276-4	•	Asbestos by PLM		All n > by Layer	or Interim  The results of the resul	Urg. Rush <3 hrs		ye 15- da
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Phone 602-506-289	1 FAX			in Bulk (Anı		eld Full Quant	251		
Email mcabeem@m				in Dust > Analyte >	Vacuum Dus	t (ASTM D-5755)  Other	3-5d	5-10d	l N/
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City, State, Zip Code Phoenix				Check here	Wipe > certifying wipo	ES USED ASTM			
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Contact (print) Chris McA	hee		Fungi	Bulk >	Sample			days	
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4) 40A	Concrete Add.	-On Portch	(R4-8)S	<del> </del>					-
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	info@fiberquant.com		-		ŕ	(	l by PLIT		r Protocol >		0	<b>/                                    </b>		
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ANALYTICAL SERVICES		ONL	T ONE M	FINUL	per COC	Ri	<u>(Cno</u> ush	ose one Norm	_
Fiberquant Analytical Services 5025 S. 33 <sup>-1</sup> St.; Phoenix, AZ 85040; Phone: 602-276-6139; FAX: 602-276-4558; info@fiberquant.com	(	Asbestos by PLM		Al n > by Laye	of Cr Interim     Or ATPF     or by Sample     Yes   or No	Urg. Rush <3 hrs	X		) 15-3 day
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City, State, Zp Code Phoenix, AZ 85004	i	Asbestos by <b>TEM</b>	in Water* >		er 🔲 Sludge 🗖		2d	3-56	N/A
Phone 602-506-2891 FAX	1	",	in Bulk (Ann	ex2) > Cha	tfield Full Quant	ļ		<u> </u>	<u> </u>
Email mcabeem@mail.maricopa.gov			in Dust >	Vacuum D	ust (ASTM D-5755)		5d ] hrs	5-10d 2-3	N/A N/A
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Review of Analysis Request (Initials):

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Phoenix, AZ 85040; Phone: 602-276-6139; FAX: 602-276-4558; info@fiberquant.com	- (	by PLM			r 🔲 or by Sample 🗀	⊲hrs	煮		0
Analysis Request/Chain-of-Custody Form			Single Laye	r Protocol >	Yes 🔲 or No 🗀	<u> </u>	. "		
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City, State, Zip Code Phoenix, AZ 85004	Ì	Asbestos by <b>TEM</b>				[	]		İ
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Required by State of Arizona  Print Name				nt assigne Number:					

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Review of Analysis Request (Initials):

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Phoenix, AZ 85040; Phone: 602-276-6139; FAX: 602-276-4558; info@fiberguant.com	by PLM	If ATPF then > by Lay	er 🔲 or by Sample 🔲	ons A		<b>ሃ</b> ፣
Analysis Request/Chain-of-Custody Form		Single Layer Protocol	> Yes C or No C	<u> </u>		
Submitted by (Company) Maricopa County Risk Mngmt	Fibers by <b>PCM</b>	Method > 7400(Area)	ORM (Personal)	4 1	24hr	
Address 222 N. Central Ave #1110		in Air > AHERA	☐ Mod. AHERA ☐	- Epr	24 hr	3
City, State, Zip Code Phoenix, AZ 85004	Asbestos by <b>TEM</b>	in Water* > Wa	ter Studge 🗀	1.24	3-50	1
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Invoice to (Company) MCDOT - Accounts Payable		Filter >	MCE D by Area (mg/cm2)		days	1
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City, State, Zip Code Phoenix, AZ 85009		Wipe > Check here certifying v	vines used are ASTM	i		1
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Contact (print) Chris McAbee	Fungi		ative (%& type) or			
Sampled by (signature)	_	Quan	itative (type/cm2)	-		L
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Sample # (1 per line) Description/Location	···	Sample Date	Sample Tin	a Voi	. or Are	
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2)Received pr://// Date: 7 4/6 Time: 7.00 4)R	eceived by:		Date:	Time:		
* TEM Water Sampler's name Required by State of Adzona Print Name		Fiberquant assigne Job Number				
Periow of Analysis Peguest (Initials):		JOU NUMBER	Page of			



### Polarized Light Microscope (PLM) Analysis for Asbestos in Bulk Sample

JobNumber:

201302253

Client:

KLEINFELDER

1335 W AUTO DR

TEMPE, AZ 85284-0000 Office Phone: (480) 763-1200 FAX: (480) 763-1212

**# Samples:** 7 PLM **Rec:** 3/8/2013 **Method:** EPA 600/R-93/116 The "New" Method; see below

**Client Job:** 133021

PO Number:

Report Date: 3/12/2013 Date Analyzed: 3/11/2013 Routing Number: -

Method and Analysis Information: Fiberquant Internal SOP: PLMn

Each bulk sample is first dissected under a 7-30x magnification stereo-microscope. This examination is used to determine the general type of sample, how many and what type of layers it has, and initial estimates of fiber types and quantities. Second, liquid media mounts are made of each layer - such mounts may be of selected fibers (used solely for identification purposes) or may be representative of the layer as a whole (used for quantitation purposes). The mounts may be made in a synthetic Canadian balsam, one of several solvents, or in refractive index oils (media of known refractive index). Generally, a variety of different mounts are made: some optimized for fiber visibility, some optimized for fiber identification, and some optimized for fiber quantitation. The mounted slides are then examined at 50-400x magnification on a Nikon Labphot-pol microscope. Optical characteristics are used to identify each observed fiber type; the optical data are contained for each sample on its detail analysis sheet, attached.

Current EPA and NESHAP regulations designate a result of <=1 % asbestos as "negative" and >1 % asbestos as "positive". Samples containing layers that have been determined to be "positive" may have to be handled differently during a renovation or demolition than samples whose layers have been determined to be "negative."

The method of fiber identification and quantitation is the "Standard Operating Procedures for the Analysis of Asbestos in Bulk Samples using Polarized Light Microscopy", Chapter 7 of the Quality Assurance and Management Manual. This SOP and its associated reporting have been designed to satisfy all requirements in both EPA Method 600/M4-82-020 (The Interim Method) and EPA Method 600/R-93/116 (The New Method). The Interim Method is the required method for AHERA (US EPA 40 CFR Pt. 763), but this method calls for the reporting of composited results of multi-layered samples that is no longer an acceptable reporting practice in most circumstances. Current EPA rules, such as NESHAP (US EPA 40CFT Pt. 61), as well as NVLAP accreditation policies, call for separate reporting for each layer of multi-layered samples. The New Method contains the same procedures for identification and quantification of asbestos as does the Interim Method, except that multi-layered samples are reported to comply with the latest US EPA rule. Fiberquant not only reports the asbestos content of each layer of multi-layered samples separately (satisfying current EPA and NVLAP reporting requirements), but Fiberquant also reports what percentage of the sample each layer comprises. Therefore, the results may be arithmetically composited to satisfy the reporting requirements of the Interim Method. The method of fiber quantitation is an estimation technique in which the analysts quantitation is routinely calibrated by reference quantitation standards, and which has been shown to be equivalent in precision and accuracy to point counting. Friability is estimated for the purposes of deciding when to point count. Friabilities determined in the field take precedence over those determined in the laboratory. Those sample layers which are friable and estimated by the analyst to contain <= 1% asbestos are point counted using 400 points. Such point counting is required by NESHAP (National Emission Standards for Hazardous Air Polutants, Nov. 1990) in order to rely on analytical results that are <= 1%. The coefficient of variation for the estimation quantitation technique is 100% in the range 0-5%. This means that PLM analysis is not capable of conclusively determining whether a layer containing close to 1% asbestos is actually "positive" or "negative". For this reason, Fiberquant refers to results where asbestos was detected but <= 1% as "borderline negative", and results where asbestos was >1 % but <= 2% as "borderline positive" to indicate the uncertainty in assigning a "positive" or "negative" label. In the sample summary, "ND" means that no asbestos was detected during the analysis. A "Tr" or "Trace" of asbestos reported is defined for our purposes as the detection of several asbestos fibers during the analysis; this level would be right at the limit of detection for the method. Trace is only reported on the analysis detail - in the summary a trace would be reported as <=1%. The limit of detection (the smallest % of asbestos that can be detected) varies greatly depending on the matrix in which the asbestos is found. As little as 0.001% asbestos can be detected in favorable samples, while detection in unfavorable samples may approach the detection limit of 1% stated in the method. During the analysis, the analyst, for Fiberquant identification purposes only, determines the "apparent sample type" and "apparent layer types." It must be emphasized that these types are only what is apparent. Often, different materials appear similar or identical after sampling, so the analyst may assign a type other than what was sampled.

Floor tiles present a special problem for PLM asbestos analysis. Floor tile can contain chrysotile fibers so thin that they cannot be resolved by optical methods. In such a case, we may observe a percentage of asbestos which is lower than the actual percentage, or not observe asbestos at all when some is present. For this reason, floor tiles reported as negative should be confirmed to be negative using transmission electron microscope (TEM) analysis. Likewise, vermiculite insulation materials containing traces of asbestiform asbestos present a problem for routine PLM analysis - the amphiboles are sometimes present in trace amounts inhomogeneously distributed. For this reason, loose vermiculite samples reported as negative should be confirmed to contain no amphibole using hydroseparation techniques.

The samples were analyzed under the following ongoing quality assurance program: Blank samples are routinely analyzed to maintain contamination-free materials. Each analyst has at least a bachelor's degree in physical science, and has also completed extensive training specific to asbestos analysis for 1-3 months before being allowed to analyze client samples. Qualitative reference samples are routinely analyzed to assure that analysts can identify asbestos and asbestos-look-alike fibers. Quantitative reference samples are routinely analyzed to calibrate and characterize the

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estimation procedure. Microscope alignment is checked each day. Refractive index oils are calibrated at least quarterly. At least 10% of client samples are re-analyzed from scratch by a different analyst than the original, and any discrepancies are resolved for the sample and similar sample types before the results are reported. All quality checks performed for these samples were in control except as detailed in the "Analytical Notes" below. All analysts participate in interlab round robins and proficiency testing to assure competence. Fiberquant is accredited by NVLAP (Lab #101031) for the analysis of bulk samples for asbestos using PLM. Accreditation does not imply endorsement by the EPA, any other United States governmental agency or any private agency or association. Each lab analysis refers only to the sample tested, and may not, due to the sampling process, be representative of the material sampled. This report may not be reproduced except in full, without the approval of Fiberquant Analytical Services.

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Some results may have been calculated using client supplied data, such as volume or area sampled, for which Fiberquant assumes no liability for accuracy.

### **Job Analysis Notes:**

Note: Samples were in un-approved nor-resealable sample containers.

PLM Analysis Summary:	Job Number:	201302253
-----------------------	-------------	-----------

Samp	le Number		Lab Number		Apparent Sample Type *	Positive Layer Yes or No
Layer	Color	Apparent Layer T	ype *	Asbes	tos Results	
Sample # C1			2013-02253-	- 1	Cementitious	Positive Layer? No
Layer # 1	gray	concrete		no asbe	estos detected	
Sample # <u>C4</u>			2013-02253-	- 2	Cementitious	Positive Layer? No
Layer # 1	gray	concrete		no asbe	estos detected	
Sample # C8			2013-02253-	- 3	Cementitious	Positive Layer? No
Layer # 1	gray	concrete		no asbe	estos detected	
Sample # C9			2013-02253-	- 4	Cementitious	Positive Layer? No
Layer # 1	gray	concrete		no asbe	estos detected	
Sample # C10			2013-02253-	- 5	Cementitious	Positive Layer? No
Layer # 1	gray	concrete		no asbe	estos detected	
Sample # C16			2013-02253-	- 6	Cementitious	Positive Layer? No
Layer # 1	gray	concrete		no asbe	estos detected	
Sample # <b>C17</b>			2013-02253-	- 7	Cementitious	Positive Layer? No
Layer # 1	gray	concrete	ı	no asbe	estos detected	

<sup>\*</sup> Apparent Sample Types and Apparent Layer Types are as they appeared to the analyst. Since many types of materials appear similar after sampling damage, the apparent type of material may not be the actual type of material.

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Sample C1 Lab Number 2013-02253- 1 Sampled: Condition: acceptable

Analyzed By RAM 3/12/2013 An? OK Apparent Smp Type Cementitious Non-fibrous Solid

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	ayers						Percents o	f Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-
	Fiber Identification:			none						

			Refractive Index Determinations										
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

**Sample Analytical Note** 

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Sample C4 Lab Number 2013-02253- 2 Sampled: Condition: acceptable

Analyzed By RAM 3/12/2013 An? OK Apparent Smp Type Cementitious Non-fibrous Solid

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

L	ayers					Percents of Each Fiber										
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6						
1	concrete	100	gray	1	n.d.	-	-	-	-	-						
	Total %	100		Overall %	n.d.	-	-	-	-	-						
	Fiber Identification:				none											

										Refractive Index Determinations						
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per			
1	none															
2																
3																
4																
5																
6																

Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Sample C8 Lab Number 2013-02253- 3 Sampled: Condition: acceptable

Analyzed By RAM 3/12/2013 An? OK Apparent Smp Type Cementitious Non-fibrous Solid

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

La	ayers				Percents of Each Fiber										
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6					
1	concrete	100	gray	1	n.d.	-	-	-	-	-					
	Total %	100		Overall %	n.d.	-	-	-	-	-					
	Fiber Identification:														

				Refractive Index Determinations									
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

**Sample Analytical Note** 

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Lab Number 2013-02253-4

201302253 Sampled:

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Condition: acceptable

Sample C9 Analyzed By RAM 3/12/2013 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Friability Fib 3 Fib 5 % Color Fib 1 Fib 2 Fib 4 Fib 6 Layer Type concrete 100 gray n.d Total % 100 Overall % n.d. Fiber Identification: none **Refractive Index Determinations** Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Ela Ext none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Lab Number 2013-02253-5 Sampled: Condition: acceptable Analyzed By RAM 3/12/2013 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Layers Percents of Each Fiber Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 4 Fib 5 Fib 6 concrete 100 n.d. gray 1 Total % 100 Overall % n.d Fiber Identification: none Refractive Index Determinations Fibers Color Mrph Iso Pleo Bi Ela Ext Col Par Col Per RI Par RI Per none 2 3 4 5 6 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid. Sample C16 Lab Number 2013-02253-6 Sampled: Condition: acceptable Analyzed By RAM 3/12/2013 An? OK Apparent Smp Type Cementitious Non-fibrous Solid Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3 Non-Fibrous Components (in approx. decreasing order): powder, rock, Percents of Each Fiber # Layer Type % Color Friability Fib 1 Fib 2 Fib 3 Fib 5 Fib 6 concrete 100 n.d. 100 Overall % Total % n.d Fiber Identification: none **Refractive Index Determinations** Fibers Col Par Col Per RI Par RI Per Color Mrph Iso Pleo Bi Elg Ext none 2 3 4 5 Sample Analytical Note Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

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none

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Sample C17 Lab Number 2013-02253- 7 Sampled: Condition: acceptable

Analyzed By RAM 3/12/2013 An? OK Apparent Smp Type Cementitious Non-fibrous Solid

Homogeneous Yes # Layers 1 Pos Layer? No # Sub-Samples 3

Non-Fibrous Components (in approx. decreasing order): powder, rock,

L	ayers						Percents of	Each Fiber		
#	Layer Type	%	Color	Friability	Fib 1	Fib 2	Fib 3	Fib 4	Fib 5	Fib 6
1	concrete	100	gray	1	n.d.	-	-	-	-	-
	Total %	100		Overall %	n.d.	-	-	-	-	-

Fiber Identification:

			Refractive Index Determinations										
	Fibers	Color	Mrph	Iso	Pleo	Bi	Elg	Ext	Oil	Col Par	Col Per	RI Par	RI Per
1	none												
2													
3													
4													
5													
6													

### Sample Analytical Note

Procedure: tweased apart using forceps. Procedure: dissolution of matrix using dilute HCl acid.

Fr=Friability: 1=very non-friable; 2= non-friable; 3=friable; 4=highly friable

Colors: B=black;BL=blue;BR=brown;CL=clear;G=Green;GY=gray;OR=orange;OW=off-white;PN=pink;PU=purple;R=red;TN=tan;W=white;Y=yellow;V=various
Fiber Morphology: A=fine fibers/bundles, white, sinewy, flexible; B=fine fibers/bundles, w-br, straight, broomed ends; C=fine fibers/bundles, blue, straight, broomed ends;
D=fine to coarse fibers, CL-B, brittle; E=coarse fibers,CL or dyed, striated; F=coarse fibers or splinters, W-BR, ribbon-like; G=lath-like or shards, low aspect ratio, may
taper

Iso=isotropism - may be yes or no; Pleo=pleochroism - may be yes or no; Bi=birefringence - may be None, Low, Medium or High
Elg=sign of elongation - may be +, - or B (both); Ext=extinction - may be Parallel, Oblique, None or Undulating; Oil=medium used to for dispersion staining
Col Par=dispersion staining colors parallel to the fiber (fiber/halo): b/w=black/white; dg/py=dark gray/pale yellow; vg/y=violet gray/yellow; db/ly=dark blue/lemon
yellow; vb/g= vivid blue/gold; sb/o=sky blue/orange; pb/r=pale blue/red; gb/dr=gray blue/dark red; w/b=white/black. Col Perp=same only perpendicular to fiber.
RI Par=refractive index parallel to fiber; RI Perp=refractive index perpendicular to fiber

Analyst: ROBERT A. McCORMICK

Printed: 12-Mar-13

Original Print Date: 12-Mar-13

Larry S. Pier, Approved Accreditation Signatory

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### **APPENDIX B**MCRM Certification

# THE ASBESTOS INSTITUTE

Certifies that

## Chris McAbee

has attended and received instruction in the EPA approved course

# AHERA Building Inspector Refresher

### October 09, 2017

and successfully completed and passed the competency exam.

4646-495-100917

Date of Examination: 9-Oct-2017

Date of Expiration: 09-Oct-2018

William T. Cavness Director

Approved Instructor

THE ASBESTOS INSTITUTE

20033 N. 19th Ave, Building 6, Phoenix, AZ 85027 602-864-6564 – www.theasbestosinstitute.com

This training meets all requirements for asbestos certification under Toxic Substance Control Act Title II.

### **APPENDIX C**MCDOT Provided Information

The functional space locations identified in Table 1 Results incorporate the coordinates listed in the "Maricopa County Department of Transportation plans for the construction of MC85 center lane expansion (MC85: 97<sup>th</sup> Avenue to 75<sup>th</sup> Avenue)" which is too large for this document. The R# listed in the Table 1 Functional Spaces (location of sampling) correlates to the "Summary of Estimated Quantities" table on page G15 of G34 within the project plans. Additional sample location maps can be provided if required at a later date.