PHASE I SUMMARY REPORT
FOR
DETROIT LEAD ASSESSMENT PROJECT
MICHIGAN SMELTING – 7885 JOSEPH CAMPAU STREET
HAMTRAMCK, WAYNE COUNTY, MICHIGAN

Prepared for:

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
REMEDIATION AND REDEVELOPMENT DIVISION
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Prepared by:

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March 2004

W.O. No.: 20083.028.001

EXECUTIVE SUMMARY

Weston Solutions of Michigan, Inc. (WESTON®) was contracted by the Michigan Department of Environmental Quality (MDEQ) Remediation and Redevelopment Division (RRD) to conduct off-site sampling for the Detroit Lead Assessment Project (the Project) in Detroit, Wayne County, Michigan. This Summary Report addresses sampling that was conducted in the vicinity of the former Michigan Smelting Company (the Facility), 7885 Joseph Campau, Hamtramck, Wayne County, Michigan.

The presence of lead identified on properties adjacent to or nearby the Facility, was evaluated against predominant atmospheric conditions, spatial distribution, and statistical analysis to determine if the lead at adjacent or nearby properties was indicative of aerial deposition from the Facility.

On 5 and 6 November 2003, WESTON collected 24 soil samples for lead analysis at locations upwind and downwind of the Facility. Review of the data concluded that the lead detected was consistent with deposition resulting from aerial releases and suggested that such releases occurred during historic smelting operations at the Facility. To address these concerns, it is recommended that the following additional tasks be completed:

- Obtain access to the Facility for:
    - Review of existing information related to property transfer (Phase I, Phase II, and development planning):
    - Interview past employees regarding historical Facility operations;
    - Perform a Facility walk through to determine existing conditions;
    - Collect on-site soil samples to determine the presence, concentration, and extent of lead on the Facility (related to the location of former structures, if possible); and
- Collect soil samples from additional downwind properties to confirm and/or determine the extent of downwind contamination.

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SECTION 1

INTRODUCTION

Weston Solutions of Michigan, Inc. (WESTON®) was contracted by the Michigan Department of Environmental Quality (MDEQ) Remediation and Redevelopment Division (RRD) to conduct off-site sampling for the Detroit Lead Assessment Project (the project) in Detroit, Wayne County, Michigan. This Summary Report addresses sampling that was conducted in the vicinity of the former Michigan Smelting Company (the Facility), 7885 Joseph Campau Street, Hamtramck, Wayne County, Michigan. The overall objectives, technical basis, and general sampling protocols for this work are described in the *Comprehensive Phase I Sampling Summary Report for the Detroit Lead Assessment Project* (Comprehensive Summary).

This Phase I Summary Report for Michigan Smelting has been organized in a format that is intended to facilitate and effectively meet the objectives of the Phase I investigation. The Summary Report is organized into the following sections:

- **Section 1** – Introduction,
- **Section 2** – Site Information,
- **Section 3** – Field Activities and Procedures,
- **Section 4** – Phase I Analytical Results, and
- **Section 5** – Recommendations

Attachments to this Summary Report include the following:

- **Attachment A** – Figures,
- **Attachment B** – Tables,
- **Attachment C** – Wind Rose Plot,
- **Attachment D** – Photographs of Sampling Locations,
- **Attachment E** – Concentration Graph, and
- **Attachment F** – Statistical Distribution.

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SECTION 2

SITE INFORMATION

2.1 SITE DESCRIPTION

The Facility, located at 7885 Joseph Campau Street in Hamtramck, Wayne County, Michigan (Detroit Metropolitan Area), was suspected of historical smelting operations and was chosen for investigation by the MDEQ based on its presence on a nationwide list of potential lead smelters. WESTON performed a preliminary records review including review of Bresser's city directory information, Sanborn fire insurance maps, aerial photographs, Fire Marshall inspection/permit records, and Baseline Environmental Assessments (BEAs). This review, presented in the *"Summary Report for Data Investigation, Detroit Lead Assessment Project"* dated September 2003, concluded that the Facility required additional investigation. Facility location maps are included in **Attachment A**. The addresses of off-site properties sampled are presented in **Table 1** located in **Attachment B**.

2.1.1 Site Location

The Facility now appears to be occupied by the Hamtramck General Motors-Cadillac Assembly Plant (GM Assembly Plant). The smelting Facility no longer exists, and has apparently been demolished and replaced with a grassy area surrounding the existing GM Assembly Plant. A fence surrounds the existing GM Assembly Plant. The area immediately to the north of the property is Interstate I-94 (I-94) with residential properties located north of the freeway and extending north for at least the next four blocks. The area immediately south of the property and extending five blocks south is industrial and residential properties, including the existing GM Assembly Plant. The areas immediately east and west of the property are primarily industrial and a part of I-94.

2.1.2 Site History

A review of the Bresser's city directory indicated that Michigan Smelting & Refin owned the property from 1946 to 1951. The property was co-owned by Bohn Alum & Brass Corporation Research Labor in 1946. The address has not been listed in the directory since.

Review of the Sanborn maps for the address showed the following chronology: In 1951 a Stock Warehouse Laboratory was on the property (built in 1915); in 1968 the property was located under a large parking lot; and in 2002 the property was still located under a large parking lot.

A review of aerial photographs indicated that the area in the immediate vicinity of the Facility was industrial from 1957 through 1994. The Facility has been demolished since 1994 and a parking lot/grass area is present on the property just south of the GM Assembly Plant. Residential areas exist approximately 900 feet (ft.) east of the Facility. Observations conducted during the drive by of the Facility confirmed that the current land use is consistent with that indicated by the aerial photograph and Sanborn maps.

During the investigation of the fire records, no records were found for the Facility.

Review of the BEA for nearby "1580 East Grand Boulevard", dated February 1997, prepared by Vision Environmental Inc. for Boulevard Properties L.L.C., indicates that lead was detected on that Site at levels up to 540 milligrams/kilogram (mg/kg) and exceeded the MDEQ Part 201 Residential Direct Contact Criterion (RDCC) (400 mg/kg).

2.2 SITE CONCERNS

The primary concern associated with the Facility is the off-site release of smelter-related metals, specifically lead, to soils in the surrounding neighborhood through aerial deposition.

SECTION 3

FIELD ACTIVITIES AND PROCEDURES

3.1 OVERVIEW OF SAMPLING ACTIVITIES

The goal of the Phase I sampling was to determine if lead concentrations consistent with smelter related releases were present off-site and could be attributed to the Facility. The general sampling protocol presented in **Section 2** of the Comprehensive Summary was followed during the Phase I evaluation of the Facility. Due to the development around the Facility, samples could not be collected within the 1,000 foot radius stated in the Quality Assurance Sampling Plan (QASP), so the radius was increased for this Facility.

Prior to sample collection, upwind and downwind sampling areas were established, 2,800 and 2,300 ft. from the Facility, respectively. These areas were established based on mean wind direction from 1984 to 1991 for the Detroit Metropolitan Area. A copy of the wind rose plot is provided in **Attachment C.** Soil samples were collected from City and/or State owned properties located within these established areas.

The City and/or State owned parcels identified for sampling were those closest to the average wind direction and at varying distances from the Facility. Where individual City and/or State owned parcels were not available, rights-of-way, utility corridors, and alleyways ('greenways') were used and have been identified on the figures included in **Attachment A**. Photographs of the sampling locations have been included in **Attachment D**. Exposure units and appropriate sample grids were established in accordance with the QASP to guide the sampling activities.

Sampling activities (sample collection, record keeping, and photo documentation) were conducted as described in the Comprehensive Summary. Because no City and/or State owned parcels were available in the sample radius for the Facility, WESTON collected samples from 9 greenways near the Facility. Six greenway parcels were sampled in the downwind direction and three greenway parcels were sampled in the upwind direction due to size and availability of the properties. Two composite samples were collected from each of the six downwind greenways and two of the upwind greenways. Eight composite samples were collected from one upwind

greenway because it was a larger parcel of land encompassing approximately four average sized parcels. A total of 24 composite samples were collected from the area upwind and downwind of the Facility and are shown on the sample sketches included in **Attachment A**.

3.2 FIELD ACTIVITIES

WESTON personnel conducted field sampling on 5 and 6 November 2003. Since City and/or State owned parcels were not available, WESTON selected greenways, prior to the sampling event, and submitted them to the City of Hamtramck to obtain their approval and access. When greenways were not located on the same street as the mailing address of the nearest building, the number of the building was used in conjunction with the street of the greenway. For example, a house located on 1998 East Grand Boulevard with an adjacent greenway located on Medbury Street, would be identified MED – 01998. These changes were noted in the logbook and can be viewed on the "Summary Table For Sample Properties" (**Attachment B**) and the sample sketches (**Attachment A**).

WESTON collected samples from three upwind greenways: Two composite samples were collected from two of the upwind greenways and eight composite samples were collected from the third larger upwind greenway for a total of 12 upwind samples. Also, two samples were collected from each of the six downwind greenways for a total of 12 downwind samples. Twenty four soil samples were submitted for analysis. Four samples were designated as matrix spike/matrix spike duplicates (MS/MSD) in accordance with the QASP.

SECTION 4
PHASE I ANALYTICAL RESULTS

4.1 SUMMARY OF ANALYSIS

During Phase I soil sampling the following samples were collected from the Facility project area:

- 12 composite soil samples in the upwind direction, and
- 12 composite soil samples in the downwind direction.

Sample locations from both the upwind and downwind areas are listed in **Table 1** included in **Attachment B**.

In accordance with the QASP, a total of 24 samples were sent to the State Laboratory located in Lansing, Michigan for analysis by United States Environmental Protection Agency (U.S. EPA) Method 6010B for lead. Samples collected from properties upwind of the Facility did not contain concentrations of lead above the project screening level (400 mg/kg) established in the Phase I QASP. Six samples collected from properties downwind of the Facility contained concentrations of lead above the project screening level (400 mg/kg) established in the Phase I QASP. A summary of the Phase I sample results is included in the table below.

Phase I Summary of Results

Location	Number of Samples	Number equal or greater than 400 mg/kg	Range of Values (mg/kg)
Upwind	12	0	66-360
Downwind	12	6	150-740
Total	24	6	66-740

4.2 ATMOSPHERIC CONDITIONS

During Phase I soil sampling activities, upwind and downwind parcels were selected based on the mean wind direction from 1984 to 1991 for the Detroit Metropolitan Area. A copy of the wind rose plot is provided in **Attachment C**. The wind rose plot showed a prominent northeast wind direction in the City of Detroit Metropolitan Area. If smelting operations occurred, lead in

soils resulting from aerial deposition would be found downwind in the northeast direction from the Facility. Parcels ranging from 1,650 ft. to 2,850 ft. were chosen west in the upwind direction of the Facility. Parcels were not chosen northeast in the major downwind direction due to lack of residential receptors within 3,600 ft. Parcels ranging from 1,350 ft. to 2,250 ft. were chosen southeast, as close to the mean downwind direction of the Facility due to the presence of residential properties. Elevated lead concentrations were detected in the downwind direction of the Facility and low-level lead concentrations were detected in the upwind direction. A detailed analysis of upwind and downwind concentrations is contained in **Section 4.3 Spatial Analysis**.

4.3 SPATIAL ANALYSIS

Where air-transport of materials occurs, it is expected that the largest impacts on the soil will occur closest to the source, and the magnitude of the impact will tend to decrease as a function of distance from the source. In addition, it is expected that the spatial pattern of soil impacts will tend to be elongated in the predominant downwind direction. Thus the Phase I investigation was designed to determine if an off-site airborne release had occurred by examining the spatial pattern of soil contaminant concentrations as a function of distance from the Facility in a downwind direction. As seen in **Figure 2 (Attachment A)**, concentrations of lead greater than the screening level occurs within the primary downwind envelope.

To determine the distribution of the lead concentrations in soils as the distance from the Facility increases, WESTON evaluated the lead concentration of samples versus the distance from the Facility by graphing the data in relation to each other. Evaluation of this graph (**Attachment E**) indicated consistently low concentrations of lead in the upwind direction and elevated levels of lead in the downwind direction. This condition, represented as decreasing concentrations with increasing distance from the Facility, would be expected if an aerial release of lead had occurred due to smelting operations. These conclusions were confirmed by a linear regression of the concentration versus distance data (**Attachment E**).

4.4 STATISTICAL ANALYSIS

Analytical data was entered into a spreadsheet file and differentiated as downwind and upwind samples, then processed using the MDEQ online statistical interface for Part 201 evaluations. As shown on the distribution analysis figures included in **Attachment F** the downwind logmean is 5.9 mg/kg and the upwind logmean is 4.9 mg/kg indicating the downwind concentrations are greater than the upwind concentration. In addition the relative frequency histogram (**Attachment F**) for the downwind data shows a larger variation across the sample set than the upwind which contains a more even distribution relative to the lognormal curve. Comparison of the upwind and downwind data sets indicates the lead concentrations are sufficiently different from each other both in mean concentration and distribution to conclude that the data represent separate conditions.

4.5 CONCLUSIONS

The pattern of analytical results for lead in soil samples collected for the Facility suggests that lead contamination detected in downwind locations may be attributable to historic releases from historic smelting operations at the Facility. The analytical data was compared to a screening level consisting of the MDEQ Residential and Commercial I Direct Contact Criteria for soils (400 mg/kg), as established under Part 201 Environmental Response of the Natural Resources and Environmental Protection Act 1994, as amended.

No samples collected from upwind of the Facility contained concentrations of lead above the 400 mg/kg screening level. The lead that is present at upwind locations is similar in concentration to that detected in the far downwind direction, which could be indicative of background concentration. However, lead concentrations in exceedance of the screening level were detected downwind of the Facility. The downwind samples show a strong trend of decreasing concentration with increasing distance with the highest levels of lead (over 700 mg/kg) closest to the Facility. This pattern of low concentrations of lead upwind and higher concentrations of lead with decreasing concentrations downwind of the Facility is consistent with deposition patterns from aerial releases and suggests that such releases occurred from the Facility during historic smelting operations.

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SECTION 5

RECOMMENDATIONS

Based on the evaluation of the Phase I analytical data, it is recommended that additional tasks be completed to further define the existing risk and the origin of the off-site contamination. The determination that additional work is necessary is based on three factors:

- The presence of residential receptors located within approximately 1,800 ft. downwind of the Facility,
- Concentrations of lead in excess of the screening level downwind of the Facility, and
- The pattern of lead concentrations within the study area suggests a strong potential that soils at downwind properties have been impacted by aerial deposition from releases of lead from historic smelting operations at the Facility.

To address these concerns, it is recommended that the following additional tasks be completed:

- Obtain access to the Facility for:
    - ° Review of existing information related to property transfer (Phase I, Phase II, and development planning):
    - ° Interview past employees regarding historical Facility operations;
    - ° Perform a Facility walk through to determine existing conditions;
    - ° Collect on-site soil samples to determine the presence, concentration, and extent of lead on the Facility (related to the location of former structures, if possible); and
- Collect soil samples from additional downwind properties to confirm and/or determine the extent of downwind contamination.

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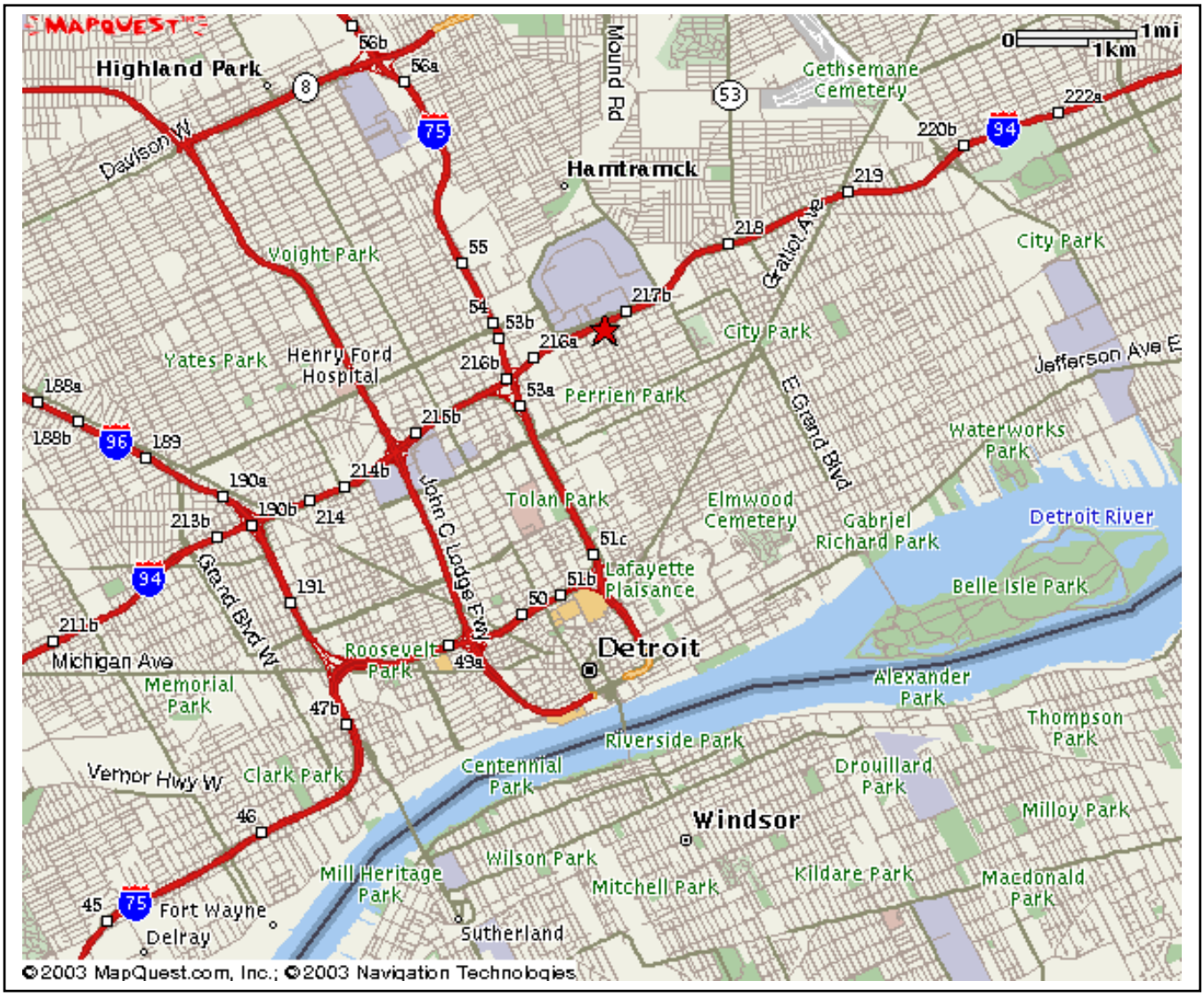
ATTACHMENT A

FIGURES

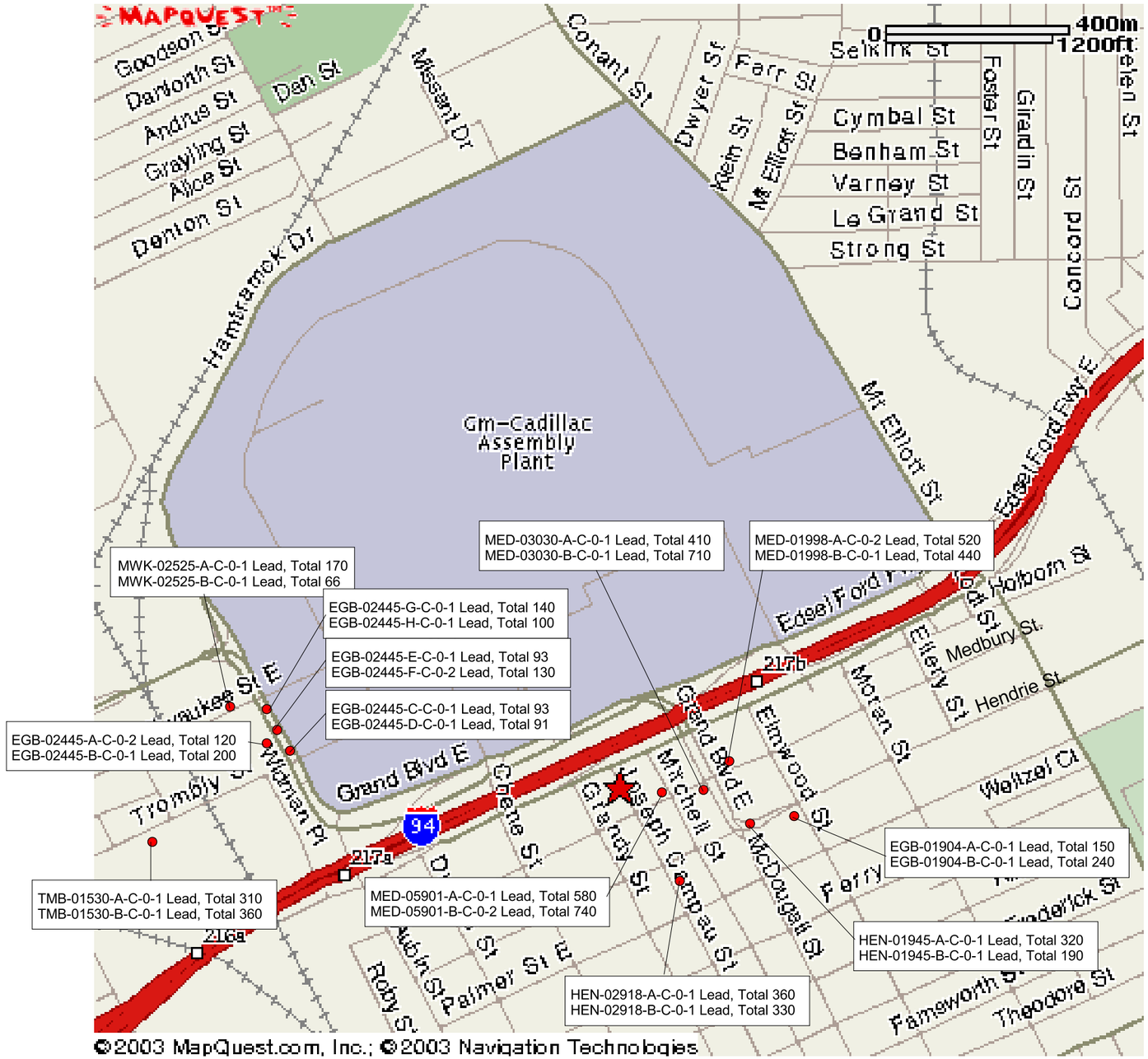
FIGURE 1
Site Location Map
7885 Joseph Campau Street



WESTON SOLUTIONS, INC. OF MICHIGAN

300 River Place, Suite 2800
Detroit, Michigan 48207

Detroit Lead Assessment Project
Detroit, Wayne County, Michigan
W.O. No. 20083.028.001



LEGEND:

EXAMPLE:

MWK-02525-A-C-0-1 Lead, Total 170

Sample ID — Constituent — Result

Note: All Lead, Total analytical resutls are shown in mg/kg.

N

WESTON SOLUTIONS SM

PROJECT NAME:

Detroit Lead Assessment Project
Detroit, Wayne County, Michigan

Weston Soultions, Inc. of Michigan
300 River Place
Suite 2800
Detroit, Michigan 48207

DRAWING TITLE:

Analytical Results Map

Michigan Smelting
7885 Jos Campau

WORK ORDER No.: 20083.028.001	PROJECT MANAGER:		
DRAWN BY: JLT	CHECKED BY:		
DRAWING NAME:	DIRECTORY/ FOLDER: J:\I\D:\DLAP\09_09_03.apr\Jos Campau		
CONTRACT No.:	DELIVERY ORDER No.:		
SCALE:	REPORT DATE:		
DATE: January 2004	REVISION No.:	FIGURE No.:	2

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET 1 of ____

CLIENT/SUBJECT DETROIT LEAD ASSESSMENT W.O. NO. ____

TASK DESCRIPTION MWK-02445 2525 E Jefferson TASK NO. ____

PREPARED BY R. NEMIROVSKY DEPT ____ DATE 11/05/03

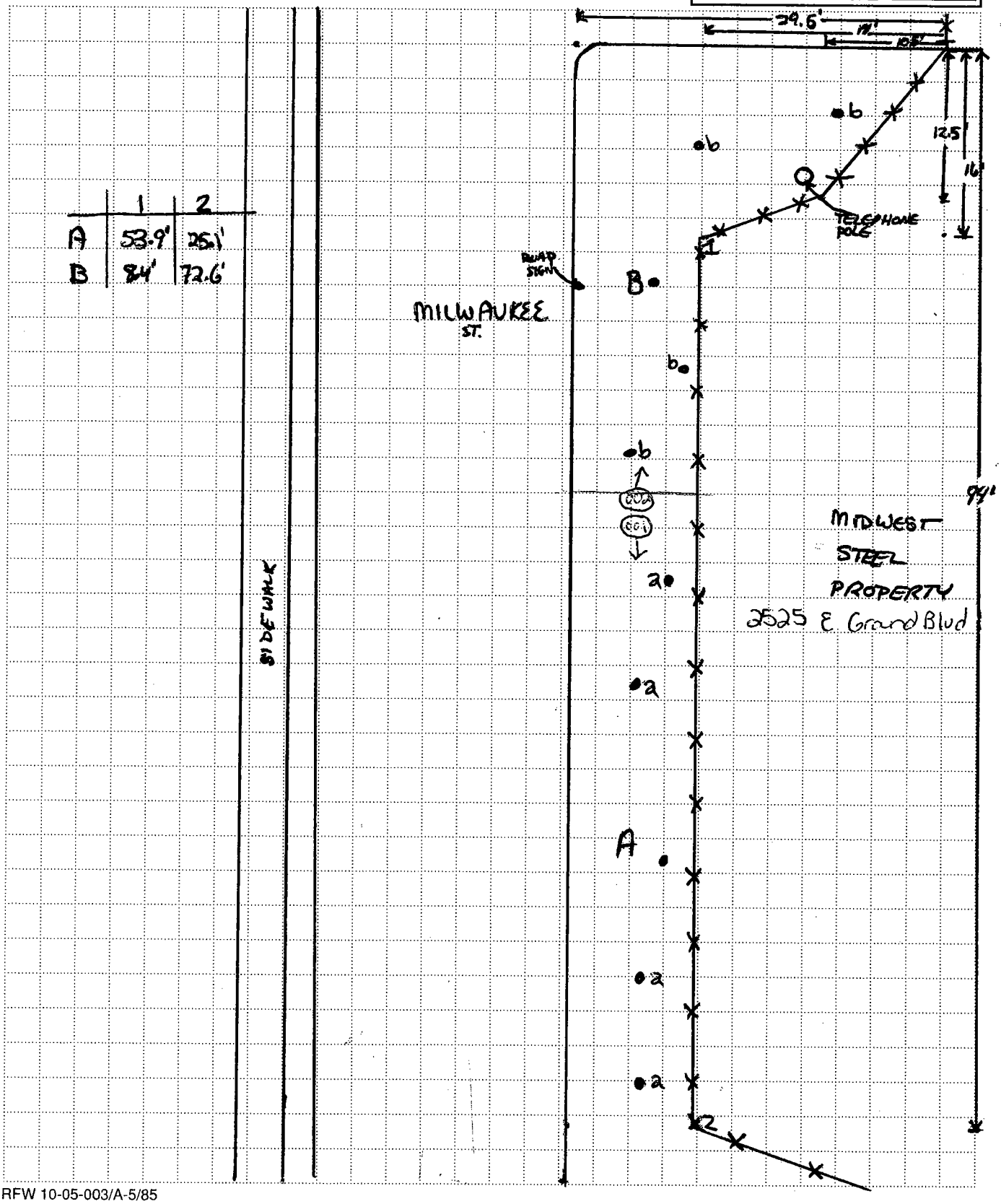
MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____

	1	2
A	53.9'	25.1'
B	84'	72.6'



WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT Joe Campau W.O. NO. ____

TASK DESCRIPTION TMB-01630 - A + B TASK NO. ____

PREPARED BY R. Nemirovsky DEPT ____ DATE 11/05/03

MATH CHECK BY ____ DEPT ____ DATE ____

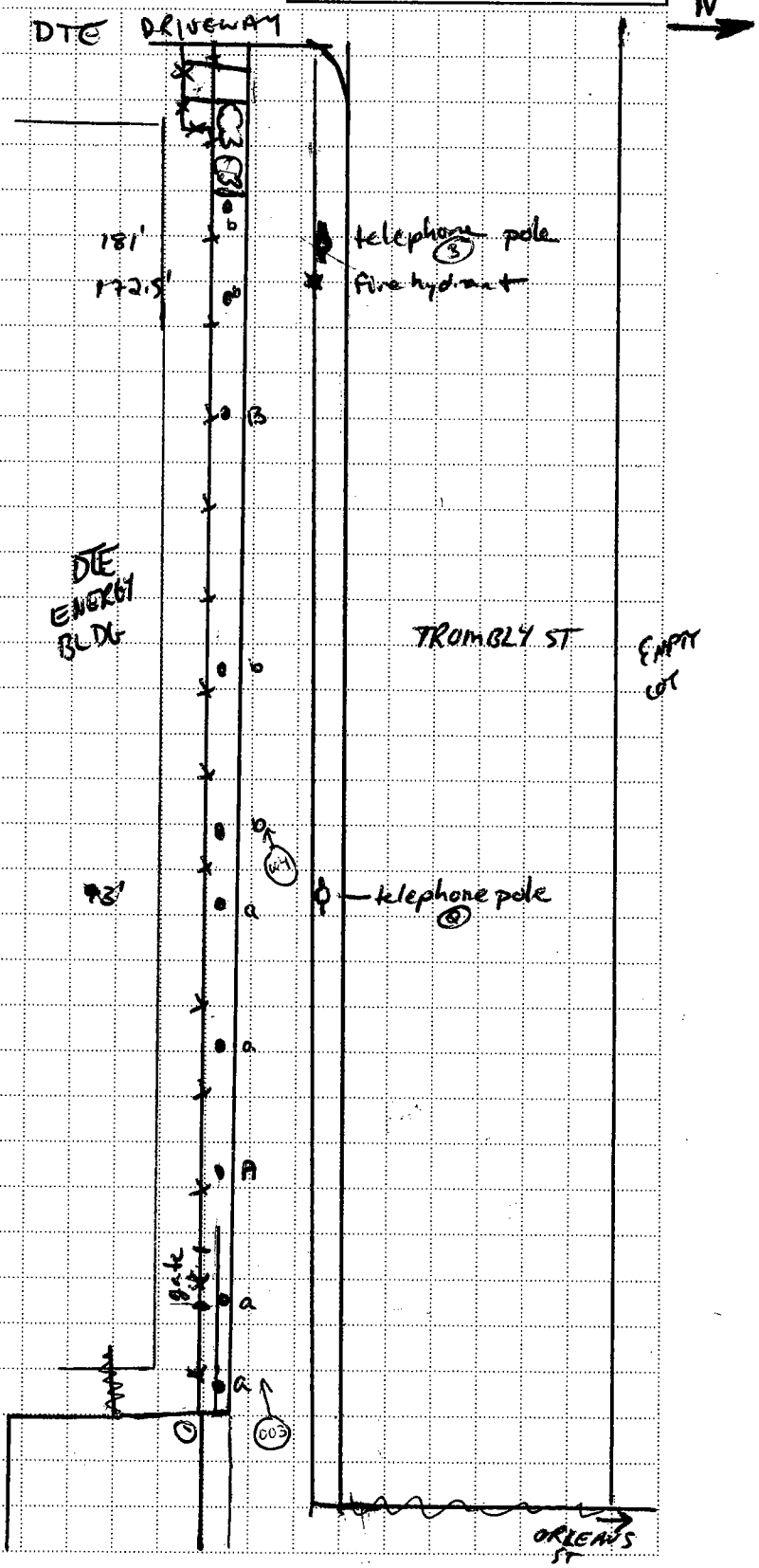
METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____

PT 1 = NW CORNER OF BLDG
PT 2 = E TELEPHONE POLE
PT 3 = W TELEPHONE POLE

	1	2	3
A	32.4	46.6	—
B	—	57.6	32



RFW 10-05-003/A-5/85

1 SQ = 7'

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT Joe Campau W.O. NO. ____

TASK DESCRIPTION 2445 E. Grand Avenue Greenway A through H TASK NO. ____

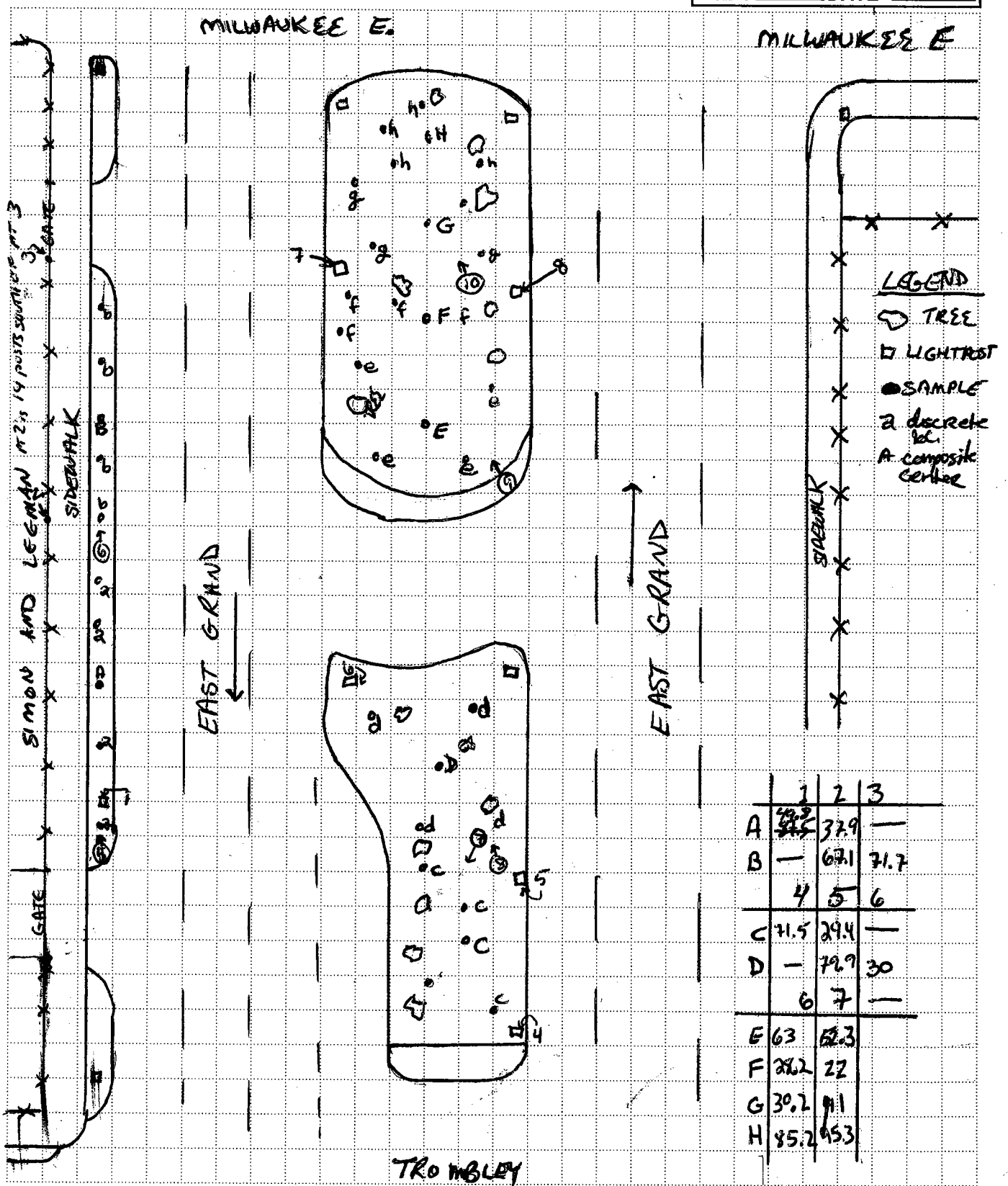
PREPARED BY R. Nemirowsky DEPT ____ DATE 11/5/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



	1	2	3
A	~~49.3~~ 34.5	37.9	—
B	—	67.1	71.7
	4	5	6
C	71.5	29.4	—
D	—	79.9	30
	6	7	—
E	63	62.3	
F	26.2	22	
G	30.2	91	
H	85.2	453	

RFW 10-05-003/A-5/85

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SHEET ____ of ____

CLIENT/SUBJECT Joe Campau W.O. NO. ____

TASK DESCRIPTION EGB-01904 - A & B TASK NO. ____

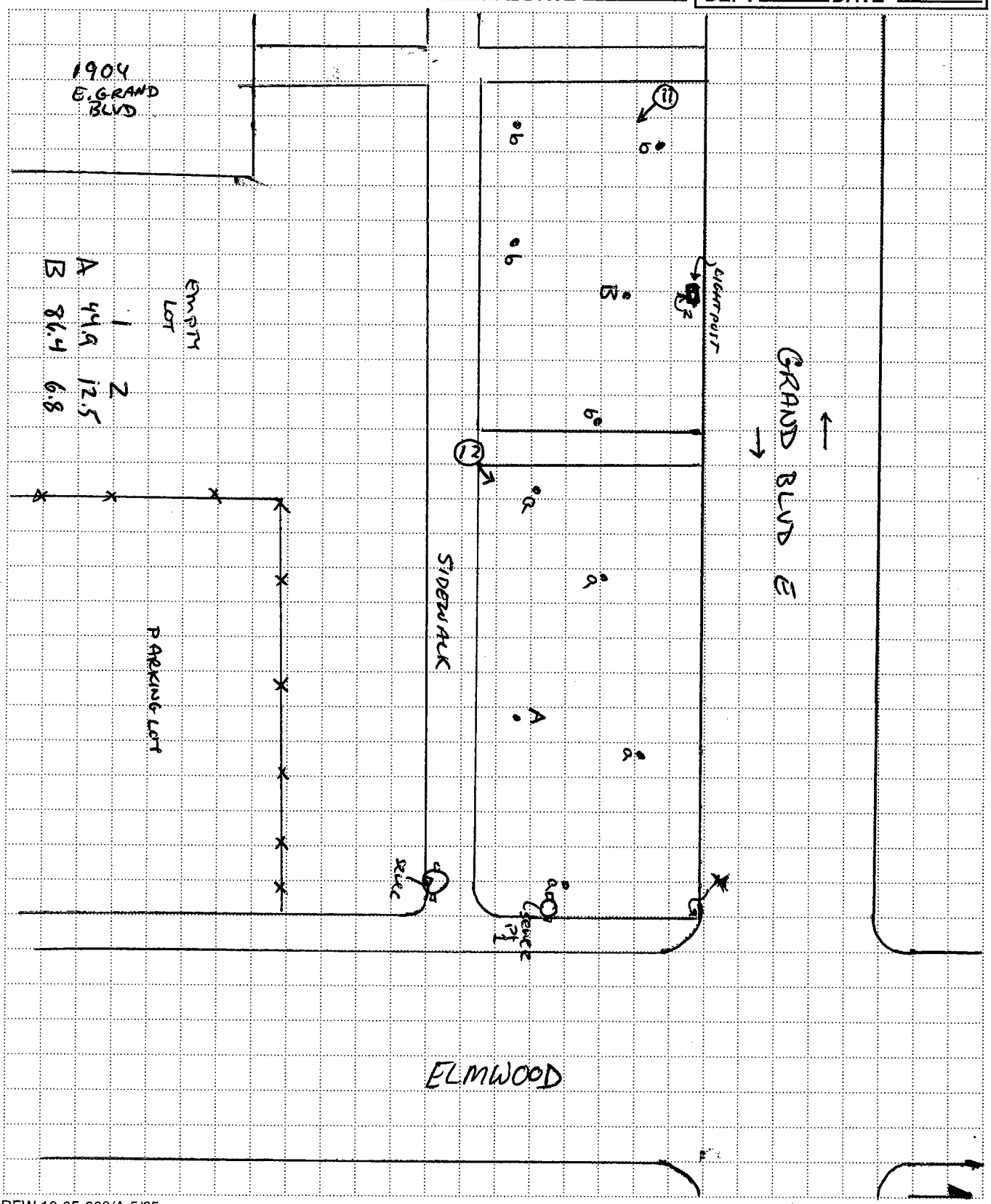
PREPARED BY R. Nemirovsky DEPT ____ DATE 11/05/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



WESTON MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT Joe Campau W.O. NO. ____

TASK DESCRIPTION MED-01998 - A + B TASK NO. ____

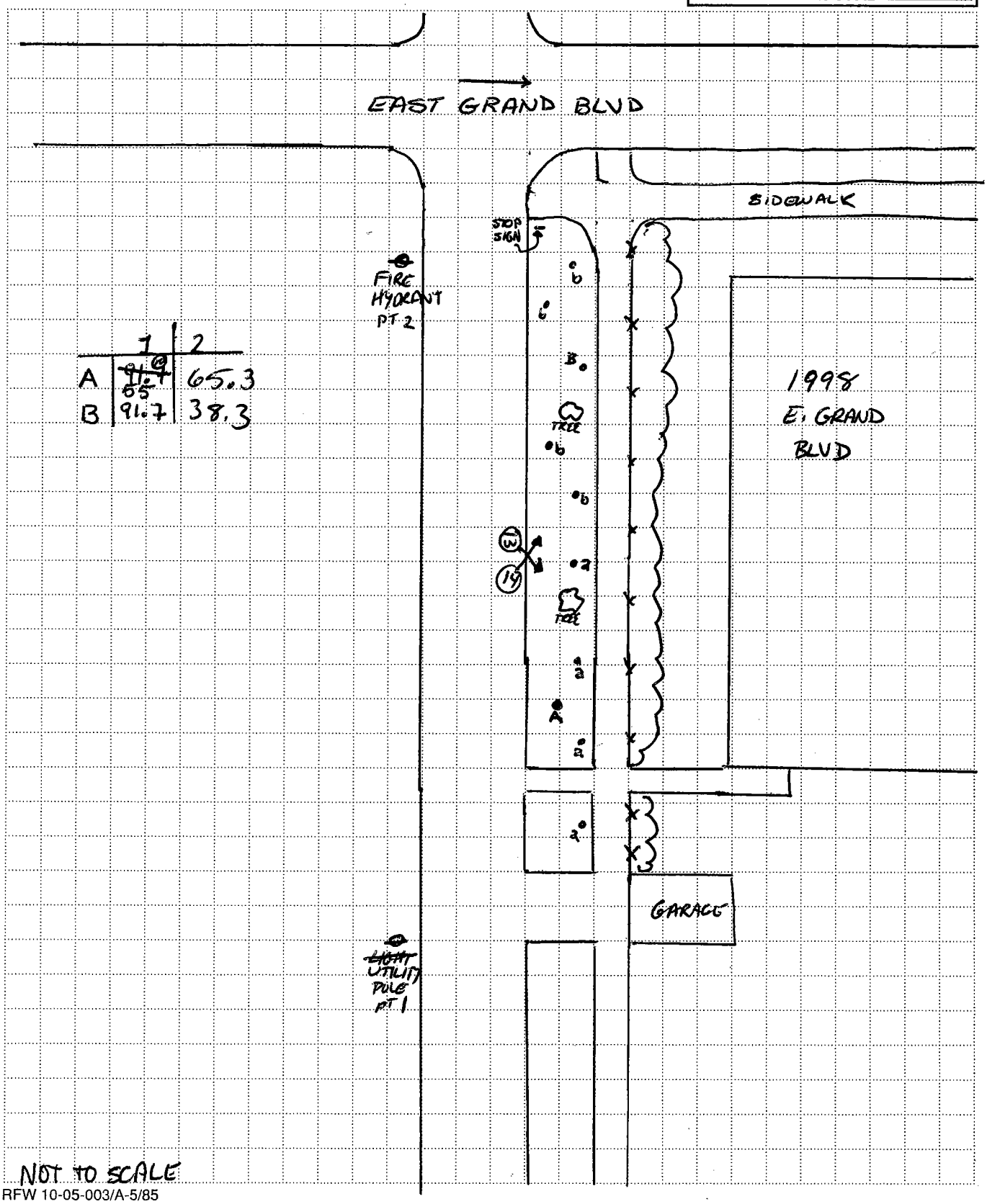
PREPARED BY R. Nemirovsky DEPT ____ DATE 11/06/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



NOT TO SCALE

RFW 10-05-003/A-5/85

WESTON MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT Joe Campau W.O. NO. ____

TASK DESCRIPTION MED-03030 - A + B TASK NO. ____

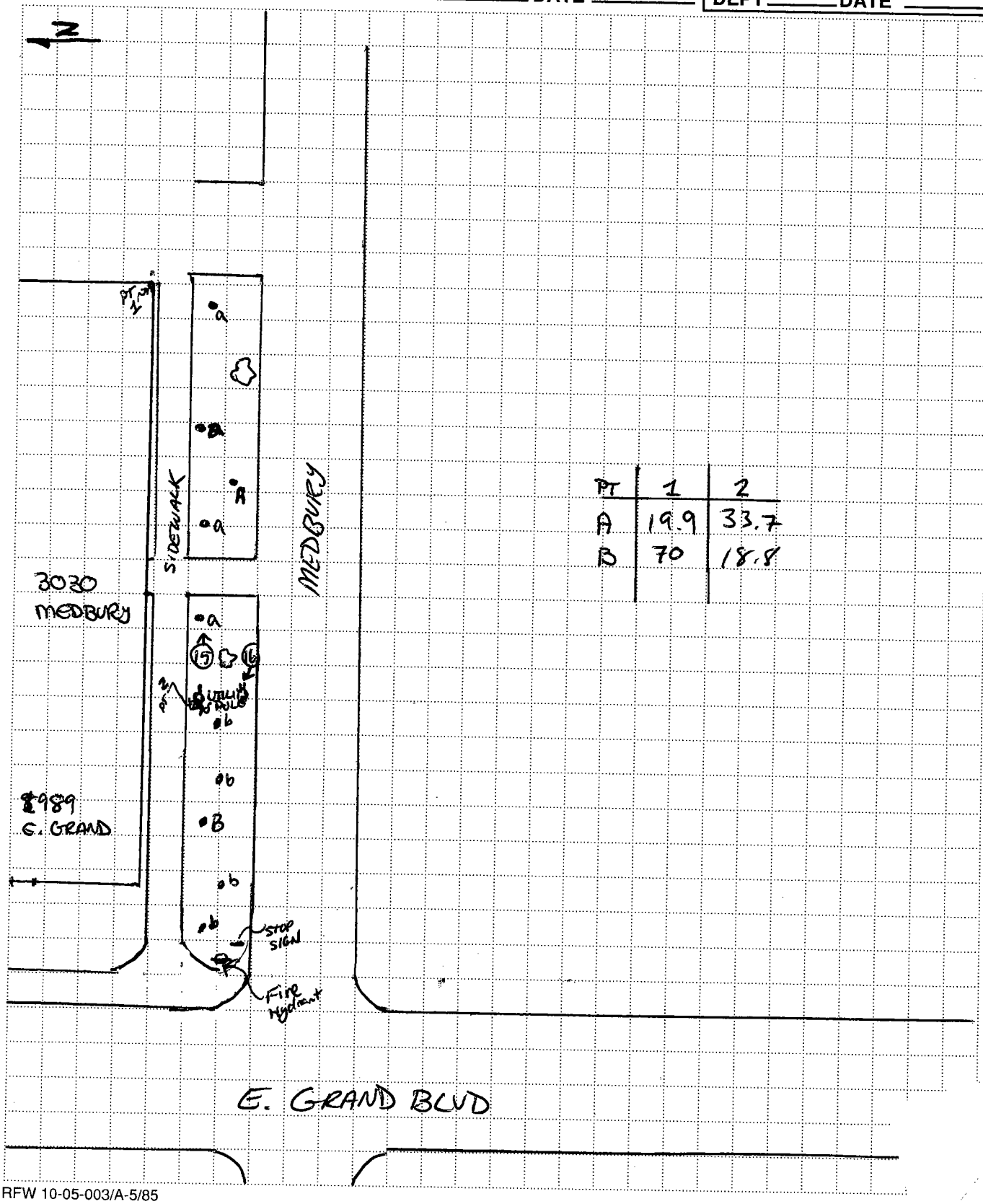
PREPARED BY R. Nemirovsky DEPT ____ DATE 11/05/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____

DEPT ____ DATE ____



PT	1	2
A	19.9	33.7
B	70	18.8

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SHEET ____ of ____

CLIENT/SUBJECT Joe Campau W.O. NO. ____

TASK DESCRIPTION MCD-5901-A-B TASK NO. ____

PREPARED BY R Nemirovsky DEPT ____ DATE 11/06/03

MATH CHECK BY ____ DEPT ____ DATE ____

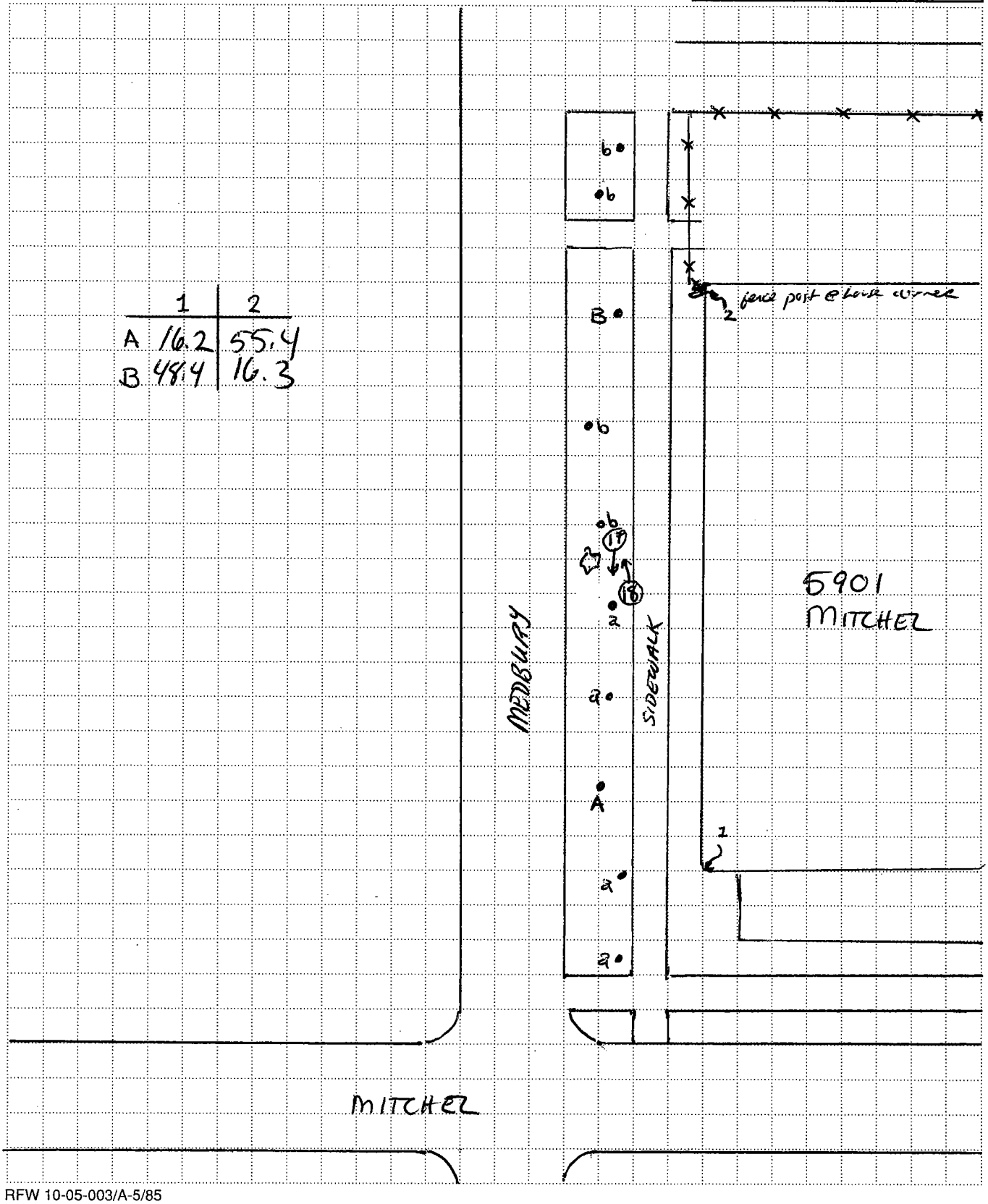
METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____

N

	1	2
A	16.2	55.4
B	48.4	16.3



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SHEET ____ of ____

CLIENT/SUBJECT Joe Campau W.O. NO. ____

TASK DESCRIPTION HEN-02918-A+B TASK NO. ____

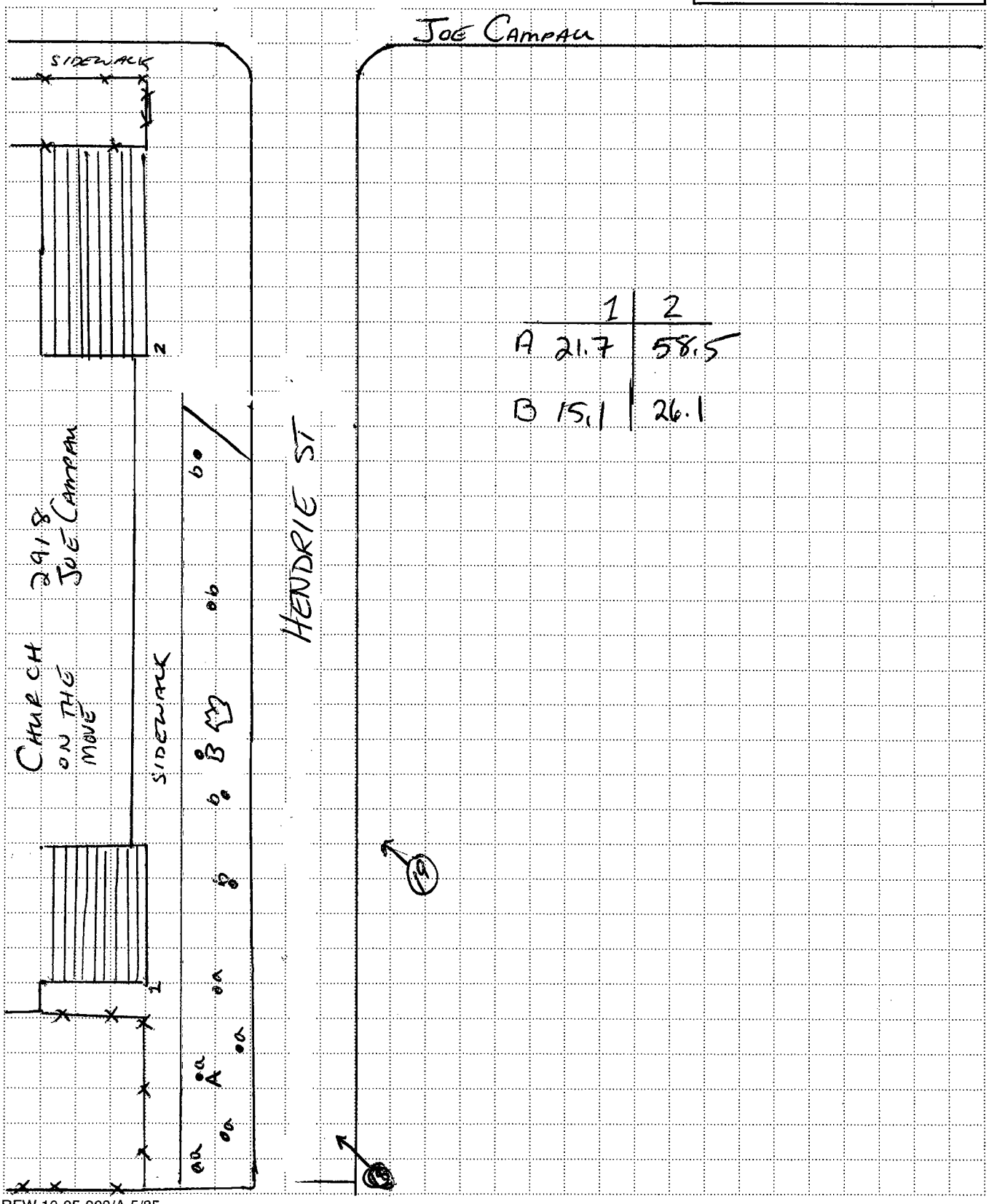
PREPARED BY R. Nemirovsky DEPT ____ DATE 11/06/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



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SHEET ____ of ____

CLIENT/SUBJECT Joe Canzan W.O. NO. ____

TASK DESCRIPTION HEN-1945 - A + B TASK NO. ____

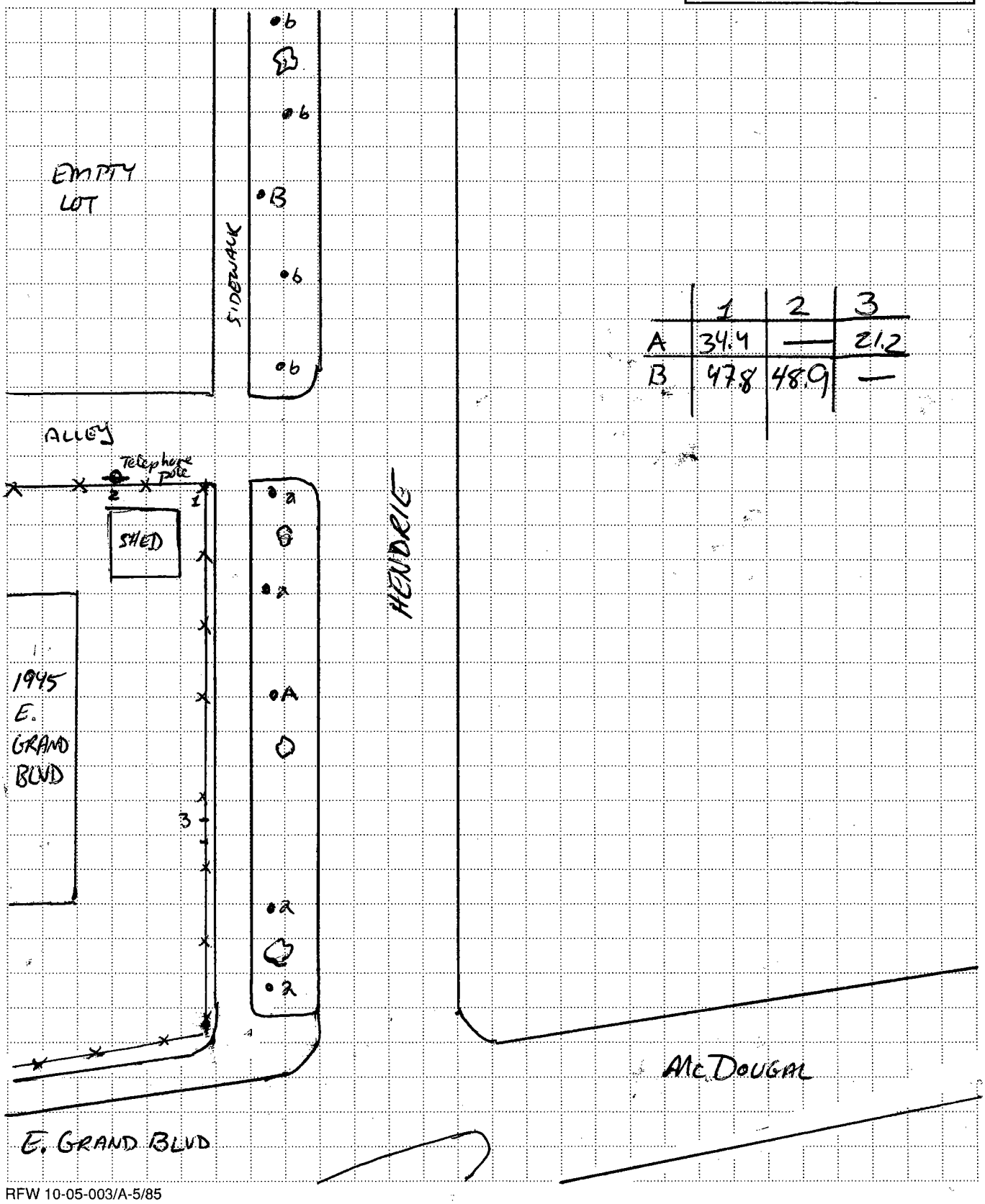
PREPARED BY R. Nemiroski DEPT ____ DATE 11/06/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



	1	2	3
A	34.4	—	21.2
B	47.8	48.9	—

ATTACHMENT B

TABLES

TABLE 1

SUMMARY OF SAMPLED PROPERTIES

Upwind Properties		
Address	**Description**	**Sample Identification**
2525 E Grand Blvd	Greenway located to the north side of Milwaukee St and the south side of the Midwest Steel building at 2525 E Grand Blvd.	MWK-02525-A-C-0-1
		MWK-02525-B-C-0-1
1530 Trombly	Greenway located on north side of Trombly St and south side of the DTE Energy building.	TMB-01530-A-C-0-1
		TMB-01530-B-C-0-1
2445 E Grand Blvd	Greenway located on the east side of the Simon and Leeman Fruits & Vegetable Distributor building.	EGB-02445-A-C-0-2
		EGB-02445-B-C-0-1
	Greenway located between the north and south bound lanes of E Grand Blvd across the street and to the east of the Simon and Leeman Fruits & Vegetable Distributor building.	EGB-02445-C-C-0-1
		EGB-02445-D-C-0-1
		EGB-02445-E-C-0-1
		EGB-02445-F-C-0-2
		EGB-02445-G-C-0-1
		EGB-02445-H-C-0-1
Downwind Properties		
Address	**Description**	**Sample Identification**
1904 E Grand Blvd	Greenway located on the south side of E Grand Blvd in between an empty lot, a house at 1904 E Grand Blvd, and a parking lot on the corner of Elmwood & E Grand Blvd.	EGB-01904-A-C-0-1
		EGB-01904-B-C-0-1
1998 E Grand Blvd	Greenway located on the north side of Medbury St and to the south side of the house at 1998 E Grand Blvd.	MED-01998-A-C-0-2
		MED-01998-B-C-0-1
3030 Medbury	Greenway located on the south side of Medbury St and to the south side of the house at 3030 Medbury.	MED-03030-A-C-0-1
		MED-03030-B-C-0-1
5901 Mitchell	Greenway located on north side of Medbury St and to the south side of the house at 5901 Mitchell.	MED-05901-A-C-0-1
		MED-05901-B-C-0-2
2918 Hendrie	Greenway located on the south side of Hendrie St and to the north side of church at 2918 Hendrie.	HEN-02918-A-C-0-1
		HEN-02918-B-C-0-1
1945 E Grand Blvd	Greenway located on the south side of Hendrie St and to the north side of the house at 1945 E Grand Blvd & Empty lot (lot directly west of house; house and lot are separated by an alley).	HEN-01945-A-C-0-1
		HEN-01945-B-C-0-1

*Notes: Greenway identifiers were taken from the street the greenways were parallel to and not the actual street to which the property belonged.

TABLE 2

ANALYTICAL RESULTS

Sample Address	Sample ID	Concentration of Lead (mg/Kg)
Upwind		
2525 E Grand Blvd	MWK-02525-A-C-0-1	170
2525 E Grand Blvd	MWK-02525-B-C-0-1	66
1530 Trombly	TMB-01530-A-C-0-1	310
1530 Trombly	TMB-01530-B-C-0-1	360
2445 E Grand Blvd	EGB-02445-A-C-0-2	120
2445 E Grand Blvd	EGB-02445-B-C-0-1	200
2445 E Grand Blvd	EGB-02445-C-C-0-1	93
2445 E Grand Blvd	EGB-02445-D-C-0-1	91
2445 E Grand Blvd	EGB-02445-E-C-0-1	93
2445 E Grand Blvd	EGB-02445-F-C-0-2	130
2445 E Grand Blvd	EGB-02445-G-C-0-1	140
2445 E Grand Blvd	EGB-02445-H-C-0-1	100
Downwind		
1904 E Grand Blvd	EGB-01904-A-C-0-1	150
1904 E Grand Blvd	EGB-01904-B-C-0-1	240
1998 E Grand Blvd	MED-01998-A-C-0-2	**520**
1998 E Grand Blvd	MED-01998-B-C-0-1	**440**
3030 Medbury	MED-03030-A-C-0-1	**410**
3030 Medbury	MED-03030-B-C-0-1	**710**
5901 Mitchell St	MED-05901-A-C-0-1	**580**
5901 Mitchell St	MED-05901-B-C-0-2	**740**
2918 Hendrie	HEN-02918-A-C-0-1	360
2918 Hendrie	HEN-02918-B-C-0-1	330
1945 E Grand Blvd	HEN-01945-A-C-0-1	320
1945 E Grand Blvd	HEN-01945-B-C-0-1	190

* Notes

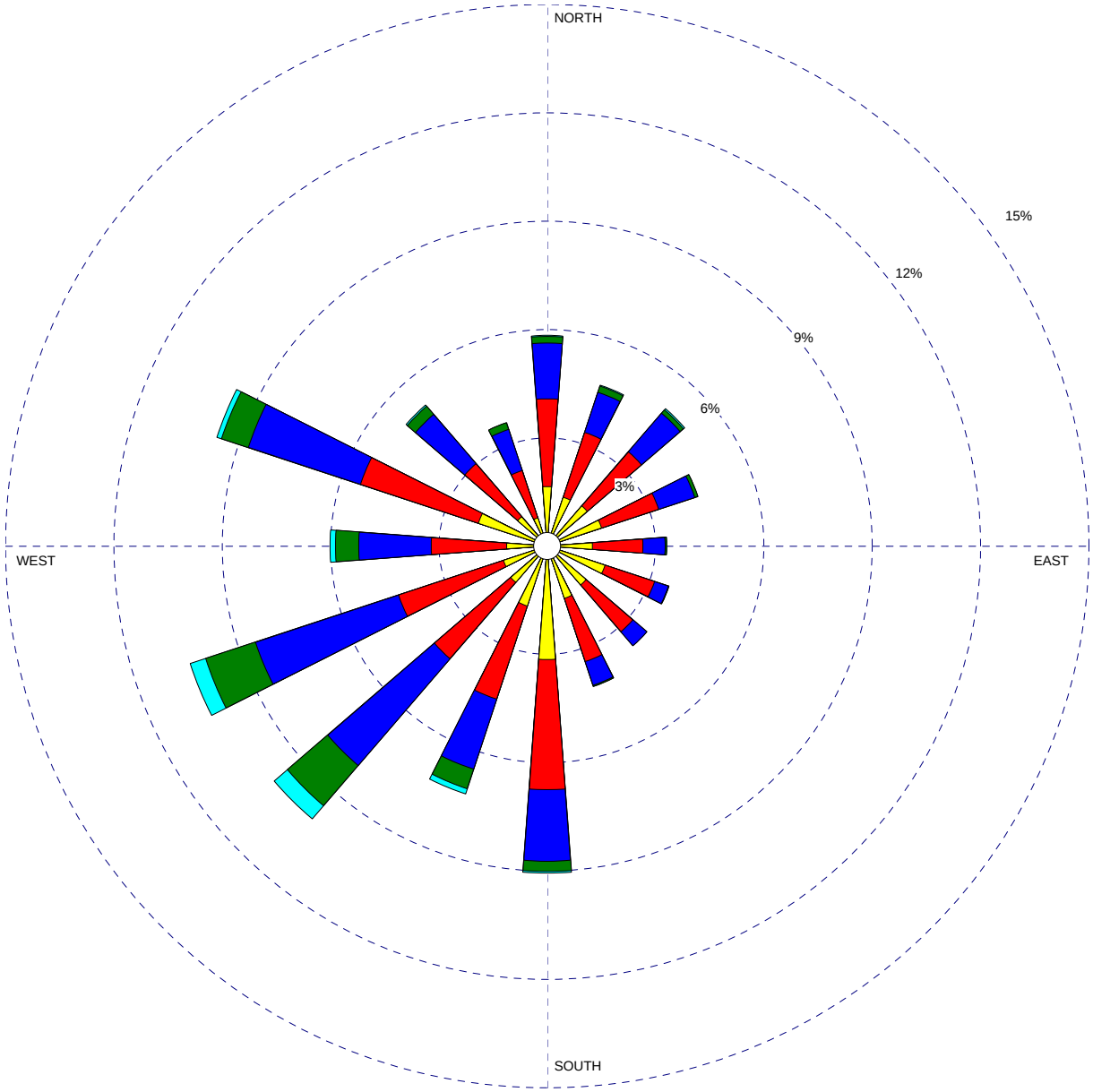
1) Bold indicates results equal to or greater than to 400 mg/kg.

ATTACHMENT C

WIND ROSE PLOT

WIND ROSE PLOT

STATION #94847 - DETROIT/METROPOLITAN ARPT, MI



Wind Speed (m/s)

> 10.8
8.8-10.8
5.7- 8.8
3.6- 5.7
2.1- 3.6
0.5- 2.1

	DATE **2/3/2003**	**Weston Solutions, Inc.**
DISPLAY **Wind Speed**	UNIT **m/s**	**Years** **1984-1991**
AVG. WIND SPEED **5.06 m/s**	CALM WINDS **3.67%**	
ORIENTATION **Direction** **(blowing from)**	PLOT YEAR-DATE-TIME **84 85 86 87 88 89 90 91** **January 1 - December 31** **Midnight - 11 PM**	**ATTACHMENT C**

ATTACHMENT D

PHOTOGRAPHS OF SAMPLING LOCATIONS

Former Michigan Smelting - 7885 Joseph Campau Street

2525 E Grand Blvd – Greenway at the corner of E Grand Blvd and Milwaukee St. It is located on the north side of Milwaukee St and to the south side of a fence surrounding the Midwest Steel building located at 2525 E Grand Blvd.

Looking east along greenway at 5 discrete sample A locations.

Looking west along greenway at 5 discrete sample B locations.

Joseph Campau (cont'd)

1530 Trombly – Greenway located on the south side of Trombly St and to the north of a fence surrounding the DTE Energy building located at 1530 Trombly.

Looking northeast along greenway at 5 discrete sample A locations.

Looking northeast along greenway at 5 discrete sample B locations.

Joseph Campau (cont'd)

2445 E Grand Blvd – Greenways located in front and to the east of a fence surrounding the Simon and Leeman Fruits & Vegetables Distributor building located at 2445 E Grand Blvd. Samples A and B were sampled on greenway on the west side of southbound E Grand Blvd and samples C, D, E, F, G, and H were samples on greenway between the north and south bound lanes of E Grand Blvd.

Looking north along greenway west of southbound E Grand Blvd at sample A and B locations, respectively.

Looking south between north and southbound E Grand Blvd at sample C locations.

Looking north between north and southbound E Grand Blvd at sample D locations.

Joseph Campau (cont'd)

2445 E Grand Blvd (cont'd)

Looking north between north and southbound E Grand Blvd at sample E and F locations, respectively.

Looking north between north and southbound E Grand Blvd at sample G and H locations, respectively.

Joseph Campau (cont'd)

1904 E Grand Blvd – Greenway located on the south side of E Grand Blvd in between an empty lot, a house at 1904 E Grand Blvd, and a parking lot on the corner of Elmwood and E Grand Blvd.

Looking northeast along greenway at 5 discrete sample A locations.

Looking southeast along greenway at 5 discrete sample B locations.

Joseph Campau (cont'd)

1998 E Grand Blvd – Greenway on the corner of Medbury St and E Grand Blvd. It is located on the north side of Medbury St and to the south side of the house at 1998 E Grand Blvd.

Looking northeast along greenway at 5 discrete sample A locations.

Looking northwest along greenway at 5 discrete sample B locations.

Joseph Campau (cont'd)

3030 Medbury – Greenway located on the south side of Medbury St and to the south side of the house at 3030 Medbury.

Looking west along greenway at 5 discrete sample A locations.

Looking east along greenway at 5 discrete sample B locations.

Joseph Campau (cont'd)

5901 Mitchell – Greenway on the corner of Mitchell St and Medbury St. It is located on the north side of Medbury St and to the south side of the house at 5901 Mitchell.

Looking east along greenway at 5 discrete sample A locations.

Looking west along greenway at 5 discrete sample B locations.

Joseph Campau (cont'd)

2918 Hendrie – Greenway on the corner of Hendrie St and Joseph Campau St. It is located on the south side of Hendrie St and to the north side of a church at 2918 Hendrie.

Looking southwest along greenway at 5 discrete sample A locations.

Looking southwest along greenway at 5 discrete sample B locations.

Joseph Campau (cont'd)

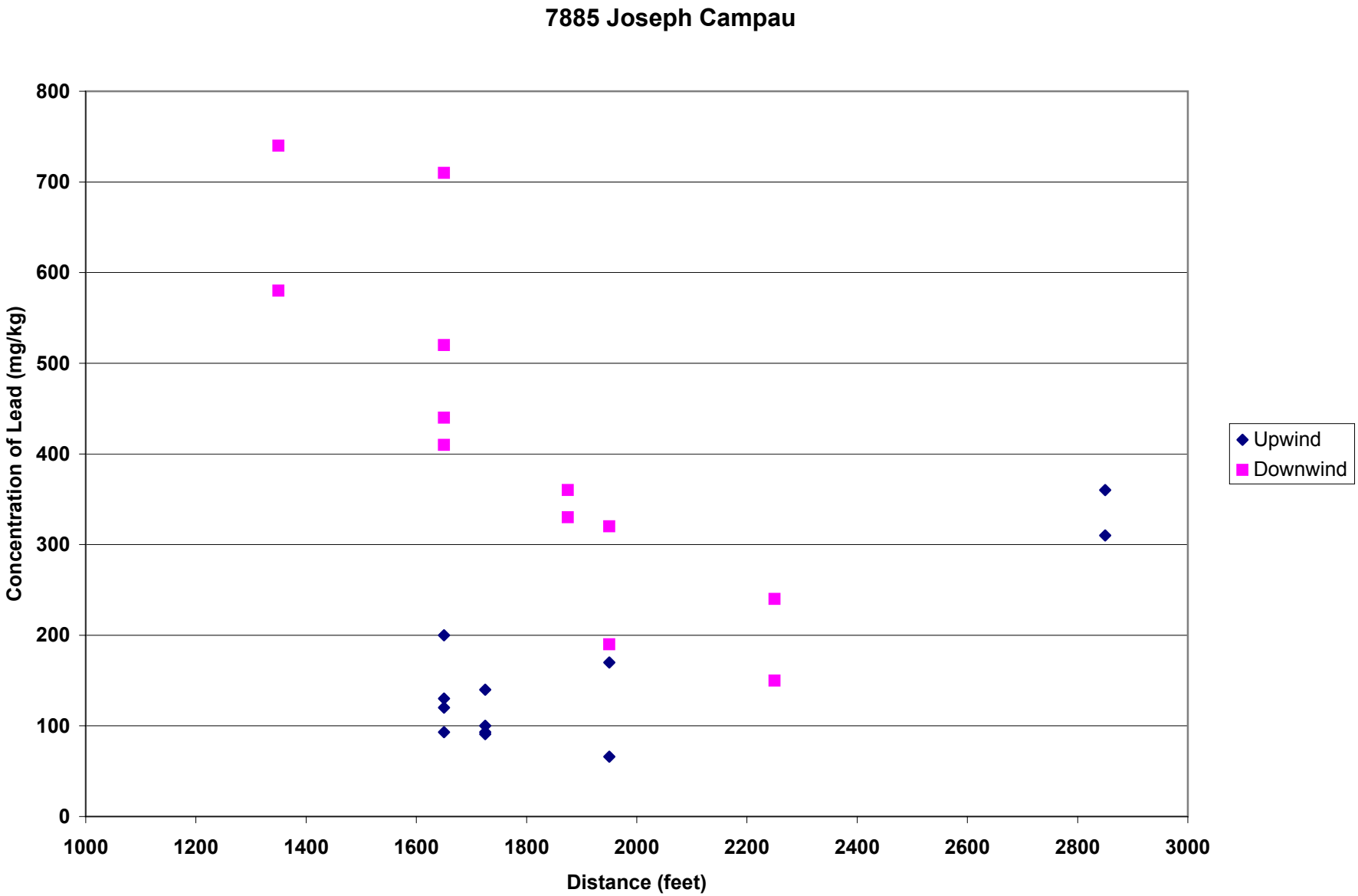
1945 E Grand Blvd – Greenway on the corner of Hendrie St and E Grand Blvd. It is located on the south side of Hendrie St and to the north side of a house at 1945 E Grand Blvd and an empty lot (lot directly west of house; house and lot are separated by an alley).

Looking west along greenway at 5 discrete sample A locations.

Looking east along greenway at 5 discrete sample B locations.

ATTACHMENT E

CONCENTRATION GRAPH


7885 Joseph Campau
Concentration of Lead (mg/kg)
800
700
600
500
400
300
200
100
0
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
Distance (feet)
Upwind
Downwind

Michigan Smelting

*** Linear Model ***

Call: lm(formula = Lead.ppm ~ Location + Distance.ft + Distance.ft:Location, data = Michigan, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-133.9 -30.89 -5.27 24.16 216.4

Coefficients:

	Value	Std. Error	t value	Pr(>|t|)
(Intercept)	-190.4388	103.3352	-1.8429	0.0802
Location	1617.4329	176.5804	9.1598	0.0000
Distance.ft	0.1800	0.0524	3.4344	0.0026
Distance.ft:Location	-0.7457	0.0949	-7.8568	0.0000

Residual standard error: 77.3 on 20 degrees of freedom
Multiple R-Squared: 0.8672
F-statistic: 43.55 on 3 and 20 degrees of freedom, the p-value is 5.898e-009

Analysis of Variance Table

Response: Lead.ppm

Terms added sequentially (first to last)

	Df	Sum of Sq	Mean Sq	F Value	Pr(F)
Location	1	404820.4	404820.4	67.74967	0.0000001
Distance.ft	1	7032.6	7032.6	1.17696	0.2908801
Distance.ft:Location	1	368845.2	368845.2	61.72896	0.0000002
Residuals	20	119504.7	5975.2		

*** Linear Model ***

Call: lm(formula = Log.Lead ~ Location + Distance.ft + Distance.ft:Location, data = Michigan, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-0.751 -0.1614 0.01587 0.1647 0.6208

Coefficients:

	Value	Std. Error	t value	Pr(>|t|)
(Intercept)	3.2305	0.4033	8.0102	0.0000
Location	5.3833	0.6892	7.8114	0.0000
Distance.ft	0.0009	0.0002	4.2871	0.0004
Distance.ft:Location	-0.0024	0.0004	-6.4305	0.0000

Residual standard error: 0.3017 on 20 degrees of freedom
Multiple R-Squared: 0.8446
F-statistic: 36.23 on 3 and 20 degrees of freedom, the p-value is 2.815e-008

Analysis of Variance Table

Response: Log.Lead

Terms added sequentially (first to last)

	Df	Sum of Sq	Mean Sq	F Value	Pr(F)
Location	1	6.059322	6.059322	66.57476	0.0000001
Distance.ft	1	0.070912	0.070912	0.77912	0.3878968
Distance.ft:Location	1	3.763584	3.763584	41.35111	0.0000028
Residuals	20	1.820306	0.091015		

ATTACHMENT F

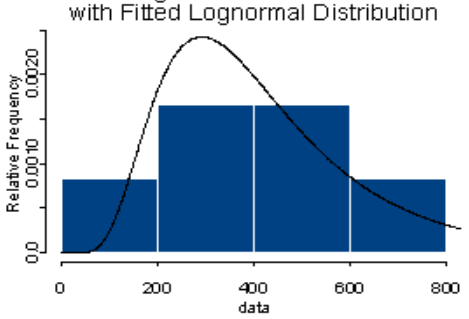
STATISTICAL DISTRIBUTION

MICHIGAN SMELTING
STATISTICAL DISTRIBUTION

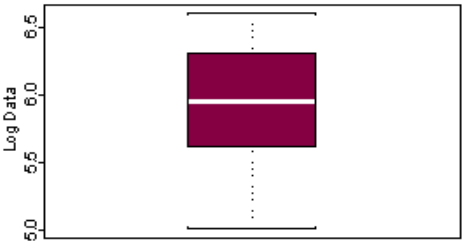
Lognormal Distribution Analysis for Data

Data Set Name: Michigan Smelting , Area: JOS D

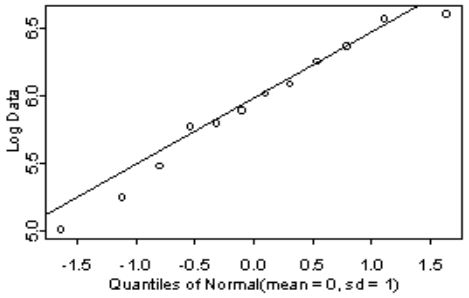
Histogram of Observed Data with Fitted Lognormal Distribution



Box Plot of Log Data Data



Normal Probability Plot of Log Data Data



Summary Statistics

Sample Size:	12
Coefficient of Variation:	0.0843176
Coefficient of Skewness:	-0.398059

Results of Shapiro-Wilk GOF

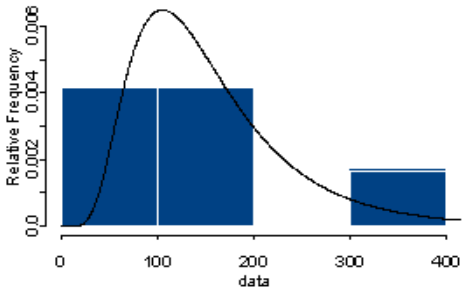
Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 5.923627 sdlog = 0.4994657
Test Statistic:	W = 0.9641433
Test Statistic Parameter:	n = 12
p-value:	0.8409223

Since p >= .05 conclude distribution is lognormal.

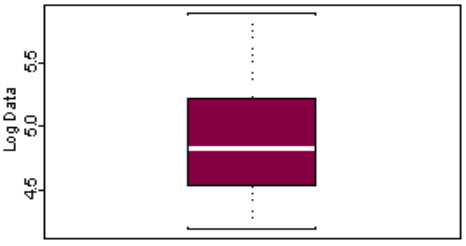
Lognormal Distribution Analysis for Data

Data Set Name: Michigan Smelting , Area: JOS U

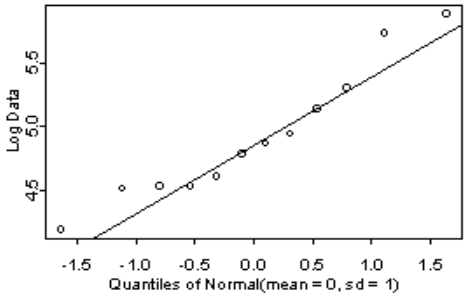
Histogram of Observed Data with Fitted Lognormal Distribution



Box Plot of Log Data Data



Normal Probability Plot of Log Data Data



Summary Statistics

Sample Size:	12
Coefficient of Variation:	0.1045805
Coefficient of Skewness:	0.732371

Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 4.918695 sdlog = 0.5143995
Test Statistic:	W = 0.9298959
Test Statistic Parameter:	n = 12
p-value:	0.3790102

Since p >= .05 conclude distribution is lognormal.