PHASE I SUMMARY REPORT
FOR
DETROIT LEAD ASSESSMENT PROJECT
CITY METALS REFINING – 2945 HUBBARD STREET
DETROIT, WAYNE COUNTY, MICHIGAN

Prepared for

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
REMEDIATION AND REDEVELOPMENT DIVISION
Detroit Field Office – Cadillac Place
Suite 2-300
3058 West Grand Boulevard
Detroit, Michigan 48202

Prepared by

WESTON SOLUTIONS OF MICHIGAN, INC.
2501 Jolly Road
Suite 100
Okemos, MI 48864

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 City Metals Refining (the Facility), 2945 Hubbard Street, Detroit, 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 14 November 2003 WESTON collected 24 soil samples for lead analysis at locations upwind and downwind of the Facility. The data collected during the Phase I sampling does not indicate that downwind soils at properties have been impacted by releases of lead from the Facility as a result of aerial deposition related to historic smelting operations. However, concentrations exceeding the screening level exist upwind of the Facility, therefore it is recommended that additional work be performed at the Facility including:

- 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

This page intentionally left blank

TABLE OF CONTENTS

Section **Page**

LIST OF APPENDICES

Title

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 City Metals Refining (the Facility), 2945 Hubbard Street, Detroit, 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 City Metals Refining 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
- **Attachment F** Statistical Distribution

This page intentionally left blank

SECTION 2

SITE INFORMATION

2.1 SITE DESCRIPTION

The Facility, located at 2945 Hubbard St in Detroit, 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 offsite properties sampled are presented in **Table 1** located in **Attachment B**.

2.1.1 Site Location

The Facility appears to be located on property currently occupied by Piston Automotive that is enclosed within a concrete wall. The area five blocks to the north of the Facility is residential. The area to the south of the Facility is industrial for four blocks and residential for at least the next one block. The area five blocks east of the Facility is a mixture of residential, industrial, and commercial. The area five blocks west of the Facility is industrial.

2.1.2 Site History

A review of the Bresser's directory indicated that City Metals Refining owned the property from 1946 to 1971. Liberman R C OFC was a co-owner in 1951. There are no listings for the address from 1971 to the present.

Review of the Sanborn maps for this address show that in 1950 a Metal Refining Plant was present with a Smelting Furnace.

The aerial photograph review showed that this address was located in an industrial area. The property is currently vacant but the surrounding area is still industrialized with light residential use approximately 600 feet (ft) to the north, east and south. Structures were not identified from the most recent aerial photograph (2003 GlobeXplorer™) and the entire lot appears paved for parking. Review of the drive by information indicates that land use is consistent with 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 a property located at the "northeast corner of Ash and Vinewood", date unknown, NTH Consultants Ltd. for Alternatives for Girls, indicates that lead was detected on the sites at levels up to 360 milligrams per kilogram (mg/kg) and did not exceed the MDEQ Part 201 Residential Direct Contact Criteria (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 1000 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, 2100 and 1350 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, photo documentation) were conducted as described in the Comprehensive Summary. Because 12 City and/or State owned parcels were not available in the sample radius for the Facility, WESTON collected samples from 6 parcels and 5 greenways near the Facility. Six City and/or State owned parcels were sampled in the downwind direction and five 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 6

downwind parcels and four of the upwind greenways. Four composite samples were collected from one large upwind greenway, which was 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 14 November, 5 December and 8 December 2003. Since City and/or State owned parcels were not available upwind, WESTON selected greenways, prior to the sampling event, and submitted them to the City of Detroit 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 greenway located at 2350 Scotten Street with an adjoining property located next door with a visible mailing address, would be identified as SCT – 02350. 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 five upwind greenways: Two composite samples were collected from each of the four upwind greenways and four composite samples were collected from the fifth larger upwind greenway for a total of 12 upwind samples. Also, two samples were collected from each of the six downwind City and/or State owned parcels for a total of twelve 12 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
- 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. Four samples collected from properties upwind of the Facility contained concentrations of lead above the project screening level (400 mg/kg) established in the Phase I QASP. Samples collected from properties downwind of the Facility did not contain 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	4	97-490
Downwind	12	0	110-340
TOTAL	24	4	97-490

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 detected downwind in the northeast direction from the Facility. Parcels were not chosen southwest in the major upwind direction due to lack of residential receptors within 1500 ft. Parcels ranging from 1725 ft to 2100 ft were selected south in the upwind direction of the Facility. Parcels ranging from 600 ft to 1350 ft were selected northeast, as close to the mean downwind direction of the Facility due to the presence of residential properties. Elevated lead concentrations were detected in the upwind direction of the Facility and low-level lead concentrations (less than the screening level) were detected in the downwind 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 upwind 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 elevated levels of lead occurred in the upwind direction. The downwind direction showed concentrations less than the screening level (400mg/kg) of lead with no statistical trend of decreasing concentrations with increasing distance from the facility. This condition 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 concentrations versus distance data (**Attachment E**).

4.4 STATISTICAL ANALYSIS

Analytical data was entered into a spreadsheet 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 mean is 212 mg/kg and the upwind mean is 326 mg/kg indicating the concentrations upwind are greater than the downwind. Comparison of the relative frequency histogram (**Attachment F**) for the downwind and upwind data sets indicates the downwind data is an uneven distribution across the sample set while the upwind results exhibit a more even increasing distribution. 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 not 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.

Samples collected from upwind of the Facility contained concentrations of lead above the screening level but do not appear to be consistent with other levels detected upwind locations and indicated no reason for the elevated concentrations. The downwind samples show a clear trend of decreasing concentration with increasing distance. The levels of lead start at 270 mg/kg (600 ft from the facility) and decrease out to a distance of 1400 ft from the facility (with the exception of a single sample with a concentration of 340 mg/kg at approximately 1300 ft). The data collected during the Phase I sampling does not support that an identifiable aerial release occurred from the Site during historic smelting operations.

This page intentionally left blank

SECTION 5
RECOMMENDATIONS

The results of this investigation do not indicate that soils at downwind properties have been impacted by releases of lead from the Facility as a result of aerial deposition related to historic smelting operations. However, concentrations exceeding the screening level exist upwind of the so it is recommended that additional work be performed at the Facility including:

- 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.

This page intentionally left blank

ATTACHMENT A

FIGURES

FIGURE 1
Site Location Map
2945 Hubbard 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

- Sampled Properties (Greenway)
- Parcel Boundaries
- Sampled Properties
- Facility of Concern
- State Owned Property
- City Owned Property
- Wind Direction

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

N

0 600 Feet

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:

City Metals Refining
2945 Hubbard Street

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

WESTON MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT HUBBARD W.O. NO. ____

TASK DESCRIPTION SCT - 02344 A+B TASK NO. ____

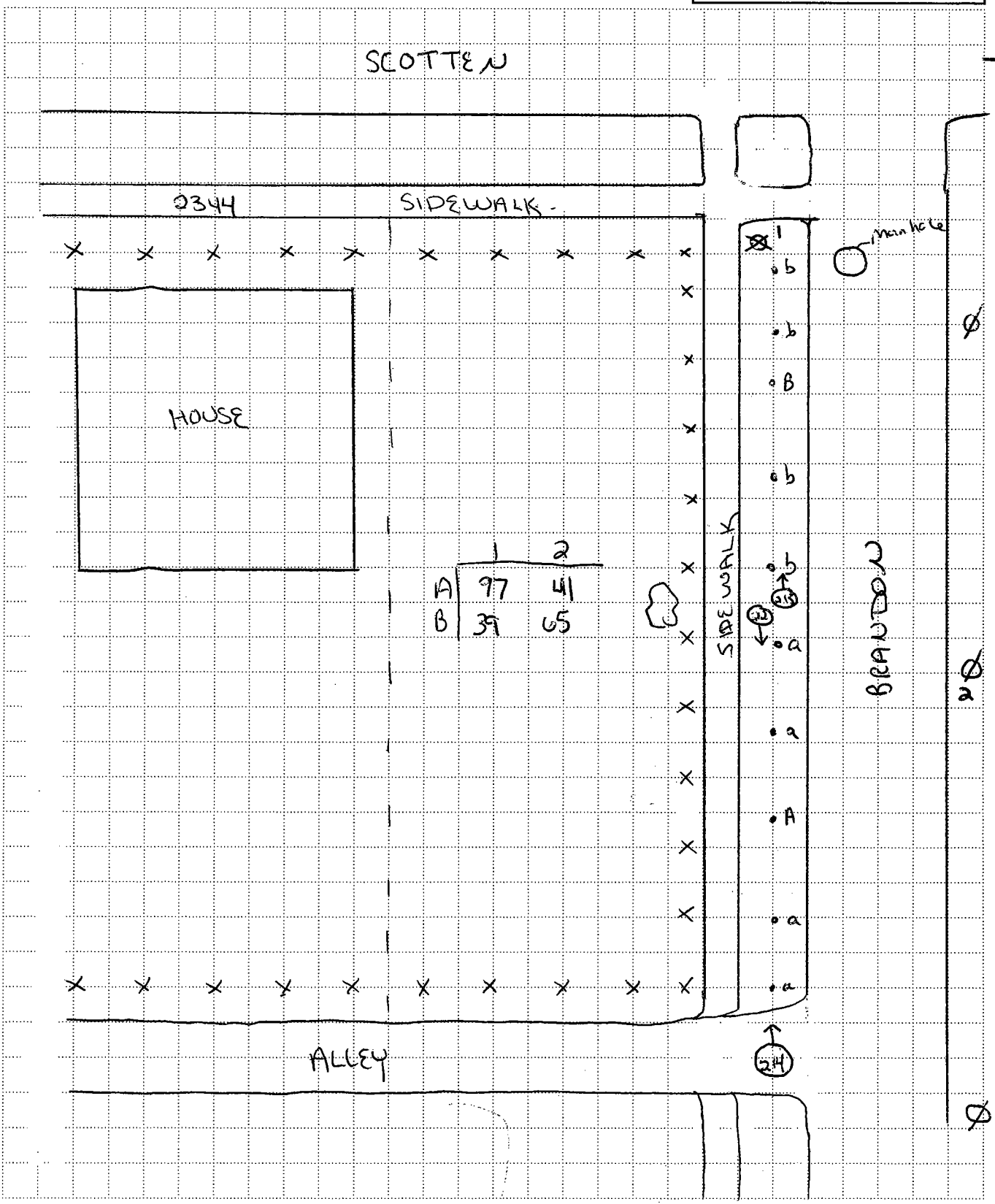
PREPARED BY A.Freeman DEPT ____ DATE 12/8/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



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

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT HUBBARD W.O. NO. ____

TASK DESCRIPTION BRA-4272 A,B,C,D CLK - 02525 A+B TASK NO. ____

PREPARED BY AFreeman DEPT ____ DATE 12/5/03

MATH CHECK BY ____ DEPT ____ DATE ____

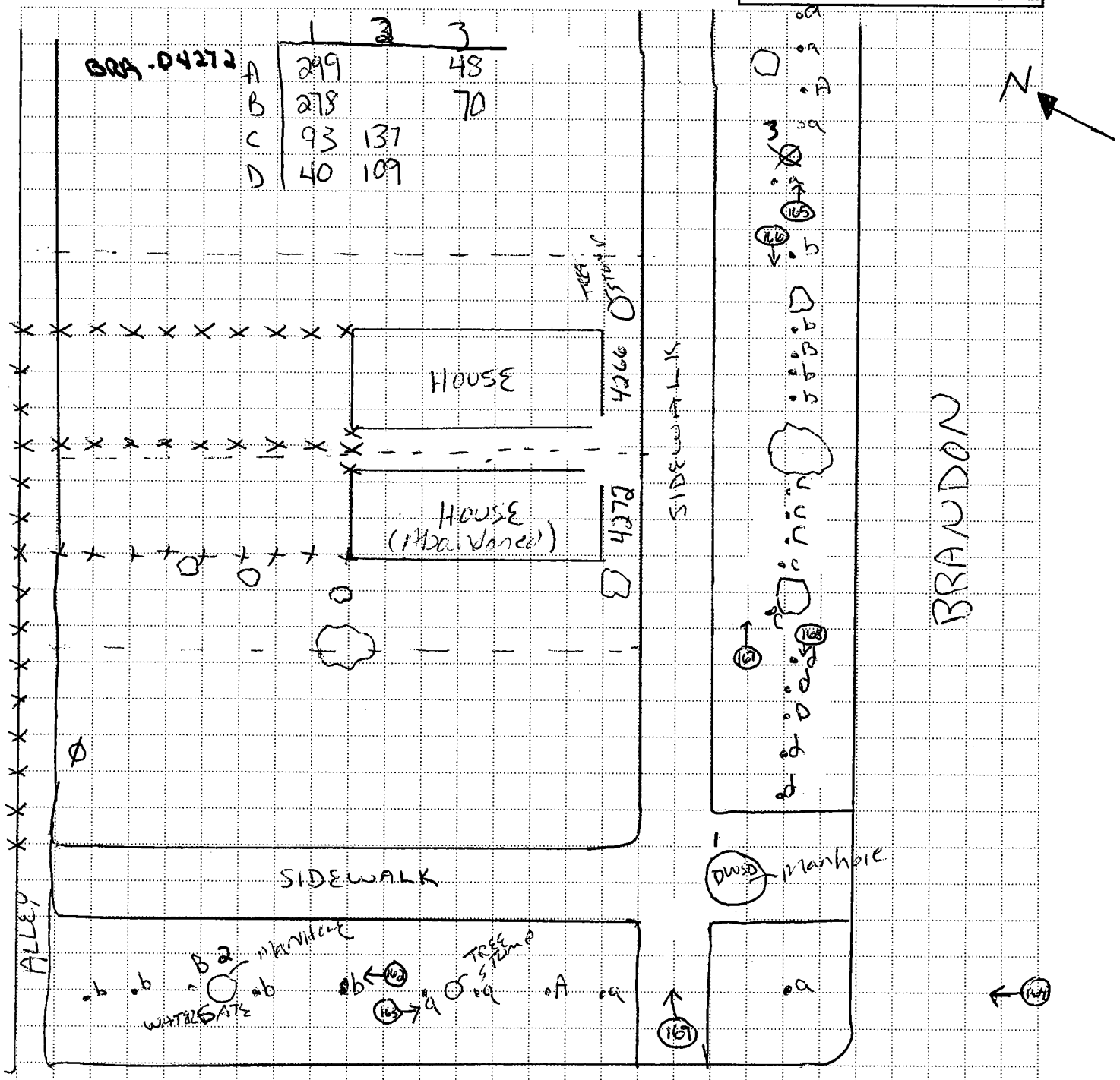
METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____

BRA-04272

	1	2	3
A	299		48
B	278		70
C	93	137	
D	40	109	



	1	2
A	28	60
B	93	5

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

IDLE GROUP

WESTON MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT HUBBARD W.O. NO. ____

TASK DESCRIPTION CLK-02353 A+B BRA-04465 A+B TASK NO. ____

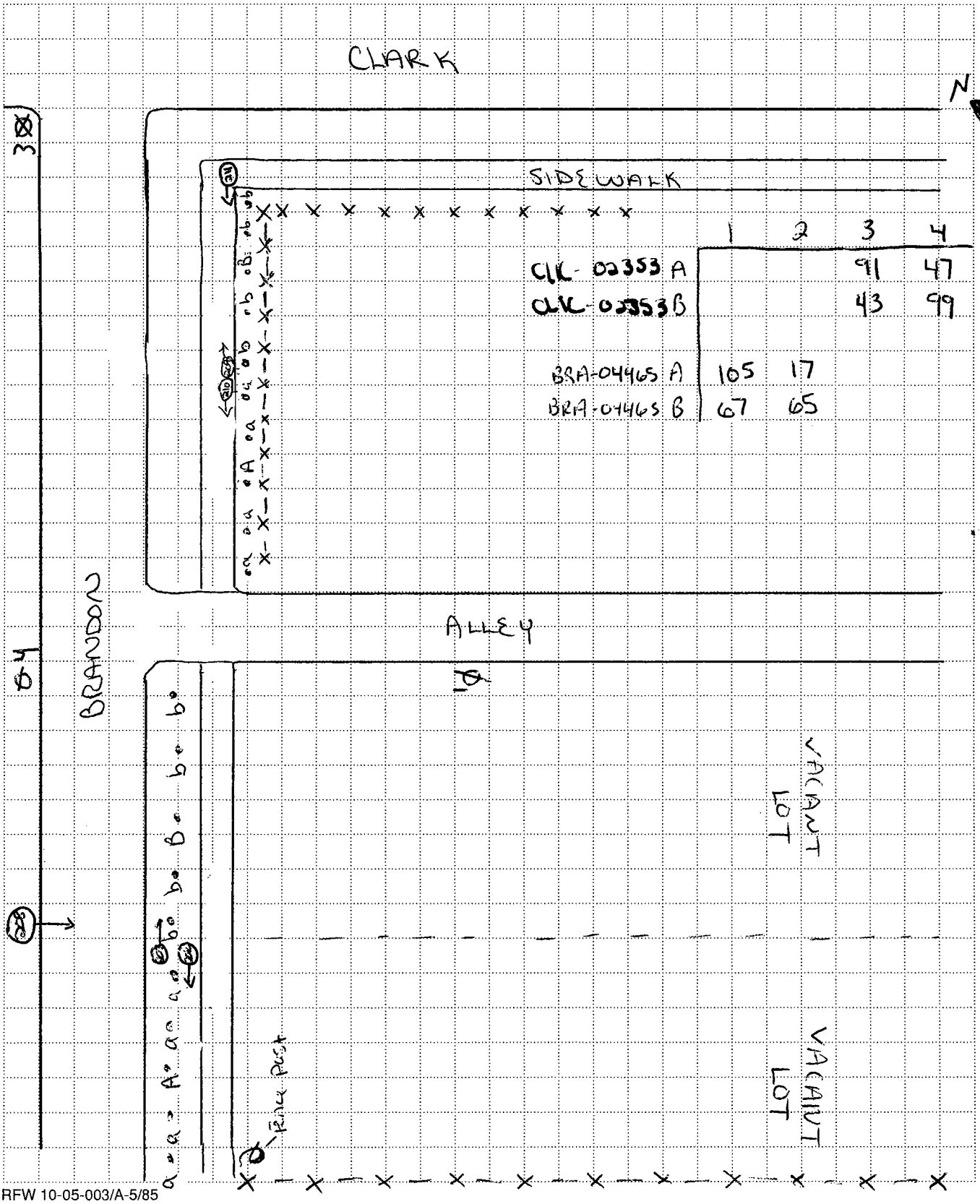
PREPARED BY A. Freeman DEPT ____ DATE 12/8/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



	1	2	3	4
CLK-02353 A			91	47
CLK-02353 B			43	99
BRA-04465 A	105	17		
BRA-04465 B	67	65		

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

WESTON MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT HUBBARD W.O. NO. ____

TASK DESCRIPTION WGR-00802 Area B TASK NO. ____

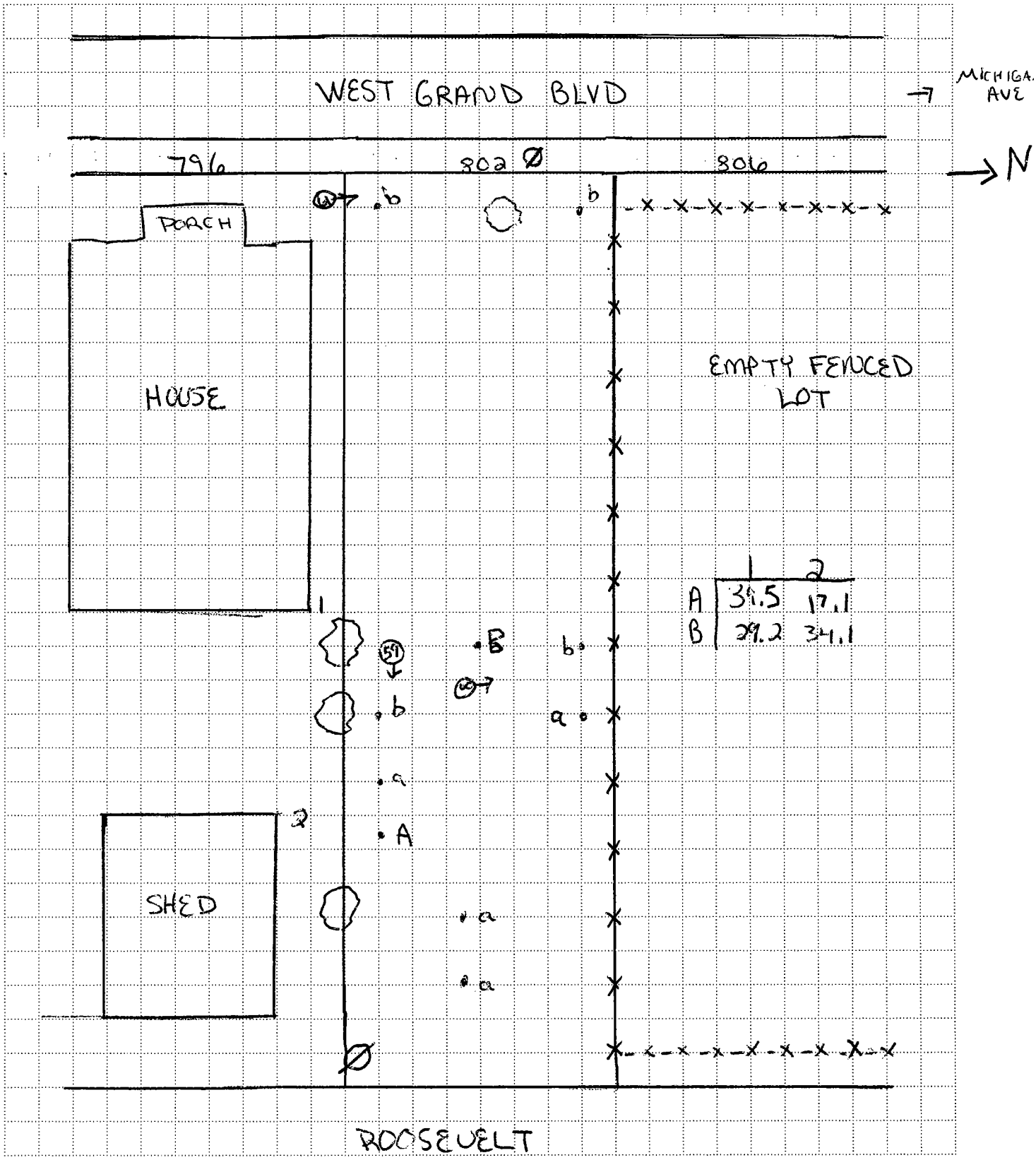
PREPARED BY A. Freeman DEPT ____ DATE 11-14-03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT HUBBARD W.O. NO. ____

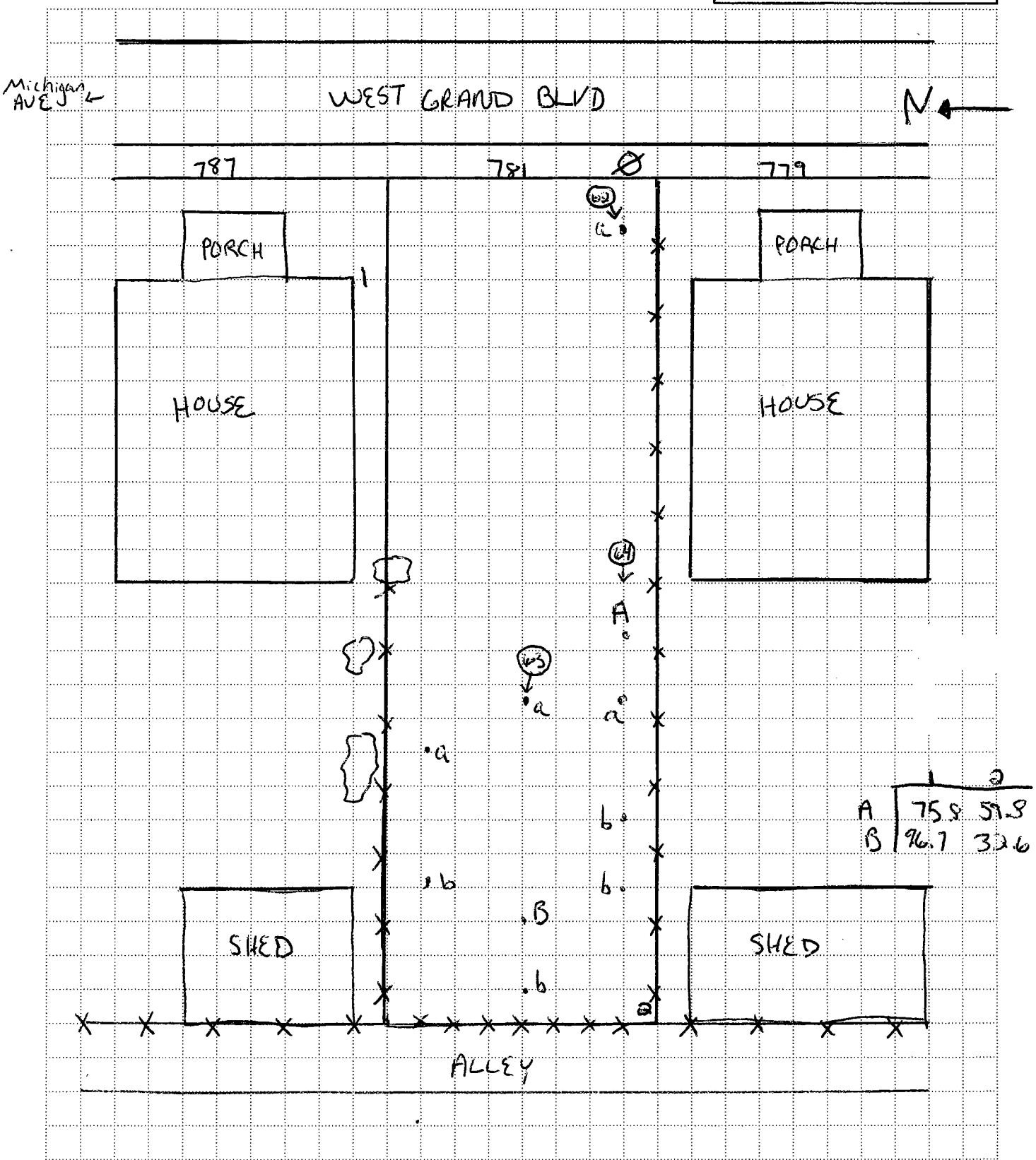
TASK DESCRIPTION WGR-00781 A+B TASK NO. ____

PREPARED BY A. Freeman DEPT ____ DATE 11-14-03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____



WESTON® MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT HUBBARD W.O. NO. ____

TASK DESCRIPTION TFH-02803-A-C-O-2 TFH-02803-B-C-O-1 TASK NO. ____

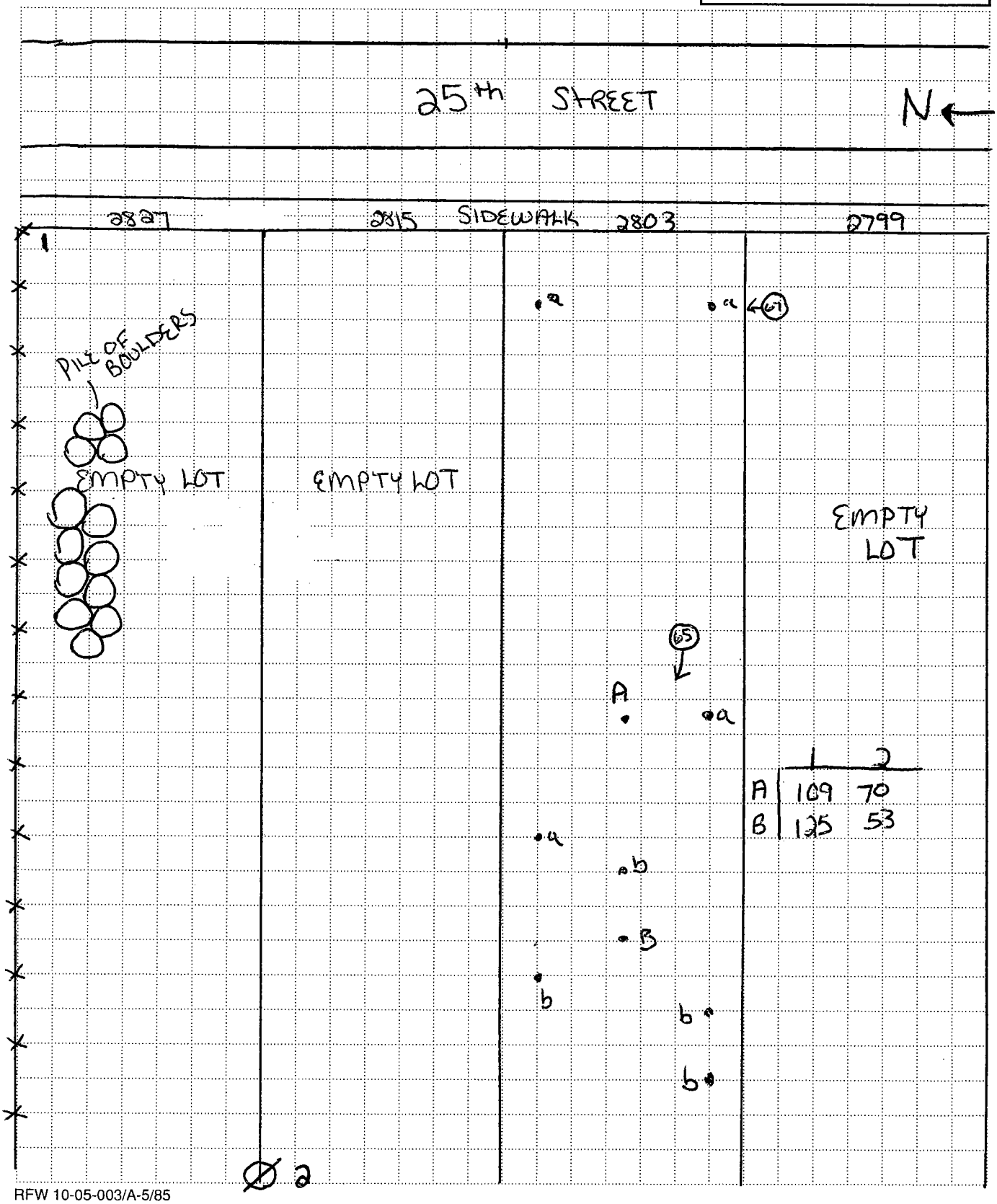
PREPARED BY A. Freeman DEPT ____ DATE 11-14-03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



WESTON® MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT HUBBARD W.O. NO. ____

TASK DESCRIPTION R00-02798 ATB AND R00-02880 02822 ATB TASK NO. ____

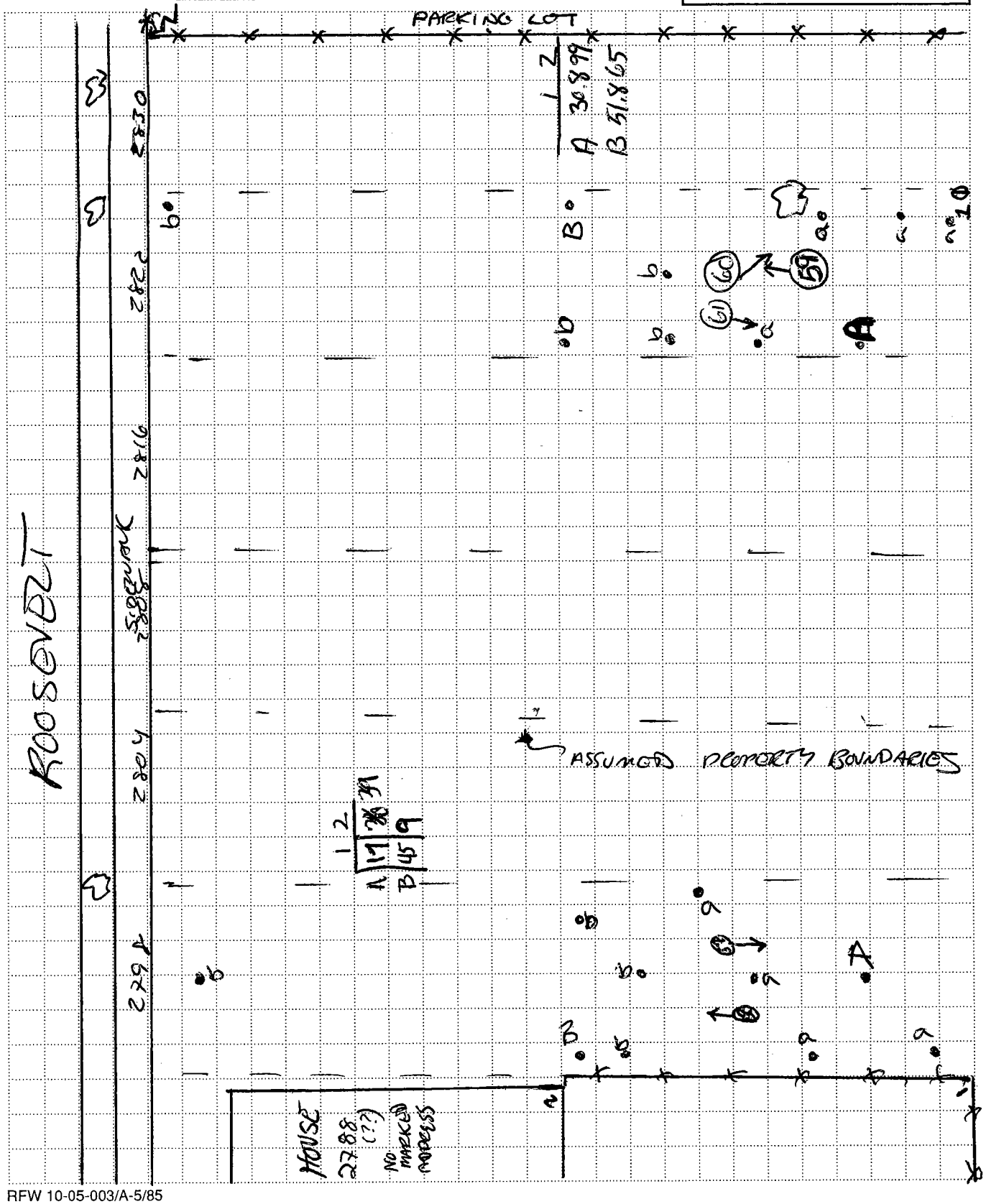
PREPARED BY R. NEMIROVSKY DEPT ____ DATE 11/14/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



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

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT HUBBARD W.O. NO. ____

TASK DESCRIPTION VIN-02916 A+B TASK NO. ____

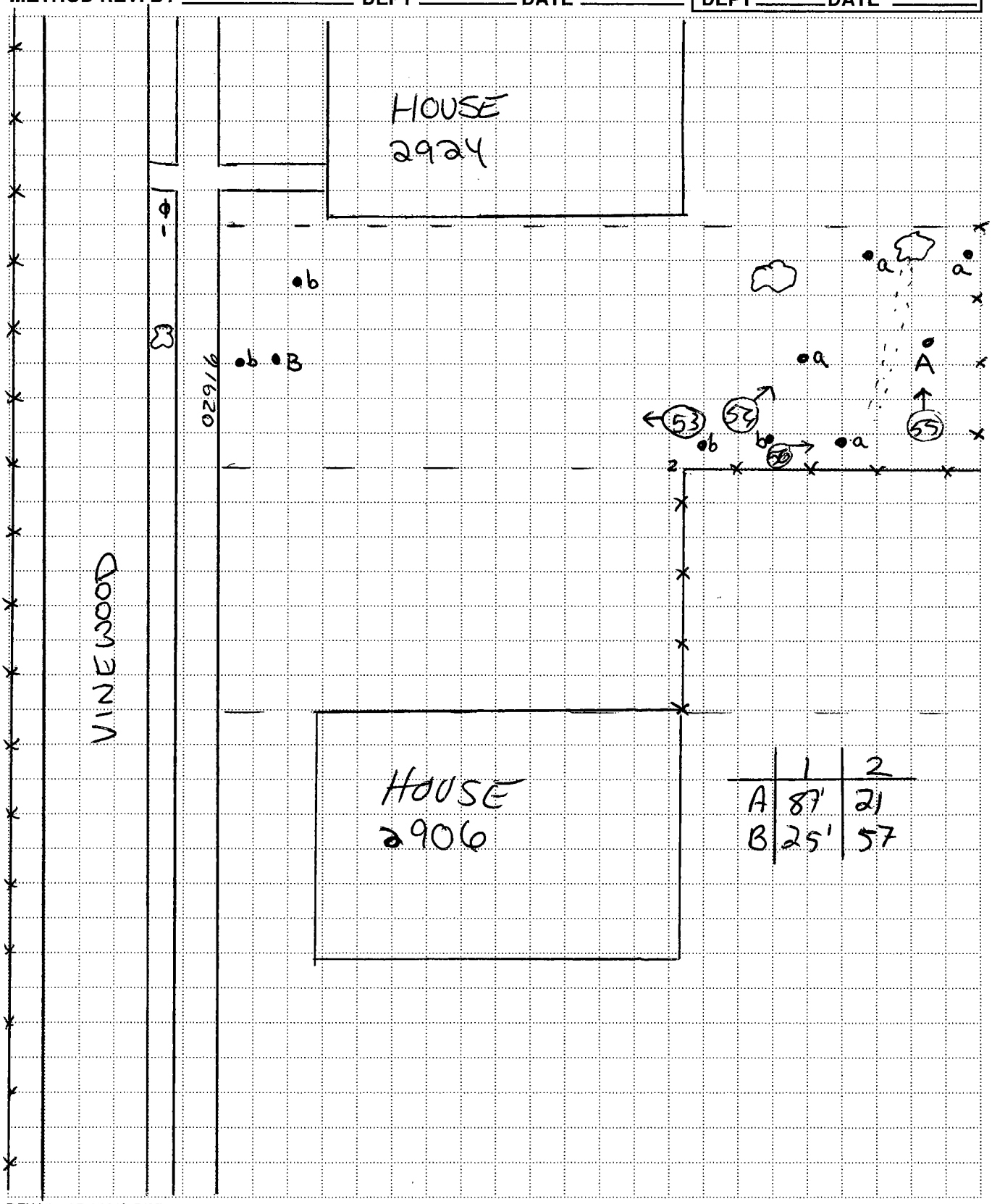
PREPARED BY R NEMIROVSKY DEPT ____ DATE 11/14/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



	1	2
A	87'	21
B	25'	57

APPENDIX B
TABLES

TABLE 1

SUMMARY OF SAMPLED PROPERTIES

Upwind Properties		
Address	**Description**	**Sample Identification**
2350 Scotten*	Greenway located on the south side of Brandon St, at the corner of Brandon and Scotten St and to the north of a house at 2344 Scotten.	SCT-02344-A-C-0-1
		SCT-02344-B-C-0-1
4272 Brandon	Greenway located on the northwest side of Brandon St and to the southwest of abandoned house at 4272 Brandon.	BRA-04272-A-C-0-1
		BRA-04272-B-C-0-1
		BRA-04272-C-C-0-1
		BRA-04272-D-C-0-1
4296 Brandon*	Greenway at the corner of Clark St and Brandon St and located northeast of building parking lot called The Idle Group at 2525 Clark.	CLK-02525-A-C-0-1
		CLK-02525-B-C-0-1
4465 Brandon	Greenway located on the southeast side of Brandon St and on the northwest side of two vacant properties.	BRA-04465-A-C-0-1
		BRA-04465-B-C-0-1
2363 Clark*	Greenway located on the corner of Clark and Brandon St and on the northwest side of a fenced in lot belonging to house at 2353 Clark.	CLK-02353-A-C-0-2
		CLK-02353-B-C-0-1
Downwind Properties		
Address	**Description**	**Sample Identification**
802 West Grand Blvd	Vacant property located on the east side of W Grand Blvd and to the north side of a house at 796 W Grand Blvd.	WGR-00802-A-C-0-1
		WGR-00802-B-C-0-1
781 West Grand Blvd	Vacant property located on the west side of W Grand Blvd and in between houses at 779 & 787 W Grand Blvd.	WGR-00781-A-C-0-1
		WGR-00781-B-C-0-1
2803 25th Street	Vacant property located on the west side of 25th Street and the thrird empty lot to the south of a fenced property.	TFH-02803-A-C-0-2
		TFH-02803-B-C-0-1
2798 Roosevelt	Vacant property on the northeast side of Roosevelt St and to the northwest of a house with no marked address which is assumed to be 2788 Roosevelt.	ROO-02798-A-C-0-1
		ROO-02798-B-C-0-1
2822 Roosevelt	Vacant property on the northeast side of Roosevelt St and the fifth empty lot to the northwest of a house with no marked address which is assumed to be 2788 Roosevelt.	ROO-02822-A-C-0-1
		ROO-02822-B-C-0-1
2916 Vinewood	Vacant property located on the northeast side of Vinewood St and to the southeast of a house at 2924 Vinewood.	VIN-02916-A-C-0-1
		VIN-02916-B-C-0-2

*Notes:

1) Greenway identifiers were taken from the street the greenway was parallel to and not the actual street to which the property belonged.

2) Address used in the sample ID of a greenway was from that of the nearest house.

TABLE 2

ANALYTICAL RESULTS

Sample Address	Sample ID	Concentration of Lead (mg/Kg)
Upwind		
2350 Scotten	SCT-02344-A-C-0-1	350
2350 Scotten	SCT-02344-B-C-0-1	270
4272 Brandon	BRA-04272-A-C-0-1	**490**
4272 Brandon	BRA-04272-B-C-0-1	**450**
4272 Brandon	BRA-04272-C-C-0-1	170
4272 Brandon	BRA-04272-D-C-0-1	**430**
4296 Brandon	CLK-02525-A-C-0-1	150
4296 Brandon	CLK-02525-B-C-0-1	97
4465 Brandon	BRA-04465-A-C-0-1	280
4465 Brandon	BRA-04465-B-C-0-1	**470**
2363 Clark	CLK-02353-A-C-0-2	390
2363 Clark	CLK-02353-B-C-0-1	370
Downwind		
802 W Grand Blvd	WGR-00802-A-C-0-1	210
802 W Grand Blvd	WGR-00802-B-C-0-1	230
781 W Grand Blvd	WGR-00781-A-C-0-1	230
781 W Grand Blvd	WGR-00781-B-C-0-1	270
2803 25th Street	TFH-02803-A-C-0-2	110
2803 25th Street	TFH-02803-B-C-0-1	220
2798 Roosevelt	ROO-02798-A-C-0-1	340
2798 Roosevelt	ROO-02798-B-C-0-1	130
2822 Roosevelt	ROO-02822-A-C-0-1	150
2822 Roosevelt	ROO-02822-B-C-0-1	170
2916 Vinewood	VIN-02916-A-C-0-1	220
2916 Vinewood	VIN-02916-B-C-0-2	270

*Notes:

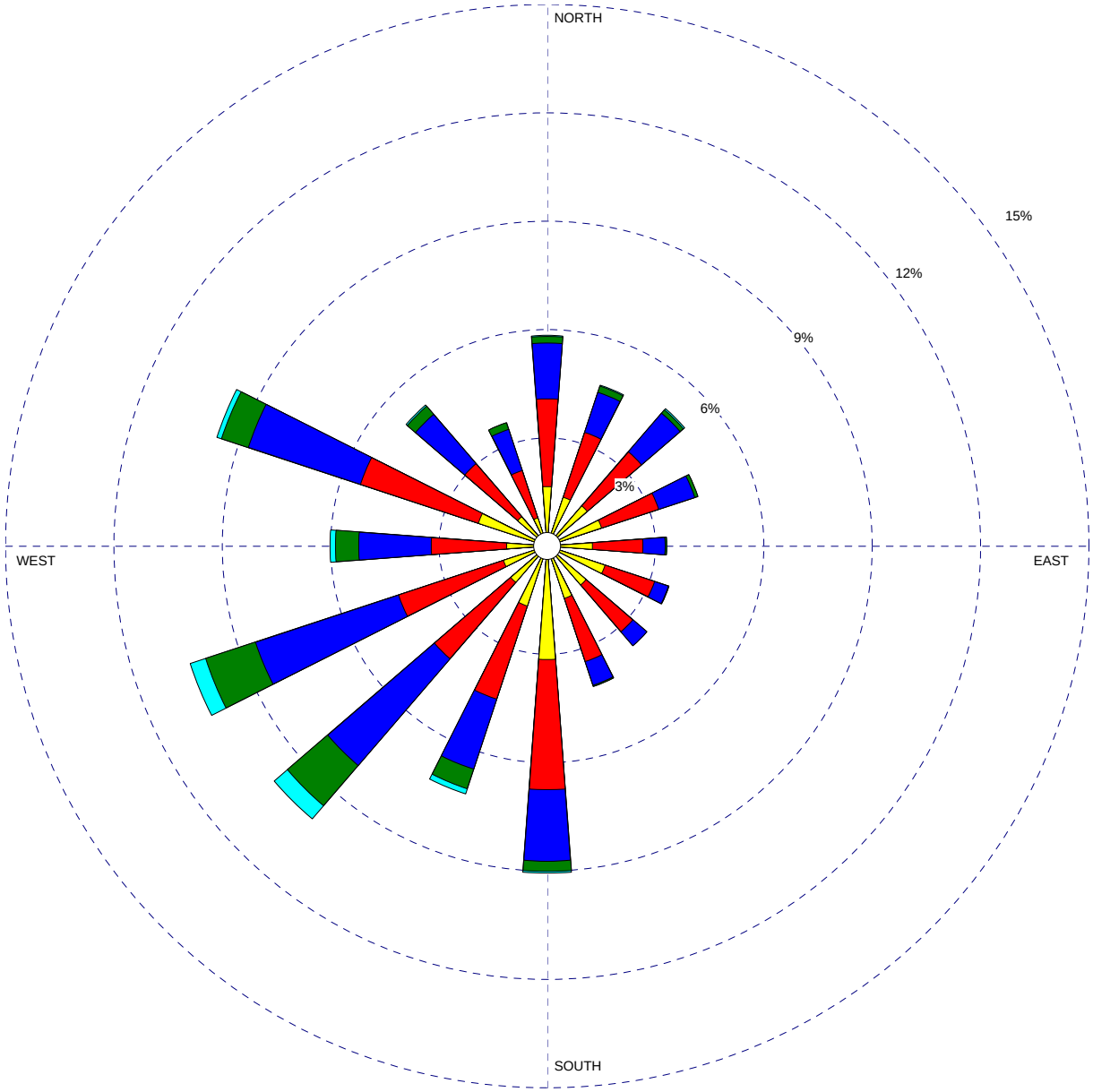
1) Bold indicates results equal to or greater than to 400 mg/kg.

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**

WRPLOT View 2.22 by Lakes Environmental Software - www.lakes-environmental.com

ATTACHMENT D

PHOTOGRAPHS OF SAMPLING LOCATIONS

Former City Metals Refining – 2945 Hubbard

2344 Scotten – Greenway located on the south side of Brandon St and at the corner of Brandon and Scotten St.

Looking east along greenway at 5 discrete sample A locations.

Looking west along greenway at 5 discrete sample B locations.

Looking west along greenway at the total sampling area.

Hubbard (cont'd)

4272 Brandon – Greenway located on the northwest side of Brandon St and to the southwest of an abandoned house at 4272 Brandon.

Looking northeast along greenway at 5 discrete sample A locations.

Looking southwest along greenway at 5 discrete sample B locations.

Hubbard (cont'd)

4272 Brandon (cont'd)

Looking northeast along greenway at 5 discrete sample C locations.

Looking southwest along greenway at 5 discrete sample D locations.

Looking along the greenway at the total sampling area.

Hubbard (cont'd)

2525 Clark – Greenway located at the corner of Clark St and Brandon St and northeast of a building parking lot called the Idle Group at 2525 Clark.

Looking southeast along greenway at 5 discrete sample A locations.

Looking northwest along greenway at 5 discrete sample B locations.

Looking northwest along greenway at the total sampling area.

Hubbard (cont'd)

4465 Brandon – Greenway located on the southeast side of Brandon St and on the northwest side of two vacant properties.

Looking southwest along greenway at 5 discrete sample A locations.

Looking northeast along greenway at 5 discrete sample B locations.

Looking southeast along the property at the total sampling area.

Hubbard (cont'd)

2353 Clark – Greenway located on the corner of Clark and Brandon St and on the northwest side of a fenced in lot belonging to a house at 2353 Clark.

Looking southwest along greenway at 5 discrete sample A locations.

Looking northeast along greenway at 5 discrete sample B locations.

Looking southwest along the greenway at the total sampling area.

Hubbard (cont'd)

802 West Grand Blvd – Vacant property located on the east side of W Grand Blvd and to the north side of a house at 796 W Grand Blvd.

Looking east along the vacant property at 5 discrete sample A locations.

Looking north along the vacant property at 5 total discrete sample B locations.

Hubbard (cont'd)

781 West Grand Blvd – Vacant property located on the west side of W Grand Blvd and in between houses at 779 & 787 W Grand Blvd.

Looking west along the vacant property at 2 of 5 discrete sample A locations, and 4 of 5 discrete sample B locations further to the west and back of the lot in the photo.

Looking southwest along the vacant property at 1 of 5 discrete sample A locations.

Looking northwest along the vacant property at 2 of 5 discrete sample A locations, and 3 of 5 discrete sample B locations further to the northwest and back of the photo.

Hubbard (cont'd)

2803 25th Street – Vacant property located on the west side of 25th St and the third empty lot to the south of a fenced property.

Looking north along the vacant property at 2 of 5 discrete sample A locations.

Looking west along the vacant property at 3 of 5 discrete sample A locations, and 5 discrete sample B locations further to the west and back of the photo.

Hubbard (cont'd)

2798 Roosevelt – Vacant property on the northeast side of Roosevelt St and to the northwest of a house with no marked address which is assumed to be 2788 Roosevelt.

Looking northeast along the vacant property at 5 discrete sample A locations.

Looking southwest along the vacant property at 5 discrete sample B locations.

Hubbard (cont'd)

2822 Roosevelt - Vacant property on the northeast side of Roosevelt St and the fifth empty lot to the northwest of a house with no marked address which is assumed to be 2788 Roosevelt.

Looking north and east, respectively, along the vacant property at 5 total discrete sample A locations.


Looking west along the vacant property at 5 discrete sample B locations.

Hubbard (cont'd)

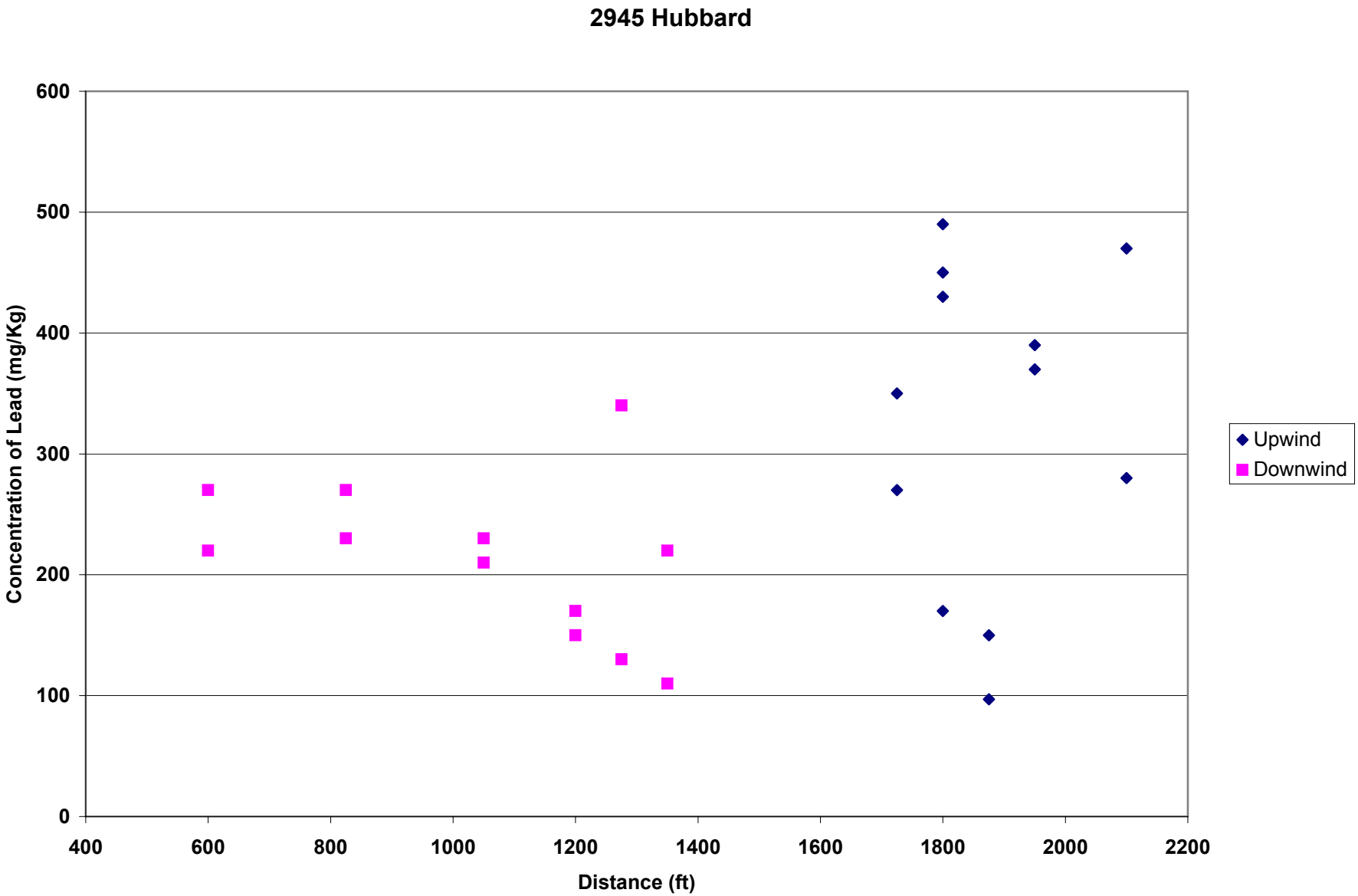
2916 Vinewood – Vacant property located on the northeast side of Vinewood St and to the southeast of a house at 2924 Vinewood.

Looking north, northwest, and northeast, respectively, along the vacant property at 5 total discrete sample A locations.

Looking southwest along the vacant property at 5 discrete sample B locations.

ATTACHMENT E

CONCENTRATION GRAPH


2945 Hubbard
Concentration of Lead (mg/Kg)
600
500
400
300
200
100
0
400
600
800
1000
1200
1400
1600
1800
2000
2200
Distance (ft)
Upwind
Downwind

City Metals

*** Linear Model ***

Call: lm(formula = Lead.ppm ~ Location + Distance.ft + Distance.ft:Location, data = CityMetals, na.action = na.exclude)
Residuals:
   Min   1Q Median   3Q   Max
 -229.4 -51.23 5.811 42.57 170.8

Coefficients:
                    Value Std. Error   t value Pr(>|t|)
       (Intercept) 146.7292 475.6320   0.3085   0.7609
          Location 166.9870 492.4033   0.3391   0.7380
       Distance.ft   0.0958   0.2531   0.3786   0.7090
Distance.ft:Location   -0.1922   0.2792   -0.6886   0.4990

Residual standard error: 107.4 on 20 degrees of freedom
Multiple R-Squared: 0.2744
F-statistic: 2.522 on 3 and 20 degrees of freedom, the p-value is 0.08698

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   77862.0 77862.04 6.750918 0.0171918
       Distance.ft 1   3920.0 3920.00 0.339878 0.5664158
Distance.ft:Location 1   5468.9 5468.94 0.474176 0.4989827
         Residuals 20 230671.0 11533.55

*** Linear Model ***

Call: lm(formula = Log.Lead ~ Location + Distance.ft + Distance.ft:Location, data = CityMetals, na.action = na.exclude)
Residuals:
   Min   1Q Median   3Q   Max
 -1.11 -0.185 0.03244 0.2526 0.6441

Coefficients:
                    Value Std. Error t value Pr(>|t|)
       (Intercept) 5.0388 1.9415   2.5954 0.0173
          Location 0.8700 2.0099   0.4328 0.6698
       Distance.ft 0.0003 0.0010   0.3332 0.7424
Distance.ft:Location -0.0009 0.0011   -0.8005 0.4328

Residual standard error: 0.4384 on 20 degrees of freedom
Multiple R-Squared: 0.2255
F-statistic: 1.941 on 3 and 20 degrees of freedom, the p-value is 0.1555

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 0.829319 0.8293188 4.315665 0.0508589
       Distance.ft 1 0.166640 0.1666403 0.867174 0.3628444
Distance.ft:Location 1 0.123131 0.1231312 0.640758 0.4328427
         Residuals 20 3.843295 0.1921648

ATTACHMENT F

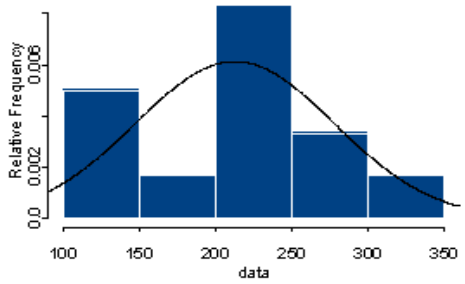
STATISTICAL DISTRIBUTION

CITY METALS REFINING
STATISTICAL DISTRIBUTION

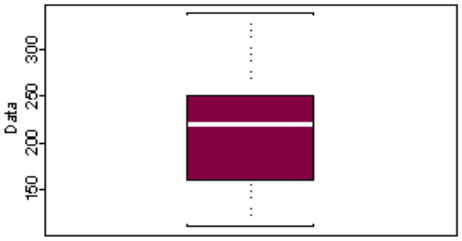
Normal Distribution Analysis for Data

Data Set Name: City Metals , Area: HUB D

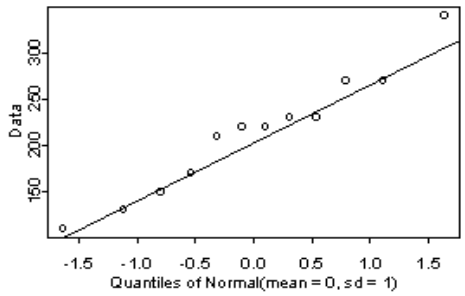
Histogram of Observed Data with Fitted Normal Distribution



Box Plot of Data Data



Normal Probability Plot of Data Data



Summary Statistics

Sample Size:	12
Coefficient of Variation:	0.3063756
Coefficient of Skewness:	0.1996862

Results of Shapiro-Wilk GOF

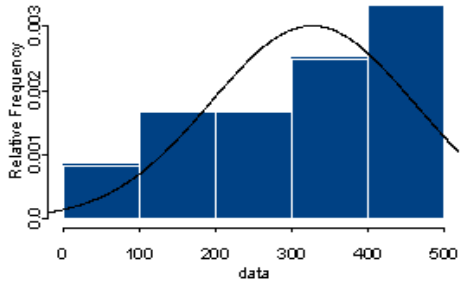
Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 212.5 sd = 65.10481
Test Statistic:	W = 0.9639678
Test Statistic Parameter:	n = 12
p-value:	0.8386055

Since p >= .05 conclude distribution is normal.

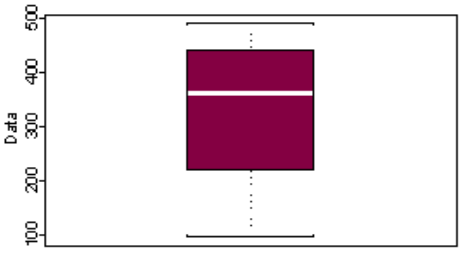
Normal Distribution Analysis for Data

Data Set Name: City Metals , Area: HUB U

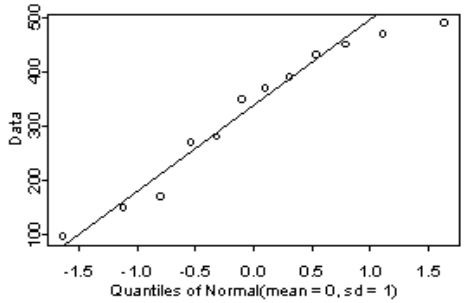
Histogram of Observed Data with Fitted Normal Distribution



Box Plot of Data Data



Normal Probability Plot of Data Data



Summary Statistics

Sample Size:	12
Coefficient of Variation:	0.406255
Coefficient of Skewness:	-0.5137726

Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 326.4167 sd = 132.6084
Test Statistic:	W = 0.9271654
Test Statistic Parameter:	n = 12
p-value:	0.3510337

Since p >= .05 conclude distribution is normal.