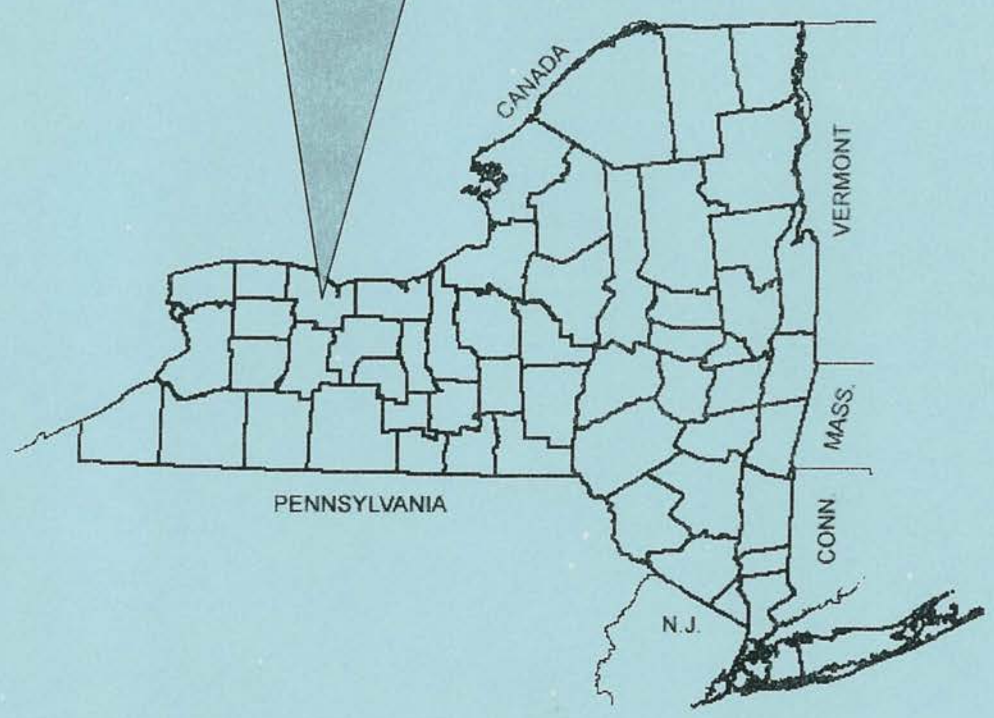
CPL COPY

TRANSPORTATION PROJECT REPORT

FINAL DESIGN REPORT

December 2012

Highway Project,
Waring Road Improvement Project
P.I.N. 4754.40
Monroe County
City of Rochester



U.S. Department of Transportation Federal Highway Administration

NEW YORK STATE DEPARTMENT OF TRANSPORTATION
ANDREW M. CUOMO, Governor JOAN MCDONALD, Commissioner

PROJECT APPROVAL SHEET

(Pursuant to SAFETEA-LU Matrix)

A. IPP Approval:

The project cost and schedule are consistent with the Regional Capital Program. The IPP was signed by:

See *Appendix I* for IPP signature

Regional Director, NYSDOT Region 4

B. Public Hearing Certification (23 USC 128):

☐ ~~A public hearing was held on _______ in accordance with 23 USC 128.~~

☐ ~~OR, A Notice of Opportunity was published in accordance with 23 CFR 771. A public hearing was not held.~~

☒ OR, A public hearing was not required. A public information meeting was held on May 17, 2012

C. Recommendation for Scoping & Design Approval:

Environmental Determination & Federal Aid Process Concurrence:

The NYSDOT on behalf of FHWA (based on the NEPA Checklist) concurs with the classification of this project as a NEPA Class II, Programmatic Categorical Exclusion as described in this document.

7/15/13

Dan Hallowell

NYSDOT R4, Regional Planning & Program Manager

D. Recommendation for Scoping, Design, & Nonstandard Feature Approval:

Procedurally, this project was progressed using the NYSDOT Locally Administered Federal Aid Procedures Manual. All requirements requisite to these actions and approvals have been met, the required independent quality control reviews separate from the functional group reviews have been accomplished, and the work is consistent with established standards, policies, regulations and procedures, except as otherwise noted and explained.

12-31-12

David Askinazi, P.E. , Clark Patterson Lee, Inc.

E. Public Hearing Certification (23 USC 128):

See part "B" of this signature page.

Nonstandard Feature Approval:

☐ ~~The nonstandard features have been adequately justified and it is not prudent to eliminate them as part of this project.~~

☒ OR, No nonstandard features have been identified, created, or retained.

Scoping & Design Approval:

The required environmental determinations have been made and the preferred alternative for this project is ready for final design.

1/11/13

James R McIntosh, City Engineer, City of Rochester

LIST OF PREPARERS

Group Director Responsible for Production of the Design Approval Document:

David Askinazi, P.E., Principal Associate, Clark Patterson Lee

Description of Work Performed by Firm:

Directed the preparation of the Design Approval Document in accordance with established standards, policies, regulations and procedures, except as otherwise explained in this document.

PLACE P.E. STAMP

Note: *It is a violation of law for any person, unless they are acting under the direction of a licensed professional engineer, architect, landscape architect, or land surveyor, to alter an item in any way. If an item bearing the stamp of a licensed professional is altered, the altering engineer, architect, landscape architect, or land surveyor shall stamp the document and include the notation "altered by" followed by their signature, the date of such alteration, and a specific description of the alteration.*

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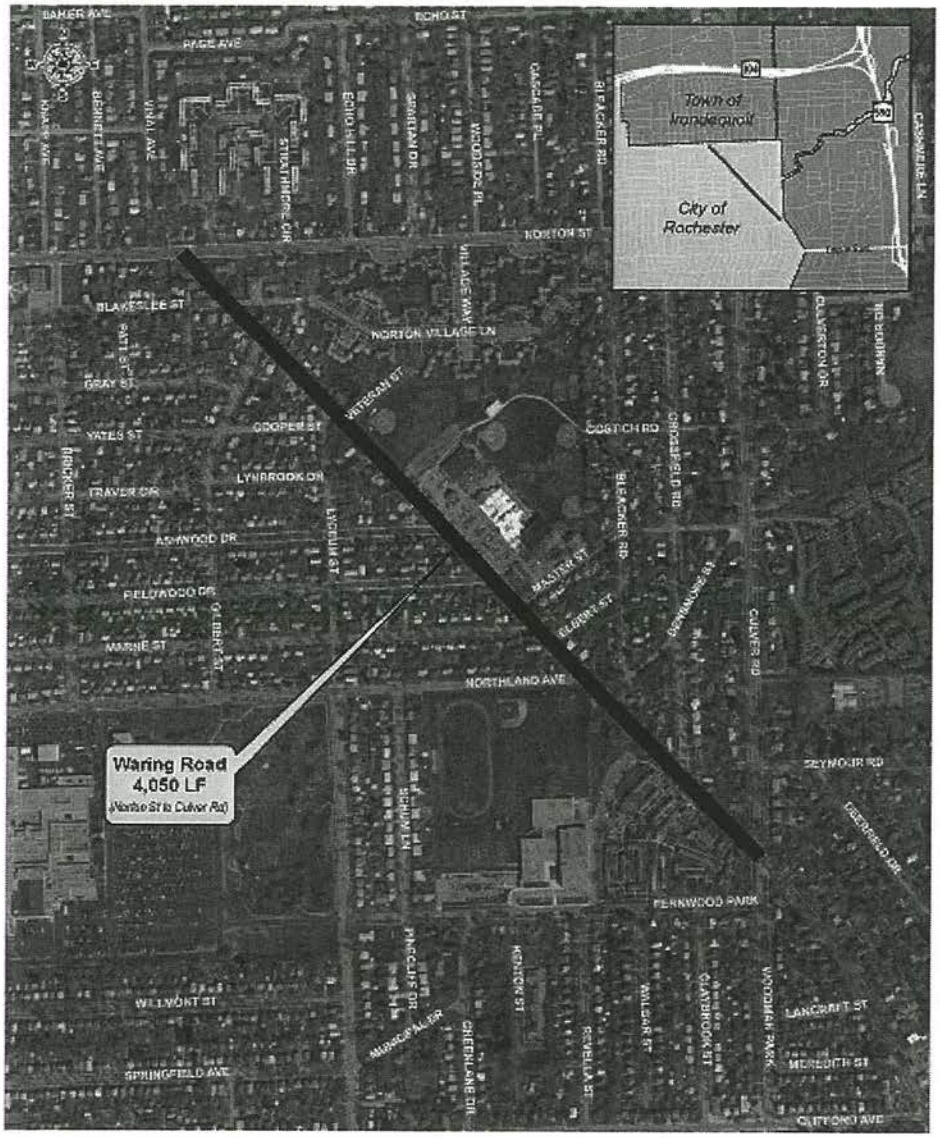
CHAPTER 1 - EXECUTIVE SUMMARY

1.1. Introduction

This report was prepared in accordance with the NYSDOT Project Development Manual, 17 NYCRR Part 15, and 23 CFR 771.

1.2. Purpose and Need

1.2.1. Where is the Project Located?



(1) Route number – N/A
(2) Route name: Waring Road
(3) Roadway Classification: Collector
(4) Features crossed: Densmore Creek Overflow Culvert
(5) Project Sponsor: City of Rochester
(6) Monroe County, NY
(7) Length is approximately 4,050 linear feet
(8) From Norton Street (north limit) to Culver Road (south limit)

1.2.2. Why is the Project Needed?

Prior to the 2010 milling and resurfacing treatment, it was obvious that the Waring Road pavement was experiencing an apparent base failure with a considerable amount of alligator cracking, joint failure, potholes and poor ride quality with increasingly demanding corrective maintenance needs. Waring Road requires rehabilitation/reconstruction to address the deteriorated condition of the existing pavement, improve circulation at the plaza entrance, address accident clusters, improve intersection alignment at various skewed side streets along the project, upgrade pedestrian facilities, provide adequate on-street parking facilities and provide bike lanes along the roadway for motorists and bicyclists to better share the roadway according to the January 2011 City of Rochester Bicycle Master Plan.

The pavement condition has deteriorated due to age and traffic use since the last full reconstruction in the 1950's. On-street parking facilities are located along the entire roadway on both sides of the street and are underutilized due to the presence of single-family dwellings, most of which have private driveways. Current road configuration along Waring Road does not provide an efficient use of the roadway width and does not adequately provide for bicycle traffic.

In addition, other infrastructure upgrades are needed to improve safety and service along the corridor including the replacement of aging and deficient water mains, upgrades to deficient street lighting (lighting levels and energy efficiency) and aging traffic signal equipment.

1.2.3. What are the Objectives/Purposes of the Project?

The primary objectives of this project include (in no particular order):

(1) Address geometric deficiencies to improve traffic flow and facilitate traffic operations, including improved bicycle traffic along the corridor.
(2) Restore pavement to very good condition and ride-ability using cost effective pavement treatments which provide a service life of 50 years.
(3) Strategically upgrade pedestrian facilities, including sidewalks and crosswalks, along the corridor.
(4) Provide an adequate amount of on-street parking facilities to meet the needs of the current and future land uses while balancing the needs of alternate forms of transportation such as bicycling.
(5) Provide a safe and efficient shared roadway for motorists and bicyclists along the entire corridor that meet current design standards and comply with local master plans.
(6) Improve the overall safety and aesthetics of the corridor, and calm traffic by:
    a. Upgrading street lighting
    b. Increasing green space along the roadway where feasible
    c. Improve the urban streetscape by infilling new trees along the curb lawn
    d. Improve the visual appeal of the roadway and the adjacent neighborhood

1.3. What Build Alternative(s) Are Being Considered?

Potential transportation improvements considered in this report include:

Alternative 1 (Null Alternative) This alternative consists of performing no improvements along the roadway. This alternative is not feasible, is not considered a build alternative and is not discussed in this section of the report.

Alternative 2 (14-Foot Shared Use Travel Lanes Alternative) This alternative consists of full depth reconstruction, narrowing the pavement from the existing 40 foot width to a proposed width of 36 feet, installing new granite curbs with pedestrian friendly curb extensions or "bump outs" along the parking lane. Key elements of this alternative include:

- Narrowing the pavement from the existing 40 foot width to a proposed width of 36 feet providing two 14-foot wide shared use travel lanes with one 8-foot wide parking lane and no shoulders between Norton Street and Lyceum Street and between Master Street and Culver Road.

- Narrowing the pavement from existing 40 foot width to a proposed width of 28 feet providing two 14-foot wide shared use travel lanes with no parking lanes and no shoulders between Lyceum Street and Master Street (along the Waring Road Plaza).
- Providing sidewalks on both sides of Waring Road for the entire length of the project, with portions of the existing sidewalk being replaced as necessary.
- Increasing the amount of green space between the sidewalk and the curb line by reducing pavement width and providing wider curb lawns in residential areas which would facilitate the planting of new trees where appropriate.
- On-street parking along the west side of Waring Road between Norton Street and Lyceum Street and between Master Street and Culver Road. These limits would essentially match the existing permitted parking limits but be limited to the west side of the road.
- Sharrow lane markings on both sides of Waring Road for the entire length of the project.

Alternative 3 (11-Foot Travel Lanes with 5-foot Bike Lanes – Reconstruction Alternative) This alternative consists of full depth reconstruction, maintains the existing pavement width of 40 feet for the majority of the project, includes new granite curbs with pedestrian friendly curb extensions or "bump outs" along the parking lane. Key elements of this alternative include:

- Maintaining the existing 40-foot pavement width providing two 11-foot wide travel lanes, two 5-foot wide bike lanes and one 8-foot wide parking lane with no shoulders between Norton Street and Lyceum Street and between Master Street and Culver Road.
- Widening the pavement from existing 40 foot width to a width of 43 feet providing two 11-foot wide travel lanes, one 11-foot wide center turn lane and two 5-foot wide bike lanes with no parking lanes and no shoulders between Lyceum Street and Master Street. The center turn lane would service the Waring Road Shopping Plaza on the east side of the road. The Plaza contains three driveway entrances with a moderate amount of traffic turning in and out of the plaza. The center turn lane would help facilitate the southbound left turn movements into the plaza and avoid the current traffic pattern of stopped vehicles waiting to turn into the plaza with other vehicles passing on the right side to avoid the congestion.
- Providing sidewalks on both sides of Waring Road for the entire length of the project, with large portions of the existing sidewalk being replaced as necessary.
- Increasing the amount of green space between the sidewalk and the curb line in various areas with curb extensions which would facilitate the planting of new trees where appropriate.
- On-street parking along the west side of Waring Road between Norton Street and Lyceum Street and between Master Street and Culver Road. These limits would essentially match the existing permitted parking limits but be limited to the west side of the road.
- Bike lane pavement markings on both sides of Waring Road for the entire length of the project.

Alternative 4 (11-Foot Travel Lanes with 5-foot Bike Lanes – Pavement Preservation Alternative) This alternative consists of milling and resurfacing the existing pavement where possible with maintaining significant portions of the existing concrete subbase. Where milling and resurfacing is not feasible due to the condition of the concrete subbase, the roadway will be reconstructed. This alternative also maintains the existing pavement width of 40 feet for the majority of the project, includes new granite curbs with pedestrian friendly curb extensions or "bump outs" along the parking lane. Key elements of this alternative include:

- Maintaining the existing 40-foot pavement width providing two 11-foot wide travel lanes, two 5-foot wide bike lanes and one 8-foot wide parking lane with no shoulders between Norton Street and Lyceum Street and between Master Street and Culver Road.
- Widening the pavement from existing 40 foot width to a width of 43 feet providing two 11-foot wide travel lanes, one 11-foot wide center turn lane and two 5-foot wide bike lanes with no parking lanes and no shoulders between Lyceum Street and Master Street. The center turn lane would service the Waring Road Shopping Plaza on the east side of the road. The Plaza contains three driveway entrances with a moderate amount of traffic turning in and out of the plaza. The center turn lane would help facilitate the southbound left turn movements into the plaza and avoid the current traffic

pattern of stopped vehicles waiting to turn into the plaza with other vehicles passing on the right side to avoid the congestion.

- Providing sidewalks on both sides of Waring Road for the entire length of the project, with large portions of the existing sidewalk being replaced as necessary.
- Increasing the amount of green space between the sidewalk and the curb line in various areas with curb extensions which would facilitate the planting of new trees where appropriate.
- On-street parking along the west side of Waring Road between Norton Street and Lyceum Street and between Master Street and Culver Road. These limits would essentially match the existing permitted parking limits but be limited to the west side of the road.
- Bike lane pavement markings on both sides of Waring Road for the entire length of the project.

Alternatives 2, 3 & 4 also include the following key elements:

Calming Traffic
This report will review the possibility of introducing curb extensions which will narrow the pavement width at the side street intersections along with improving lane delineation and new tree plantings as traffic calming measures.

Improving Street Lighting
New street lighting mounted to the existing wood utility poles will provide a more uniform and more energy efficient lighting system.

Providing Wider Sidewalks at Bus Stops
Through coordination with the Rochester Genesee Regional Transportation Authority (RGRTA) who maintains and operates the bus stops along Waring Road, the project will improve the bus stop areas and further promote the use of public transportation and increase the safety and comfort for travelers using public transit.

Replace the Existing Water Main
The existing water main is approaching the end of its useful life and provides low water pressure due to unacceptable levels of deposits inside the main. This condition also affects the quality of the water being delivered to the local residents. The project proposes to replace the existing 8" ductile iron water main with a new 8" PVCO Pipe (Molecularly Oriented PVC). PVCO pipe is designed for pressure applications, is lighter than conventional PVC pipe, provides better impact resistance, and increased tensile strength when compared to standard PVC.

For an in-depth discussion of the design criteria see Section 3.2.3. Design Criteria for Feasible Alternatives.

1.4 How will the Alternative(s) affect the Environment?

Exhibit 1.4-A
Environmental Summary

NEPA Classification	Class II Programmatic Categorical Exclusion	BY	Federal Highway Administration	Date	August 2012
SEQR Type:	Type II Action	BY	City of Rochester	Date	August 2012

There is no mitigation measures proposed for this project.

Anticipated Permits/Certifications/Coordination:

Permits
NYSDEC:

- Notice of Intent (NOI) for coverage under NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Storm Water Discharges from General Construction Activity (Permit No. GP-0-10-001) - Development of a Storm Water Pollution Prevention Plan (SWPPP)

Coordination

- Coordination with NYSDEC pursuant to the "NYSDEC/NYSDOT Memorandum of Understanding Regarding ECL Article 15 & 24"
- Coordination with Federal Highway Administration

1.5. What Are The Costs & Schedules?

Design Approval is scheduled for February 2013 with Construction anticipated to last 9 months beginning in April of 2015 (tentative date pending funding availability).

Exhibit 1.5A
Project Schedule

Activity	Date Occurred/Tentative
Scoping Approval	October 2008
Design Approval	February 2013
ROW Acquisition	July 2013
Construction Start	April 2015 (tentative date pending funding availability)
Construction Complete	November 2015 (tentative date pending funding availability)

Exhibit 1.5B Comparison of Alternatives Project Costs (Millions)							
Activities		Alternative 2		Alternative 3		Alternative 4	
		Pavement Reconstruction		Pavement Reconstruction		Pavement Preservation (Mill and Resurface / Partial Reconstruction)	
		(14-Foot Shared Use Travel Lanes)		(11-Foot Travel Lanes with 5-foot Bike Lanes)		(11-Foot Travel Lanes with 5-foot Bike Lanes)	
		Street Share	City Water Share	Street Share	City Water Share	Street Share	City Water Share
Construction Costs	Bridge	n/a		n/a		n/a	
	Highway	$3.323	$1.106	$3.489	$1.106	$3.745	$1.162
SPDES Mitigation Costs		Included in Highway estimate above					
Incidentals 10%		$0.332	$0.111	$0.349	$0.111	$0.375	$0.116
Subtotal ($)		$3.655	$1.217	$3.838	$1.217	$4.120	$1.278
Contingency (15% at Design Approval)		$0.548	$0.182	$0.576	$0.182	$0.618	$0.192
Subtotal ($)		$4.204	$1.399	$4.414	$1.399	$4.737	$1.470
Field Change Order		$0.200	$0.050	$0.200	$0.050	$0.200	$0.050
Subtotal ($)		$4.404	$1.449	$4.614	$1.449	$4.937	$1.520
Mobilization (4%)		$0.176	$0.058	$0.185	$0.058	$0.197	$0.061
Subtotal ($)		$4.580	$1.507	$4.798	$1.507	$5.135	$1.581
Expected Award Amount - inflate 2012 costs/ prices at 3%/yr to midpoint of construction (2016-tentative date)		$5.155	$1.696	$5.400	$1.696	$5.779	$1.779
Construction Inspection (13%)		$0.670	$0.221	$0.702	$0.221	$0.751	$0.231
ROW Costs ($)		$0.010	$0.000	$0.010	$0.000	$0.217	$0.000
Total Project Costs		**$5.835**	**$1.917**	**$6.112**	**$1.917**	**$6.748**	**$2.010**

1.6. Which Alternative is Preferred?

The feasible and prudent alternative that best meets the project objectives is Alternative 3. A final decision to enter final design will not be made until after the environmental determination and evaluation of the comments on the draft design approval document and comments received from the public meeting.

While Alternative 3 is identified as the preferred alternative, all feasible alternatives are under consideration. The final selection of the preferred alternative will not be made until after all the alternatives' impacts, comments on the draft design approval document, and comments from the public meeting are evaluated.

1.7. Who Will Decide Which Alternative Will Be Selected And How Can I Be Involved In This Decision?

Exhibit 1.7
Public Involvement Plan Schedule of Milestone Dates

Activity	Date Occurred/Tentative
Initial Project Proposal	October 2008
City of Rochester Scoping Meeting	October 2011
Community Advisory Group Meeting	March 2012
Meeting with local Utility and Agency Representatives	April 2012
First Public Informational Meeting	May 2012
Second Community Advisory Group Meeting	May 2013 (tentative)
Second Public Informational Meeting	May 2013 (tentative)
Current Project Letting date	February 2015 (tentative)
Third Public Informational Meeting-Construction Phase	April 2015 (tentative)

Refer to *Appendix F* for Input from Stakeholders including Public.

You may offer your comments by contacting:

Lisa Reyes, Project Manager for City Street Design

Please include the six digit Project Identification Number (PIN) 4754.40
Questions or comments

email: reyesl@cityofrochester.gov
telephone: (585) 428-6354
City of Rochester
30 Church Street
Room 300B
Rochester NY 14614

contact:

David Askinazi, Project Design Consultant
email: daskinazi@clarkpatterson.com
telephone: (800) 274-9000
Clark Patterson Lee
186 N. Water Street
Rochester, New York 14604

The deadline for submitting comments on this report circulation is November 30, 2012.
The remainder of this report is a detailed technical evaluation of the existing conditions, the proposed alternatives, the impacts of the alternatives, copies of technical reports and plans and other supporting information.

CHAPTER 2 - PROJECT CONTEXT: HISTORY, TRANSPORTATION PLANS, CONDITIONS AND NEEDS

This chapter addresses the history and existing context of the project site, including the existing conditions, deficiencies, and needs for this part of the Waring Road corridor.

2.1. Project History

Waring Road was initially constructed in the 1930's as a 20-foot wide local street serving the immediate neighborhood. The roadway saw little investment with the exception of the installation of concrete sidewalks along both sides of the road in the 1940's. The late 1940's and into the 50's saw a period of growth in the surrounding neighborhood, primarily residential growth but also some commercial land uses. This growth led to a more intensive reconstruction effort which widened the roadway to its current width of 40 feet – two 12-foot wide travel lanes and two 8-foot wide on-street parking lanes with granite curbing. This reconstruction included an 8-inch thick concrete subbase with 3 inches of asphalt as its wearing surface. As part of regular maintenance activities, the roadway has seen numerous efforts to extend its useful life, including overlays (1968), milling and surfacing (1994 and 2010) and crack filling (between 1988 and 2005). The current condition of the roadway has reached a point where significant reconstruction efforts are needed to avoid more frequent application of the various maintenance treatments that have been implemented to ensure a safe and efficient roadway for users.

The City of Rochester identified the need to improve roadway conditions on Waring Road through their 2011-2012 Capital Improvement Program (CIP).

2.2. Transportation Plans and Land Use

2.2.1. Local Plans for the Project Area

2.2.1.1. Local Master Plan

The City of Rochester's 2010 Renaissance Plan does not call out any specific streets with the exception of those within Center City (outlined in Campaign Ten). However, the plan does include several policies and goals related to transportation improvements that apply to this project, including:

- Creating a public infrastructure system that positively contributes to the physical, social and economic development objectives of the Greater Rochester Community. (Campaign Five)
- Encourage an integrated transportation system that is safe, efficient, and meets the transportation requirements of our businesses, industries and citizens. (Campaign Six)
- Ensure adequate parking resources or facilities that balance the protection of neighborhoods and residences with the need to sustain the economic viability and vitality of commercial areas. (Campaign Eight)
- Promote the creation of a safe, reliable and aesthetically pleasing transportation system that facilitates the movement of people and goods throughout our community and connects neighborhoods while encouraging alternatives to automobile transportation. (Campaign Eight)

The intent and overall objective of the Waring Road improvement project is consistent with the general goals and vision of the City's master plan.

The Genesee Transportation Council has reviewed the local master plan prepared for the City of Rochester. This project is consistent with the local master plan.

2.2.1.2. Local Private Development Plans

There are no approved developments planned within the project area that will impact traffic operations.

2.2.2. Transportation Corridor

2.2.2.1. Importance of the Project Route Segment

In 2007, the City of Rochester reconstructed Norton Street (northern boundary of the project area) from Portland Avenue to the eastern City line. This project was a full depth, curb to curb reconstruction that also included new sidewalks, improved pavement markings and upgraded intersection signals. The Waring Road improvement project would build upon these recent improvements the City has undertaken in making strategic improvements to its roadways. Waring Road is an important collector in the City connecting Norton Street, an east-west arterial, and Culver Road, a north-south arterial.

2.2.2.2. Alternate Routes

There are no alternative routes that would be suitable as a replacement route or permanent detour (not related to construction operations) as this road provides direct access to the Waring Road Shopping Plaza, Norton Village Park, 14 local side streets and various residential dwellings located along the roadway.

2.2.2.3. Corridor Deficiencies and Needs

Waring Road hinders personal and commercial mobility due to its deteriorated pavement condition and poor roadway delineation. The excessive lane width and unused parking areas along the corridor also contribute to unsafe vehicular movements and speeds. Waring Road is a collector road located within a predominantly residential area. Although some non-residential uses exist, including commercial, recreational and community services, there are no formal TSM (Transportation Systems Management) or TDM (Transportation Demand Management) facilities located or implemented in the corridor.

2.2.2.4. Transportation Plans

This project is not on the approved Transportation Improvement Program (TIP) for construction funding as of 2011 – it is included on the City of Rochester's 2011-2012 Capital Improvement Program (CIP), dated May 3, 2011, although the project construction has been delayed until 2015-2016. The project is not part of an approved Congestion Management System or adequate Interim Congestion Management System, nor is it subject to a Major Investment Study (MIS). No Intelligent Transportation System (ITS), TSM or TDM improvements are recommended for implementation along the corridor.

2.2.2.5. Abutting Highway Segments and Future Plans for Abutting Highway Segments

The Norton Street reconstruction project (completed in 2007) was located at the northerly limit of the Waring Road Project corridor and included new curbing, sidewalks, street landscaping, street lighting and drainage improvements. Norton is predominantly a two lane roadway with two 11 foot travel lanes and two 8 foot shoulders. At key intersections, a dedicated turning lane takes the place of one of the shoulders.

Residential side streets adjoining Waring Road range between 20 and 24 feet in width and consist of two travel lanes only – no shoulders. The only exception to this is Northland Avenue, located approximately 0.25 miles north of Culver Road, which is approximately 42 feet in width and consists of two 12-foot travel lanes and two 8-foot shoulders. Culver Road, at the south end of Waring Road, is also 40-foot wide with two 12-foot travel lanes and two 8-foot shoulders. A dedicated turning lane takes the place of the shoulders at the Waring-Culver Road intersection. Woodman Park continues southbound from the Waring-Culver intersection – this roadway is only 33 feet wide with two travel lanes.

There are no current plans for reconstruction or widening on any of these roads in the immediate future with the exception of preventative pavement maintenance projects along Northland Avenue and Woodman Park.

2.3. Transportation Conditions, Deficiencies and Engineering Considerations

2.3.1. Operations (Traffic and Safety) & Maintenance

2.3.1.1. Functional Classification and National Highway System (NHS)

Exhibit - 2.3.1.1 Classification Data	
Route(s)	Waring Road (No Route number)
Functional Classification	Collector
National Highway System (NHS)	No
Designated Truck Access Route	No
Qualifying Highway	No
Within 1 mile of a Qualifying Highway	Yes
Within the 3 miles vertical clearance network	No

2.3.1.2. Control of Access – Waring Road has uncontrolled access.

2.3.1.3. Traffic Control Devices – There are only three intersections along Waring Road that are controlled by traffic signals. At the Norton Street-Waring Road intersection a three-way traffic signal controls traffic in all directions; a dedicated turning signal controls left turns from Waring northbound to Norton westbound and Norton westbound to Waring southbound. The Waring Road-Northland Avenue intersection is controlled by a three-way signal with no dedicated turning phases. The Waring Road and Culver Road intersection is controlled by a four-way signal with 3 dedicated phases to control vehicular circulation which includes a right turn arrow for northbound traffic from Culver Road and left turn arrow for southbound traffic from Culver Road. All other streets adjoining Waring Road are all controlled through stop signs. It is assumed that none of these signs meet the new FHWA retro-reflectivity standards due to the age of the roadway and date of the last reconstruction. Monroe County DOT will confirm the age of the existing signs along the project corridor.

2.3.1.4. Intelligent Transportation Systems (ITS)
Signal coordination between the Culver Road/Waring Road intersection and the Northland Avenue/Waring Road intersection is planned with the installation of PVC traffic conduit and fiber optic communications cable between these intersections should a signal be warranted at Northland Avenue in the future.

2.3.1.5. Speeds and Delay

Exhibit - 2.3.1.5 Speed Data	
Route	Waring Road
Existing Speed Limit	30 MPH
Operating Speed and Method Used for Measurement	The 85^{th} percentile speed is 40 MPH based on field verification using time and distance measurements along Waring Road

2.3.1.6. Traffic Volumes - Refer to *Appendix C* of this report for traffic flow diagrams. The traffic data was obtained in the year 2011.

2.3.1.6. (1) Existing traffic volumes
Refer to Exhibit 2.3.1.6-1 for a summary of the traffic data. A discussion of the traffic count methodology, peak hour, and turning movement volumes for intersections with identified accident problems, all major intersections, & major traffic generator driveways/entrances are included in *Appendix C.*

Exhibit - 2.3.1.6-1 Traffic Data	
Route	Waring Road
AADT	6893
Directional Distribution	52% southbound/48% northbound AM traffic 48%southbound/52%northbound PM traffic
Peak Hour Factor	0.92 (approximate)
% Peak Hour Trucks	6%AM, 1.5%PM (approximate based on traffic counts)
% Daily Trucks	4% (approximate based on traffic counts)

2.3.1.6. (2) Future no-build design year traffic volume forecasts – The Estimated Time of Completion (ETC)+20 design year was selected per DPM Appendix 5. An ETC+30 year projection was not completed as the project is not near a bridge or large open channel culvert. Peak hour turning movement volumes for intersections with identified accident problems, all major intersections, & major traffic generator driveways/entrances are included for the design year(s) in *Appendix C.*

2.3.1.7. Level of Service and Mobility

2.3.1.7. (1) Existing level of service and capacity analysis – Existing level of service and capacity analysis findings for commuter travel periods (e.g., A.M. and P.M. peak hours) along Waring Road for all approaches of signalized intersections and significant traffic generators such as intersections at the plaza entrances are as shown below in Exhibits 2.3.1.7-1 and 2.3.1.7-2.

Exhibit - 2.3.1.7-1 Stop Controlled Intersection Level of Service and Delays (sec)		
YEAR	**EB**	**WB**
	P.M.	**P.M.**
Intersection of Waring Road and Southern Plaza Driveway/Fieldwood Drive		
Existing (2011)	LOS B delay 12.1	LOS B delay 13.2
ETC (2015)	LOS B delay 12.7	LOS B delay 13.9
ETC+20 (2035)	LOS B delay 13.1	LOS B delay 14.7
Intersection of Waring Road and Center Plaza Driveway/Ashwood Drive		
Existing (2011)	LOS B delay 13.5	LOS B delay 12.4
ETC (2015)	LOS B delay 13.9	LOS B delay 13.1
ETC+20 (2035)	LOS B delay 14.7	LOS B delay 13.9
Intersection of Waring Road and Northern Plaza Driveway		
Existing (2011)	N/A	LOS B delay 10.4
ETC (2015)		LOS B delay 10.8
ETC+20 (2035)		LOS B delay 11.0

Exhibit - 2.3.1.7-2

Signalized Intersection Level of Service and Delays (sec)

YEAR	EB			WB			NB			SB			TOTAL INTERSECTION		
	A.M.	NOON	P.M.	A.M.	NOON	P.M.	A.M.	NOON	P.M.	A.M.	NOON	P.M.	A.M.	NOON	P.M.
Intersection of Waring Road and Culver Road															
Existing 2011	LOS B delay 15.3	LOS C delay 24.8	LOS C delay 28.5	LOS B delay 12.5	LOS B delay 14.6	LOS B delay 16.1	LOS B delay 18.1	LOS C delay 29.1	LOS C delay 32.9	LOS B delay 14.3	LOS B delay 11.4	LOS B delay 18.3	LOS B delay 14.5	LOS B delay 19.0	LOS C delay 23.6
ETC 2015	LOS B delay 15.7	LOS C delay 25.2	LOS C delay 30.1	LOS B delay 12.7	LOS B delay 14.8	LOS B delay 16.3	LOS B delay 18.9	LOS C delay 29.5	LOS C delay 33.7	LOS B delay 14.7	LOS B delay 12.2	LOS B delay 19.6	LOS B delay 14.9	LOS B delay 19.5	LOS C delay 24.7
ETC+20 2035	LOS B delay 16.5	LOS C delay 25.6	LOS C delay 33.3	LOS B delay 13.2	LOS B delay 15.0	LOS B delay 16.8	LOS C delay 20.4	LOS C delay 30.0	LOS D delay 35.2	LOS B delay 15.2	LOS B delay 13.2	LOS C delay 22.0	LOS B delay 15.6	LOS C delay 20.0	LOS C delay 26.6
Intersection of Waring Road and Northland Ave															
Existing 2011	LOS B delay 15.9	LOS B delay 16.4	LOS B delay 17.9				LOS A delay 7.3	LOS A delay 5.9	LOS A delay 6.1	LOS A delay 5.8	LOS A delay 6.0	LOS A delay 6.5	LOS A delay 7.5	LOS A delay 7.9	LOS A delay 9.3
ETC 2015	LOS B delay 16.0	LOS B delay 16.5	LOS B delay 18.0		n/a		LOS A delay 7.4	LOS A delay 5.9	LOS A delay 6.3	LOS A delay 5.9	LOS A delay 6.0	LOS A delay 6.6	LOS A delay 7.7	LOS A delay 8.0	LOS A delay 9.4
ETC+20 2035	LOS B delay 16.1	LOS B delay 16.6	LOS B delay 18.3				LOS A delay 7.8	LOS A delay 6.0	LOS A delay 6.4	LOS A delay 6.0	LOS A delay 6.2	LOS A delay 6.8	LOS A delay 8.0	LOS A delay 8.1	LOS A delay 9.7

2.3.1.8. Safety Considerations, Accident History and Analysis

An accident analysis was performed after reviewing New York State Motor Vehicle Accident Report forms (MV-104) for Waring Road between Norton Street and Culver Road. The accidents included in this review occurred during a three year period from March 2008 to August 2011. The accident review included reported accidents in the Waring Road plaza parking lot; however, those accidents are not included in this summary unless explicitly stated. During this three year period, a total of 49 reported accidents occurred along the project corridor (with an additional 29 accidents occurring within the plaza parking lot which were not included in the project analysis). A summary of the relevant accidents is shown in Exhibits 2.3.1.8-1, 2.3.1.8-2, and 2.3.1.8-3 below.

There are no high accident locations within the study area.

Exhibit 2.3.1.8-1 provides a summary of the accident types in the project corridor, which includes all of the intersections. Of the accidents shown below, 13 of them (27 percent) occurred along Waring Road between intersections, one occurred on Traver Road and the remaining 35 (71 percent) occurred at intersections. The highest number of intersection accidents (12 or 24 percent of the total) occurred at Norton Street. Norton Street and Culver Road are the most notable clusters, with the remaining accidents spread throughout the corridor.

Exhibit - 2.3.1.8-1
Collision Summary
Waring Road, From Norton Street to Culver Road

Type of Collision	Number	Percentage
Rear End	13	26.6
Sideswipe (same direction)	9	18.4
Left Turn (opposite direction)	1	2.0
Right Angle (opposite direction)	8	16.3
Right Turn (same direction)	1	2.0
Right Turn (opposite direction)	2	4.1
Head On	7	14.3
Sideswipe (opposite direction)	1	2.0
Left Turn (same direction)	4	8.2
Other	3	6.1

Exhibit 2.3.1.8-2 provides a summary of the accident severity along the project.

Exhibit 2.3.1.8-2
Accident Severity
Waring Road, From Norton Street to Culver Road

Year	Fatal	Injury	Property Damage Only(1)	Total
2008	0	4	5	9
2009	0	1	16	17
2010	0	4	10	14
2011	0	2	7	9

(1) Estimated property damage above the $1,000 threshold as reported on the MV-104A form

Exhibit 2.3.1.8-3 provides a comparison of the computed intersection accident rates to the average rates with the City of Rochester for the various types of intersections along the project.

Exhibit 2.3.1.8-3
Accident Analysis at Key Intersections Along the Project Corridor
Waring Road, From Norton Street to Culver Road

Intersection	Computed Accident Rate (Acc/MEV)	County (Urban) Average Accident Rates	Intersection Type
Waring Rd/Northland Ave	0.209	0.530	Urban Collector/Collector-Signalized
Waring Rd/Culver Rd/ Woodman Park	0.432	0.440	Urban Minor Arterial/Collector-Signalized
Waring Road/South Plaza Entrance	0.378	0.140	Urban Collector/Local Street-Unsignalized
Waring Road/Center Plaza Entrance/Ashwood Drive	0.395	0.140	Urban Collector/Local Street-Unsignalized
Waring Road/Northern Plaza Entrance	0.138	0.140	Urban Collector/Local Street-Unsignalized

An accident analysis including an accident summary (TE-213), collision diagrams (TE-56), and recommendations for improvements is in *Appendix C.* The accident analysis recommends consideration of the following countermeasures:

- The pavement is poorly delineated in regards to the travelled roadway and on-street parking areas. On-street parking is underutilized and has led to vehicles using the space to pass other waiting/turning vehicles, resulting in sideswipe accidents. Narrowing the width of the motorized vehicular travel way, providing a clear pavement edge line and decreasing the amount of underutilized on-street parking will help decrease sideswipe accidents along the corridor.
- Providing curb extensions along the road where on-street parking is permitted to better define the travel way and protect the on-street parking spaces from being encroached upon by through traffic will help decrease sideswipe accidents along the corridor. Also, The curb extensions can help define where parking is not permitted in locations such as bus stops, corner clearances and at cross walks.

2.3.1.9. Existing Police, Fire Protection and Ambulance Access

Emergency Medical Services (EMS): Rural/Metro provides contract service to the City of Rochester, which includes Waring Road. Irondequoit Volunteer Ambulance (2332 Norton Street) is located within 1 mile of the project area and does not provide direct service to Waring Road, but may provide mutual aid services as needed.

- Fire protection to the Waring Road corridor is provided by the City of Rochester Fire Department with the two closest stations located within two miles – Quint 7 at 740 North Goodman Street and Engine 16 at 704 Hudson Avenue. Ridge-Culver and Laurelton Fire Districts (Town of Irondequoit) are located within one mile of Waring Road with each of their stations within two miles of the project area.
- Police protection is provided to the Waring Road corridor through the City of Rochester Police Department, Patrol Division East. The East Division's substation is located at 30 Hart Street, approximately 3 miles away.

As an Urban Collector, Waring Road is an important emergency access route which provides access to various residential neighborhoods as well as the Waring Road Plaza. Emergency vehicles regularly use Waring Road for direct access to adjacent dwellings and businesses as well as a connection to adjacent streets.

2.3.1.10. Parking Regulations and Parking Related Conditions

On-street parking is allowed on both sides of Waring Road between Norton Street and Culver Road according to Exhibit 2.3.1.10-1.

Exhibit - 2.3.1.10-1
On-Street Parking Summary
Waring Road, From Norton Street to Culver Road

Portion of Waring Road	Centerline Distance	East Side	West Side
Culver Road to Northland Ave	1100 ft	Parking Permitted	Parking Permitted
Northland Ave to Master Street	500 ft	Parking Permitted	No Parking
Master Street to just north of Ashwood Drive	800 ft	No Parking	No Parking
Just north of Ashwood Drive to Norton St	1600 ft	Parking Permitted	Parking Permitted

A parking utilization study was performed along Waring Road over a 7 day period to determine the on street parking demand. Exhibit 2.3.2.10-2 summarizes the existing parking utilization along Waring Road.

Exhibit - 2.3.1.10-2
On-Street Parking Utilization

West Side of Waring Road		Spaces Available	Date and Time of Observation (December 2011)							
			12/5	12/6	12/7	12/9	12/10	12/10	12/11	12/11
From	To		8 PM	8 PM	9 PM	9 PM	10 AM	6 PM	11:30 AM	5:30 PM
Culver Rd	Northland Ave	47	15	14	15	8	14	8	12	13
Northland Ave	Marne St	0	No Parking Permitted							
Marne St	Fieldwood Dr	0								
Fieldwood Dr	Ashwood Dr	0								
Ashwood Dr	Lyceum St	23	1	0	1	0	0	0	0	0
Lyceum St	Travers Cir	11	0	0	0	0	0	0	0	0
Travers Cir	Blakeslee St	5	0	0	1	1	0	1	1	0
Blakeslee St	Norton St	4	1	1	1	1	1	1	1	1

Exhibit - 2.3.1.10-2 – (Continued)
On-Street Parking Utilization

East Side of Waring Road		Spaces Available	Date and Time of Observation (December 2011)							
			12/5	12/6	12/7	12/9	12/10	12/10	12/11	12/11
From	To		8 PM	8 PM	9 PM	9 PM	10 AM	6 PM	11:30 AM	5:30 PM
Culver Rd	Crossfield Rd	13	0	0	0	0	0	0	0	0
Crossfield Rd	Densmore St	14	0	0	0	0	0	0	0	0
Densmore St	Elbert St	9	0	0	0	0	0	0	0	0
Elbert St	Master St	5	0	0	0	0	1	0	1	0
Master St	Ashwood Dr	0	No Parking Permitted							
Ashwood Dr	Veteran St	15	0	0	0	0	0	0	0	0
Veteran St	Blakeslee St	23	3	2	4	2	1	3	1	2
Blakeslee St	Norton St	8	0	0	0	0	0	0	0	0

2.3.1.11. Lighting

Street lights are located on both sides of the street at irregular intervals along Waring Road. The lights are owned, operated and maintained by the City of Rochester. Existing lighting consists of cobra style fixtures with davit arms mounted on wood power poles. The poles are owned by RG&E.

The City has expressed a desire to replace the existing lighting system with a new system of similarly mounted lights utilizing more energy efficient fixtures and lamps that will provide a more uniform lighting pattern at a desired level of illumination based on IES (Illuminating Engineering Society of North America) standards. IES standards have been adopted by the City of Rochester and AASHTO for determining appropriate lighting levels for roadway systems. The new fixtures will also provide an IP66 rating. IP stands for Intrusion Protection which is a rating that describes the protection a light fixture provides against intrusion of solid and liquid material. An IP66 rated fixture is designed to totally protect against dust intrusion and provide protection against liquid intrusion from a high powered water jet or heavy seas. This level of protection insures that for the life of the fixture no outside influence will impact the fixtures ability to cast light in an efficient manner. Older fixtures can suffer a reduction in light distribution of up to 40% due to dust and dirt intrusion and require periodic cleaning to prevent such lighting loss.

The existing and proposed lighting levels along Waring Road are summarized in Exhibit 2.3.1.11

Exhibit - 2.3.1.11
Lighting Levels along Waring Road

	Average Illumination			Average/ Min Lighting Ratio	Lamps
	Roadway	Signalized Intersections	Unsignalized Intersections		
Existing Lighting	0.8 fc	0.8 fc	0.8 fc	> 5:1 (poor)	250w Mercury Vapor
Proposed Lighting	1.0 fc	2.0 fc	1.0 fc	≤ 3:1	150/250w High Pressure Sodium

fc = foot candles

2.3.1.12. Ownership and Maintenance Jurisdiction

Exhibit - 2.3.1.12
Existing Ownership and Maintenance Jurisdiction

Highway	Limits	Feature(s) being Maintained	Centerline (miles)	Lane (miles)	Agency	Division
Waring Road	Norton Street to Culver Road	Traffic Signals and Signs	0.75	1.50	Monroe County	Dept. of Transportation
		Street Lights	0.75	1.50	City of Rochester	Dept. of Environmental Services
		Pavement & sidewalks	0.75	1.50	City of Rochester	Dept. of Environmental Services
		Storm and Sanitary Sewers	0.75	1.50	Monroe County	Pure Waters

2.3.2. Multimodal

2.3.2.1. Pedestrians

Sidewalks exist for pedestrians on both sides of Waring Road along the entire project corridor. Striped crosswalks are located only at signalized intersections including Norton Street, Culver Road and Northland Avenue. The sidewalks are physically separated from the roadway by a tree lawn that ranges from five to six feet wide. Higher levels of pedestrian activity were observed in the vicinity of the Waring Road plaza, especially at the bus stops at Ashwood Drive and Fieldwood Drive. Sidewalk ramps do exist at most corners with a fair degree of ADA compliancy with respect to condition and ramp slope, but none of the ramps contain detectable warning systems.

2.3.2.2. Bicyclists
There are no dedicated facilities for bicyclists; they are allowed to share the road with other vehicles and obey vehicle traffic laws. However, there is no signage that identifies Waring Road as a shared road environment. The wide pavement width, lack of on-street parking definition and low utilization provide an informal bicycling environment. In January of 2011, the City adopted its Bicycle Master Plan which outlines the City's desire to expand biking and identify long-range opportunities for improving facilities throughout the City. The plan identified the existing conditions for bicyclists in Rochester as well as recommendations for enhancing streets to accommodate bicyclists in a cost effective manner. Waring Road, although not specifically highlighted in the report, was identified as having a bicyclist level of service rating of "D" which reflects the roadway's bike lane/paved shoulder width, outside lane width, traffic volume/speed/type, pavement surface condition and presence of on-street parking. Additionally, the roadway was identified as a likely candidate for roadway restriping to accommodate bicyclists.

2.3.2.3. Transit
The Rochester Genesee Regional Transportation Authority (RGRTA) operates a single route through the corridor – Route 6-Clifford Avenue. Bus stops are located periodically along the southbound direction of Waring Road. There are no bus shelters located along Waring Road.

2.3.2.4. Airports, Railroad Stations, and Ports
There are no airports, railroad stations or port entrances within or in the vicinity of the project limits.

2.3.2.5. Access to Recreation Areas (Parks, Trails, Waterways, State Lands)
Norton Village Park and Recreational Facility operated and maintained by the City of Rochester, is located just north of the plaza on Waring Road. The facility has a dedicated entrance and parking lot off Waring Road.

2.3.3. Infrastructure
2.3.3.1. Existing Highway Section
The existing highway section consists of 40 feet wide pavement containing two 12-foot wide travel lanes and two 8-foot wide on-street parking lanes with granite curbing. The existing pavement section consists of an 8-inch thick concrete subbase with approximately 6 inches of asphalt as a wearing surface. The area outside the pavement consists of a combination of 5 foot wide sidewalks and 5-6 foot wide curb lawns which contain mature street trees and wood utility poles.

2.3.3.2. Geometric Design Elements Not Meeting Standards

2.3.3.2.(1) Critical Design Elements
There are no existing nonstandard features.

2.3.3.2.(2) Other Design Parameters
There are no existing nonconforming features.

2.3.3.3. Pavement and Shoulder
A Pavement Surface Rating Survey is conducted in 2005. The system assigns a condition rating from "1" (impassable) to "10" (new) based on the distresses appearing on the pavement surface. Waring Road was rated as a 5 which falls in to the category of "Poor – with frequent and severe distress". In 2010 the City performed a milling and resurfacing treatment along Waring Road as a "stop gap" measure until this project can be implemented. The City has provided the design team several photographs of the pavement which were taken prior to the 2010 Milling and resurfacing treatment. These photos clearly show that the Waring Road pavement presents significant areas of alligator cracking, rutting, and potholes which are all signs of pavement failure. A Pavement Evaluation and Treatment Selection Report (PETSR) was not prepared as part of the early scoping and planning process and it's not practical to do so at this time because the roadway has recently been resurfaced. The condition of the roadway was also well documented in the IPP.

A geotechnical investigation along the roadway was performed to determine the existing pavement section and its underlying course thicknesses/condition. The thickness of the asphaltic concrete along

Waring Road measured between 5 and 7¼ inches thick. The underlying concrete base varied in thickness from approximately 4 inches to 9 inches thick. However in general the thickness of the asphaltic concrete as well as the underlying concrete was typically around 6 inches thick.

A distinct subbase layer was generally absent beneath the concrete base. The subgrade material that was generally encountered beneath the concrete base can be described as a fill soil of indigenous silty clayey and sandy soil deposits with varying moisture, density and compaction characteristics. This type of material does not provide any significant structural support to the pavement section.

The proposed roadway profile will very likely be approximately 3-4 inches lower than the existing grade. This will allow the necessary grade change to provide a full curb reveal and promote positive drainage along the project. Lowering the roadway by this amount would leave only 2-3 inches of potential wearing course above the existing concrete base. Also, approximately half of the pavement cores retrieved throughout the project corridor indicate the concrete base has completely disintegrated in sporadically spaced locations and should not be considered a viable pavement component. The City Water Bureau has also requested that the existing water main along Waring Road be replaced. This will require considerable trenching through the existing pavement section causing further damage to and restoration of the existing pavement. Based on these reasons, it is not feasible to preserve the existing concrete base and full depth reconstruction is the most viable alternative.

This report includes a recommended pavement section based on the projected traffic volumes and Equivalent Single Axle Loads (ESALs) using the guidance contained in the NYSDOT Comprehensive Pavement Design Manual.

2.3.3.4. Drainage Systems

The project corridor is not subject to flooding and is adequately drained. The storm system consists of a closed drainage system that is partially separated from the sanitary sewer system and is partially combined with the sanitary system according to Exhibit 2.3.3.4

Exhibit - 2.3.3.4
Existing Drainage Systems

	Storm System		Sanitary System		Year Built	Condition
	Description	Flow Direction	Description	Flow Direction		
Norton St to Lyceum St	Combined System 6ft diameter Brick Sewer, accepts flow from 5'-9" sewer along Lyceum			Northerly	1921	Good
Lyceum St to Ashwood Drive	Combined System 12" diameter VTP Sewer that accepts flow from an 8" Cast Iron force main along Waring Rd from the south			Northerly	1928	Good
Ashwood Drive to Master Str	12" VTP Storm Sewer	Southerly	8" VTP Sanitary Sewer	Southerly	1933/ 1928	Good
	8" Cast Iron force main from Master Street			Northerly	1928	Good
Master Street to Densmore Street	12" VTP Storm Sewer. Flows to Densmore Creek Overflow Structure	Southerly to Densmore Creek Overflow Structure	8" VTP Sanitary Sewer	Southerly to Densmore Street	1933/ 1928	Good
Densmore Street to Culver Road	12" VTP Storm Sewer. Flows	Northerly to Densmore Creek Overflow Structure	8" VTP Sanitary Sewer	Northerly to Densmore Street	1933/ 1928	Good

VTP-Vetrified Tile Pipe

2.3.3.5. Geotechnical

There are no special geotechnical concerns with the soils or rock slopes within the project area. A geotechnical investigation was performed along the project corridor to identify the existing pavement section, determine the subsoil conditions, locate the presence of any rock formations within the anticipated limits of excavation and determine the corrositivity of the subsoil as a design consideration for the proposed water main along the project. The results of the investigation can be summarized as follows:

- Twenty six conventional test borings and twenty six shallow pavement cores were taken along the project corridor. One deep boring was taken near the Densmore Creek overflow structure and refusal was encountered at a depth of 10.3 feet below existing ground surface. The remaining borings revealed a mixture of native soils that can be described as silts, sands and gravel like materials typically found in the soils of this area and can further be described as moist and either firm or compact.
- Photoionization Detection was performed on the samples recovered at each test location. The results of these screenings did not reveal any evidence of the presences of Volatile Organic Compounds in the soils.
- Twelve of the soil samples along the project were tested for resistivity, redox, pH, Sulfides and moisture content according to the procedures established by the Ductile Pipe Research Institute (DIPRA). The total point values for the twelve samples ranged between 5 and 6. Cathodic protection from pipe corrosion is recommended when the total point value reaches 10 or higher.
- The same twelve samples were also tested for Chlorides.
- Pavement recommendations were also prepared as part of the report.

The complete report can be found in *Appendix E.*

2.3.3.6. Structure
There are no bridges within the project limits.

2.3.3.7. Hydraulics of Bridges and Culverts
The Densmore Creek Overflow Structure is located within the project limits. The structure consists of a 3100 feet long reinforced concrete culvert which has an arch shaped roof slab with a maximum interior height of 8ft and a 15ft clear opening in the vicinity of Waring Road. Within the highway boundary the structure is oriented perpendicular to the Waring Road centerline at the Densmore Street intersection. The structure begins approximately 2100 feet west and ends at a point approximately 1000 feet east of the Waring Road centerline. There is approximately 18 inches of cover between the existing pavement surface and the top of the structures roof slab. Monroe County Pure Waters has recently inspected the structure and determined that the structure is in good condition. No improvements to the structure are anticipated.

2.3.3.8. Guide Railing, Median Barriers and Impact Attenuators
There are no sections of guide railing, median barriers or impact attenuators within the project limits.

2.3.3.9. Utilities

Exhibit - 2.3.3.9 Existing Utilities				
Owner	**Type**	**Location/Side**	**Length**	**Condition/Conflict/Replacement**
RG&E	16" Wrapped Steel Gas Main	West Sidewalk	4000 LF	The gas main is in good condition. Only partial replacement is anticipated based on conflicts with the proposed grades at roadway crossings
RG&E	6/8" PE Gas Main	West Sidewalk	2100 LF	The gas main is in good condition. Only partial replacement is anticipated based on conflicts with the proposed grades at roadway crossings
City of Rochester	8" DIP Water Main	In the roadway	4000 LF	Poor condition with poor flow characteristics. Full replacement is anticipated with 8" PVCO water main
Monroe County Pure Waters	Combined Sewer from (12" to 6ft Diameter)	In the roadway	1900 LF	Good Condition Existing sewer will not be replaced

Exhibit - 2.3.3.9 (Continued) Existing Utilities				
Owner	**Type**	**Location/Side**	**Length**	**Condition/Conflict/Replacement**
Monroe County Pure Waters	8" Cast Iron Sanitary Force Main	In the roadway	500 LF	Good Condition Existing sewer will not be replaced
Monroe County Pure Waters	12"-21" Storm Water Sewer	In the roadway	1600 LF	Good Condition Existing sewer will not be replaced
Monroe County Pure Waters	8" Sanitary Sewer	In the roadway	1600 LF	Good Condition Existing sewer will not be replaced

2.3.3.10. Railroad Facilities
There are no railroads within the project limits and no at-grade crossings within 1 mile of the project that could impact traffic conditions.

2.3.4. Potential Enhancement Opportunities

This section focuses on the existing areas to identify potential enhancement opportunities related to the project and to help avoid and minimize impacts. Chapter 4 focuses on the impacts, enhancements, and mitigation.

2.3.4.1. Landscape

2.3.4.1. (1) Terrain - Waring Road is generally level; there are no abrupt changes in slope within the project limits.

2.3.4.1. (2) Unusual Weather Conditions
There are no unusual weather conditions within the project area.

2.3.4.1. (3) Visual Resources – The Waring Road corridor can be generally described as a developed urban neighborhood with pockets of commercial uses and recreational and community uses. Residential structures are typically single-family wooden structures on narrow lots and include private driveways. The view from the roadway consists primarily of residential dwellings and some commercial uses, but is broken up in the central section by green space from the Norton Village Recreational Facility on the east side and Northeast College Preparatory High School on the west side. There are no scenic views or vistas along the corridor. Street trees and shrubs and other landscaping on adjacent private property help to soften the visual character of the corridor. Opportunities exist for additional street trees and greenspace in the public realm/tree lawn to provide additional visual enhancements.

Waring Road does not contain any important vistas or scenic views. However, with the July 2010 inclusion of the Fernwood Park Historic District on the National Register of Historic Places, protection of views adjacent to this resource will need to be taken in to consideration. The district consists of numerous World War II era two-story brick structures, an extensive sidewalk network and extensive green space and mature trees.

2.3.4.2. Opportunities for Environmental Enhancements – As outlined in previous sections, the most feasible opportunity for environmental enhancements in the corridor consist of reducing the pavement surface area and expanding the adjacent tree lawn where possible. This will provide an opportunity to install additional street trees to enhance the visual appeal of the neighborhood. In addition, the desire to create a shared roadway by providing dedicated bike lanes has also been previously identified. There are no other practical opportunities for additional environmental enhancements within the project limits.

2.3.5. Miscellaneous - None

CHAPTER 3 – ALTERNATIVES

This chapter discusses the alternatives considered and examines the engineering aspects for all feasible alternatives to address project objectives in Chapter 1 of this report.

3.1. Alternatives Considered and Eliminated from Further Study

Alternative 1 – The No Build

The no-build alternative will result in the continued deterioration of the pavement structure, resulting in increased maintenance costs lower property values, further inconvenience to the traveling public due to poor road conditions and would not address the City's desire to provide a more bicycle friendly corridor. This alternative will not satisfy the project objectives or the programming goal and therefore will not be considered further.

3.2. Feasible Build Alternatives

3.2.1. Description of Feasible Alternatives

Alternative 2 - 14-Foot Shared Use Travel Lanes, Reconstruction Alternative - This alternative consists of full depth reconstruction, narrowing the pavement from the existing 40 foot width to a proposed width of 36 feet, and installing new granite curbs with pedestrian friendly curb extensions or "bump outs" along the parking lane. See *Appendix A* for Alternative 2 Plans, Profiles and Typical Sections.

Key elements of this alternative include:

- Narrowing the pavement from the existing 40 foot width to a proposed width of 36 feet providing two 14-foot wide shared use travel lanes with one 8ft wide parking lane and no shoulders between Norton Street and Lyceum Street and between Master Street and Culver Road.
- Narrowing the pavement from existing 40 foot width to a proposed width of 28 feet providing two 14-foot wide shared use travel lanes with no parking lanes and no shoulders between Lyceum Street and Master Street (along the Waring Road Plaza).
- Providing sidewalks on both sides of Waring Road for the entire length of the project, with portions of the existing sidewalk being replaced as necessary.
- Increasing the amount of green space between the sidewalk and the curb line by reducing pavement width and providing wider curb lawns in residential areas which would facilitate the planting of new trees where appropriate.
- Providing on-street parking along the west side of Waring Road between Norton Street and Lyceum Street and between Master Street and Culver Road. These limits would essentially match the existing permitted parking limits but be limited to the west side of the road.
- Providing sharrow lane markings on both sides of Waring Road for the entire length of the project.

Operational

- This alternative does not affect operations.

Control of Access

- This alternative does not affect control of access

Right of Way

- Waring Road improvements will require minor amounts of corner type ROW acquisition for sidewalk and handicap access/ADA compliance. All other work will be performed within existing highway boundaries.

Environmental

- There are no wetland impacts associated with the Waring Road Improvements.
- There are no significant noise or visual impacts associated with the Waring Road Improvements

Cost

- Total estimated cost of Alternative 2 is $5.835M for the Street Improvements share and $1.917M for the Local Water Improvements share.

Project Goals

- These improvements meet the overall project objectives.

Alternative 3 (11-Foot Travel Lanes with 5-foot Bike Lanes, Reconstruction Alternative) - This alternative consists of full depth reconstruction, maintains the existing pavement width of 40 feet (with the exception of the section between Lyceum Street and Master Street), and installing new granite curbs with pedestrian friendly curb extensions or "bump outs" along the parking lane. See *Appendix A* for Alternative 3 Plans, Profiles and Typical Sections.

Key elements of this alternative include:

- Maintaining the existing 40ft pavement width providing two 11-foot wide travel lanes, two 5-foot wide bike lanes and one 8-foot wide parking lane with no shoulders between Norton Street and Lyceum Street and between Master Street and Culver Road.
- This alternative would widen the pavement from existing 40 foot width to a proposed width of 43 feet providing two 11-foot wide travel lanes, one 11-foot wide center turn lane and two 5-foot wide bike lanes with no parking lanes and no shoulders between Lyceum Street and Master Street. The center turn lane would service the Waring Road Shopping Plaza on the east side of the road. The Plaza contains three driveway entrances with a moderate amount of traffic turning in and out of the plaza. The center turn lane would help facilitate the southbound left turn movements into the plaza and avoid the current traffic pattern of stopped vehicles waiting to turn into the plaza with other vehicles passing on the right side to avoid the congestion.
- This alternative would provide sidewalks on both sides of Waring Road for the entire length of the project, with large portions of the existing sidewalk being replaced as necessary.
- This alternative would increase the amount of green space between the sidewalk and the curb line in various areas with curb extensions which would facilitate the planting of new trees where appropriate.
- This alternative would include on-street parking along the west side of Waring Road between Norton Street and Lyceum Street and between Master Street and Culver Road. These limits would essentially match the existing permitted parking limits but be limited to the west side of the road.
- Bike lane pavement markings on both sides of Waring Road for the entire length of the project.

Operational

- This alternative does not affect operations.

Control of Access

- This alternative does not affect control of access

Right of Way

- Waring Road improvements will require minor amounts of corner type ROW acquisition for sidewalk and handicap access/ADA compliance. All other work will be performed within existing highway boundaries.

Environmental

- There are no wetland impacts associated with the Waring Road Improvements.
- There are no significant noise or visual impacts associated with the Waring Road Improvements

Cost

- Total estimated cost of Alternative 3 is $6.112M for the Street Improvements share and $1.917M for the Local Water Improvements share.

Project Goals

- These improvements meet the overall project objectives.

Alternative 4 (11-Foot Travel Lanes with 5-foot Bike Lanes, Pavement Preservation Alternative) - This alternative consists of milling and resurfacing the existing pavement where possible with maintaining significant portions of the existing concrete subbase. In areas where milling and resurfacing is not feasible due to the condition of the concrete subbase, the roadway will be reconstructed. This alternative also maintains the existing pavement width of 40 feet for the majority of the roadway and includes new granite curbs with pedestrian friendly curb extensions or "bump outs" along the parking lane.

The existing grade along Waring Road would be closely maintained to ensure that the thickness of the proposed asphalt overlay (above the concrete base) was not compromised. The new 7 ¼ inch high granite curbing along the roadway is higher than the existing 3 to 5 inch curb reveal. This elevation change combined with the requirement to maintain the roadway profile creates a condition behind the sidewalks where significant grading in the curb lawns and driveways outside the highway boundary would be required. This adds significant cost to the project related to both construction operations and Right of Way acquisition. Also, utility trenching operations within the portions of the roadway where the existing concrete base is to remain would result in additional costs related restoring the concrete base above the trenches. Alternative 4 is identical to Alternative 3 from a geometric perspective (curbs and pavement widths), but the roadway profile would be higher to avoid impacting the existing concrete base. The higher profile would cause drainage and grading challenges that significantly increase the cost of this alternative making Alternative 4 more expensive than Alternative 3.

Appendix A contains Plans, Profiles and Typical Sections for Alternatives 2 and 3, but does not contain a set for Alternative 4. This Alternative was developed from a feasibility perspective and conceptual plans were not prepared.

Key elements of this alternative include:

- Two 11-foot wide travel lanes, two 5-foot wide bike lanes and one 8-foot wide parking lane with no shoulders between Norton Street and Lyceum Street and between Master Street and Culver Road.
- This alternative would widen the pavement from existing 40 foot width to a proposed width of 43 feet providing two 11-foot wide travel lanes, one 11-foot wide center turn lane and two 5-foot wide bike lanes with no parking lanes and no shoulders between Lyceum Street and Master Street. The center turn lane would service the Waring Road Shopping Plaza on the east side of the road. The Plaza contains three driveway entrances with a moderate amount of traffic turning in and out of the plaza. The center turn lane would help facilitate the southbound left turn movements into the plaza and avoid the current traffic pattern of stopped vehicles waiting to turn into the plaza with other vehicles passing on the right side to avoid the congestion.
- This alternative would provide sidewalks on both sides of Waring Road for the entire length of the project, with large portions of the existing sidewalk being replaced as necessary.
- This alternative would increase the amount of green space between the sidewalk and the curb line in various areas with curb extensions which would facilitate the planting of new trees where appropriate.
- This alternative would include on-street parking along the west side of Waring Road between Norton Street and Lyceum Street and between Master Street and Culver Road. These limits would essentially match the existing permitted parking limits but be limited to the west side of the road.
- Bike lane pavement markings on both sides of Waring Road for the entire length of the project.

Operational

- This alternative does not adversely affect operations.

Control of Access

- This alternative does not affect control of access.

Right of Way

- Waring Road improvements would require significant amounts of temporary easements along the highway boundaries for grading in lawn areas and driveway restoration along with a minor amount of corner type ROW acquisition for sidewalk and handicap access/ADA compliance.

Environmental

- There are no wetland impacts associated with the Waring Road Improvements.
- There are no significant noise or visual impacts associated with the Waring Road Improvements

Cost

- Total estimated cost of Alternative 4 is $6.748M for the Street Improvements share and $2.010M for the Local Water Improvements share.

Project Goals

- These improvements meet the overall project objectives.

Exhibit 3.2.1 Summary of Alternative Costs - Million Dollars (Calculated Year)							
Activities		Alternative 2		Alternative 3		Alternative 4	
		Full Reconstruction		Full Reconstruction		Pavement Preservation (Mill and Resurface / Partial Reconstruction)	
		(14 Foot Shared Use Travel Lanes)		(11 Foot Travel Lanes with 5 Foot Bike Lanes)		(11 Foot Travel Lanes with 5 Foot Bike Lanes)	
		Street Share	City Water Share	Street Share	City Water Share	Street Share	City Water Share
Construction	Bridge	N/A		N/A		N/A	
	Highway	$3.323	$1.106	$3.489	$1.106	$3.745	$1.162
SPDES Mitigation Costs		Included in the Highway estimate above					
Incidentals[1] (2012) 10%		$0.332	$0.111	$0.349	$0.111	$0.375	$0.116
Subtotal (2012)		$3.655	$1.217	$3.838	$1.217	$4.120	$1.278
Contingencies[2](15% @ Design Approval)		$0.548	$0.182	$0.576	$0.182	$0.618	$0.192
Subtotal (2012)		$4.204	$1.399	$4.414	$1.399	$4.737	$1.470
Potential Field Change Order[3]		$0.200	$0.050	$0.200	$0.050	$0.200	$0.050
Subtotal (2012)		$4.404	$1.449	$4.614	$1.449	$4.937	$1.520
Mobilization (4%)		$0.176	$0.058	$0.185	$0.058	$0.197	$0.061
Subtotal (2012)		$4.580	$1.507	$4.798	$1.507	$5.135	$1.581
Expected Award Amount – Inflated[4] @ 3%/yr to midpoint of Construction (2016)		$5.155	$1.696	$5.400	$1.696	$5.779	$1.779
Construction Inspection (13%)		$0.670	$0.221	$0.702	$0.221	$0.751	$0.231
ROW Costs (2013)		$0.010	$0.000	$0.010	$0.000	$0.217	$0.000
Total Cost (2016)		**$5.835**	**$1.917**	**$6.112**	**$1.917**	**$6.748**	**$2.010**

3.2.2 Preferred Alternative

While Alternative 3 is identified as the preferred alternative, all feasible alternatives are under consideration. The selection of the preferred alternative will not be finalized until the alternatives' impacts, comments on the draft design approval document, and comments from the public meetings have been fully evaluated.

3.2.3. Design Criteria for Feasible Alternative(s)

3.2.3.1. Design Standards

3.2.3.2. Critical Design Elements

Exhibit 3.2.3.2.
Critical Design Elements for Waring Road

PIN:	4754.40	NHS (Y/N):	No
Route No. & Name:	Waring Road	Functional Classification:	Urban Collector
Project Type:	Moderate Complexity	Design Classification:	Collector
% Trucks:	4%	Terrain:	Level
AADT:	6893	Truck Access/Qualifying Hwy.	Neither

	Element	Standard	Existing Condition	Proposed Condition
1	Design Speed	40 mph(1)	30 mph posted	40 mph(1)
2	Lane Width	10ft minimum, 12ft maximum	12 ft	11 ft
3	Shoulder Width	Right shoulder/lateral offset for bicycling = 5 ft	0	5 ft (bike lane)
4	Bridge Roadway Width	n/a	n/a	n/a
5	Maximum Grade	9%	3.2%	3.2%
6	Horizontal Curvature	533 ft minimum	n/a	n/a
7	Superelevation	4% Maximum	n/a	n/a
8	Stopping Sight Distance	305 ft Minimum	unlimited	unlimited
9	Horizontal Clearance	5 ft bike lane or shoulder width to curb line	5 ft	5 ft
10	Vertical Clearance (above traveled way)	14.1 ft Minimum	n/a	n/a
11	Travel Lane Cross Slope	1.5% Min. to 2% Max.	2%	2%
12	Rollover	4% between travel lanes; 8% at edge of traveled way;	4%	4%
13	Structural Capacity	n/a	n/a	n/a
14	Level of Service	"D" for signalized intersections	B	B
15	Control of Access	Uncontrolled	Uncontrolled	Uncontrolled
16	Pedestrian Accommodation	Complies with HDM Chapter 18	Full	Full
17	Median Width	n/a	n/a	n/a

(1) Based on the 85th percentile speed by performing a time and distance study along Waring Road. The posted speed will remain at 30 mph.

3.2.3.3. Other Design Parameters – There are no other design parameters.

3.3. Engineering Considerations

3.3.1. Operations (Traffic and Safety) & Maintenance

3.3.1.1. Functional Classification and National Highway System - This project will not change the functional classification of the highway.

3.3.1.2. Control of Access - No control of access will be provided.

3.3.1.3. Traffic Control Devices

3.3.1.3. (1) Traffic Signals: No new traffic signals are proposed. The existing traffic signal equipment at the Culver Road intersection is proposed to be replaced and signal equipment at the Northland Avenue intersection will be removed.

A traffic signal warrant analysis for the Waring Road/Northland Ave Intersection was performed. There are 9 Warrants that are part of the analysis and at least one of these warrants must be met to justify the retention of the traffic signal. None of the 9 Warrants were met for the installation of a traffic signal at the intersection of Waring Road and Northland Avenue. Based on this information the decision was made to remove the signal and convert Northland Avenue to a stop controlled intersection. Northland Ave will receive a stop sign and the two Waring Road approaches will be uncontrolled.

A stop controlled Level of Service analysis was performed for the design year 2035 at the intersection of Waring Road and Northland Avenue. The AM peak and the PM peak movements were analyzed and the results indicate that the intersection will perform at an acceptable Level of Service with a single shared lane on the eastbound approach on Northland Avenue.

Exhibit – 3.3.1.3-1
Traffic Data – Northland Ave/Waring Road Intersection with Stop Control

Future Condition – ETC+20 (2035)	Level of Service (delay-seconds)		
Peak	EB Approach	NB/SB Approach	Overall
AM	A (8.2 seconds)	B (11.1 seconds)	B (11.1 seconds)
PM	A (8.2 seconds)	C (15.6 seconds)	C (15.6 seconds)

Monroe County DOT has requested that the project install traffic signal conduit under the intersection pavement to prepare for a potential future traffic signal should it be warranted at the Northland Ave / Waring Road intersection.

3.3.1.3. (2) Signs: Existing signs will be evaluated and replaced as necessary. New signs will be added where required. Existing signs will be eliminated where no longer necessary.

3.3.1.4. Intelligent Transportation Systems (ITS)

Signal coordination between the Culver Road/Waring Road intersection and the Northland Avenue/Waring Road intersection is planned with the installation of PVC traffic conduit and fiber optic communications cable between these intersections should a signal be warranted at Northland Avenue in the future.

3.3.1.5. Speeds and Delay

3.3.1.5. (1) Proposed Speed Limit - The posted speed limit within the project limits will be 30 mph.

Exhibit - 3.3.1.5 Speed Data

Route	Waring Road
Posted Speed Limit	30 mph
Operating Speed and Method Used to Measure	85^{th} percentile speed is 40mph based on time and distance measurements

3.3.1.5. (2) Travel Time Estimates

Travel time estimates are not included as the feasible alternatives will not change the capacity.

3.3.1.6. Traffic Volumes

The preferred alternative will not impact the travel of school buses, RTS buses, farm machinery, milk trucks, large trucks, etc., that routinely use the route.

Since there are no significant changes in traffic volumes see Section 2.3.1.6 for existing traffic volumes. Refer to *Appendix C* for traffic data. Refer to Exhibits 2.3.1.6-1 and 2.3.1.6-2 for a summary of the traffic data. Peak hour turning movement volumes for intersections with identified accident problems, all major intersections, & major traffic generator driveways/entrances are included in *Appendix C.* Exhibit 3.3.1.6-1 summarizes the key existing traffic data for Waring Road.

Exhibit 3.3.1.6 -1 Traffic Data	
Route	Waring Road
AADT	6893
Directional Distribution	AM: 52%(SB) / 48%(NB) PM: 48%(SB) / 52%(NB)
Peak Hour Factor	0.92 (approximated)
Peak Hour Percent Trucks	4% AM, 4% PM (approximated based on traffic data)
Daily Trucks	4% (approximated based on traffic data)

3.3.1.7. Level of Service and Mobility

3.3.1.7 (1) At Project Completion & Design Year

The level of service at the signalized intersections along the project are expected to remain at acceptable levels for both the time of completion and in the design year. Refer to Exhibits 2.3.1.7-1 & 2 for further information.

3.3.1.7 (2) – **Work Zone Safety & Mobility**

A. Work Zone Traffic Control Plan - A Work Zone Traffic Control Plan will be developed during Final Design, but it is anticipated that a single lane of southbound traffic will be maintained along Waring Road during construction and that a posted detour will be implemented for northbound Waring Road traffic.

B. Special Provisions – No special provisions have been identified at this time.

C. Significant Projects (per 23 CFR 630.1010) - The Waring Road Improvement Project is not considered a significant project under 23 CFR 630.1010.

3.3.1.8. Safety Considerations, Accident History and Analysis

3.3.1.9. Impacts on Police, Fire Protection and Ambulance Access

Refer to Section 2.3.1.9 for discussion of the existing emergency access conditions. During construction, emergency access will be maintained along Waring Road via a single lane of southbound traffic. Northbound traffic will be maintained via a posted offsite detour which will be determined during final design.

3.3.1.10. Parking Regulations and Parking Related Issues

Parking is currently permitted along both sides of Waring Road for the majority of the project length. The feasible alternatives both propose the elimination of on-street parking along the northbound side of Waring Road and maintaining on-street parking along the southbound side of Waring Road. Refer to Section 2.3.1.10 for further information on the parking along Waring Road.

3.3.1.11. Lighting
The existing lighting along Waring Road consists of Davit Style lighting mast arms and cobra head light fixtures mounted to the wooden utility poles along the project. Proposed lighting system will also be mounted to the wood utility poles but will provide a more uniform lighting pattern meeting current standards and a more energy efficient system. Refer to section 2.3.1.11 for more information on the lighting along Waring Road.

3.3.1.12. Ownership and Maintenance Jurisdiction
No changes are proposed. The City of Rochester will continue ownership and maintenance responsibilities for the highway. Monroe County DOT will continue ownership and maintenance for traffic signs and traffic signals. Monroe County Pure Waters will continue ownership and maintenance for storm and sanitary sewers. Refer to Section 2.3.1.12.

3.3.1.13. Constructability Review
A constructability review will be performed as part of the final design process.

3.3.2. Multimodal

3.3.2.1. Pedestrians
Concrete sidewalks exist along both sides of Waring Road. Sections of the existing sidewalks will be either retained or replaced based on several factors such as condition of the concrete flags, utility conflicts, grade related issues and ADA compliance. A Pedestrian Generator Checklist is included in *Appendix C*. All corner ramps will be evaluated for ADA compliance and detectable warning surfaces will be installed. Striped crosswalks will be provided at signalized intersections.

3.3.2.2. Bicyclists
Either 14 foot wide shared use lanes or 11 foot wide travel lanes with separate 5 foot wide bike lanes will be provided along both sides of Waring Road to accommodate bicycle traffic.

3.3.2.3. Transit
The Rochester Genesee Regional Transportation Authority (RGRTA) maintains a Bus Route 6 – (Clifford Avenue) along Waring Road and plans to continue to do so after the project is complete. RGRTA plans to review the existing bus stop locations and may decide to move or eliminate some of the stops. This will be further coordinated during final design.

3.3.2.4. Airports, Railroad Stations, and Ports
No changes are proposed; no conflicts are expected.

3.3.2.5. Access to Recreation Areas (Parks, Trails, Waterways, and State Lands)
No changes are proposed.

3.3.3. Infrastructure

3.3.3.1. Proposed Highway Section
See Section 3.2.1 Description of Feasible Alternatives for a description of the proposed highway section. Also see *Appendix A* for Plans and Typical Sections.

3.3.3.2. Special Geometric Design Elements
None anticipated.

3.3.3.3. Pavement and Shoulder
A geotechnical investigation along the roadway was performed to determine the existing pavement section and its underlying course thicknesses/condition. The thickness of the asphaltic concrete along Waring Road measured between 5 and 7¼ inches thick. The underlying concrete base varied in thickness from approximately 4 inches to 9 inches thick. However in general the thickness of the asphaltic concrete as well as the underlying concrete was typically around 6 inches thick.

The proposed roadway profile will very likely be approximately 3 inches lower than the existing grade. This will allow the necessary grade change to provide a full curb reveal and promote positive drainage along the project. Lowering the roadway by this amount would leave only 3 inches of potential wearing course above the existing concrete base. Also, the pavement cores show that there are significant areas along the project where the concrete base has completely disintegrated and is not longer considered a viable pavement component. The City Water Bureau has also requested that the existing water main along Waring Road be replaced. This will require considerable trenching through the existing pavement section causing further damage to and restoration of the existing pavement. Based on these reasons, it is not feasible to preserve the existing concrete base and full depth reconstruction is recommended.

The proposed pavement section for both travel and parking lanes will consist of a geotextile-fabric placed at subgrade (which will protect the subbase from contamination by existing silts and other fine material in the subgrade), 12 inches of subbase material, 6 inches of base course asphalt, 2 inches of binder course asphalt and 1.5 inches of top course asphalt. The pavement cross slope will be designed at 2%.

3.3.3.4. Drainage Systems
The majority of the existing drainage system will be maintained with only minor modifications to the existing laterals and some new laterals as required to construct new catch basins along the entire project.

3.3.3.5. Geotechnical
There are no special geotechnical concerns with the soils or rock slopes within the project area. See Section 2.3.3.5 for further information.

3.3.3.6. Structures
There are no proposed bridges within the project limits.

3.3.3.7. Hydraulics of Bridges and Culverts
The Densmore Creek Overflow Structure is located within the project limits. The structure is a 15ft wide by 8ft tall concrete box culvert with a circular roof slab and a rectangular floor and sidewall section that is oriented perpendicular to the Waring Road centerline at the Densmore Street intersection. Monroe County Pure Waters has recently inspected the culvert and determined that the structure is in good condition. No improvements to the Culvert are anticipated.

3.3.3.8. Guide Railing, Median Barriers and Impact Attenuators
There is no existing or proposed guiderail within the project limits.

3.3.3.9. Utilities
The City Water Bureau has recommended that the existing 8" cast iron water main be replaced as part of the project due to age, poor flow, low pressure and water quality issues. The new water main will be an 8" PVCO water main with new PE water services.

RG&E has indicated that portions of their gas main system along Waring Road may need to be replaced due to grade conflicts at side street intersections. RG&E is in the process of evaluating the existing gas mains along the project. A final determination is not anticipated until the project reaches final design stages.

RG&E maintains an over head electric distribution system along Waring Road which will remain with only minor improvements. Several of the existing wood poles along the project may need to be replaced due to design conflicts or pole condition. There are a few minor underground electric feeds to individual structures that may need to be lowered if depth of cover becomes an issue.

3.3.3.10. Railroad Facilities
There are no railroads within the project limits.

3.3.4. Landscape and Environmental Enhancements
Refer to Chapter 4 for complete discussion.

3.3.4.1. Landscape Development and Other Aesthetics Improvements

The proposed landscape improvements include installing new trees in the curb lawns along the project where gaps in the existing trees exist. There are several existing trees that may be in conflict with the proposed alternatives and will need to be removed. New trees will be proposed in these areas as well. Refer to Chapter 4 for a more detailed discussion.

3.3.4.2. Environmental Enhancements

There are no environmental enhancements planned.

3.3.5. Miscellaneous - None

CHAPTER 4 - SOCIAL, ECONOMIC and ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

The purpose of this chapter is to identify the social, economic and environmental consequences of this project; to identify avoidance or mitigation measures if necessary; to satisfy the applicable social, economic, and environmental laws; and to identify all permits and approvals required. This project proposes to improve Waring Road from Culver Road to Norton Street in the City of Rochester, Monroe County, New York. An Environmental Checklist for which this project was screened is included in *Appendix B.*

4.1.1 Environmental Classification

NEPA Classification

It is expected that the project will be categorized as a Class II Programmatic Categorical Exclusion. This is because it will not cause a significant environmental impact, either individually or cumulatively. As a Programmatic Categorical Exclusion, the project is exempt under NEPA from the requirement to prepare an Environmental Impact Statement (EIS) or an Environmental Assessment (EA). A copy of the NEPA checklist is included within this report in *Appendix B.*

The lead agency for NEPA is the Federal Highway Administration (FHWA)

SEQR Classification and Lead Agencies

In accordance with 17 NYCRR, Part 15, "Procedures for Implementation of State Environmental Quality Review Act," it is expected that this project will be classified as a SEQR Type II Action. As such, no further SEQR processing is required. The project has been identified as a Type II action, per 17 NYCRR Part 15, Section 15.14, Subdivision (e), item 37, Paragraph (v) minor reconstruction or rehabilitation of existing highways within existing right-of-way or involving minimal right-of-way acquisition.

The lead agency for SEQR is the City of Rochester

4.1.2 Coordination with Agencies

The following agencies are Cooperating Agencies in accordance with 23 CFR 771.111(d):

- City of Rochester
- Monroe County DOT
- Monroe County Pure Waters
- New York State Department of Transportation
- New York State Department of Environmental Conservation (NYSDEC)
- Federal Highway Administration (FHWA)

4.2 Social

The purpose of this section is to discuss the social environment of the project corridor. The project includes the Waring Road corridor from Norton Street to Culver Road which is a developed area, (partially residential and partially commercial) at low to moderate density. With the exception of the no-build alternative, each alternative will involve the full depth reconstruction of Waring Road on existing alignment, the installation of granite curbs with pedestrian friendly curb "bump outs" along the parking lane, replacement as needed of existing sidewalks along the entire corridor and increased green space.

4.2.1 Land Use

Demographics and Affected Population

The project area is developed at low to moderate density. The project corridor is primarily single family homes. The exceptions include: the Fernwood Park Apartment complex located along the southwest portion of the project corridor; athletic fields associated with Northeast and Northwest College Preparatory High School on the Douglass Campus located north of the Fernwood Park Apartments; the Waring Road Plaza located along the east side of Waring Road in the central portion of the project corridor; the athletic fields associated with the Norton Village Recreation Center located on the east side of Waring Road north of the plaza.

This project is compatible with the City of Rochester master plans.

Comprehensive Plans and Zoning

The project objectives are consistent with the City of Rochester's Comprehensive Plan for construction relating to streets, sidewalks and infrastructure.

4.2.2 Neighborhoods and Community Cohesion

Community Cohesion

The project will not divide neighborhoods, isolate part of a neighborhood, generate new development or otherwise affect community cohesion.

Home and Business Relocations

Since this project involves the repair of an existing highway on predominately the existing alignment and does not require the acquisition of occupied dwellings/businesses, it will not cause adverse impacts upon neighborhood character and stability. The proposed alternative would require no displacement of residences or businesses and therefore there would be no relocation impacts.

4.2.3 Social Groups Benefited or Harmed

Elderly and/or Disabled Persons or Groups

The project would not adversely impact any particular social, minority or special interest group. Likewise, the project will not have a disproportionately high and adverse health and environmental effect on minority or low income-income populations.

Transit Dependent, Pedestrians, and Bicyclists

The preferred project alternative will address the need to upgrade pedestrian facilities, to better utilize on-street parking facilities and provide a shared roadway for motorists, RTS transportation and bicyclists consistent with the City of Rochester Bicycle Master Plan.

Low Income, Minority and Ethnic Groups (Environmental Justice)

The project corridor is not located within an Environmental Justice Area. There are two potential environmental justice areas within the vicinity of the project corridor. One is located north of Norton Street bounded roughly by Vinal Avenue east to Spartan Drive; the other is located south west of the project corridor bounded roughly by Clifford Avenue, Woodman Park, Fernwood Park, Schum Lane, Northland Avenue and Goodman Street. A map identifying these areas is included in *Appendix B* of this report. No impact is anticipated to potential environmental justice areas.

4.2.4 Changes in Travel Patterns or Accessibility

The proposed project will not permanently alter the existing travel patterns in the project area nor will it have permanent effects on vehicular or pedestrian accessibility. Local traffic will experience a minor change in travel patterns or constricted accessibility during construction. During construction, a single lane of southbound traffic will be maintained along Waring Road and a posted detour will be implemented for northbound Waring Road traffic. During construction, pedestrian access will be maintained throughout the corridor on either the east or west side of the roadway, with appropriate signage to direct pedestrians. Upon completion of the project, travel patterns and accessibility will return to normal.

Impacts on Police, Fire Protections and Ambulance Access

The proposed project will not permanently adversely impact emergency vehicle access. Emergency response time to calls along Waring Road may temporarily increase due to construction components. Clear and frequent communication with all local emergency service organizations is recommended during construction.

4.2.5 School Districts, Recreational Areas, and Places of Worship

School Districts

The proposed project is within the Rochester City School District. Northeast and Northwest College Preparatory High Schools, Douglass Campus, is located at 940 Fernwood Park. The athletic fields are adjacent to the project corridor south of Northland Avenue. Sidewalks exist along the project corridor and are used by students from the adjacent neighborhoods.

It is not expected that there would be any long term adverse impacts to the Douglass Campus Schools. During construction, the project may temporarily impact bus routes to and from school. Communication with the City of Rochester School district during construction will help mitigate temporary impacts. Access to Northeast and Northwest Preparatory High Schools from Waring Road will be maintained throughout the construction phase. Construction impacts will be temporary and minor.

Recreational Areas

Norton Village Recreation Center is adjacent to the project corridor and is located on the east side of Waring Road and is bounded roughly by Waring Road, Veteran Street, Norton Village Lane, Bleaker Road and Master Street. During construction, there may be some short-term restricted accessibility impacts to the park from Waring Road. This would be a temporary and relatively minor impact. Norton Village Recreation Center can also be accessed from Costich Road.

Places of Worship

Waring Road Baptist Church exists at the corner of Waring Road and Norton Street which is adjacent to the project corridor at the northeast project limit. People from surrounding neighborhoods congregate at this church on a weekly basis. During construction there may be delays for some motorists traveling through the project corridor. However, the church is accessible from all directions with the use of surrounding roads. The delay in accessibility during construction would be a temporary and relatively minor impact.

4.3 Economic

The purpose of this section is to discuss the economic environment of the project corridor and to evaluate and analyze the effects of design alternatives on the economic environment present along the project corridor.

4.3.1 Regional and Local Economies

The proposed project is not expected to alter the general population or encourage new development that would stimulate economic activity and alter the economic viability within the project limits. Therefore, no significant impacts are anticipated for the regional and local economies.

4.3.2 Business Districts

Effects on Business Districts

There are no established business districts within the project corridor.

4.3.3 Specific Business Impacts

Established Businesses

The Waring Road Plaza exists in the center of the project corridor on the east side of Waring Road and consists of the following businesses: Family Dollar, M&T Bank, US Post Office, Rochester Works, H&R Block, Monroe County WIC Program and Citizens Bank. Fino's Klassy Clippers barber shop exists on the east side of Waring Road at the corner of Blakeslee Street and Waring Road. During construction, customers and employees may experience temporary inconvenience; however access to all businesses will be maintained throughout the construction phase. Project components will be designed such that they improve circulation at the plaza entrance.

Effects Assessment

There will be minor impacts to established businesses during project construction. Businesses located along the project corridor may see lower levels of traffic and experience minor losses in business during the construction operations. Other than impacts directly relating to project construction, the business climate along Waring Road is not expected to have appreciable changes.

4.4 Environmental

4.4.1 Wetlands

State Freshwater Wetlands

There are no NYSDEC regulated freshwater wetlands within the project area, as per the NYSDEC Freshwater Wetlands Map, Rochester East Quadrangle; and the NYSDEC online Environmental Resource Mapper. No further investigation is required.

State Tidal Wetlands

A review of the NYSDEC GIS wetland data files indicates that there are no NYSDEC jurisdictional tidal wetlands or regulated adjacent areas within or near the project limits, and ECL Article 24 does not apply.

Federal Jurisdiction Wetlands

The National Wetlands Inventory (NWI) online mapper accessed from the United States Fish and Wildlife Service (USFWS) indicated that there are no federally regulated wetlands within the project limits.

The National Resources Conservation Service (NRCS) Web Soil Survey of the project location indicated the presence of non-hydric soils.

A field visit was conducted on December 1, 2011. Observations of the vegetation present at the project location indicate that non-hydrophytic vegetation is present.

Executive Order 11990

Based on a site visit, there are no wetlands located within the project's area of potential effect. Executive Order 11990 does not apply to this project.

Mitigation Summary

No wetland mitigation/monitoring plan is required for this project, since no wetlands are within the project area.

4.4.2 Surface Waterbodies and Watercourses

There are no surface waters within the project corridor. No further review is required.

4.4.3 Wild, Scenic, and Recreational Rivers

There are no rivers within the project corridor. Therefore no further review is required regarding State Wild, Scenic and Recreational River or National Wild and Scenic Rivers.

4.4.4 Navigable Waters

There are no waters within the project corridor. Therefore, no further review regarding navigable waters is required.

4.4.5 Floodplains

The FEMA map panel that the project corridor is located in (36055C0212G) is a panel that is not printed. Unprinted panels indicate that the areas encompassed by that panel are not within the 100-year flood plain. No further review is required.

4.4.6 Coastal Resources

The project corridor is not within a coastal zone and is not covered by either the Coastal Zone Management Act or the Waterfront Revitalization and Coastal Resources Act. No further review is required.

4.4.7 Groundwater Resources, Aquifers, and Reservoirs

Aquifer

NYSDEC aquifer GIS data files have been reviewed and it has been determined that the proposed project is not located in an identified Primary Water Supply or Principal Aquifer Area. No further review is required.

A review of the EPA designated Sole Source Aquifer map for Region 2 indicated that Monroe County is not located within a Sole Source Aquifer System. No further review is required.

Unconfined Aquifer

The USGS Numbered Series map from the Water-Resources Investigations Report entitled "Potential Yields of Wells in Unconsolidated Aquifers in Upstate New York, Finger Lakes Sheet," dated 1988, indicated there are no designated confined or unconfined aquifers within the project area.

Drinking Water Supply Wells (Public and Private Wells) and Reservoirs

There are no municipal drinking water wells, wellhead influence zones, or reservoirs within or near the project area, according to the Geocheck Physical Setting Source Summary provided by Environmental Data Resources (EDR) and the *NYS Atlas of Community Water System Sources*, dated 1982, issued by the NYS Department of Health

4.4.8 Storm Water Management

It is not expected that the project will result in changes to the overall surface water drainage patterns and will not significantly increase pavement surface area. The preferred alternative will maintain the existing roadway width throughout the corridor with the exception of 1200 feet long section between Lyceum Street and Master Street which will be widened by 3 feet to create a center turn lane in the vicinity of the Waring Road Shopping Plaza. This increase in hard surface will be offset by intermittent roadway narrowing in areas where curb extensions or "bump-outs" will be introduced which will add "green space" for surface water to be absorbed. Therefore, increases in the overall surface water runoff rates and volumes are not expected as a result of the proposed project.

During construction, storm water runoff from exposed soil surfaces may flow into the existing surface conveyance system and subsequently into adjacent surface water streams. These flows will be managed by the use of sediment and erosion control techniques. These techniques will be part of a sediment and erosion control plan to be implemented during construction and will conform with the requirements of the NYS Department of Transportation "Standard Specification for Temporary Soil Erosion and Water Pollution Control" and the "NYS Guidance for Urban Erosion and Sediment Control," which will be a part of the final contract documents.

It is expected that the proposed project will result in a total area of disturbance that will exceed the designated disturbance threshold of 1-acre. Therefore, a Storm Water Pollution Prevention Plan will be required in accordance with NYSDEC State Pollution Discharge Elimination System General Permit for Storm Water Discharges from Construction Activity, and a Notice of Intent (NOI) submitted to the NYSDEC. It is anticipated that the SWPPP will be developed as part of the final design.

4.4.9 General Ecology and Endangered Species

Fish, Wildlife, and Waterfowl

A cursory review of the projects area of potential effect indicates that there is not a special habitat or breeding area for certain species of plants or animals. No further review is required.

Habitat Areas, Wildlife Refuges, and Wildfowl Refuges

The proposed project does not involve work in, or adjacent to, a wildlife or waterfowl refuge. No further consideration is required.

Invasive Species

A review of the existing corridor did not indicate any significant presence of known invasive species within the right-of-way. Precautions will be taken to prevent the introduction of invasive species during project design and construction.

Federal Listed Threatened or Endangered Species

The National Oceanic and Atmospheric Administration (NOAA) division of National Marine Fisheries Service (NMFS) and the United States Fish and Wildlife Service (USFWS) share the responsibility for managing federally listed threatened and endangered species. NOAA division of NMFS manages marine and anadromous species while the USFWS typically manages land and freshwater species. There are no waterbodies within the project limits; therefore, further coordination with NOAA-NMFS is not required. The USFWS online Monroe County list of species was reviewed. The bog turtle is a threatened species with known or likely occurrence in Riga and Sweden Townships; since the proposed project is not in Riga or Sweden Townships further coordination with USFWS is not required.

State Listed Threatened or Endangered Species

The New York State Department of Environmental Conservation (NYSDEC) was contacted for information regarding the presence of state listed threatened, endangered or special concern species that may be impacted by the proposed project. A response from the NYSDEC was received on December 7, 2011 indicating, "We have no records of rare or state listed animals or plants, significant natural communities or other significant habitats on or in the immediate vicinity of your project site". No further review is required.

A copy of applicable correspondence is included in *Appendix B* of this report.

4.4.10 Critical Environmental Areas

State Critical Environmental Areas

There are no critical environmental areas located within or adjacent to the project limits, per NYSDEC data.

State Forest Preserve Lands

According to information obtained from NYSDEC, the proposed project does not involve work in or near state forest preserve lands.

4.4.11 Historic and Cultural Resources

National Register of Historic Places

Records from the New York State Historic Preservation Office (SHPO) and National Register of Historic Places were reviewed for listed historic properties that may be impacted by the proposed project. There are two cultural districts on the National Registry which exist adjacent to the project corridor as follows:

- Fernwood Park Historic District, Listing Number 10000360: adjacent to the southeast portion of the project corridor. It is bounded by Fernwood Avenue, Woodman Park, Culver Road and Waring Road.

- Norton Village Historic District, Listing Number 10000362: adjacent to the northeast portion of the project corridor. It is bounded by Norton Street, Norton Village Lane, Village Way and Veteran Street.

It is anticipated that project components will not impact either Nationally Registered Historic District.

Archaeological Resources

The project corridor is located within an archeologically sensitive area per the internet map prepared by the New York State Park, Office of Parks, Recreations and Historic Preservation. A copy of this map is contained in *Appendix B.*

It is anticipated that project component will be limited to areas that have been previously disturbed.

Conclusion

A project review request has been prepared and submitted to the NYSDOT Region 4 SHPO liaison for review. Based on their review, it has been determined that "project activities have no potential to cause effects on historic properties in accordance with 36 CFR 800.3(a)(1) therefore, there are no further obligations for compliance with Section 106 of the National Historic Preservation Act." Applicable documentation is included in *Appendix B.* A Phase 1A Cultural Resources Reconnaissance Survey is not warranted.

4.4.12 Parks and Recreational Resources

Norton Village Recreation Center is adjacent to the project corridor and is located on the east side of Waring Road and is bounded roughly by Waring Road, Veteran Street, Norton Village Lane, Bleaker Road and Master Street. Project components will not permanently disturb any park land. During construction, there may be some short-term accessibility impacts to the park from Waring Road. This would be a temporary and relatively minor impact. Norton Village Recreation Center can also be accessed from Costich Road.

State Heritage Area Program

The proposed project will not impact areas identified as State Heritage Areas.

National Heritage Areas Program

The proposed project will not impact areas identified as National Heritage Areas.

National Registry of Natural Landmarks

There are no listed nationally significant natural areas within, or adjacent to, the project area.

Section 4(f) Involvement

The proposed project is located adjacent to Norton Village Recreation Center, owned by the City of Rochester. However, the project will not affect the park and a Section 4(f) evaluation is not required.

Section 6(f) Involvement

The project does not impact parklands or facilities that have been partially or fully federally funded through the Land and Water Conservation Act. No further consideration under Section 6(f) is required.

Section 1010 Involvement

This project does not involve the use of land from a park to which Urban Park and Recreation Recovery Program funds have been applied.

4.4.13 Visual Resources

The implementation of this project will result in a minor positive visual impact to the immediate visual environment.

4.4.14 Farmlands

State Farmland and Agricultural Districts

Based on a review of the NYS Agricultural District Maps for Monroe County, the proposed project is not located in or adjacent to an Agricultural District.

Federal Prime and Unique Farmland

The proposed project activities will not convert any prime or unique farmland, or farmland of state or local importance, as defined by the USDA Natural Resources Conservation Service, to a nonagricultural use, no further review is required.

4.4.15 Air Quality

An Air Quality Analysis is not necessary since the project will not increase traffic volumes, reduce source-receptor distances, or change other existing conditions to such a degree as to jeopardize attainment of the National Ambient Air Quality Standards.

During construction, air quality is most affected by the increase of airborne particulates (dust). This increase is sporadic and temporary in nature and would be most noticeable in the area immediately adjacent to construction. The impacts can be minimized by the use of dust control provisions found in the NYSDOT Standard Specifications for Construction.

4.4.16 Energy

The proposed project is classified as a categorical exclusion and will not require an energy analysis since, by definition, it will not significantly impact energy utilization.

4.4.17 Noise

The project will not significantly change either the horizontal or vertical alignment, or increase the number of through-traffic lanes. Therefore, this project is not a Type I project and does not require a traffic noise analysis as per 23 CFR 772.

4.4.18 Asbestos

An asbestos screening was conducted for the proposed project. The purpose of the screening was to identify suspect asbestos containing materials (ACM) that have the potential to be impacted by project construction. This screening included a review of available records. A copy of records reviewed in the section is available upon request.

Record Review

Sanitary and Storm Sewer: Record Drawings titled, 'Waring Rd. Asphaltic Concrete Pavement and Widening Reconstruction', dated May 26, 1949, Drawings Numbers 1, 2 and 3 were reviewed. The following information was obtained:

- From Culver Road to approximately Naples Street the storm and sanitary sewers are separate systems. The remaining portion of the project corridor is part of the East Side Trunk Sewer: combined sanitary and storm system.
- The existing 12-inch, 21-inch and 15-inch storm sewer pipe line is composed of vitrified tile and was installed in 1933.
- The existing 8-inch sanitary sewer is composed of vitrified tile and was installed in 1928.
- The existing combined sanitary and storm sewer is composed of vitrified tile and was installed in 1928.

Conclusion(s): Vitrified Tile is not a suspect asbestos containing material. No other suspect asbestos containing materials were identified.
Gas and Electric: A request for underground gas and/or electric maps for planning purposes were requested of Rochester Gas and Electric Corporation (RGE) by Clark Patterson Lee for the project corridor from Norton Street to Culver Road at 75 feet from the roadway centerline. In response, RGE provided Gas Map #'s 808 and 810 and Electric Map #'s 1845.01 and 1845.04.

- Gas Map #808, dated July 6, 2009: Gas mains exist on the west side of Waring Road. The size ranges between 8, 12 and 16 inches in diameter. All mains are composed of wrapped steel and have various installation dates beginning in 1957.
- Gas Map #810, dated January 2010: Gas main exists on the west side of Waring Road. The main is 16-inches in diameter and was installed in 1957.
- Electric Map #s 1845.01 and 1845.04 dated October 2011 were reviewed. There is underground electric along the project corridor. Materials associated with underground electric are not identified on the records.

Conclusion(s): Wrapped steel is a suspected asbestos containing material associated with gas mains. It is unknown from the information shown on the electric maps if there are suspect asbestos materials present underground. No other suspect asbestos containing materials were identified.

Water Main: The Water Main Evaluation Report of the project corridor conducted by the City of Rochester, Bureau of Water was reviewed. Table A entitled "Existing Water Main and Appurtenances" identifies the following information:

- The existing water main along the project corridor is an 8-inch main composed of cast iron. The main was constructed in years 1922, 1923, 1933 and 1934. The service laterals are composed of copper or galvanized steel.

Conclusion(s): Cast iron, galvanized steel and copper are not suspect asbestos containing materials. No other suspect asbestos containing materials were identified.

Asbestos Screening Conclusions and Recommendations

An asbestos screening was conducted for the proposed project. Available records were reviewed for suspect asbestos containing materials.

The existing gas main is composed of wrapped steel which is a suspect asbestos containing material. If this utility is to be impacted by the proposed project, it is the responsibility of RGE to test for the presence of asbestos and remove/dispose of materials according to State and Federal Regulations.

It is unknown if asbestos materials associated with the underground electric are present or if it will be impacted by project construction. If it is determined that the utility will be impacted, it is the responsibility of RGE to test for the presence of asbestos and remove/dispose of materials according to State and Federal Regulations.

Due to the nature of the proposed project, it is recommended that an Asbestos Assessment be conducted by NYSDOL certified inspectors in accordance with the requirements of Code Rule 56 and NYSDOT protocols

4.4.19 Hazardous Waste and Contaminated Materials

Introduction

A Hazardous Waste/Contaminated Materials (HW/CM) Screening was conducted for the project corridor. This screening included a review of available records and a project corridor site walkover conducted on December 1, 2011. The purpose of this screening is to identify potential areas of environmental concern that may be disturbed during construction of the proposed project.

Environmental Data Resources (EDR)

A review of local, State and Federal environmental databases was conducted. EDR inc. was contracted to provide a comprehensive review of Federal, State and local listed data on potential hazardous waste sites within the project vicinity. This data search was performed in accordance with ASTM E-1527-05 standards. The use of the EDR resource allows for a comprehensive listing of sites of potential concern. The following table summarizes the information available through the EDR report and the subsequent findings of this search.

Table 3-1: Environmental Records Review

STANDARD Environmental Record Sources	Minimum Search Distance: ASTM Standard-Miles	No. of Listed Properties[1] (summarized from the EDR Report)
Federal NPL Site List	1.0	0
Federal Delisted NPL Site List	1.0	0
Federal CERCLIS List	0.5	0
Federal CERCLIS NFRAP Site List	0.5	0
Federal RCRA CORRACTS Facilities List	1.0	1
Federal RCRA non-CORRACTS TSD Facilities List	0.5	1
Federal RCRA Generators List	0.25	0
Federal Institutional Control/ Engineering Control Registries	0.5	0
Federal ERNS List	TP	0
State and Tribal Hazardous Waste Sites – equivalent NPL	1.0	0
State and Tribal Hazardous Waste Sites – equivalent CERCLIS	1.0	0

Table 3-1: Environmental Records Review

STANDARD Environmental Record Sources	Minimum Search Distance: ASTM Standard-Miles	No. of Listed Properties[1] (summarized from the EDR Report)
State and Tribal Landfill and/or Solid Waste Disposal Site Lists	0.5	0
State and Tribal Leaking Storage Tank Lists	0.5	12
State and Tribal Historic Leaking Storage Tank Lists	0.5	13
State and Tribal Registered Storage Tank Lists	0.25	5
State and Tribal Institutional Control/Engineering Control Registries	Site only	0
State and Tribal Voluntary Cleanup Sites	0.5	0
State and Tribal Brownfield Sites	0.5	0
Additional Environmental Records		
Local Brownfield lists-US Brownfields	0.5	1
Local Lists of Registered Storage Tanks-HIST UST	0.250	4
Records of Emergency Release Reports		
NY Spills	0.125	8
NY Historic Spills	0.125	7
Other Ascertainable Records		
RCRA-Non Gen	0.250	3
MANIFEST	0.250	4
DRYCLEANERS	0.250	1

[1] Sites may be listed in more than one database.

EDR Findings Overview

Twenty-six (26) properties were indentified in the EDR report within a one mile radius of the project corridor. In most cases, the majority of sites can be eliminated from further review due to one or more of the follow:

- Project components are minor and it is likely that contamination will not be present
- Distance of the site in relation to the project corridor
- The direction of groundwater flow
- The contaminant of concern is non-persistent or a gas. An example is a release of chlorine gas inadvertently released in the past and contamination has been diluted
- The issue/spill was minor in nature and cleaned up immediately. An example is antifreeze from a car accident
- The site is in the EDR report due to legal disposal records where no violation was reported.

The following properties indicated in the EDR report are either along or within close proximity to the project corridor and therefore were thoroughly reviewed. The following table contains information relating to the sites and an environmental concern determination.

EDR ID #	Site Name	Address	Spill #	Spill Date	Spill Close Date	Environmental Concern: Y/N
A1	Norton Recreation Center	300 Waring Road	9513938	10/12/95	11/12/96	N
A2	RGE	338 Waring Road	0206289	9/17/02	9/20/02	N
3	Culver/Waring	Culver/Waring intersection	8702825	7/9/87	7/09/87	N
B4	Sisters of Mercy Baptist Church	1937 Norton Street	9200913	4/21/92	10/27/92	N
B5	City of Rochester	1937 Norton Street	9407916	9/13/94	9/13/94	N
6	City of Rochester	38 Cooper Street	9503499	6/20/95	6/20/95	N
7	Waring Car Wash	50 Masters Street	9416251	3/15/95	5/30/95	N

EDR Conclusion

Twenty-six (26) sites were identified within the EDR report within a one mile radius of the project corridor. Seven (7) sites identified within the EDR report exist either along or within close proximity to the project corridor. After further review of those sites it has been determined that none of the sites pose an environmental concern to the proposed project.

Aerial Photography Review

Aerial photos of the project location were reviewed from the following years: 2008, 2006, 1994, 1985, 1980, 1971, 1966, and 1958. No items of environmental concern were identified with regards to the proposed project.

Historical Sanborn Map Review

Sanborn Maps are utilized as part of the HW/CM Screening since they serve as an historical reference to prior land use. Sanborn maps from 1971 and 1950 were reviewed.

A review of the 1971 Sanborn Map revealed that a gas station occupied the northwest corner of the Waring Road Plaza parking lot adjacent to and east of Waring Road. Currently, this location is paved over and serves as parking for the Family Dollar Store. Refer to the section titled HW/CM Screening Conclusions/Recommendations for further discussion.

EDR City Directory Review

EDR was contracted to develop a City Directory Abstract of the project corridor. The City Directory is a useful tool for identifying past land use. The City Directory was developed by EDR utilizing the Polk's Directory by R.L. Polk Co. Publishers to identify businesses along the project corridor between the years 1940 and 1992.

The City Directory Abstract was reviewed. The following sites on Waring Road were identified with regards to Hazardous Waste and Contaminated Materials.

Address	Year	Uses
286 Waring Road	1970	Speedys Dry Cleaners
	1965	Morgan Dry Cleaners
	1960	Morgan Dry Cleaners
	1955	Morgan Dry Cleaners
	1975	Waring Plaza Service Gas Station

Address	Year	Uses
328 Waring Road	1970	Waring Road Service Gas Station
	1965	Wightmans Service Gas Station
	1960	Norton Village Playground Gas Station Arts Friendly Service
	1955	Arts Friendly Service Gas Station

Refer to the section titled HW/CM Screening Conclusions/Recommendations for further discussion.

Historical Plat Map Review

Plat Maps are utilized as part of the HW/CM Screening since they serve as an historical reference to prior land use. Available Plat Maps of the project corridor were reviewed.

- Volume Four Plat Book of the City of Rochester, compiled under the direction of and published by G. M. Hopkins Co. Publishers, Copyrighted 1936, Plate 12 and Plate 6 were reviewed. No items of environmental concern were identified.
- Volume Four Plat Book of the City of Rochester, compiled under the direction of and published by G. M. Hopkins Co. Publishers, Copyrighted 1926, Plate 27 was reviewed. No items of environmental concern were identified.

NYSDEC Spill Incidents Database

The NYSDEC Spill Incidents Database (online) was searched for potential spills on Waring Road. From January 2003 to April 2012, no spills were identified.

Project Site Walkover

The HW/CM Screening included a walkover of the project corridor, conducted on December 1, 2011. No items of environmental concern were identified.

HW/CM Screening Conclusions/Recommendations

Available records were reviewed and a site visit was conducted to screen for the potential of hazardous waste and/or contaminated materials within the project corridor that may be disturbed by project construction. The following sites present a potential for concern:

286 Waring Road

It was identified from the City Directory review that a dry cleaner existed at 286 Waring Road (within Waring Road Plaza) between the years 1955 and 1970. As a result of the past land use at this location, there is the potential for contamination to be encountered during project construction. It is recommended that this location be identified on design plans and a specification be added to the contract documents for the screening, segregating, sampling and potential disposal of dry cleaner related soil contaminants (solvents).

328 Waring Road

It was identified from the City Directory Review that a gas station existed at 328 Waring Road between the years 1955 and 1975. This finding is consistent with the Sanborn Map review which identified a gas station at this location. As shown on the 1971 Sanborn Map, the former 328 Waring Road was located at the northwest corner of the Waring Road Plaza, adjacent to the roadway. Currently, this location is paved over and serves as parking for the Family Dollar Store.

It is unknown if the underground storage tank(s) were removed as a result of the closing of the gas station. If the tank(s) were abandoned in place, adjacent soil may be contaminated. Since the gas station was in close proximity to the highway right-of-way, contamination may be encountered during construction. It is recommended that this location be identified on design plans and a specification be added to the contract documents for the screening, segregating, sampling and potential disposal of petroleum contaminated soil.

Overall Conclusion

As with any environmental assessment in areas where subsurface testing was not completed, the possibility of unknown subsurface contamination exists. Should suspect materials be encountered during the course of project execution, appropriate measures should be taken to report such contamination, determine the nature and extent of any possible hazardous materials, and for proper management of such materials. Provisions will be included within the construction documents that will require the contractor to properly dispose of any contaminated materials during construction.

4.5 Construction Effects

Construction Impacts

Alternative 1 would have no impact as it is the no-build alternative.

Alternative 2 will have a limited impact. It will remain on the same alignment but will improve the infrastructure for both vehicles and pedestrians. This alternative includes the implementation of green space which will enhance the aesthetics of the project corridor. There are no long term negative impacts expected as a result of this alternative.

Alternatives 3 and 4 will have a limited impact. The social impact will be positive with the improvement of sidewalks and addition of bike lanes that will benefit pedestrians and bicyclists. Similar to alternative 2, this alternative includes the implementation of green space which will enhance the aesthetics of the project corridor. There are no long term negative impacts expected as a result of this alternative.

Mitigation Measures

The construction of the build alternative(s) would involve conventional construction methods and products. Therefore, the consequences are well known and can be mitigated using conventional methods. During construction, a temporary increase in heavy vehicle traffic within the project area would result due to the presence of heavy construction equipment and other construction related vehicles. The impacts of the construction would be temporary in nature.

4.6 Indirect and Secondary Effects

Indirect Socioeconomic Effects

The proposed project has the potential to indirectly affect social conditions by improving conditions for vehicles, pedestrians and bicyclists.

Social Consequences

Alternative 3 would have a positive social consequence on bicyclist and pedestrian movement as a result of the implementation of bike lanes and the improvement of sidewalks along the entire corridor. This alternative will improve the flow of traffic in front of the shopping plaza by the implementation of a turn lane.

Economic Consequences

It is not anticipated that there will be long term economic consequences as a result of this project. The resulting improvement of vehicular and pedestrian circulation in the front of the plaza has the potential to positively impact businesses.

4.7 Anticipated Environmental Permits/Certifications, Detailed Studies and Agency Coordination

- Notice of Intent (NOI) for coverage under NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from General Construction Activity (Permit No. GP-0-10-001)
- Development of a Storm Water Pollution Prevention Plan (SWPPP)
- Asbestos Assessment

APPENDIX A – MAPS, PLANS, PROFILES & TYPICAL SECTIONS

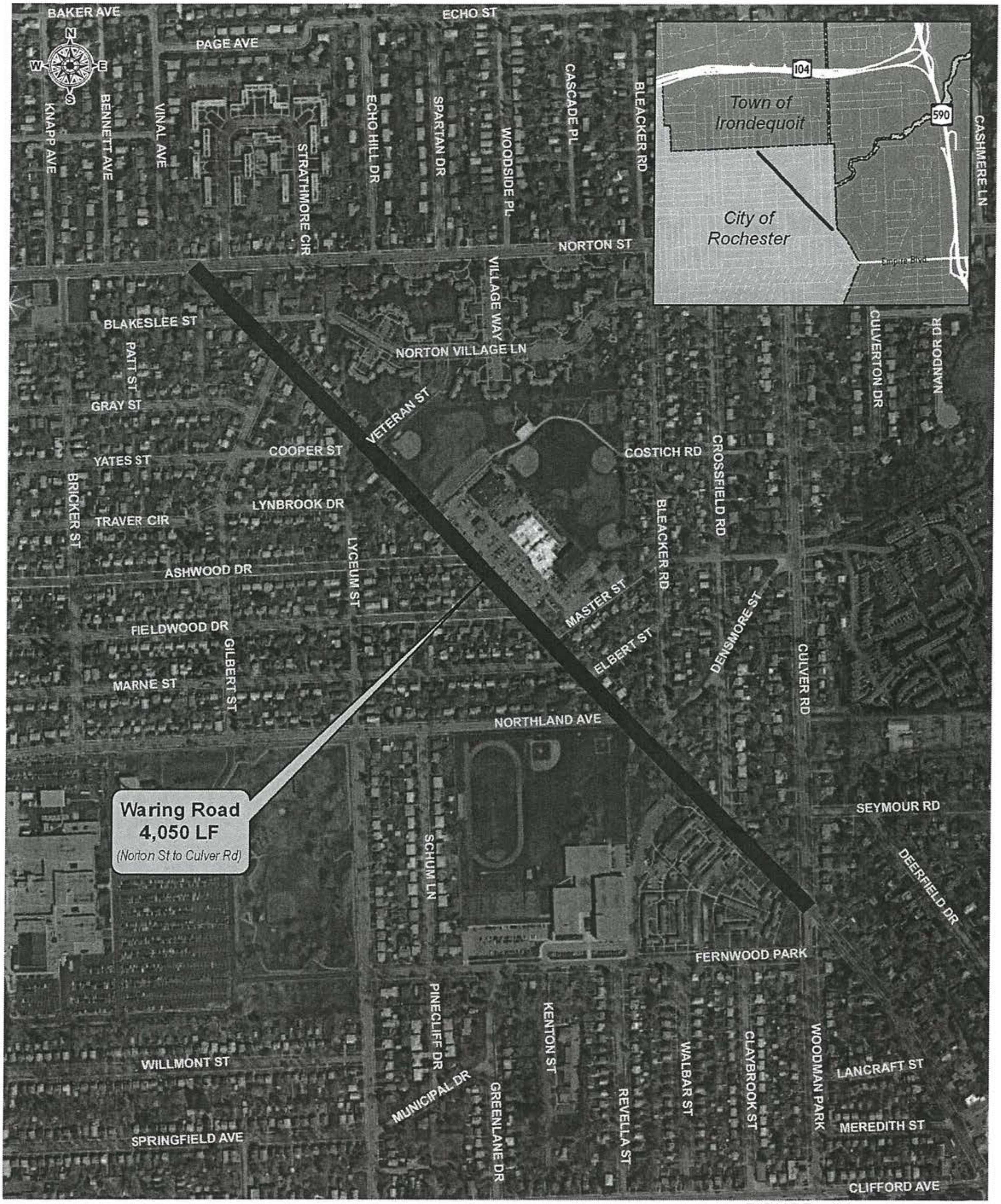
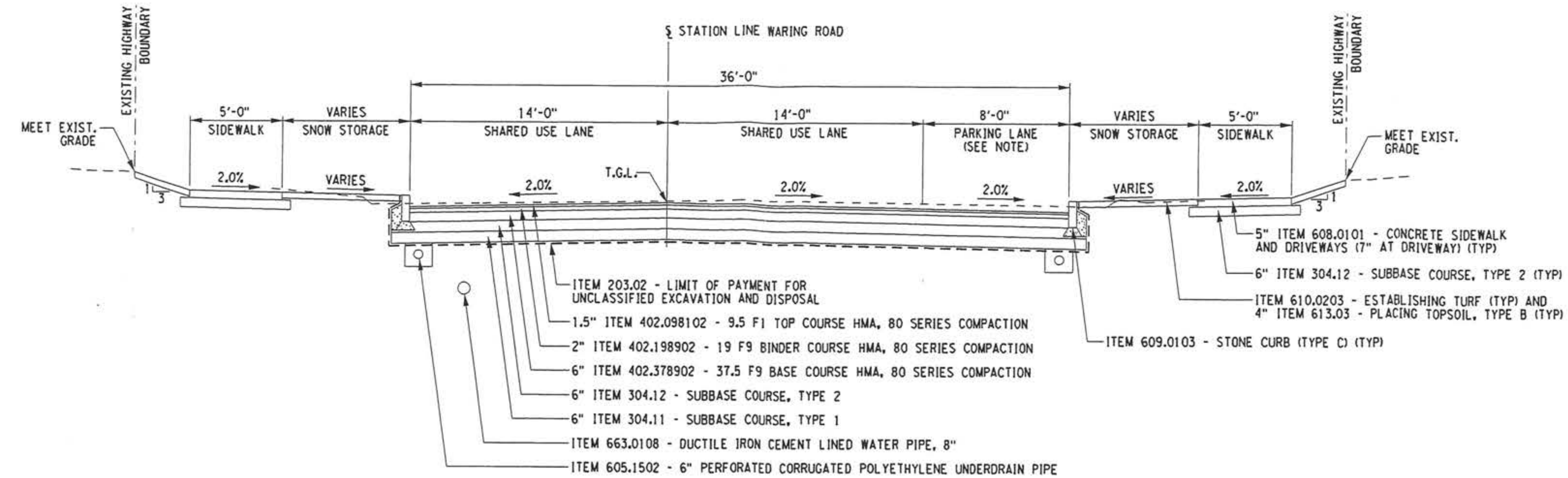


FIGURE #1

Clark Patterson Lee DESIGN PROFESSIONALS 186 NORTH WATER STREET ROCHESTER, NEW YORK 14604 (585)454-7600 www.clarkpatterson.com	DATE: 11/16/11 DRAWN: JWS CHECKED: DBA SCALE: 1"=800' PROJ. #:12233.00	LOCATION MAP WARING ROAD IMPROVEMENT PROJECT CITY OF ROCHESTER, MONROE COUNTY, NEW YORK

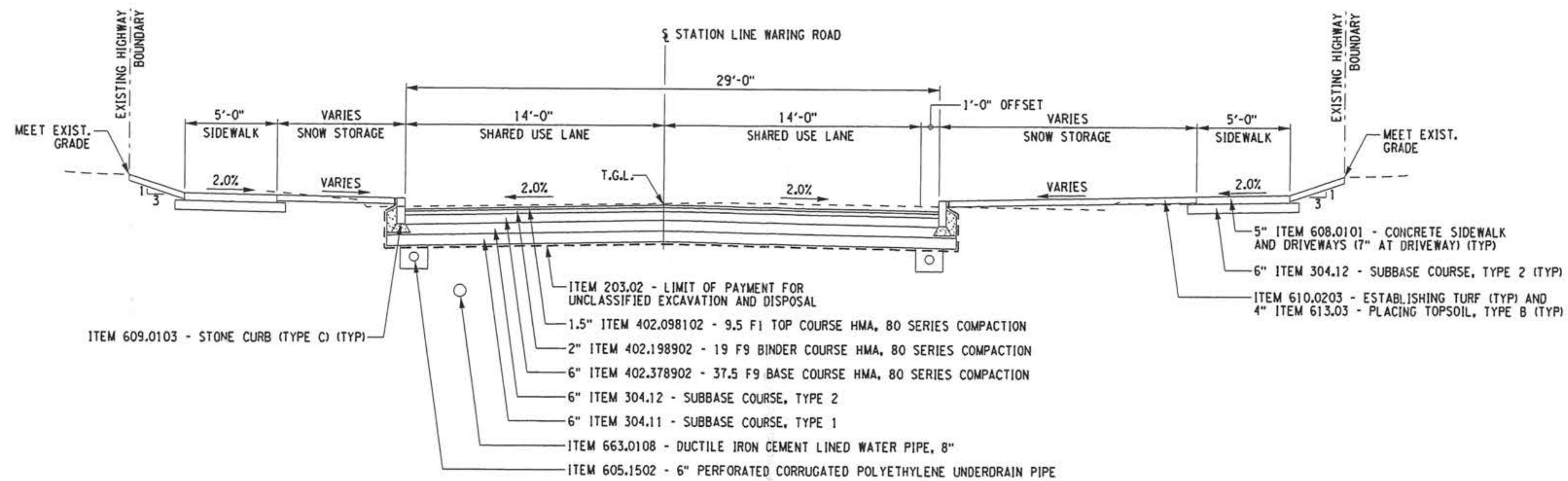


ROADWAY TYPICAL SECTION

STA. 0+65 TO STA. 1+84
STA. 4+18 TO STA. 4+56
STA. 5+70 TO STA. 9+45
STA. 10+40 TO STA. 24+91
STA. 25+77 TO STA. 27+23
STA. 30+87 TO STA. 39+50

NOTE:

SEE ROADWAY PLANS FOR LOCATIONS OF PARKING LANES.



ROADWAY TYPICAL SECTION

STA. 1+84 TO STA. 4+18
STA. 4+56 TO STA. 5+70
STA. 9+45 TO STA. 10+40
STA. 24+91 TO STA. 25+77
STA. 27+23 TO STA. 30+87

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FAX (585) 232-5836
www.clarkpatterson.com

REVISIONS

NO.	DATE	DESCRIPTION	REV.	CH'D.

Project Name:

WARING ROAD IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES

Drawing Title:

ALTERNATE 2

TYPICAL SECTIONS

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	MAY 2012
Scale:	1/8" = 1'-0"
Drawing No.: TS-01	Sheet No.: X

Date

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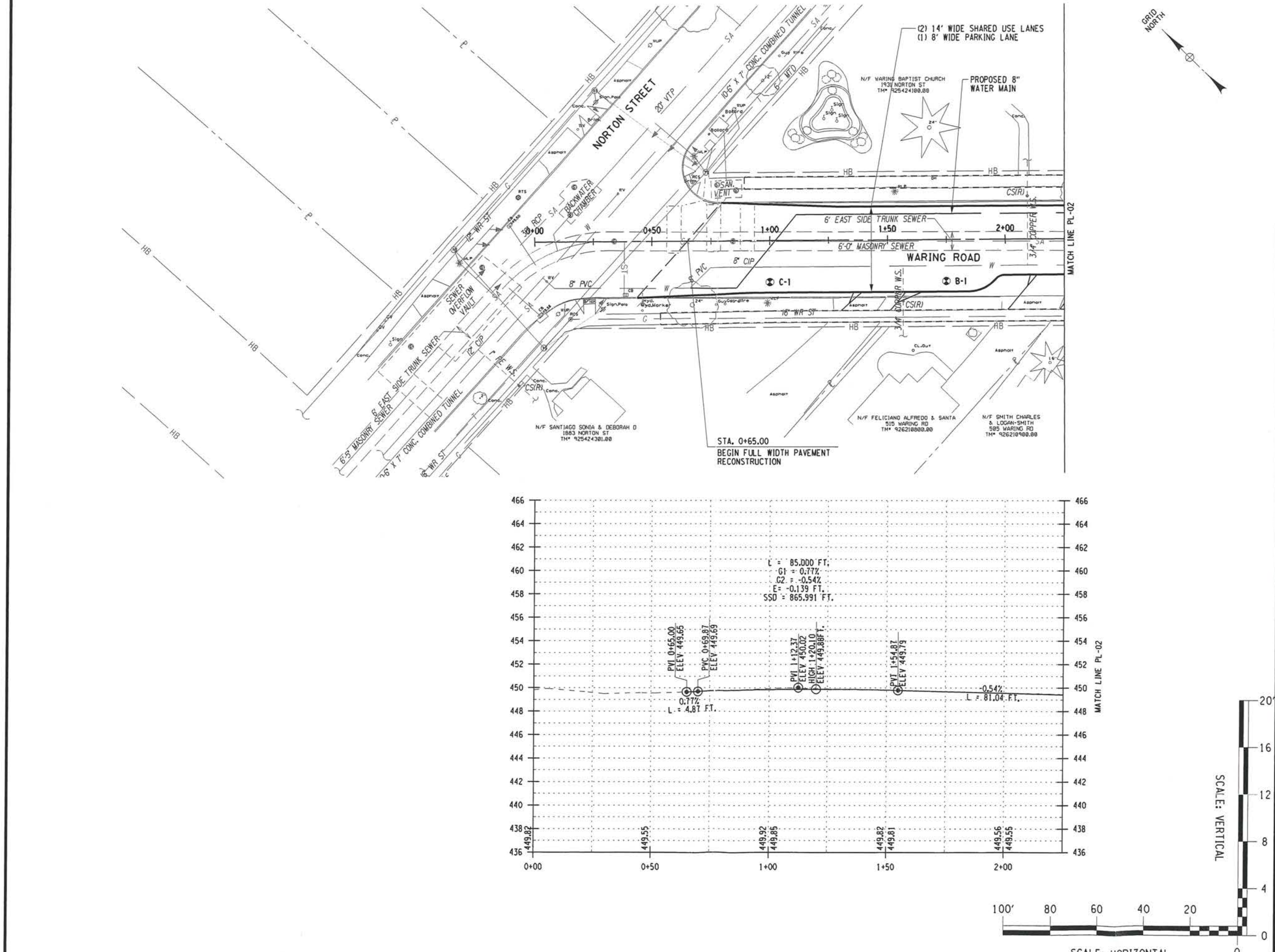

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REVISIONS

NO.	DATE	DESCRIPTION	REV.	CH'D.

Project Name:

WARING ROAD IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES

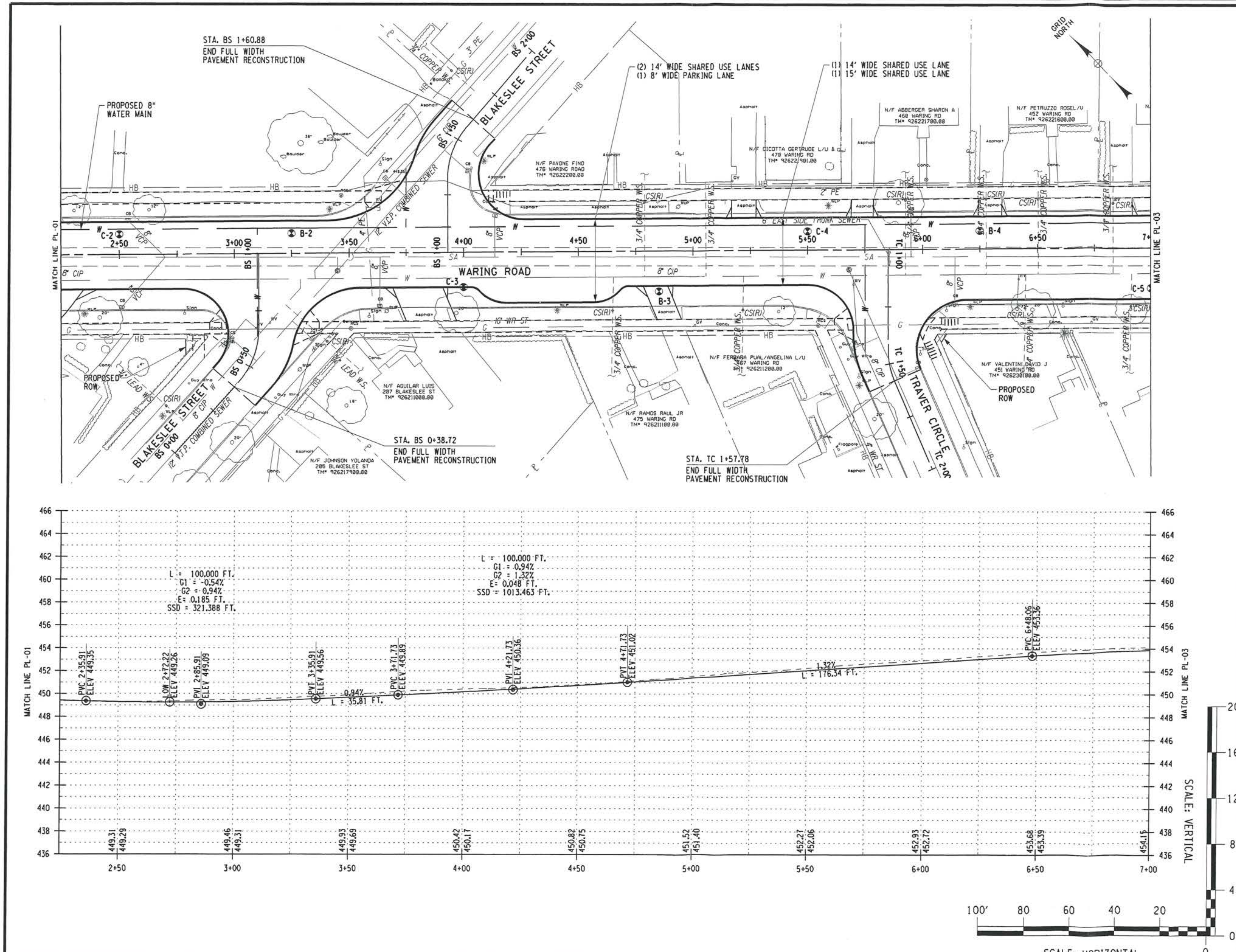
Drawing Title:

ALTERNATE 2

ROADWAY PLAN AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	MAY 2012
Scale:	AS SHOWN
Drawing No: PL-01	Sheet No: X

Date



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REVISIONS

NO.	DATE	DESCRIPTION	REV.	CH'D.

Project Name:

WARING ROAD
IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF
ENVIRONMENTAL SERVICES

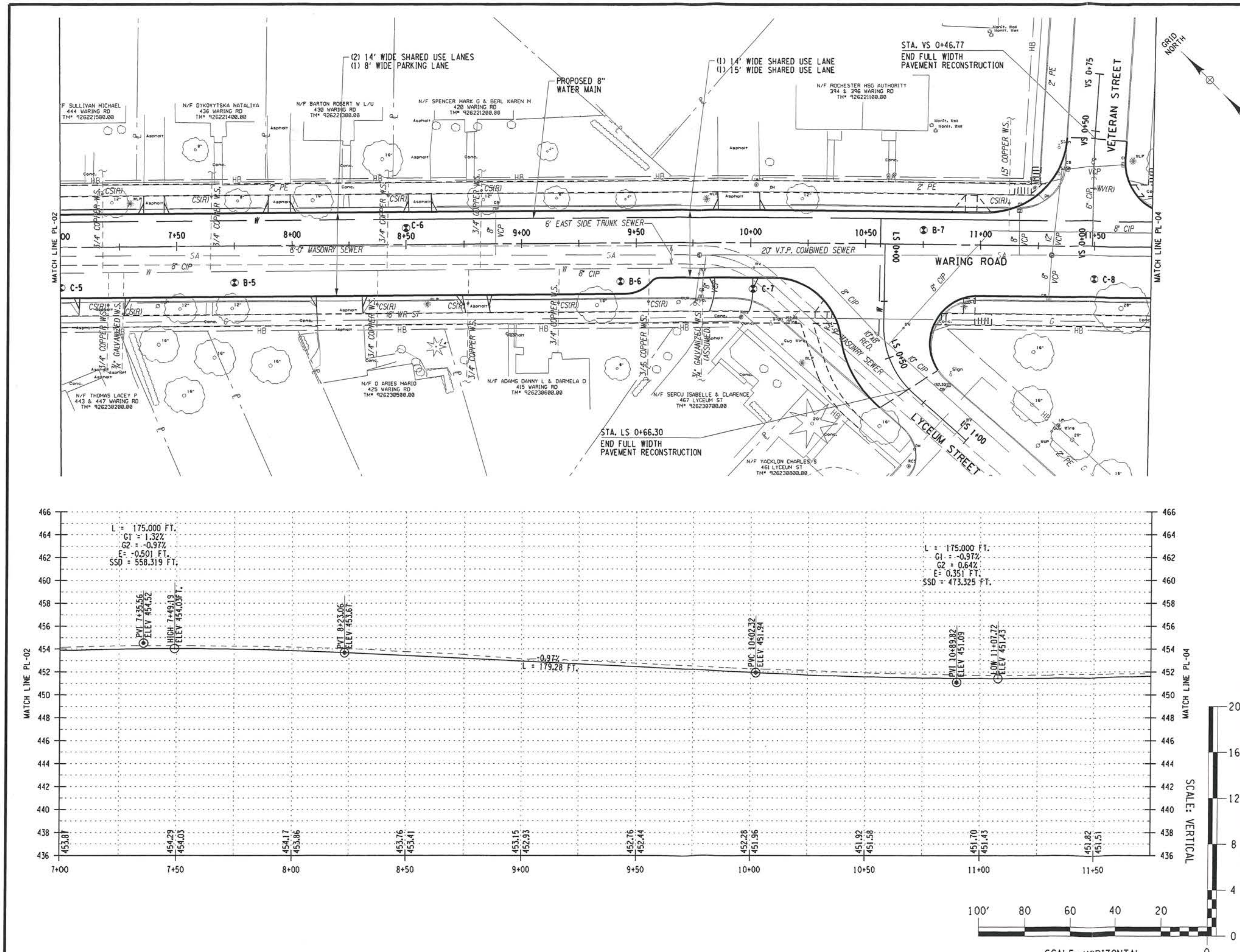
Drawing Title:

ALTERNATE 2

ROADWAY PLAN
AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	MAY 2012
Scale:	AS SHOWN
Drawing No.: PL-02	Sheet No.: X

Date



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REVISIONS

NO.	DATE	DESCRIPTION	REV.	CH'D.

Project Name:

WARING ROAD IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES

Drawing Title:

ALTERNATE 2
ROADWAY PLAN AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	MAY 2012
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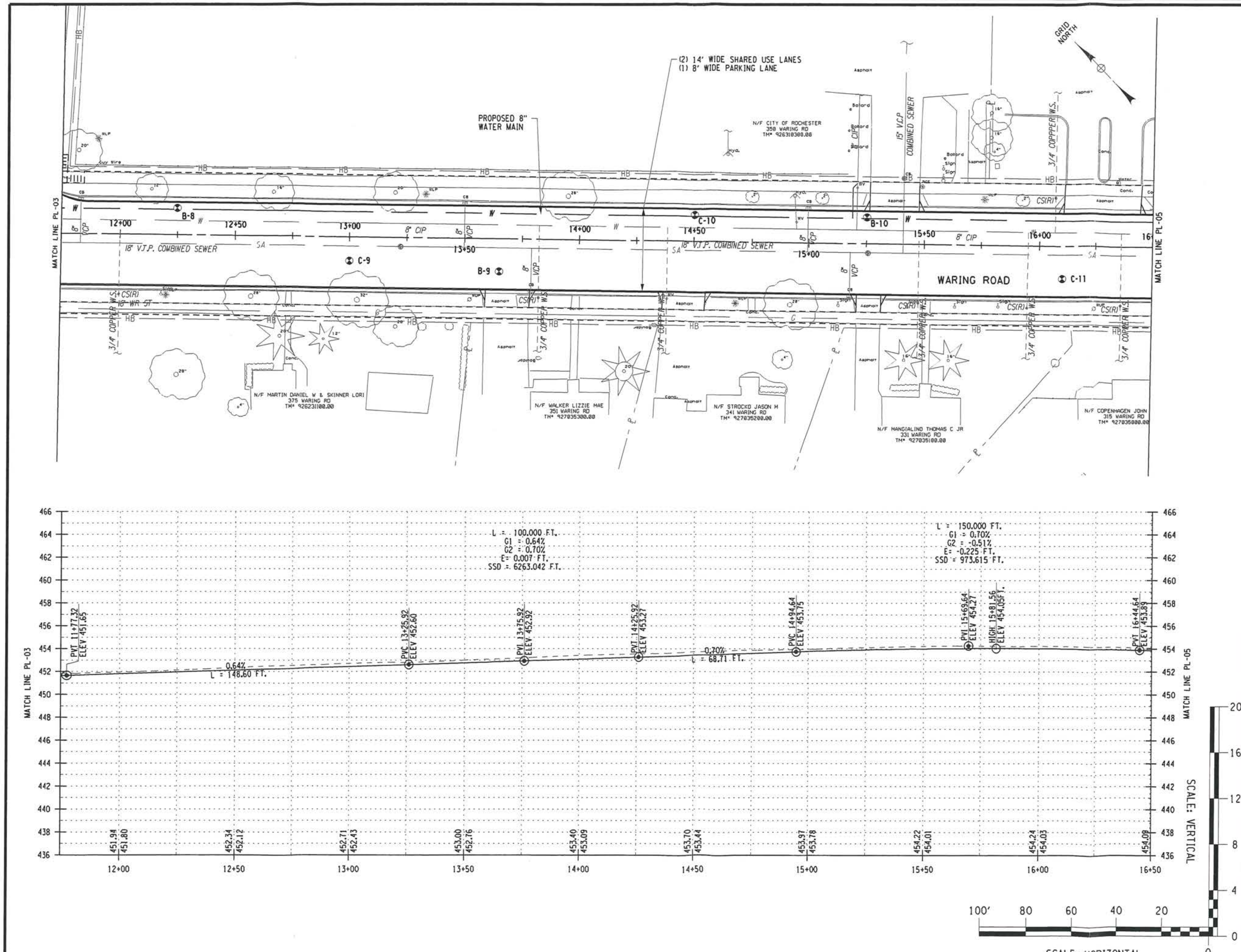
Drawing No: PL-03	Sheet No: X

Date



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NO.	DATE	DESCRIPTION	REV.	CH'D.

Project Name:

WARING ROAD IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES

Drawing Title:

ALTERNATE 2
ROADWAY PLAN AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	MAY 2012
Scale:	AS SHOWN
Drawing No: PL-04	Sheet No: X

Date

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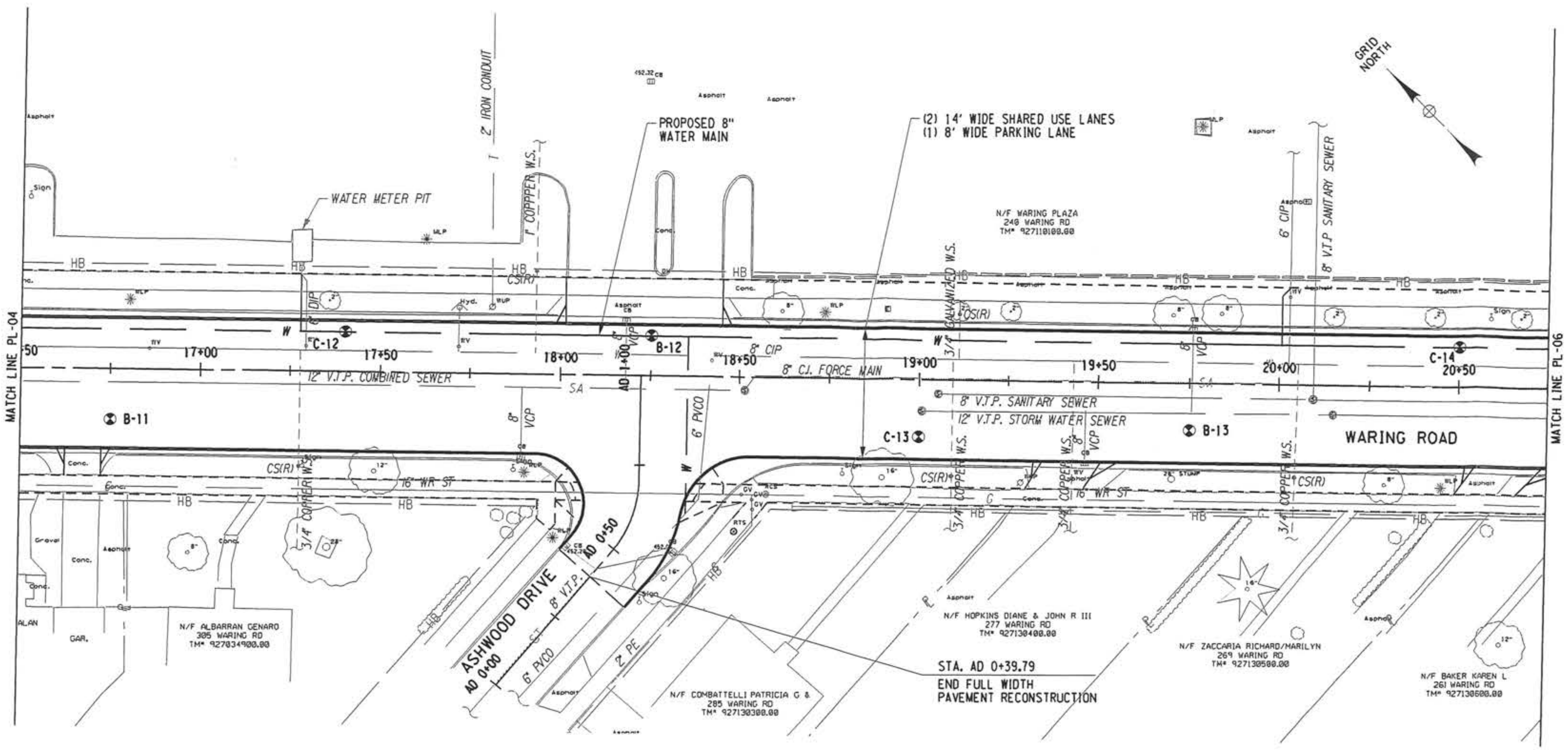
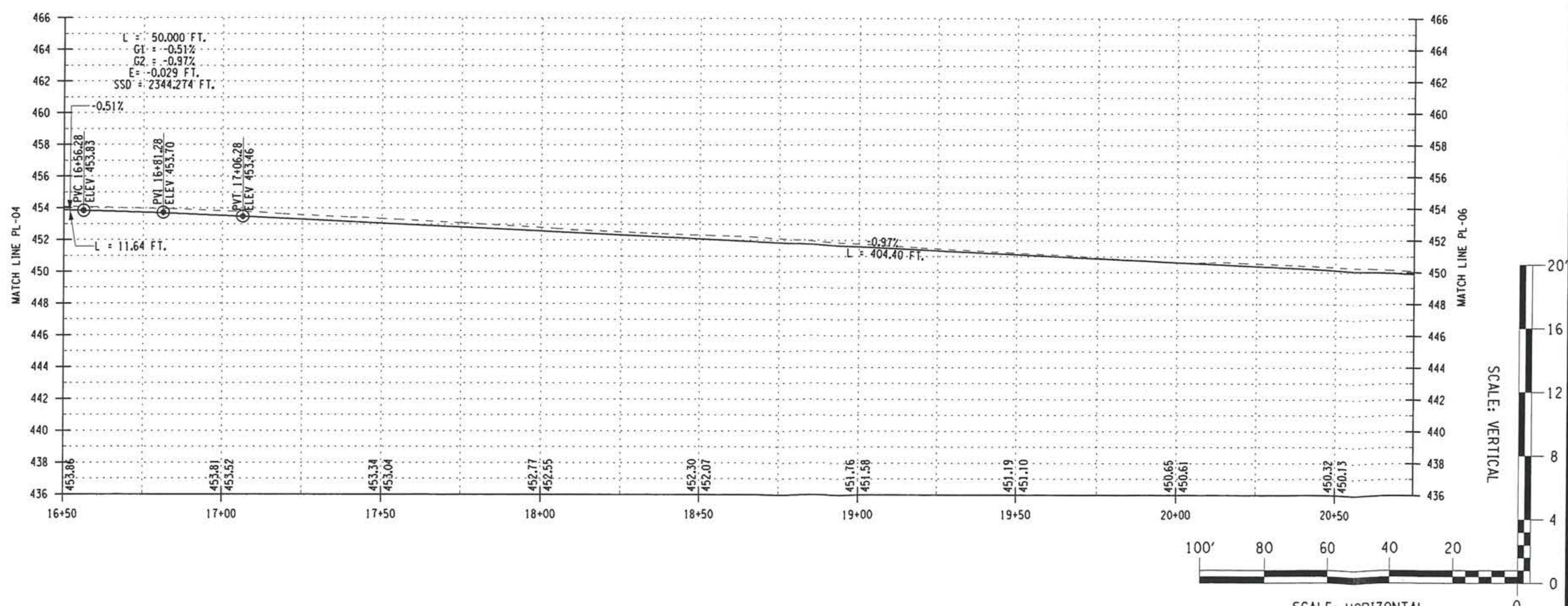




REVISIONS

NO.	DATE	DESCRIPTION	REV.	CH'D.

Project Name:

WARING ROAD IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES

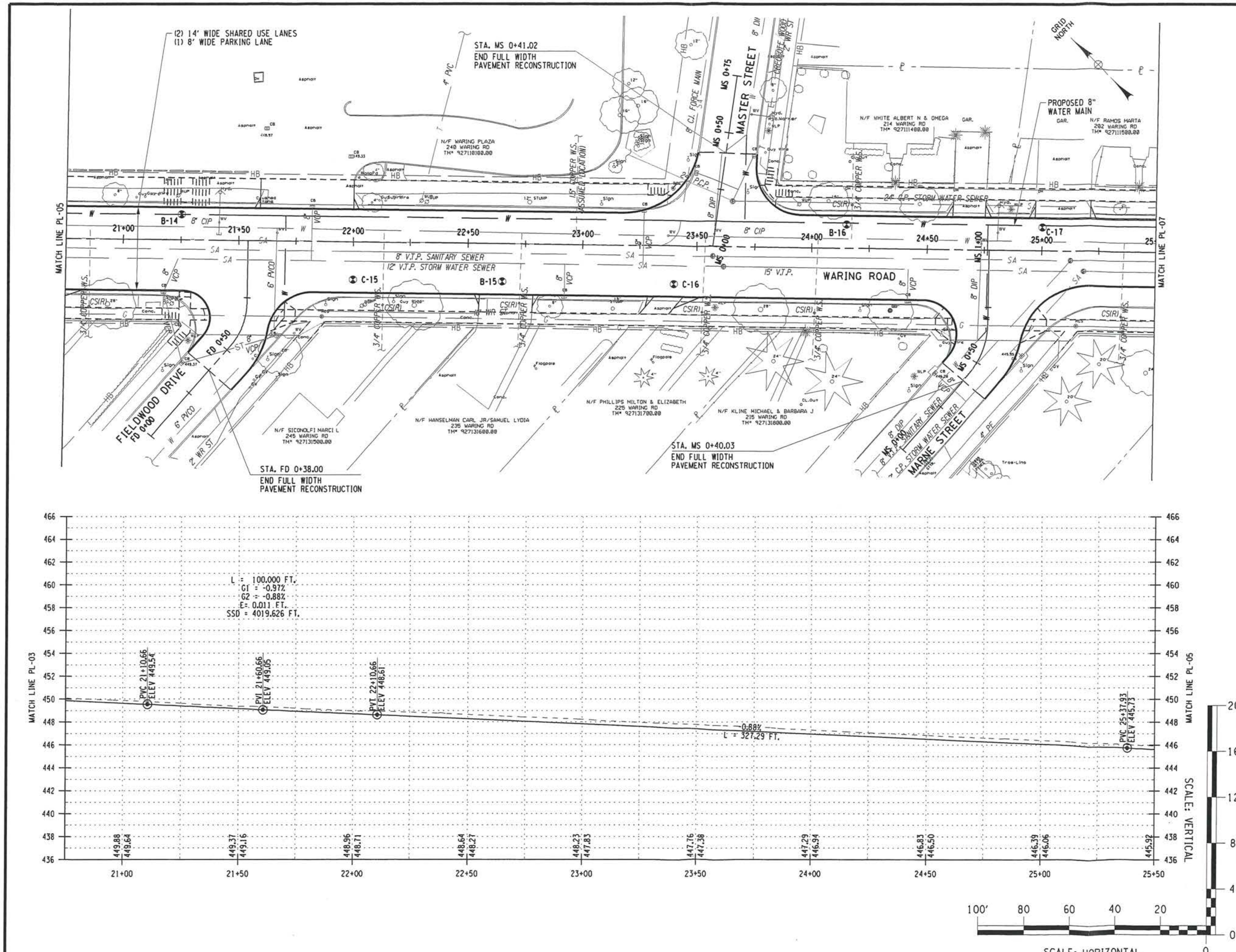
Drawing Title:

ALTERNATE 2

ROADWAY PLAN AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	MAY 2012
Scale:	AS SHOWN
Drawing No:	PL-05
Sheet No:	X

Date



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NO.	DATE	DESCRIPTION	REV.	CH'D.

Project Name:

WARING ROAD
IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF
ENVIRONMENTAL SERVICES

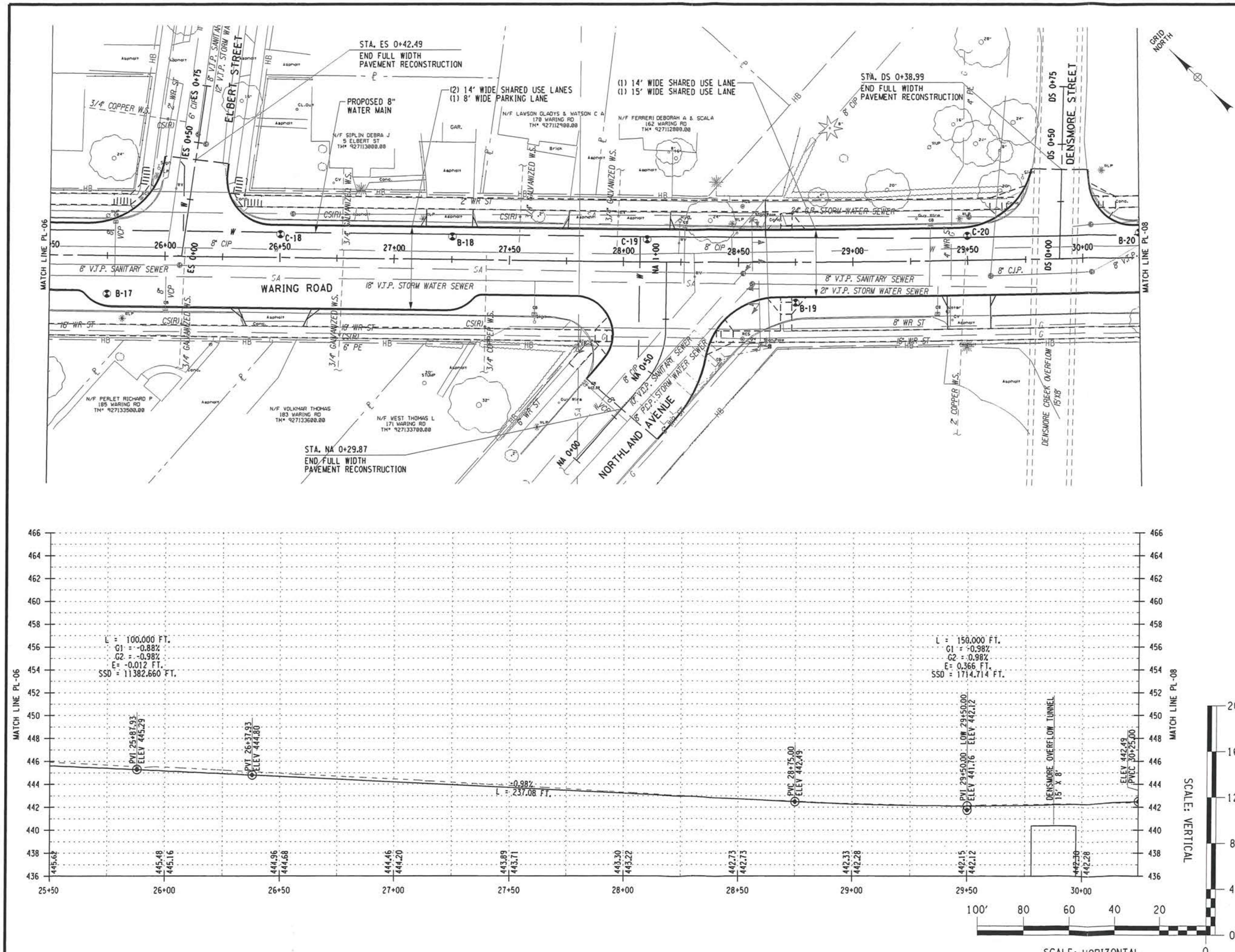
Drawing Title:

ALTERNATE 2

ROADWAY PLAN
AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	MAY 2012
Scale:	AS SHOWN
Drawing No.: PL-06	Sheet No.: X

Date



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Project Name:

WARING ROAD
IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF
ENVIRONMENTAL SERVICES

Drawing Title:

ALTERNATE 2
ROADWAY PLAN
AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	MAY 2012
Scale:	AS SHOWN
Drawing No.: PL-07	Sheet No.: X

Date

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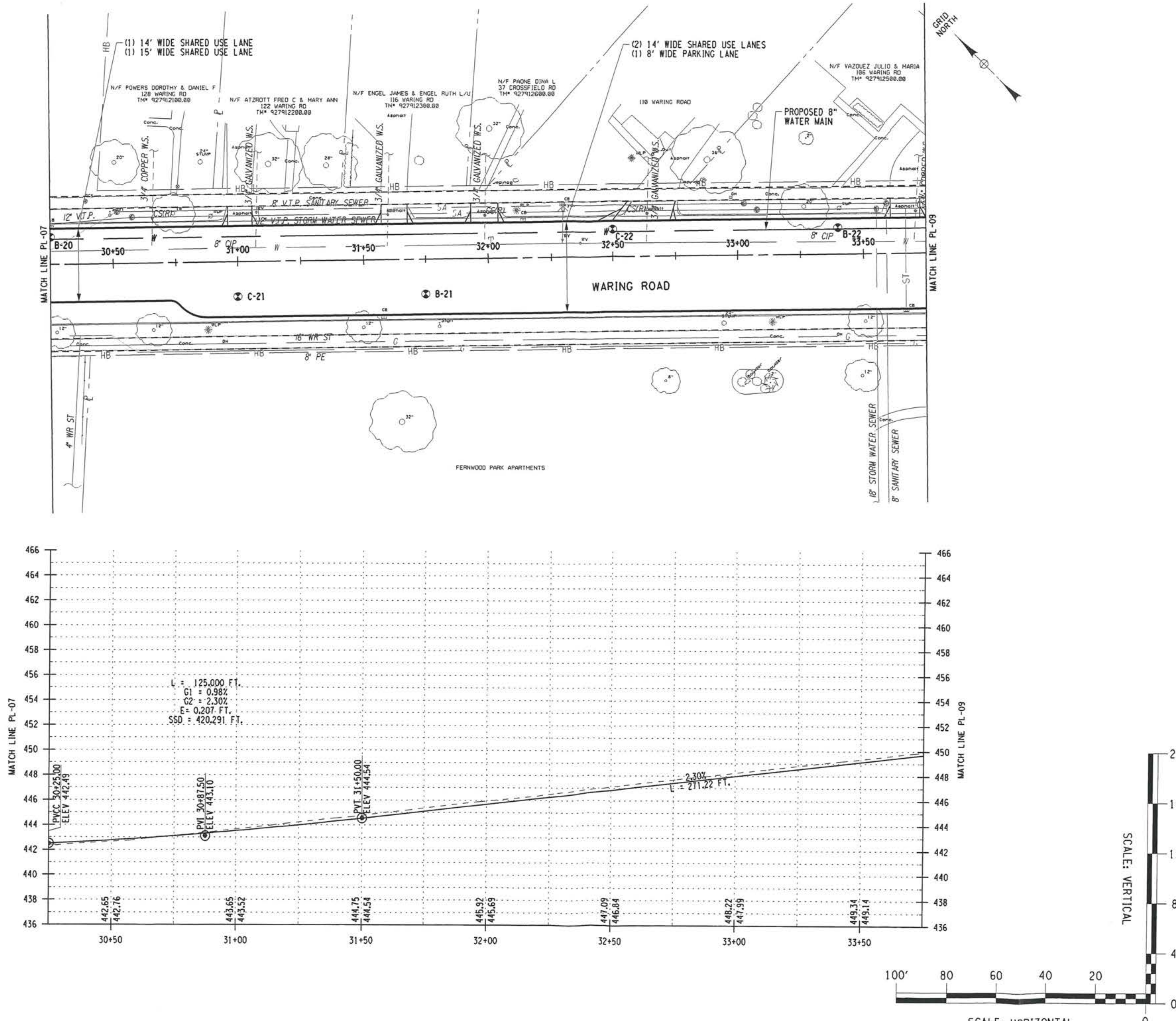

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Drawing Title:

ALTERNATE 2

ROADWAY PLAN
AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	MAY 2012
Scale:	AS SHOWN
Drawing No.: PL-08	Sheet No.: X

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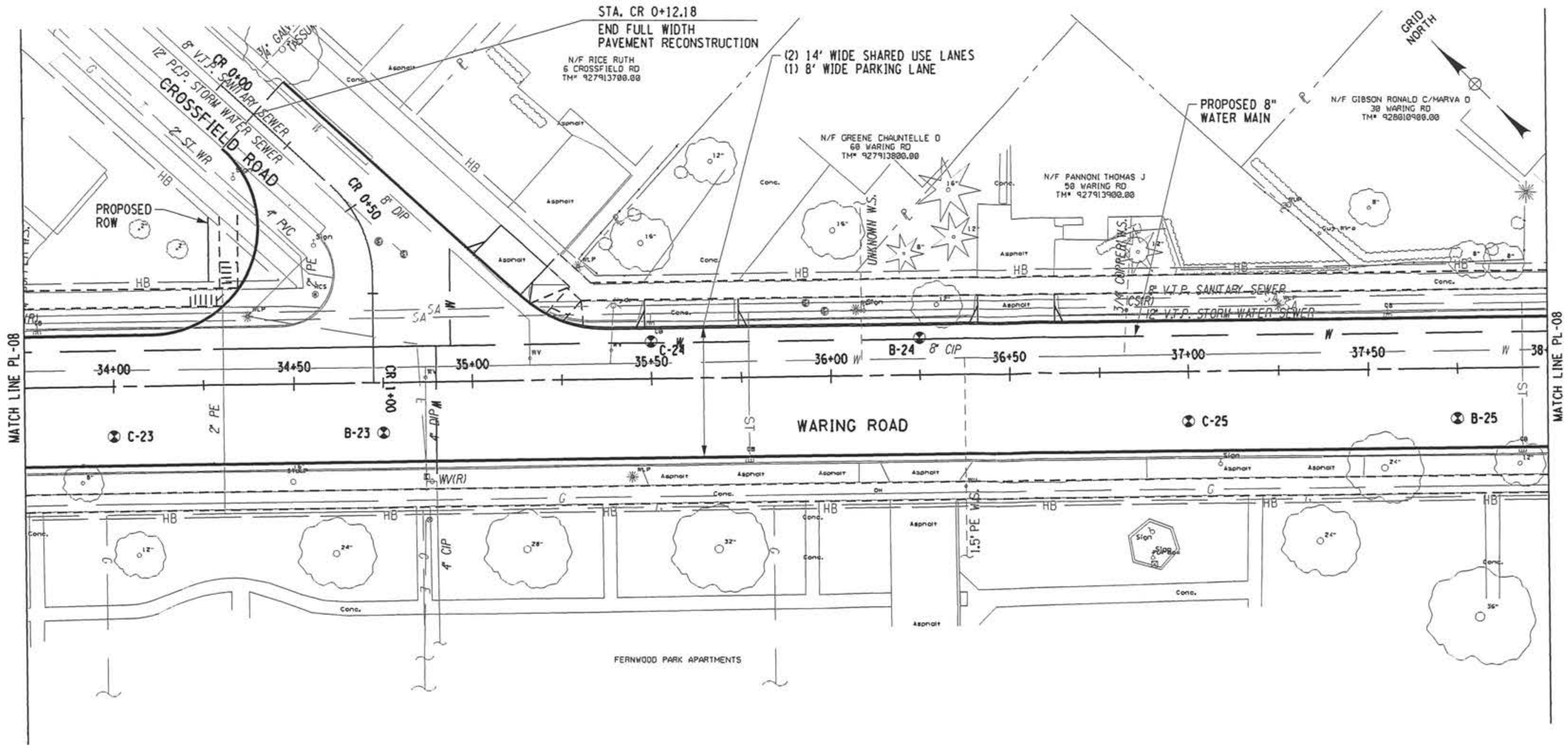

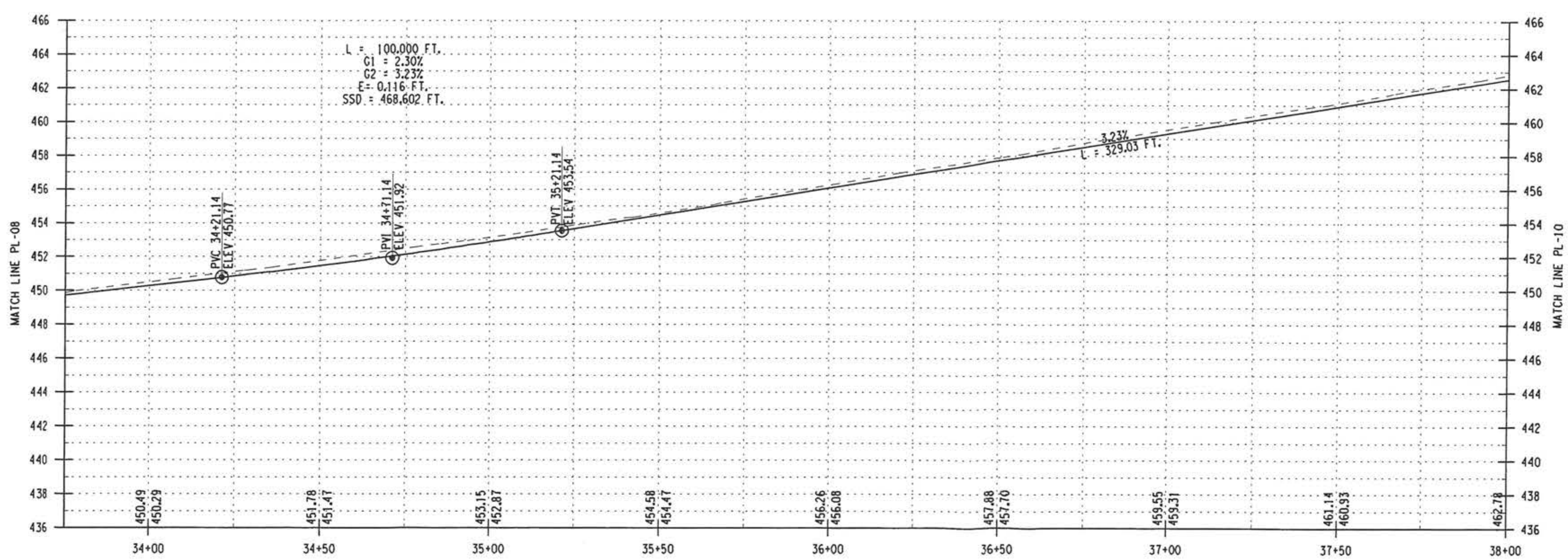

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Project Name:

WARING ROAD IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES

Drawing Title:

ALTERNATE 2
ROADWAY PLAN AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	MAY 2012
Scale:	AS SHOWN
Drawing No.: PL-09	Sheet No.: X

Date

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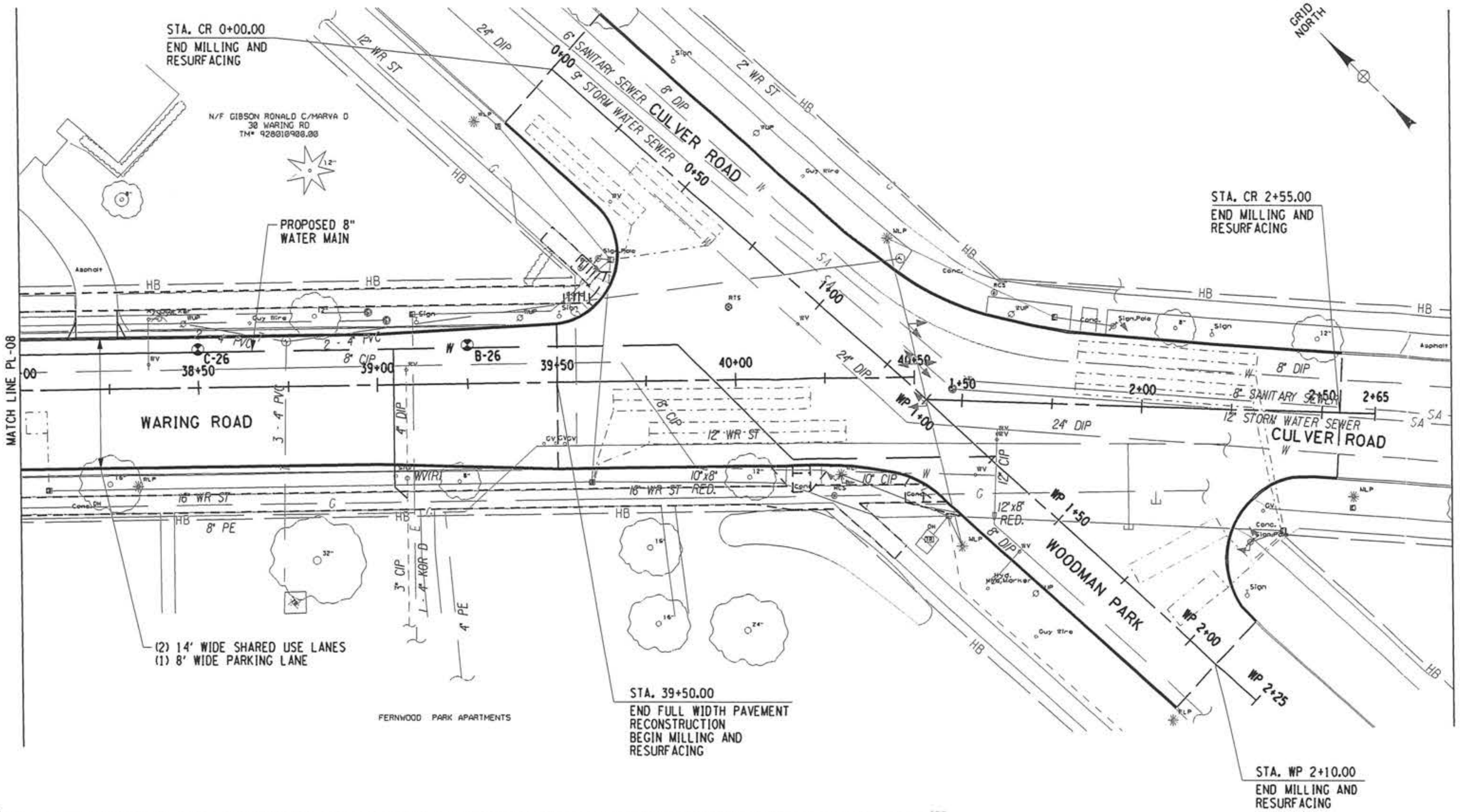
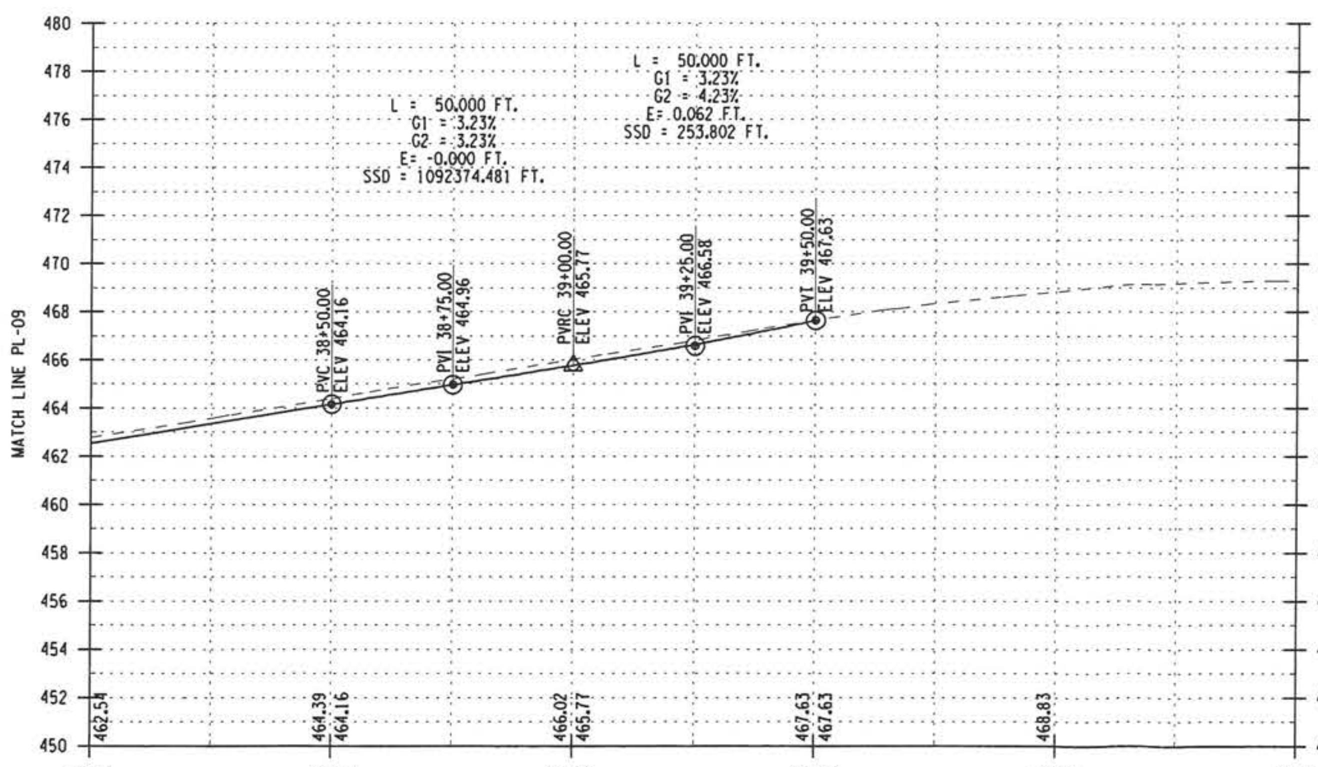




SCALE: VERTICAL
SCALE: HORIZONTAL

REVISIONS

NO.	DATE	DESCRIPTION	REV.	CH'D.

Project Name:

WARING ROAD IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES

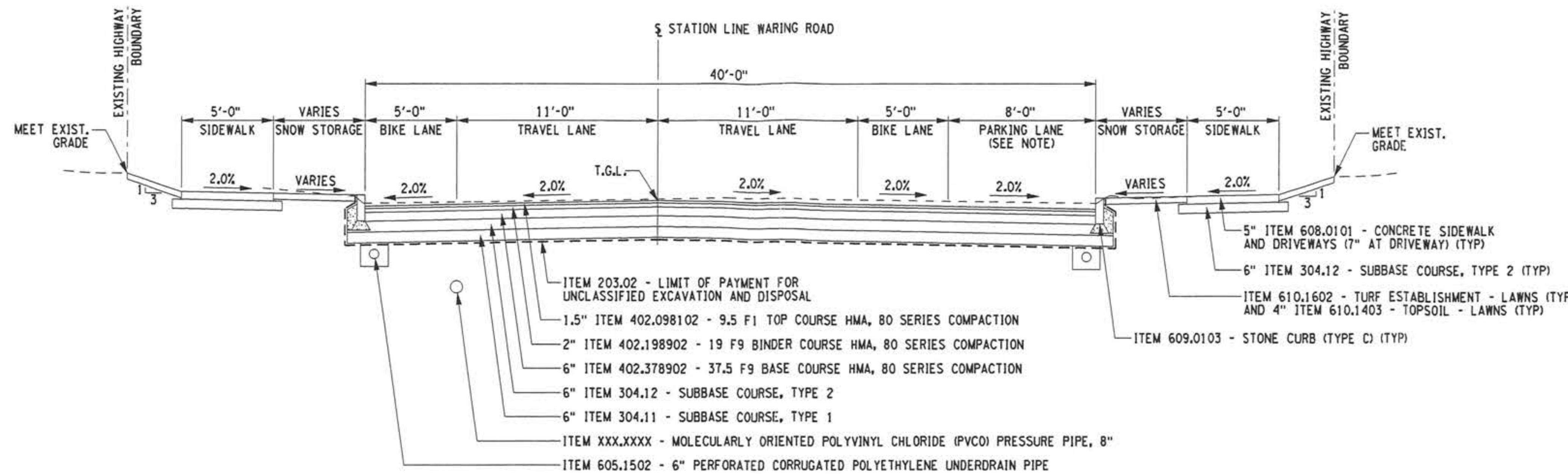
Drawing Title:

ALTERNATE 2

ROADWAY PLAN AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	MAY 2012
Scale:	AS SHOWN
Drawing No.: PL-10	Sheet No.: X

Date

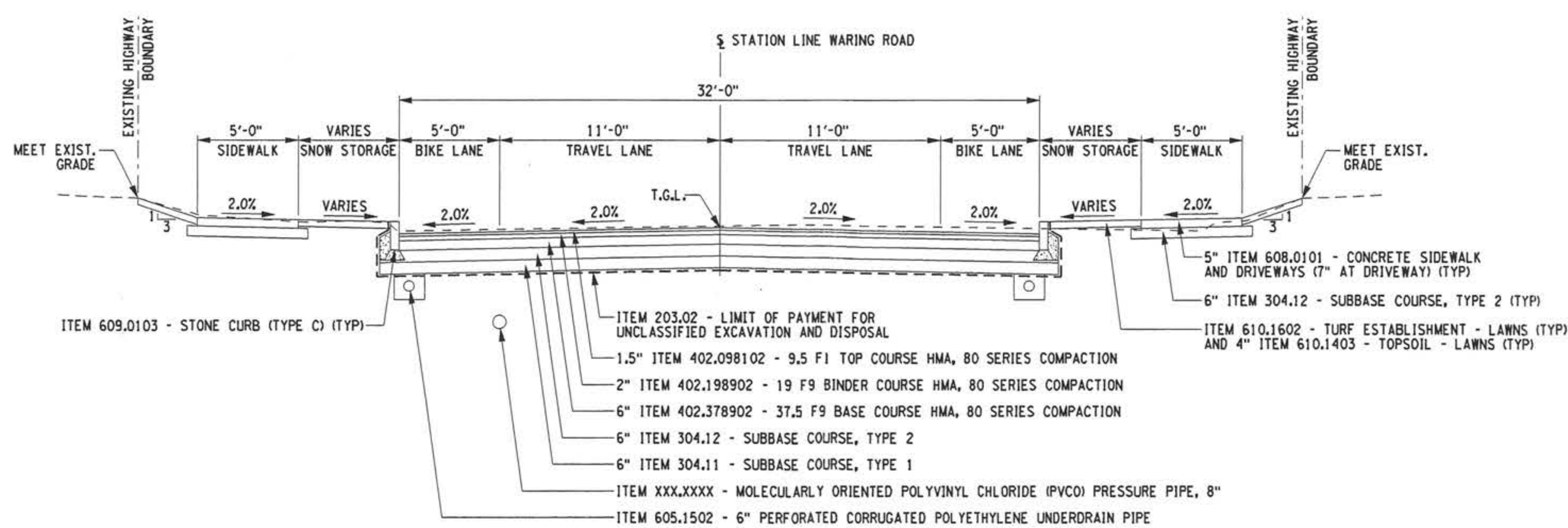


ROADWAY TYPICAL SECTION

STA. 0+65 TO STA. 1+84
STA. 4+18 TO STA. 4+56
STA. 5+70 TO STA. 9+45
STA. 10+40 TO STA. 11+50
STA. 24+50 TO STA. 27+23
STA. 30+87 TO STA. 39+50

NOTE:

SEE ROADWAY PLANS FOR LOCATIONS OF PARKING LANES.



ROADWAY TYPICAL SECTION

STA. 1+84 TO STA. 4+18
STA. 4+56 TO STA. 5+70
STA. 9+45 TO STA. 10+40
STA. 24+91 TO STA. 25+77
STA. 27+23 TO STA. 30+87

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REVISIONS

NO.	DATE	DESCRIPTION	REV.	CH'D.

Project Name:

WARING ROAD IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES

Drawing Title:

ALTERNATE 3

TYPICAL SECTIONS

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	OCTOBER 2012
Scale:	1/8" = 1'-0"
Drawing No.: TS-01	Sheet No.: X

Date

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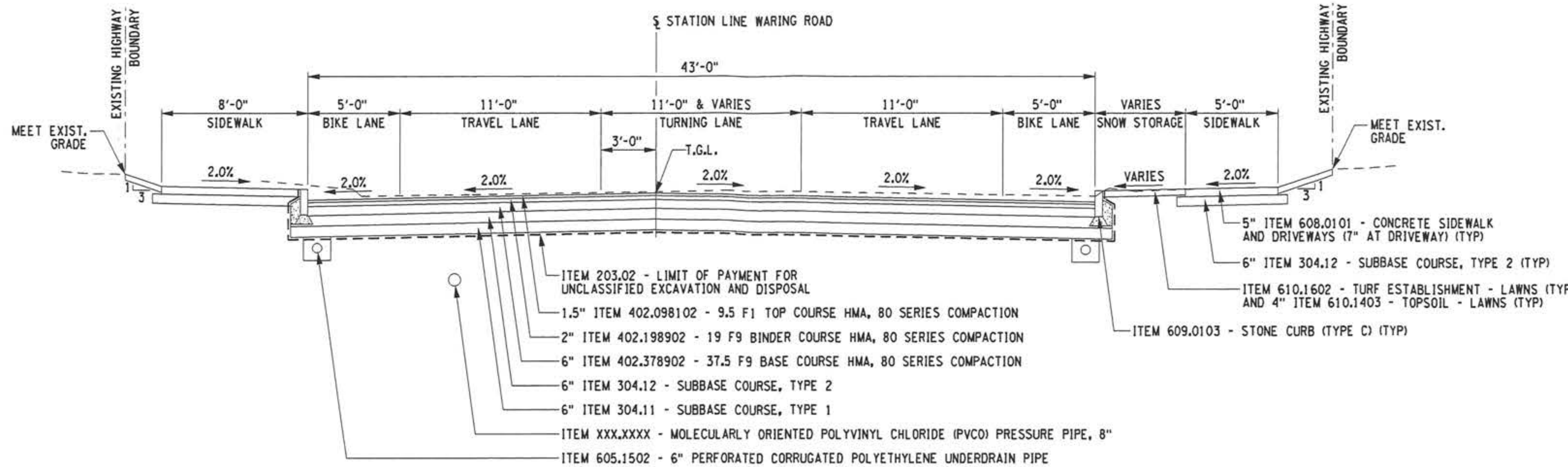

ROADWAY TYPICAL SECTION

STA. 11+50.00 TO STA. 24+50.00

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NO.	DATE	DESCRIPTION	REV.	CH'D.

Project Name:

WARING ROAD IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES

Drawing Title:

ALTERNATE 3

TYPICAL SECTIONS

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	OCTOBER 2012
Scale:	1/8" = 1'-0"
Drawing No.: TS-02	Sheet No: X

Date

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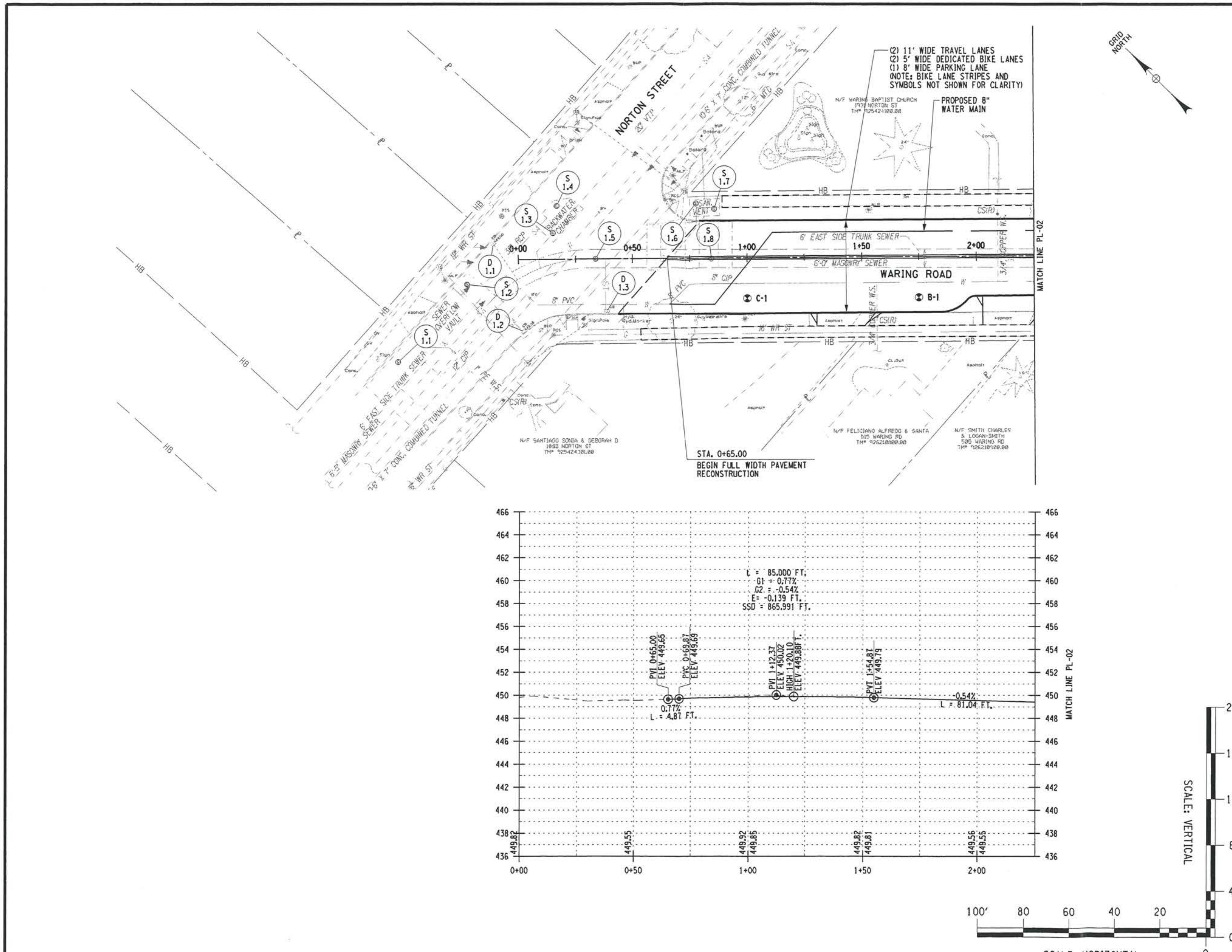


REVISIONS

NO.	DATE	DESCRIPTION	REV.	CH'D.

Project Name:

WARING ROAD IMPROVEMENT PROJECT

Client:

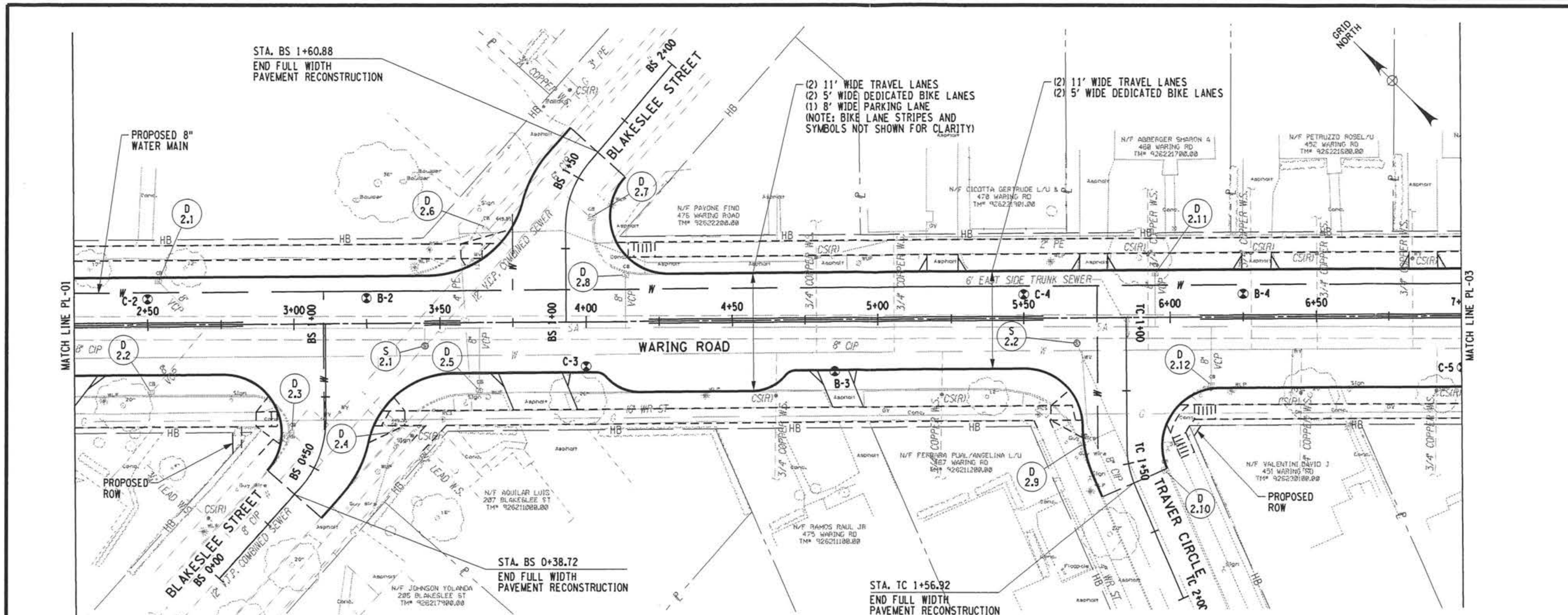
CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES

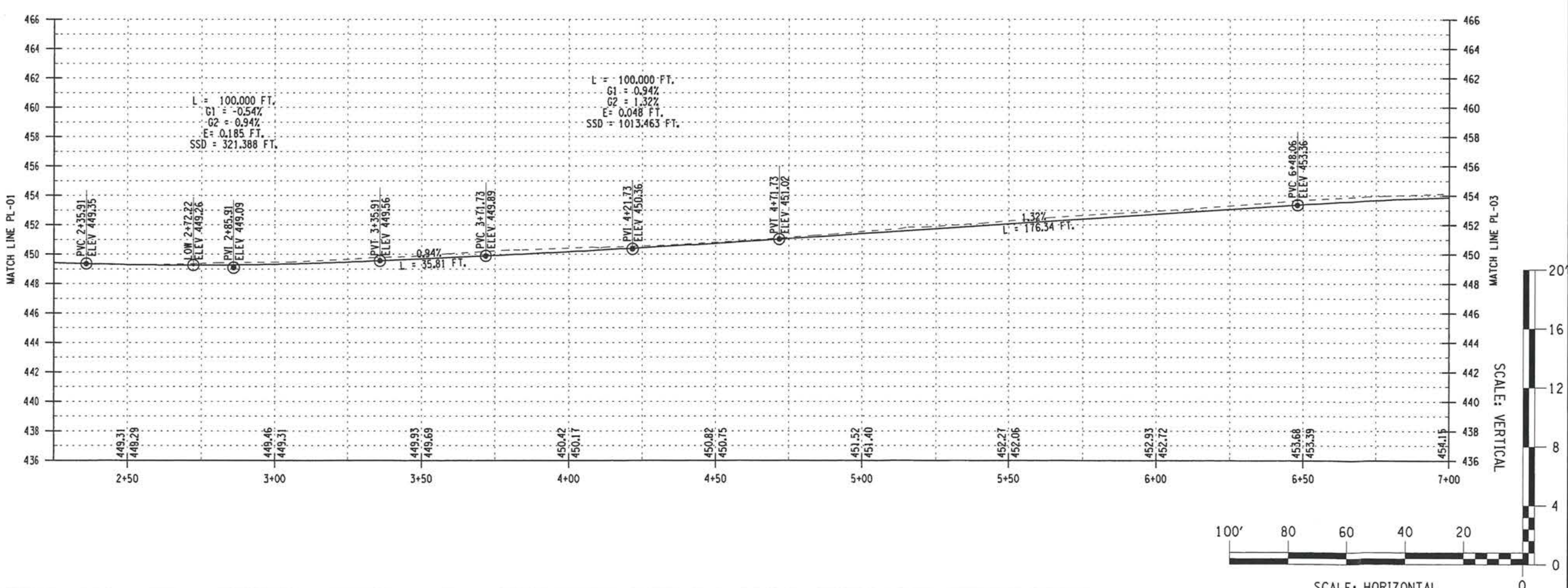
Drawing Title:

ALTERNATE 3
ROADWAY PLAN AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	OCTOBER 2012
Scale:	AS SHOWN
Drawing No.:	PL-01
Sheet No.:	X

Date





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NO.	DATE	DESCRIPTION	REV.	CH'D.

Project Name:

WARING ROAD IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES

Drawing Title:

ALTERNATE 3
ROADWAY PLAN AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	OCTOBER 2012
Scale:	AS SHOWN
Drawing No.: PL-02	Sheet No.: X

Date

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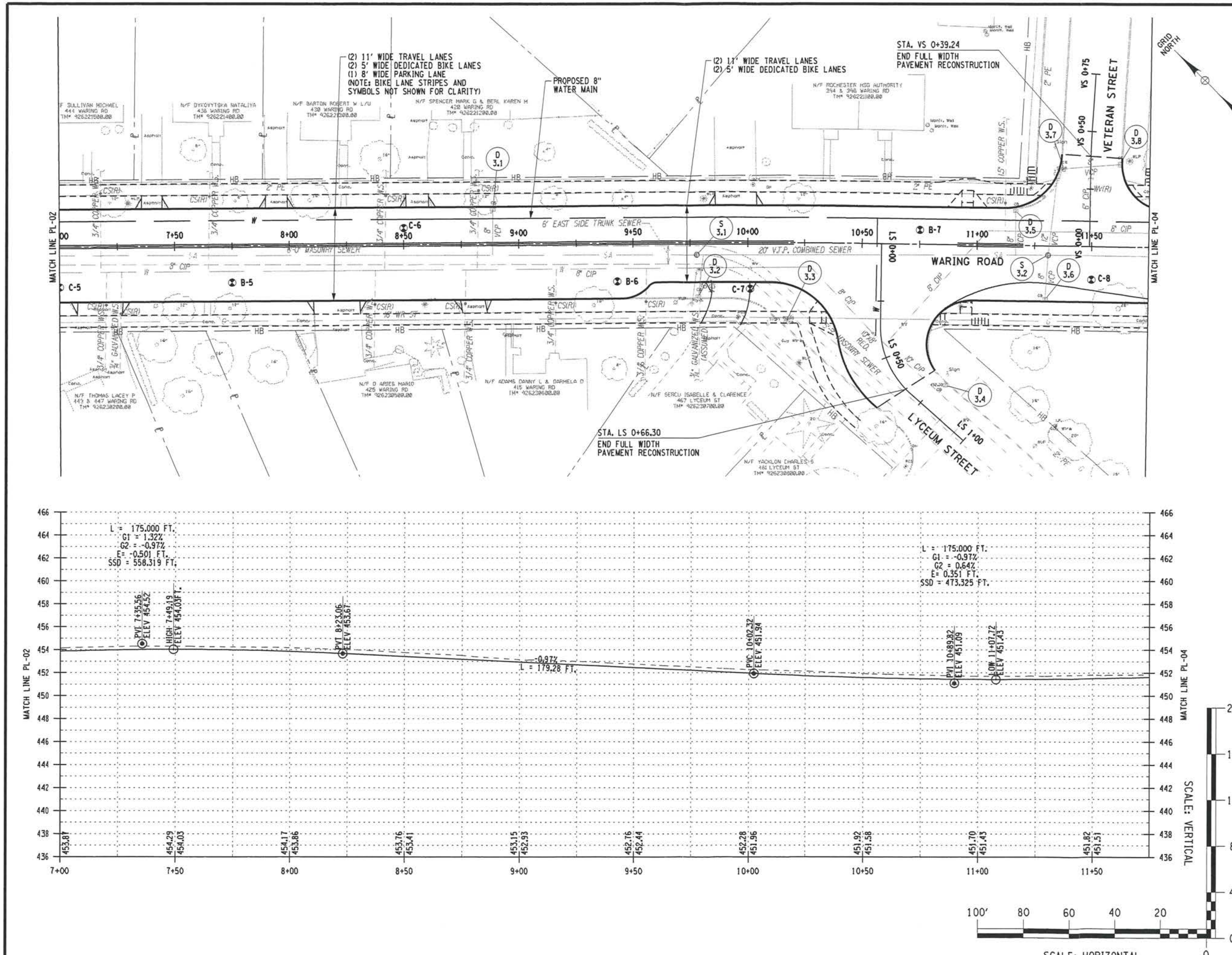

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REVISIONS				
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Project Name:

WARING ROAD IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES

Drawing Title:

ALTERNATE 3
ROADWAY PLAN AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	OCTOBER 2012
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Drawing No.: PL-03	Sheet No.: X

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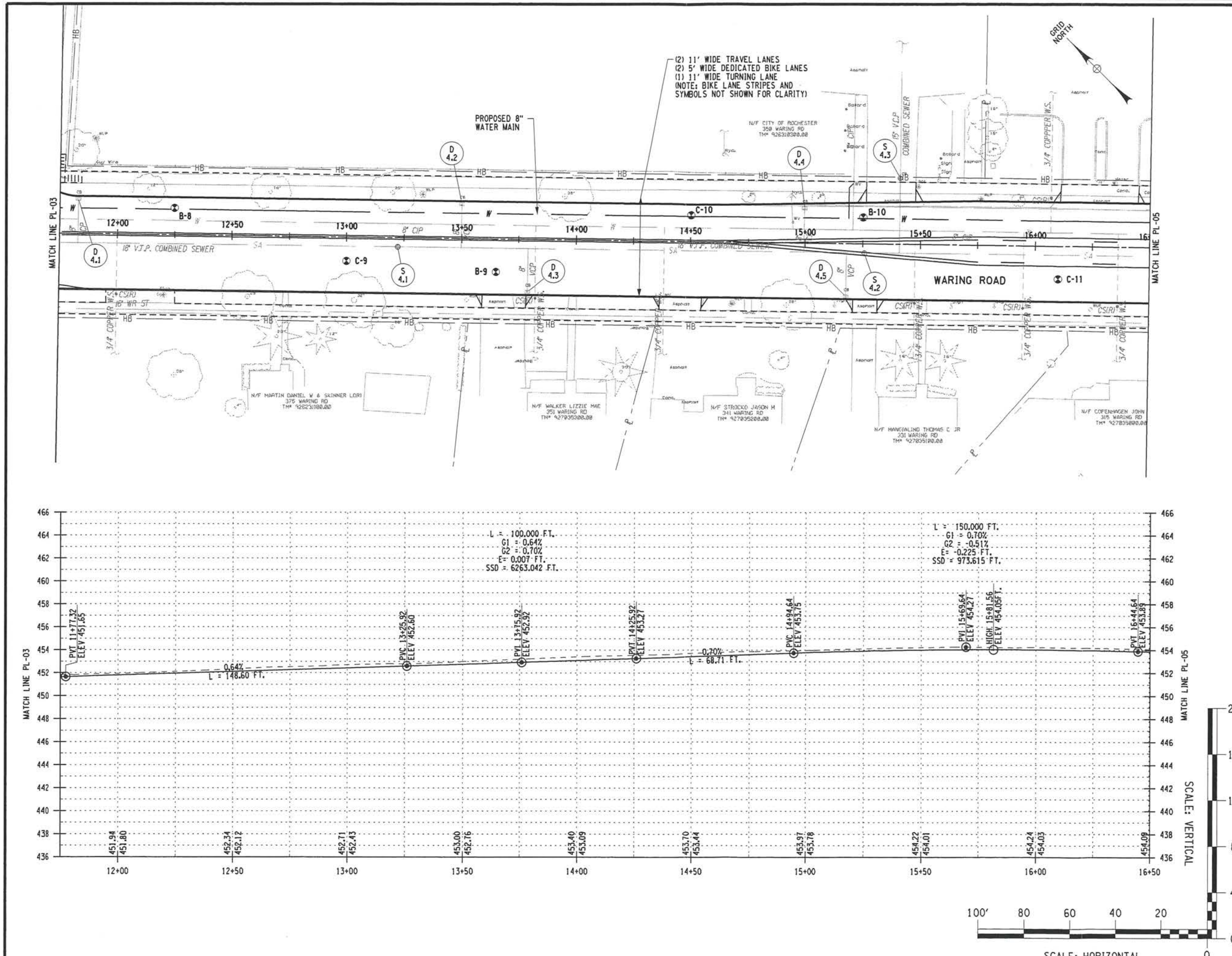

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WARING ROAD IMPROVEMENT PROJECT

Client:

CITY OF ROCHESTER
DEPARTMENT OF ENVIRONMENTAL SERVICES

Drawing Title:

ALTERNATE 3
ROADWAY PLAN AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	OCTOBER 2012
Scale:	AS SHOWN
Drawing No.: PL-04	Sheet No.: X

Date

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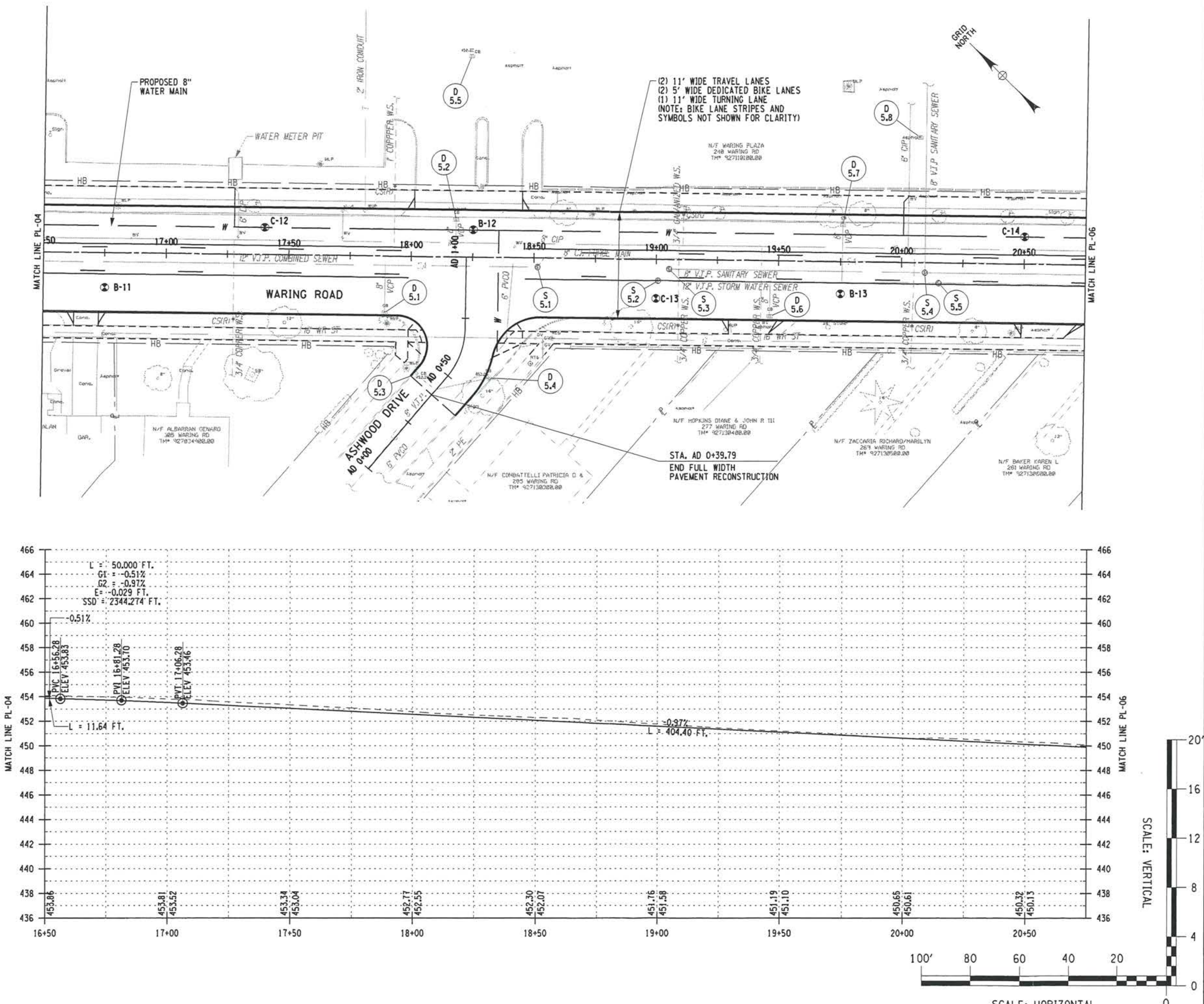

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Project Name:

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Client:

CITY OF ROCHESTER
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Drawing Title:

ALTERNATE 3
ROADWAY PLAN AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
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Date Issued:	OCTOBER 2012
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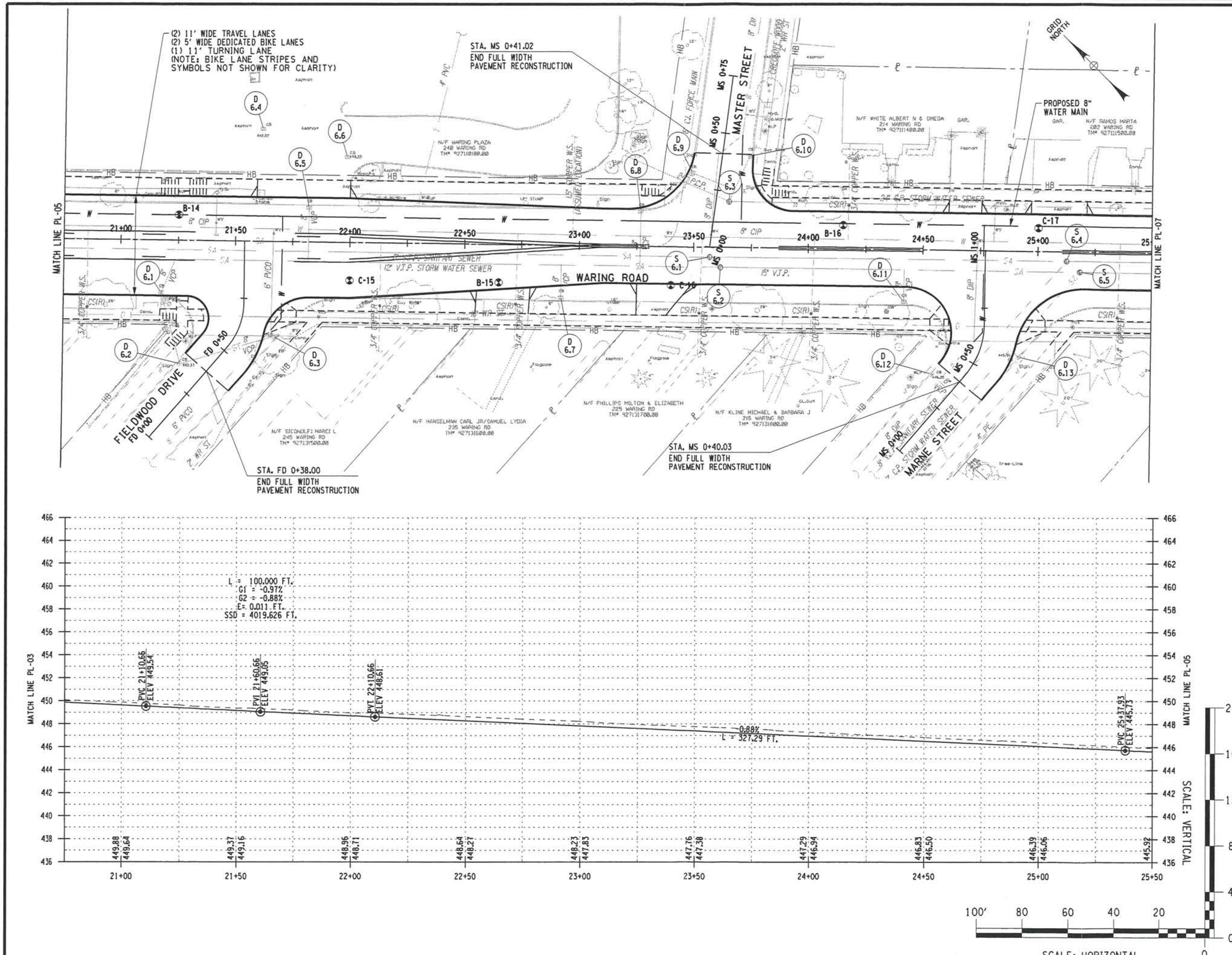

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Drawing Title:
ALTERNATE 3
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Project Engineer:	DBA
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Drawn by:	TJG
Checked by:	DBA
Date Issued:	OCTOBER 2012
Scale:	AS SHOWN
Drawing No.:	PL-06
Sheet No:	X

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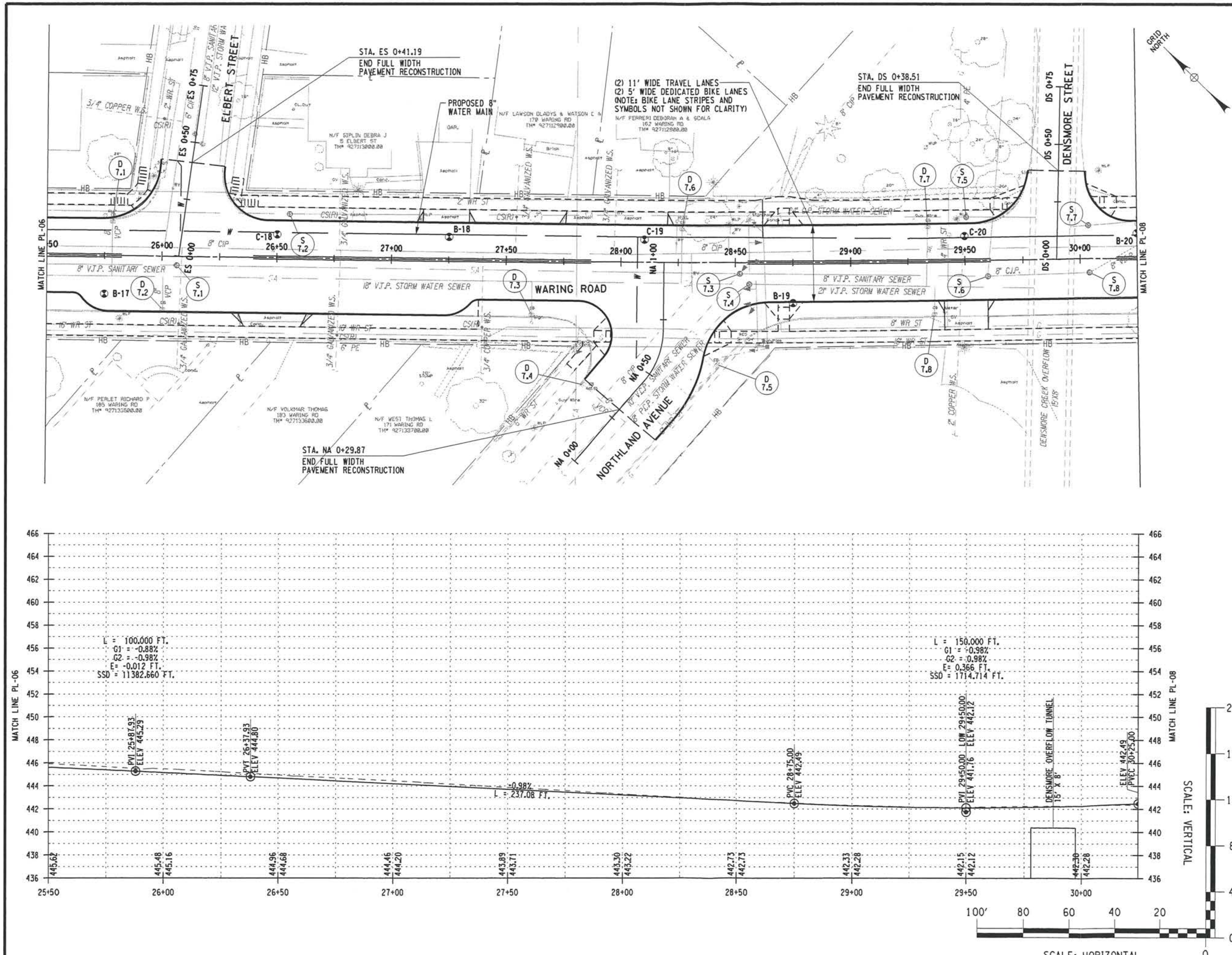

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Project Engineer:	DBA
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Drawing No.: PL-07	Sheet No: X

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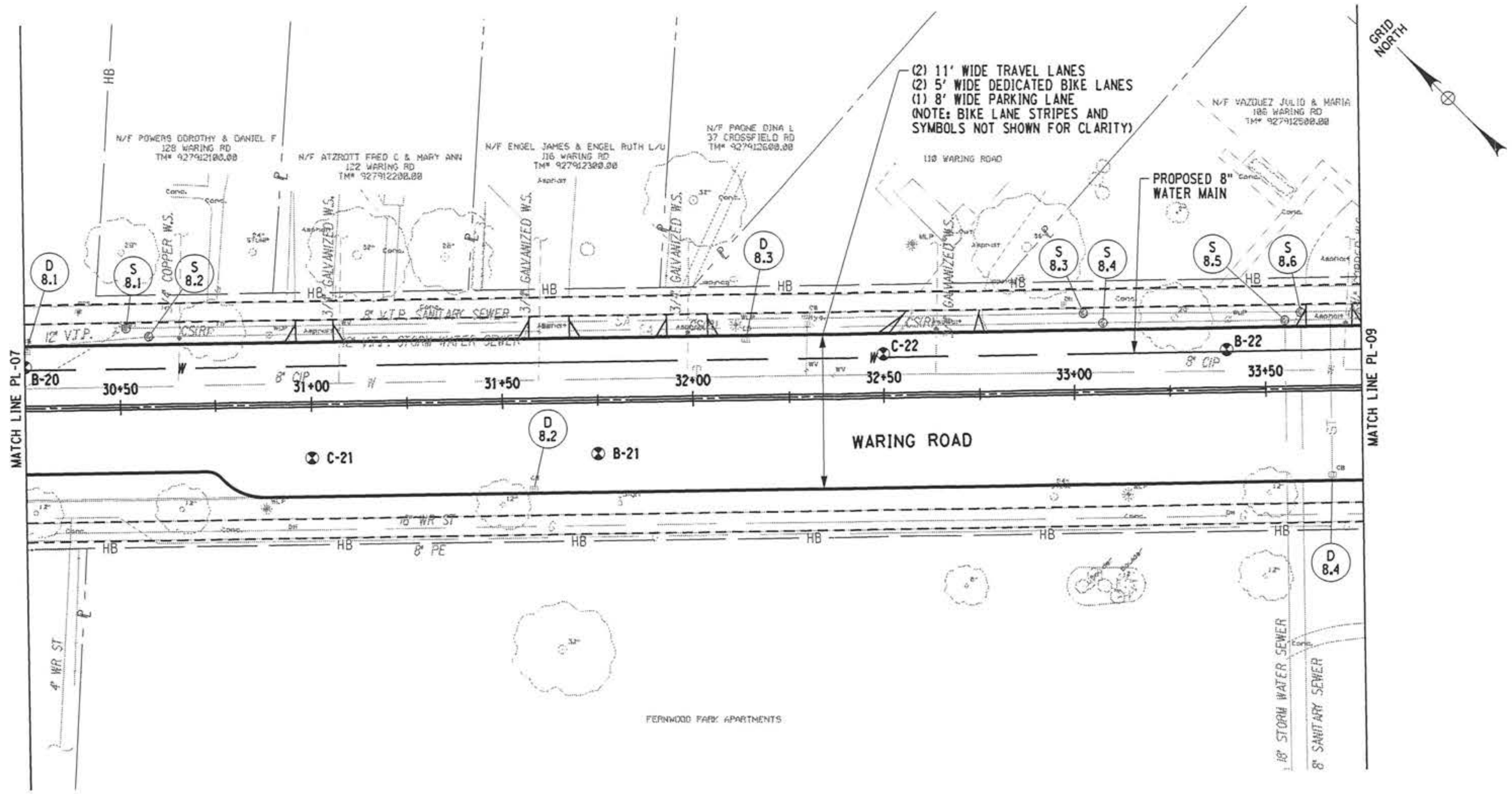

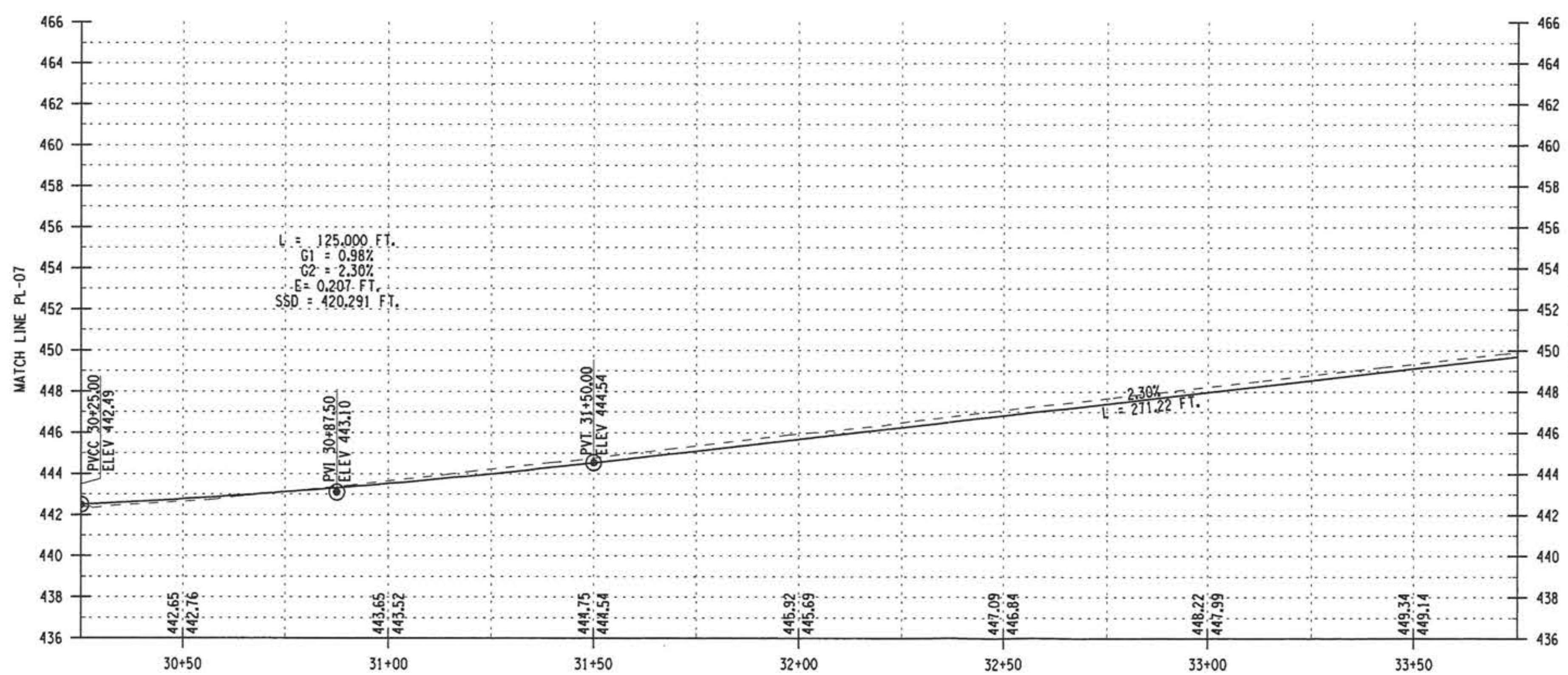

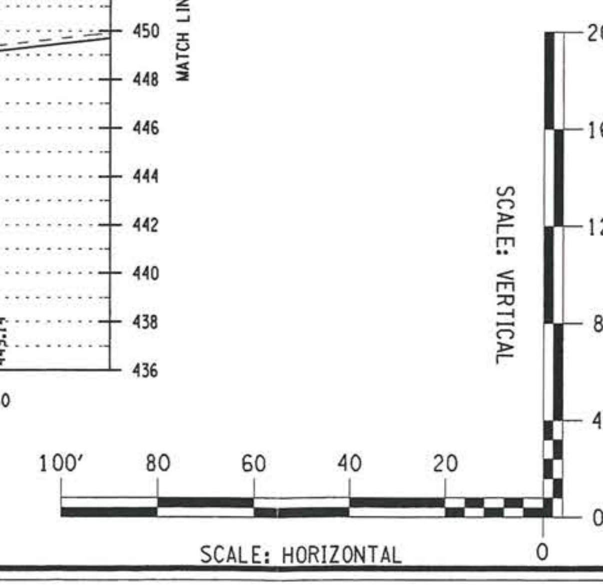

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Drawing Title:

ALTERNATE 3
ROADWAY PLAN AND PROFILE

Project Engineer:	DBA
Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	OCTOBER 2012
Scale:	AS SHOWN
Drawing No.: PL-08	Sheet No.: X

Date

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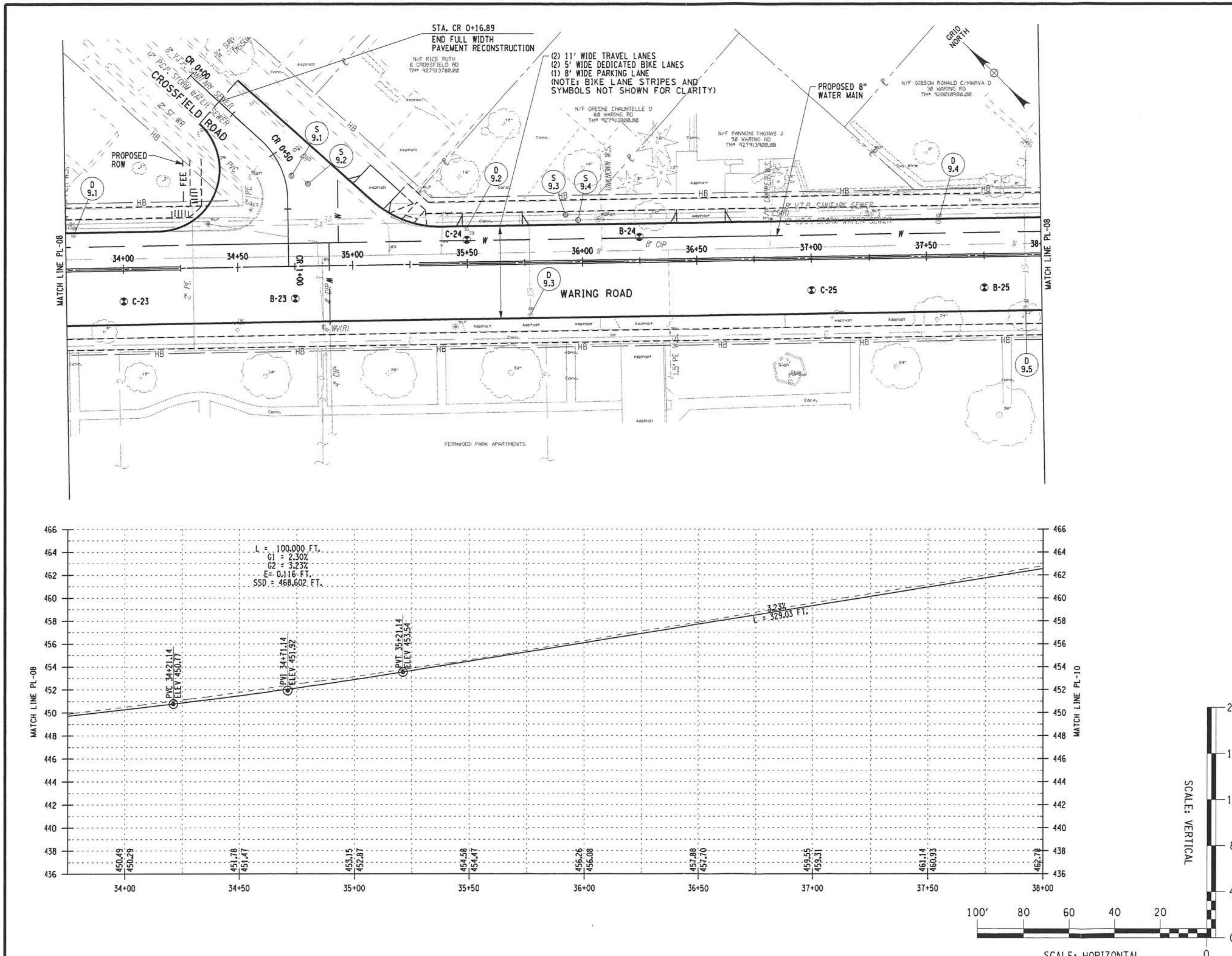

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Drawing Title:

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Project Engineer:	DBA
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Drawn by:	TJG
Checked by:	DBA
Date Issued:	OCTOBER 2012
Scale:	AS SHOWN
Drawing No.:	PL-09
Sheet No.:	X

Date

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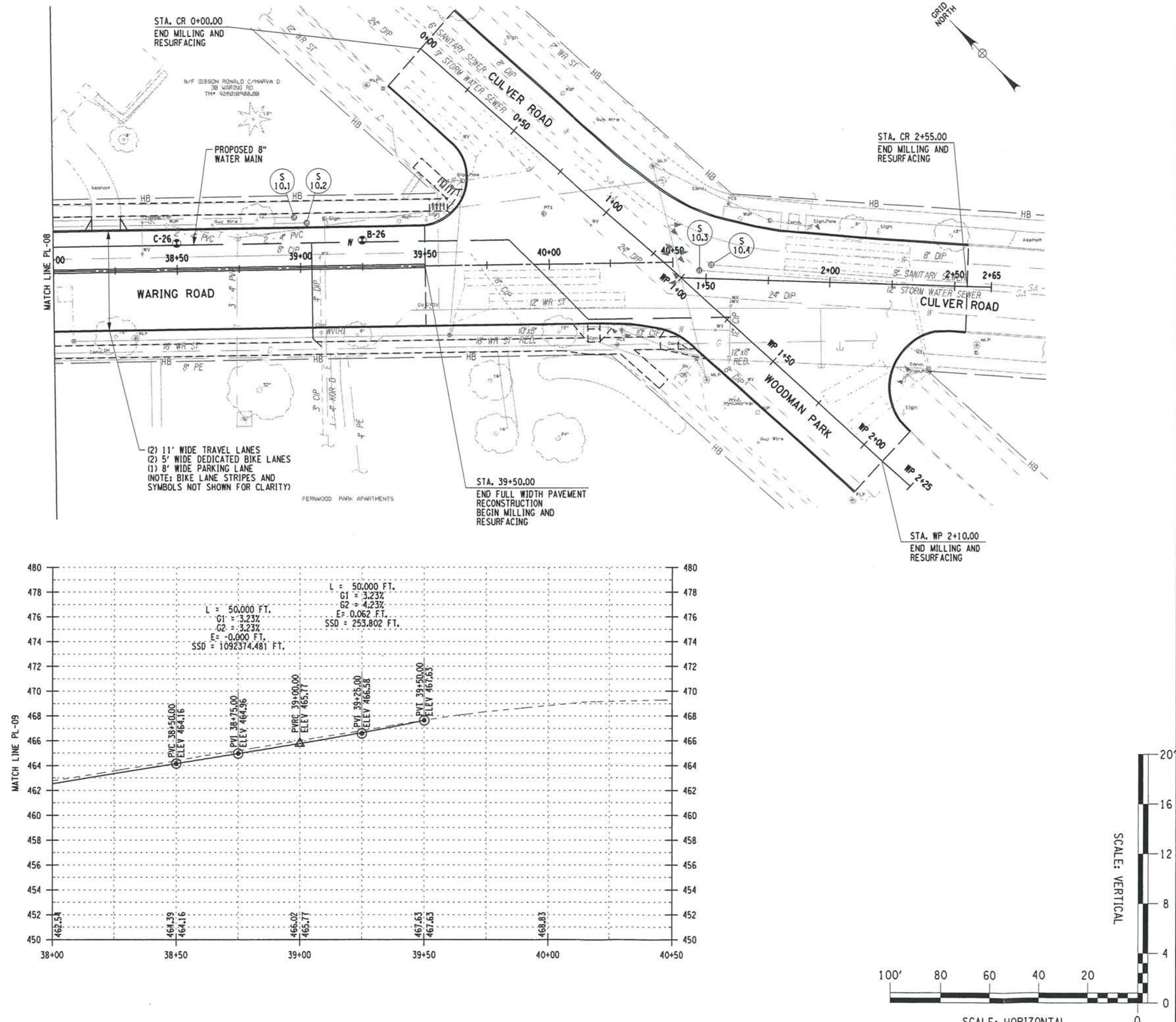

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Designed by:	TJG
Drawn by:	TJG
Checked by:	DBA
Date Issued:	OCTOBER 2012
Scale:	AS SHOWN
Drawing No.: PL-10	Sheet No.: X

Date

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APPENDIX B – ENVIRONMENTAL INFORMATION

Answer the following questions by checking YES or NO.

I. **THRESHOLD QUESTION**	**YES**	**NO**
1. Does the project involve unusual circumstances as described in 23 CFR §771.117(b)?		✓

- If YES, the project does not qualify as a Categorical Exclusion and an EA or EIS is required. You may STOP COMPLETING THE CHECKLIST
- If NO, go on

II. **AUTOMATIC CATEGORICAL EXCLUSION**	**YES**	**NO**
2. Is the project an action listed as an Automatic Categorical Exclusion in 23 CFR §771.117(c) (C List) and/or is the project an element-specific project classified by FHWA as a Categorical Exclusion on July 22, 1996?		✓

- If YES to question 2, the project qualifies for a C List Categorical Exclusion. You may STOP COMPLETING THE CHECKLIST. The checklist should be included in the appendix of the Final Design Report (or Scope Summary Memorandum/Final Design Report). The CATEGORICAL EXCLUSION DETERMINATION memo is to be sent to the appropriate Main Office Design liaison unit with a copy of the Final Design Report (or Scope Summary Memorandum/Final Design Report). A copy of the CATEGORICAL EXCLUSION DETERMINATION memo must also be sent to the Office of Budget and Finance, Project and Letting Management, and others (see sample DETERMINATION memo attached).

  (Note - Even if YES to question 2, there may be specific environmental issues that still require an action such as an EO 11990 Wetland Finding or a determination of effect on cultural resources. The project is still an Automatic Categorical Exclusion but the necessary action must be taken, such as obtaining FHWA's signature on the wetland finding. Refer to the appropriate section of the Environmental Procedures Manual for guidance.)

- If NO to question 2, go on.

III. **PROGRAMMATIC CATEGORICAL EXCLUSION**	**YES**	**NO**
3. Is the project on new location or does it involve a change in the functional classification or added mainline capacity (add through-traffic lanes)?		✓
4. Is this a Type I project under 23 CFR 772, "Procedures for Abatement of Highway Traffic Noise and Construction"?		✓
5. If the project is located within the limits of a designated sole source aquifer area or the associated stream flow source area, is the drainage pattern altered?		✓
6. Does the project involve changes in travel patterns?		✓
7. Does the project involve the acquisition of more than minor amounts of temporary or permanent right-of-way (a minor amount of right-of-way is defined as not more than 10 percent of a parcel for parcels under 4 ha (10 acres) in size, 0.4 ha (1 acre) of a parcel 4 ha to 40.5 ha (10 to 100 acres) in size and 1 percent of a parcel for parcels greater than 40.5 ha (100 acres) in size?		✓
8. Does the project require a Section 4(f) evaluation and determination in accordance with the FHWA guidance?		✓
9. Does the project involve commercial or residential displacement?		✓

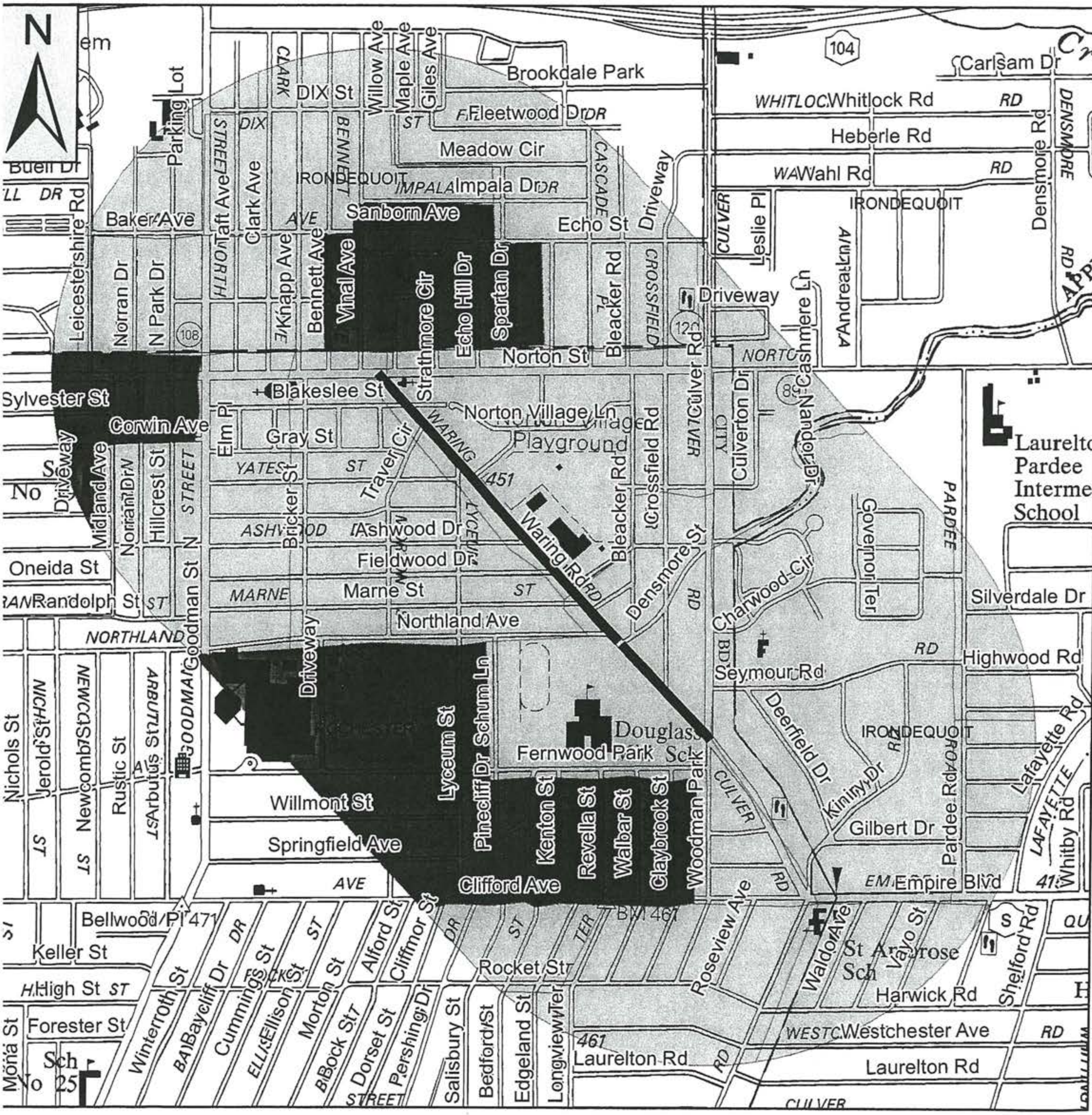
	YES	NO
22. Since the project involves the use of temporary road, detour or ramp closure, will all of the following conditions be met:	✓	
i. Provisions will be made for pedestrian access, where warranted, and access by local traffic and so posted.	✓	
ii. Through-traffic dependent business will not be adversely affected.	✓	
iii. The detour or ramp closure, to the extent possible, will not interfere with any local special event or festival.	✓	
iv. The temporary road, detour or ramp closure does not substantially change the environmental consequences of the action	✓	
v. There is no substantial controversy associated with the temporary road, detour or ramp closure.	✓	

- If questions 3-20 are NO, 21 is YES and 22 (i-v) are YES, the project qualifies for a Programmatic Categorical Exclusion. You may STOP COMPLETING THE CHECKLIST. The checklist should be included in the appendix of the Final Design Report (or Scope Summary Memorandum/Final Design Report). The CATEGORICAL EXCLUSION DETERMINATION memo should be sent to the appropriate Main Office Design liaison unit with a copy of the Final Design Report (or Scope Summary Memorandum/Final Design Report.) A copy of the CATEGORICAL EXCLUSION DETERMINATION memo must also be sent to the Office of Budget and Finance, Project and Letting Management, and others (see sample DETERMINATION memo attached).
- If questions 3-20 are NO, 21 is YES and any part of 22 is NO, go on to question 23.

	YES	NO
23. Is the project section listed in 23 CFR §771.117(d) (D List) or is the project an action similar to those listed in 23 CFR §771.117(d)?		

For those questions which precluded a Programmatic Categorical Exclusion, documentation should be provided for any YES response to questions 3-20 or for a NO response to any part of questions 22 (i-v). This documentation, as well as the checklist, should be included in the Design Approval Document, i.e., Final Design Report, etc., to be submitted to the Main Office/FHWA Design liaison unit for submission to the FHWA Division for classification of the project as a D List Categorical Exclusion.

Potential Environmental Justice Areas within one half mile of Waring Road between Culver Road and Norton Street Rochester, New York 14609



0	0.1	0.2	0.3	0.4	0.5	Miles

SCALE: 1:14,000

his computer representation has been compiled from upplied data or information that has not been erified by NYSDEC. The data is offered here as a eneral representation only and is not to be used for ommercial purposes without verification by an independent rofessional qualified to verify such data or information.

YSDEC does not guarantee the accuracy, ompleteness, or timeliness of the information shown and hall not be liable for any loss or injury resulting from reliance.

ata Source for Potential Environmental Justice Areas: .S. Census Bureau, 2000 U.S. Census

Legend

- Not an EJ Area
- Potential EJ Area
- Waring Road Project Area

For questions about this map contact:
New York State Department of Environmental Conservation
Office of Environmental Justice
625 Broadway, 14th Floor
Albany, New York 12233-1500
(518) 402-8556
ej@gw.dec.state.ny.us

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

Joe Martens
Commissioner

December 5, 2011

Megan Garbach
Ravi Engineering
2110 South Clinton Avenue, Suite 1
Rochester, NY 14618

RECEIVED
DEC 07 2011
RAVI ENGINEERING, P.C.

Dear Ms. Garbach:

In response to your recent request, we have reviewed the New York Natural Heritage Program database, with respect to an Environmental Assessment for the proposed Waring Road Improvements, Norton Street to Culver Road, area as indicated on the map you provided, located in the City of Rochester, Monroe County.

We have no records of rare or state listed animals or plants, significant natural communities or other significant habitats, on or in the immediate vicinity of your site.

The absence of data does not necessarily mean that rare or state-listed species, natural communities or other significant habitats do not exist on or adjacent to the proposed site. Rather, our files currently do not contain information which indicates their presence. For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

This response applies only to known occurrences of rare or state-listed animals and plants, significant natural communities and other significant habitats maintained in the Natural Heritage Data bases. Your project may require additional review or permits; for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, as listed at www.dec.ny.gov/about/39381.html.

Sincerely,

Jean Pietrusiak

Jean Pietrusiak, Information Services
NYS Department Environmental Conservation

Enc.
cc: Region 8

\# 1174

MEMORANDUM
DEPARTMENT OF TRANSPORTATION

TO: Craig Ekstrom, Region Local Project Liaison

FROM: Chris Caraccilo, Regional Cultural Resource Coordinator

BJECT: PROJECT SUBMITTAL PACKAGE – SECTION 106 RECOMMENDATIONS

PIN 4754.40, Waring Road Improvements, City of Rochester, Monroe County

DATE: May 10, 2012

As the Regional Cultural Resource Coordinator (RCRC) I have reviewed the Project Submittal Package (PSP) prepared for the above referenced Locally-Administered Federal-Aid project for assessment of obligations under Section 106 of the National Historic Preservation Act (36 CFR Part 800).

Based on review of this PSP, I conclude:

- ☒ The project activities have no potential to cause effects on historic properties in accordance with 36 CFR 800.3(a)(1) therefore, there are no further obligations for compliance with Section 106 of the National Historic Preservation Act. This determination should be recorded in the project environmental documentation.

- ☐ The project activities may cause effects on historic properties. A Cultural Resource Survey is needed to identify historic and cultural resources.

- ☐ A Finding Documentation package is needed to assess the project effect on (a previously National Register (NR) listed property) ________________________.

- ☐ The following additional information is needed to complete our assessment:

  - ☐ Detailed project description
  - ☐ Project location map showing project limits (USGS Quad)
  - ☐ Photos of prior ground disturbance
  - ☐ Photos of buildings
  - ☐ Information from SHPO web site (archaeological sensitivity and NR listed buildings)
  - ☐ Other

Waring Rd.

Legend
Background Maps
(Scanned Quads)

- Archeo Sensitive Area
- State/National Register
- Federal Eligibility
- National Register Listed
- State Register Listed (only)
- Listing in Progress
- State Parks
- County Boundaries
- Quad Index
- Municipal Boundaries

November 17, 2011

Disclaimer: This map was prepared by the New York State Parks, Recreation and Historic Preservation National Register Listing Internet Application. The information was compiled using the most current data available. It is deemed accurate, but is not guaranteed.

Social, Economic and Environmental Resources Checklist				
PIN: 4754.40	TYPE FUNDING: Federal			
DESCRIPTION: Waring Road Improvements	DATE: May 11, 2012 REVISION DATE: August 14, 2012			
CITY: Rochester	NEPA CLASS: Type II			
COUNTY: Monroe	SEQRA TYPE: Type II			

SOCIAL, ECONOMIC AND ENVIRONMENTAL CONSIDERATIONS	PRESENCE OR ANALYSIS NEEDED?		IMPACT OR ISSUE?	
	YES	NO	YES	NO
Social				
Land Use	☒	☐	☐	☒
Neighborhoods and Community Cohesion	☒	☐	☐	☒
General Social Groups	☒	☐	☐	☒
School Districts, Recreation Areas and Places of Worship	☒	☐	☐	☒
Economic				
Regional and Local Economies	☒	☐	☐	☒
Business Districts	☒	☐	☐	☒
Specific Business Impacts	☒	☐	☐	☒
Environmental				
Wetlands	☐	☒	☐	☒
Surface Waterbodies and Watercourses	☐	☒	☐	☒
Wild, Scenic, and Recreational Rivers	☐	☒	☐	☒
Navigable Waters	☐	☒	☐	☒
Floodplains	☐	☒	☐	☒
Coastal Resources	☐	☒	☐	☒
Aquifers, Wells, and Reservoirs	☐	☒	☐	☒
Stormwater Management	☒	☐	☒	☐
General Ecology and Wildlife Resources	☐	☒	☐	☒
Critical Environmental Areas	☐	☒	☐	☒
Historic and Cultural Resources	☒	☐	☐	☒
Parks and Recreational Resources	☒	☐	☐	☒
Visual Resources	☐	☒	☐	☒
Farmlands	☐	☒	☐	☒
Air Quality Analysis	☐	☒	☐	☒
Energy Analysis	☐	☒	☐	☒
Noise Analysis	☐	☒	☐	☒
Asbestos	☒	☐	☒	☐
Contaminated and Hazardous Materials (provide call out on plans and specification as indicated in Section 4.4.19 of Ch. 4 report)	☒	☐	☐	☒
Construction Effects	☒	☐	☐	☒
Indirect (Secondary) Effects	☐	☒	☐	☒
Cumulative Effects	☐	☒	☐	☒

APPENDIX C – TRAFFIC INFORMATION

NYSDOT Pedestrian Generator Checklist

PEDESTRIAN GENERATOR CHECKLIST		
PIN:4754.40	Project Name: Waring Road Improvement Project	
	Location: City of Rochester, Monroe County, NY	
Note: The term Agenerator@ in this document refers to both pedestrian generators (where pedestrians originate) and destinations (where pedestrians travel to). A check of" yes" indicates a potential need to accommodate pedestrians and coordination with the Regional Bicycle and Pedestrian Coordinator is necessary during project scoping. Answers to the following questions should be checked with the local municipality to ensure accuracy.		
1.	Is there an existing or planned sidewalk, trail, or pedestrian-crossing facility?	**YES**☺ **NO**□
2.	Are there bus stops, transit stations or depots/terminals located in or within 800 m of the project area?	**YES**☺ **NO**□
3.	Is there more than occasional pedestrian activity? Evidence of pedestrian activity may include a worn path.	**YES**☺ **NO**□
4.	Are there existing or approved plans for generators of pedestrian activity in or within 800m of the project that promote or have the potential to promote pedestrian traffic in the project area, such as schools, parks, playgrounds, places of employment, places of worship, post offices, municipal buildings, restaurants, shopping centers, or other commercial areas, or shared-use paths?	**YES** □ **NO** ☺
5.	Are there existing or approved plans for seasonal generators of pedestrian activity in or within 800 m of the project that promote or have the potential to promote pedestrian traffic in the project area, such as ski resorts, state parks, camps, amusement parks?	**YES** □ **NO**☺
6.	Is the project located in a residential area within 800 m of existing or planned pedestrian generators such as those listed in 4 above?	**YES**☺ **NO**□
7.	From record plans, were pedestrian facilities removed during a previous highway reconstruction project?	**YES**□ **NO**☺
8.	Did a study of secondary impacts indicate that the project promotes or is likely to promote commercial and/or residential development within the intended life cycle of the project?	**YES**□ **NO**☺
9.	Does the community's comprehensive plan call for development of pedestrian facilities in the area?	**YES**□ **NO**☺
10.	Based on the ability of students to walk and bicycle to school, would the project benefit from engineering measures under the Safe-Routes-To-School program? Eligible infrastructure-related improvements must be within a 3.2 km radius of the project.	**YES**□ **NO**☺

Note: This checklist should be revisited due to a project delay or if site conditions or local planning changes during the project development process.

Comments: Safe Routes to School program has already been implemented in this area.

Regional Bicycle and Pedestrian Coordinator:

Project Designer: Clark Patterson Lee, Rochester NY

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: JLM
Agency/Co.: Clark Patterson Lee
Date Performed: 11/1/2011
Analysis Time Period: PM Peak - ETC
Intersection: Center Plaza Driveway
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2015 (ETC)
Project ID: Waring Road
East/West Street: Ashwood/Center Plaza Drive
North/South Street: Waring Road
Intersection Orientation: NS   Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	12	171	53	55	207	4
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	12	171	53	55	207	4
Percent Heavy Vehicles	11	--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	39	19	62	7	19	5
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	39	19	62	7	19	5
Percent Heavy Vehicles	0	0	2	0	0	0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	12	55		120			31	
C(m) (vph)	1308	1345		562			435	
v/c	0.01	0.04		0.21			0.07	
95% queue length	0.03	0.13		0.80			0.23	
Control Delay	7.8	7.8		13.1			13.9	
LOS	A	A		B			B	
Approach Delay				13.1			13.9	
Approach LOS				B			B	

Center Plaza Drive_ETC+20 Peak.txt
HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: JLM
Agency/Co.: Clark Patterson Lee
Date Performed: 11/1/2011
Analysis Time Period: PM Peak - ETC+20
Intersection: Center Plaza Driveway
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2035 (ETC+20)
Project ID: Waring Road
East/West Street: Ashwood/Center Plaza Drive
North/South Street: Waring Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	12	190	58	60	227	4
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	12	190	58	60	227	4
Percent Heavy Vehicles	11	--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	41	19	67	7	19	5
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	41	19	67	7	19	5
Percent Heavy Vehicles	0	0	2	0	0	0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	12	60		127			31	
C(m) (vph)	1286	1318		532			401	
v/c	0.01	0.05		0.24			0.08	
95% queue length	0.03	0.14		0.92			0.25	
Control Delay	7.8	7.9		13.9			14.7	
LOS	A	A		B			B	
Approach Delay				13.9			14.7	
Approach LOS				B			B	

Center Plaza Drive_Exist Peak.txt
HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: JLM
Agency/Co.: Clark Patterson Lee
Date Performed: 11/1/2011
Analysis Time Period: PM Peak - Existing
Intersection: Center Plaza Driveway
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2011 (Existing)
Project ID: Waring Road
East/West Street: Ashwood/Center Plaza Drive
North/South Street: Waring Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	9	167	49	51	201	2
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	9	167	49	51	201	2
Percent Heavy Vehicles	11	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal?		No			No	

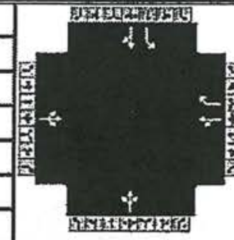
Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	35	15	58	5	16	3
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	35	15	58	5	16	3
Percent Heavy Vehicles	0	0	2	0	0	0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	9	51		108			24	
C(m) (vph)	1317	1348		591			448	
v/c	0.01	0.04		0.18			0.05	
95% queue length	0.02	0.12		0.66			0.17	
Control Delay	7.8	7.8		12.4			13.5	
LOS	A	A		B			B	
Approach Delay				12.4			13.5	
Approach LOS				B			B	

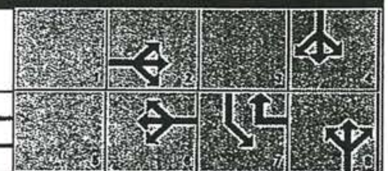
2010 HCS Signalized Intersection Results Summary

ıeral Information				Intersection Information	
ıncy	CPL			Duration, h	0.25
ılyst	JLM	Analysis Date	Dec 6, 2011	Area Type	Other
sdiction		Time Period	ETC AM Peak	PHF	0.92
rsection		Analysis Year	2015	Analysis Period	1> 7:00
Name	Waring at Culver_AM Peak_ETC.xus				
ject Description	AM ETC Peak				



ıand Information	EB			WB			NB			SB		
roach Movement	L	T	R	L	T	R	L	T	R	L	T	R
ıand (v), veh/h	7	183	40	12	172	66	37	63	13	301	165	8

ıal Information										
le, s	41.4	Reference Phase	2							
et, s	0	Reference Point	End	Green	7.8	9.9	4.2	0.0	0.0	0.0
oordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0
ce Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	2.0	0.0	0.0	0.0



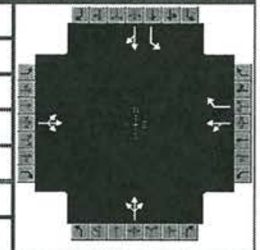
er Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
gned Phase	2	2	6	6	8	8	4	4
e Number	8.0	8.0	7.0	7.0	12.0	12.0	10.0	10.0
se Duration, s	14.4	14.4	14.4	14.4	10.5	10.5	16.4	16.4
nge Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
ue Clearance Time (g_s), s	7.4	7.4	6.0	6.0	4.8	4.8	9.5	9.5
en Extension Time (g_e), s	1.0	1.0	1.0	1.0	0.2	0.2	0.9	0.9
se Call Probability	1.00	1.00	1.00	1.00	0.76	0.76	1.00	1.00
Out Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ement Group Results	EB			WB			NB			SB		
roach Movement	L	T	R	L	T	R	L	T	R	L	T	R
gned Movement	5	2	12	1	6	16	3	8	18	7	4	14
sted Flow Rate (v), veh/h	250	0	0	200	0	72	123	0	0	327	0	188
sted Saturation Flow Rate (s), veh/h/ln	1740	1976	0	1793	1900	1451	1764	1976	0	1675	1900	1778
ue Service time (g_s), s	0.4	0.0	0.0	0.0	0.0	1.2	2.8	0.0	0.0	7.5	0.0	3.7
e Queue Clearance Time (g_c), s	5.4	0.0	0.0	4.0	0.0	1.2	2.8	0.0	0.0	7.5	0.0	3.7
acity (c), veh/h	444	402		458	387	661	194	217		422	479	448
me-to-Capacity Ratio (X)	0.564	0.000	0.000	0.437	0.000	0.109	0.633	0.000	0.000	0.775	0.000	0.420
able Capacity (c_a), veh/h	1323	1431		1326	1376	1416	1107	1240		1052	1193	
of Queue (Q), veh/ln	1.8			1.4	0.0	0.2	1.0			2.4	0.0	1.2
flow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ue Storage Ratio (RQ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
rm Delay (d_1), s/veh	15.3	0.0		14.7	0.0	6.5	17.6	0.0		14.4	0.0	13.0
mental Delay (d_2), s/veh	0.4	0.0	0.0	0.2	0.0	0.0	1.3	0.0	0.0	1.2	0.0	0.2
l Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
rol Delay (d), s/veh	15.7	0.0		15.0	0.0	6.5	18.9	0.0		15.6	0.0	13.2
l of Service (LOS)	B			B		A	B			B		B
oach Delay, s/veh / LOS	15.7	B		12.7	B		18.9	B		14.7	B	
section Delay s/veh / LOS	14.9						B					

Modal Results	EB		WB		NB		SB	
strian LOS Score / LOS	2.1	B	2.3	B	2.3	B	2.1	B
le LOS Score / LOS	0.9	A	0.9	A	0.7	A	1.3	A

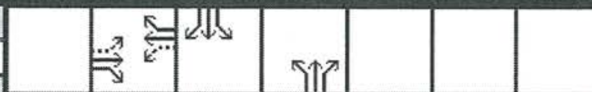
 HCS 2010™ Version 6.1 Generated: 12/6/2011 3:45:06 PM

eneral Information		Intersection Information	
jency	CPL	Duration, h	0.25
alyst	JLM	Analysis Date: Dec 6, 2011	Area Type: Other
risdiction		Time Period: ETC Noon Peak	PHF: 0.92
ersection		Analysis Year: 2015	Analysis Period: 1> 7:00
e Name	Waring at Culver_Noon Peak_ETC.xus		
oject Description	Noon ETC Peak		

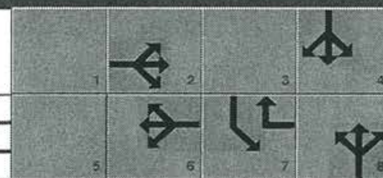


emand Information	EB			WB			NB			SB		
proach Movement	L	T	R	L	T	R	L	T	R	L	T	R
emand (v), veh/h	12	195	49	6	119	105	54	92	7	160	85	13

gnal Information			
cle, s	63.5	Reference Phase	2
fset, s	0	Reference Point	End
coordinated	Yes	Simult. Gap E/W	On
rce Mode	Fixed	Simult. Gap N/S	On



Green	12.1	26.0	7.3	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	2.0	2.0	2.0	0.0	0.0	0.0



mer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
signed Phase	2	2	6	6	8	8	4	4
ase Number	8.0	8.0	7.0	7.0	12.0	12.0	10.0	10.0
ase Duration, s	18.1	18.1	18.1	18.1	13.3	13.3	32.0	32.0
ange Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
ax Allow Headway (MAH), s	3.2	3.2	3.2	3.2	3.1	3.1	3.1	3.1
eue Clearance Time (g_s), s	11.2	11.2	6.1	6.1	7.5	7.5	28.0	28.0
een Extension Time (g_e), s	1.0	1.0	1.0	1.0	0.3	0.3	0.0	0.0
ase Call Probability	1.00	1.00	1.00	1.00	0.95	0.95	0.99	0.99
ax Out Probability	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00

ovement Group Results	EB			WB			NB			SB		
proach Movement	L	T	R	L	T	R	L	T	R	L	T	R
signed Movement	5	2	12	1	6	16	3	8	18	7	4	14
justed Flow Rate (v), veh/h	278	0	0	136	0	114	166	0	0	174	0	107
justed Saturation Flow Rate (s), veh/h/ln	1816	0	0	1790	0	1548	1870	0	0	1707	0	1819
eue Service time (g_s), s	2.5	0.0	0.0	0.0	0.0	2.0	5.5	0.0	0.0	4.2	26.0	2.3
cle Queue Clearance Time (g_c), s	9.2	0.0	0.0	4.1	0.0	2.0	5.5	0.0	0.0	4.2	26.0	2.3
pacity (c), veh/h	407			402		930	216			699	0	745
lume-to-Capacity Ratio (X)	0.684	0.000	0.000	0.338	0.000	0.123	0.771	0.000	0.000	0.249	0.000	0.143
ailable Capacity (c_a), veh/h	898			874		1366	766			699	0	
ck of Queue (Q), veh/ln	3.8			1.7		0.5	2.4			1.4		0.8
erflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
eue Storage Ratio (RQ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
iform Delay (d_1), s/veh	24.4			22.4		5.5	27.3			12.3		11.7
cremental Delay (d_2), s/veh	0.8	0.0	0.0	0.2	0.0	0.0	2.2	0.0	0.0	0.1	0.0	0.0
tial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ntrol Delay (d), s/veh	25.2			22.6		5.5	29.5			12.4		11.8
vel of Service (LOS)	C			C		A	C			B		B
proach Delay, s/veh / LOS	25.2	C		14.8	B		29.5	C		12.2	B	
ersection Delay s/veh / LOS	19.5						B					

ltiModal Results	EB		WB		NB		SB	
destrian LOS Score / LOS	2.1	B	2.3	B	2.3	B	2.1	B
cycle LOS Score / LOS	0.9	A	0.9	A	0.8	A	1.0	A

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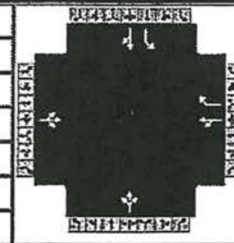
2010 HCS Signalized Intersection Results Summary

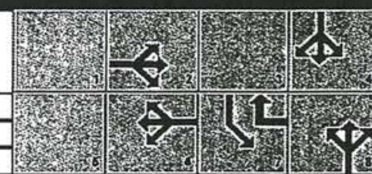
ıeral Information				Intersection Information	
ncy	CPL			Duration, h	0.25
lyst	JLM	Analysis Date	Dec 6, 2011	Area Type	Other
sdiction		Time Period	ETC PM Peak	PHF	0.92
rsection		Analysis Year	2015	Analysis Period	1> 7:00
Name	Waring at Culver_PM Peak_ETC.xus				
ect Description	PM ETC Peak				



ıand Information	EB			WB			NB			SB		
roach Movement	L	T	R	L	T	R	L	T	R	L	T	R
ıand (v), veh/h	17	330	46	8	168	140	50	186	15	217	113	11

ıal Information			
e, s	77.9	Reference Phase	2
et, s	0	Reference Point	End
oordinated	Yes	Simult. Gap E/W	On
e Mode	Fixed	Simult. Gap N/S	On

Green	19.1	26.0	12.3	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	2.0	2.0	2.0	0.0	0.0	0.0



er Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
gned Phase	2	2	6	6	8	8	4	4
e Number	8.0	8.0	7.0	7.0	12.0	12.0	10.0	10.0
se Duration, s	26.5	26.5	26.5	26.5	19.3	19.3	32.0	32.0
ıge Period, *(Y+Rc)*, s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Allow Headway *(MAH)*, s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
ue Clearance Time *(gs)*, s	19.2	19.2	8.6	8.6	13.0	13.0	28.0	28.0
en Extension Time *(ge)*, s	1.3	1.3	1.5	1.5	0.4	0.4	0.0	0.0
se Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Out Probability	0.04	0.04	0.00	0.00	0.00	0.00	1.00	1.00

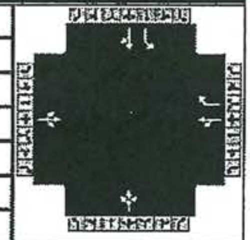
ement Group Results	EB			WB			NB			SB		
oach Movement	L	T	R	L	T	R	L	T	R	L	T	R
gned Movement	5	2	12	1	6	16	3	8	18	7	4	14
sted Flow Rate *(v)*, veh/h	427	0	0	191	0	152	273	0	0	236	0	135
sted Saturation Flow Rate *(s)*, veh/h/ln	1837	0	0	1821	0	1451	1880	0	0	1792	0	1852
ue Service time *(gs)*, s	6.5	0.0	0.0	0.0	0.0	3.7	11.0	0.0	0.0	7.9	26.0	4.1
e Queue Clearance Time *(gc)*, s	17.2	0.0	0.0	6.6	0.0	3.7	11.0	0.0	0.0	7.9	26.0	4.1
acity *(c)*, veh/h	533			529		867	322			598	0	618
me-to-Capacity Ratio *(X)*	0.802	0.000	0.000	0.362	0.000	0.176	0.848	0.000	0.000	0.394	0.000	0.218
able Capacity *(ca)*, veh/h	748			735		1043	627			598	0	
of Queue *(Q)*, veh/ln	7.5			2.8		1.0	4.9			3.1		1.7
flow Queue *(Q3)*, veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ue Storage Ratio *(RQ)*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
rm Delay *(d1)*, s/veh	27.3			23.5		7.0	31.3			19.9		18.6
mental Delay *(d2)*, s/veh	2.8	0.0	0.0	0.2	0.0	0.0	2.4	0.0	0.0	0.2	0.0	0.1
l Queue Delay *(d3)*, s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
rol Delay *(d)*, s/veh	30.1			23.7		7.1	33.7			20.1		18.7
l of Service (LOS)	C			C		A	C			C		B

oach Delay, s/veh / LOS	30.1	C	16.3	B	33.7	C	19.6	B
section Delay s/veh / LOS	24.7				C			

lModal Results	EB		WB		NB		SB	
strian LOS Score / LOS	2.1	B	2.3	B	2.3	B	2.1	B
le LOS Score / LOS	1.2	A	1.1	A	0.9	A	1.1	A

2010 HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	CPL			Duration, h	0.25
Analyst	JLM	Analysis Date	Dec 6, 2011	Area Type	Other
Jurisdiction		Time Period	ETC+20 AM Peak	PHF	0.92
Intersection		Analysis Year	2035	Analysis Period	1> 7:00
File Name	Waring at Culver_AM Peak_ETC+20.xus				
Project Description	AM ETC+20 Peak				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	7	201	42	12	189	71	39	68	13	330	182	8

Signal Information				
Cycle, s	43.9	Reference Phase	2	
Offset, s	0	Reference Point	End	
Uncoordinated	Yes	Simult. Gap E/W	On	
Force Mode	Fixed	Simult. Gap N/S	On	

Green	7.8	9.9	4.2	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	2.0	2.0	2.0	0.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	2	2	6	6	8	8	4	4
Case Number	8.0	8.0	7.0	7.0	12.0	12.0	10.0	10.0
Phase Duration, s	15.3	15.3	15.3	15.3	10.8	10.8	17.8	17.8
Change Period, *(Y+Rc)*, s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway *(MAH)*, s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Queue Clearance Time (g_s), s	8.3	8.3	6.6	6.6	5.1	5.1	10.8	10.8
Green Extension Time (g_e), s	1.1	1.1	1.1	1.1	0.2	0.2	1.0	1.0
Phase Call Probability	1.00	1.00	1.00	1.00	0.80	0.80	1.00	1.00
Max Out Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

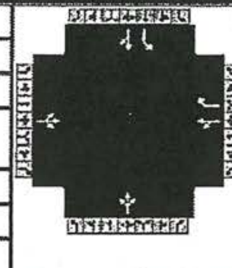
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	272	0	0	218	0	77	130	0	0	359	0	207
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1745	1976	0	1802	1900	1451	1766	1976	0	1675	1900	1779
Queue Service time (g_s), s	0.6	0.0	0.0	0.0	0.0	1.3	3.1	0.0	0.0	8.8	0.0	4.2
Cycle Queue Clearance Time (g_c), s	6.3	0.0	0.0	4.6	0.0	1.3	3.1	0.0	0.0	8.8	0.0	4.2
Capacity (*c*), veh/h	456	421		471	405	698	193	216		449	510	477
Volume-to-Capacity Ratio *(X)*	0.596	0.000	0.000	0.464	0.000	0.111	0.677	0.000	0.000	0.798	0.000	0.433
Available Capacity (c_a), veh/h	1252	1349		1259	1297	1379	1045	1169		991	1124	
Back of Queue *(Q)*, veh/ln	2.1			1.6	0.0	0.3	1.2			2.8	0.0	1.4
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Storage Ratio *(RQ)*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uniform Delay (d_1), s/veh	16.1	0.0		15.4	0.0	6.2	18.8	0.0		15.0	0.0	13.3
Incremental Delay (d_2), s/veh	0.5	0.0	0.0	0.3	0.0	0.0	1.6	0.0	0.0	1.3	0.0	0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay *(d)*, s/veh	16.5	0.0		15.7	0.0	6.3	20.4	0.0		16.2	0.0	13.5
Level of Service (LOS)	B			B		A	C			B		B
Approach Delay, s/veh / LOS	16.5	B		13.2	B		20.4	C		15.2	B	
Intersection Delay s/veh / LOS	15.6						B					

MultiModal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.1	B	2.3	B	2.3	B	2.1	B
Bicycle LOS Score / LOS	0.9	A	1.0	A	0.7	A	1.4	A

 HCS 2010™ Version 6.1 Generated: 12/6/2011 3:45:06 PM

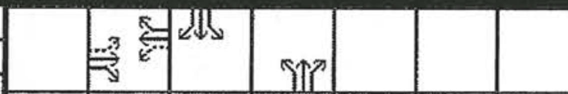
2010 HCS Signalized Intersection Results Summary

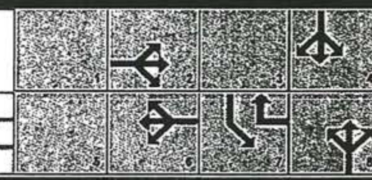
ıeral Information				Intersection Information	
ıncy	CPL			Duration, h	0.25
ılyst	JLM	Analysis Date	Dec 6, 2011	Area Type	Other
sdiction		Time Period	ETC+20 Noon Peak	PHF	0.92
rsection		Analysis Year	2035	Analysis Period	1> 7:00
Name	Waring at Culver_Noon Peak_ETC+20.xus				
ect Description	Noon ETC+20 Peak				



ıand Information	EB			WB			NB			SB		
roach Movement	L	T	R	L	T	R	L	T	R	L	T	R
ıand (*v*), veh/h	12	214	52	6	130	115	59	101	7	177	92	13

ıal Information





le, s	65.4	Reference Phase	2
et, s	0	Reference Point	End
oordinated	Yes	Simult. Gap E/W	On
ːe Mode	Fixed	Simult. Gap N/S	On

Green	11.3	26.0	6.7	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	2.0	2.0	2.0	0.0	0.0	0.0

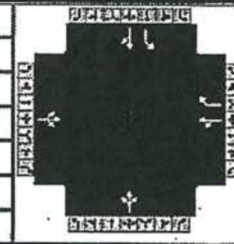
er Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
gned Phase	2	2	6	6	8	8	4	4
e Number	8.0	8.0	7.0	7.0	12.0	12.0	10.0	10.0
se Duration, s	19.3	19.3	19.3	19.3	14.1	14.1	32.0	32.0
nge Period, *(Y+Rc)*, s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Allow Headway *(MAH)*, s	3.2	3.2	3.2	3.2	3.1	3.1	3.1	3.1
ue Clearance Time *(gs)*, s	12.2	12.2	6.6	6.6	8.2	8.2	28.0	28.0
ːn Extension Time *(ge)*, s	1.1	1.1	1.1	1.1	0.3	0.3	0.0	0.0
se Call Probability	1.00	1.00	1.00	1.00	0.96	0.96	1.00	1.00
Out Probability	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00

ement Group Results	EB			WB			NB			SB		
ːoach Movement	L	T	R	L	T	R	L	T	R	L	T	R
gned Movement	5	2	12	1	6	16	3	8	18	7	4	14
sted Flow Rate (*v*), veh/h	302	0	0	148	0	125	182	0	0	192	0	114
sted Saturation Flow Rate (*s*), veh/h/ln	1822	0	0	1794	0	1548	1871	0	0	1707	0	1822
ue Service time (*gs*), s	2.8	0.0	0.0	0.0	0.0	2.3	6.2	0.0	0.0	5.0	26.0	2.6
e Queue Clearance Time (*gc*), s	10.2	0.0	0.0	4.6	0.0	2.3	6.2	0.0	0.0	5.0	26.0	2.6
ːacity (*c*), veh/h	428			422		930	232			678	0	724
me-to-Capacity Ratio *(X)*	0.706	0.000	0.000	0.350	0.000	0.134	0.781	0.000	0.000	0.284	0.000	0.158
ːlable Capacity (*ca*), veh/h	876			853		1325	744			678	0	
ː of Queue *(Q)*, veh/ln	4.2			1.9		0.6	2.7			1.7		1.0
ːflow Queue (*Q3*), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ıe Storage Ratio *(RQ)*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ːrm Delay (*d1*), s/veh	24.8			22.6		5.7	27.8			13.4		12.7
ːmental Delay (*d2*), s/veh	0.8	0.0	0.0	0.2	0.0	0.0	2.2	0.0	0.0	0.1	0.0	0.0
l Queue Delay (*d3*), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
rol Delay (*d*), s/veh	25.6			22.8		5.7	30.0			13.5		12.7
l of Service (LOS)	C			C		A	C			B		B
oach Delay, s/veh / LOS	25.6	C		15.0	B		30.0	C		13.2	B	
section Delay s/veh / LOS	20.0						C					

iModal Results	EB		WB		NB		SB	
ːstrian LOS Score / LOS	2.1	B	2.3	B	2.3	B	2.1	B
ːle LOS Score / LOS	1.0	A	0.9	A	0.8	A	1.0	A

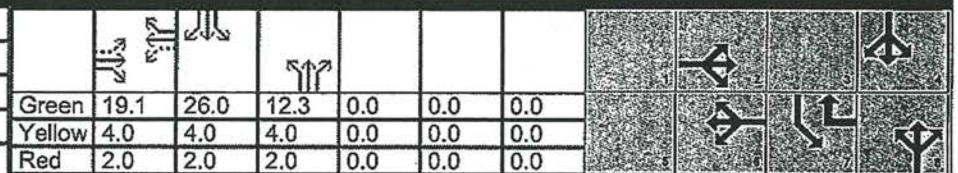
2010 HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	CPL			Duration, h	0.25
Analyst	JLM	Analysis Date	Dec 6, 2011	Area Type	Other
Jurisdiction		Time Period	ETC+20 PM Peak	PHF	0.92
Intersection		Analysis Year	2035	Analysis Period	1> 7:00
File Name	Waring at Culver_PM Peak_ETC+20.xus				
Project Description	PM ETC+20 Peak				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	17	362	50	8	187	153	53	204	15	238	124	11

Signal Information										
Cycle, s	82.1	Reference Phase	2							
Offset, s	0	Reference Point	End	Green	19.1	26.0	12.3	0.0	0.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	2.0	0.0	0.0	0.0



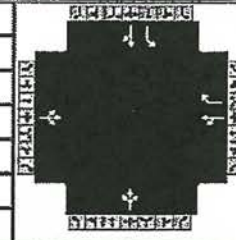
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	2	2	6	6	8	8	4	4
Case Number	8.0	8.0	7.0	7.0	12.0	12.0	10.0	10.0
Phase Duration, s	29.2	29.2	29.2	29.2	20.9	20.9	32.0	32.0
Change Period, *(Y+Rc)*, s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway *(MAH)*, s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Queue Clearance Time (g_s), s	21.8	21.8	9.6	9.6	14.5	14.5	28.0	28.0
Green Extension Time (g_e), s	1.3	1.3	1.7	1.7	0.4	0.4	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.14	0.14	0.00	0.00	0.00	0.00	1.00	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	466	0	0	212	0	166	296	0	0	259	0	147
Adjusted Saturation Flow Rate (s), veh/h/ln	1841	0	0	1820	0	1451	1881	0	0	1792	0	1854
Queue Service time (g_s), s	7.8	0.0	0.0	0.0	0.0	4.3	12.5	0.0	0.0	9.5	26.0	4.8
Cycle Queue Clearance Time (g_c), s	19.8	0.0	0.0	7.6	0.0	4.3	12.5	0.0	0.0	9.5	26.0	4.8
Capacity (c), veh/h	565			559		869	342			567	0	587
Volume-to-Capacity Ratio (X)	0.825	0.000	0.000	0.379	0.000	0.191	0.864	0.000	0.000	0.456	0.000	0.250
Available Capacity (c_a), veh/h	713			701		989	596			567	0	
Back of Queue (Q), veh/ln	9.0			3.2		1.1	5.7			3.8		2.0
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Storage Ratio *(RQ)*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uniform Delay (d_1), s/veh	28.1			23.9		7.5	32.6			22.4		20.8
Incremental Delay (d_2), s/veh	5.1	0.0	0.0	0.2	0.0	0.0	2.6	0.0	0.0	0.2	0.0	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	33.3			24.0		7.5	35.2			22.6		20.9
Level of Service (LOS)	C			C		A	D			C		C
Approach Delay, s/veh / LOS	33.3	C		16.8	B		35.2	D		22.0	C	
Intersection Delay s/veh / LOS	26.6						C					

MultiModal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.1	B	2.3	B	2.3	B	2.1	B
Bicycle LOS Score / LOS	1.3	A	1.1	A	1.0	A	1.2	A

2010 HCS Signalized Intersection Results Summary

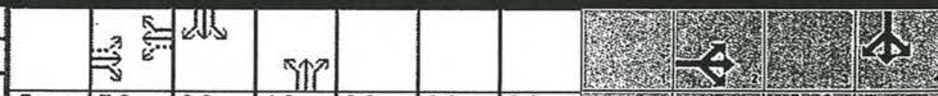
ıeral Information				Intersection Information	
ıncy	CPL			Duration, h	0.25
ılyst	JLM	Analysis Date	Dec 6, 2011	Area Type	Other
sdiction		Time Period	Exist AM Peak	PHF	0.92
rsection		Analysis Year	2011	Analysis Period	1> 7:00
Name	Waring at Culver_AM Peak_Exist.xus				
ect Description	AM Existing Peak				



ıand Information	WARING EB			WB			NB NB WOODMAN			SB		
roach Movement	L	T	R	L	T	R	L	T	R	L	T	R
ıand (v), veh/h	4	177	36	8	167	62	33	59	9	293	161	4

ıal Information			
le, s	40.0	Reference Phase	2
et, s	0	Reference Point	End
oordinated	Yes	Simult. Gap E/W	On
ːe Mode	Fixed	Simult. Gap N/S	On

Green	7.8	9.9	4.2	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	2.0	2.0	2.0	0.0	0.0	0.0



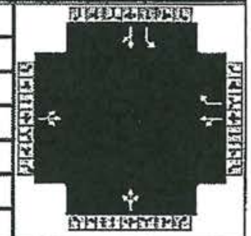
er Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
gned Phase	2	2	6	6	8	8	4	4
e Number	8.0	8.0	7.0	7.0	12.0	12.0	10.0	10.0
se Duration, s	13.8	13.8	13.8	13.8	10.2	10.2	15.9	15.9
nge Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
ue Clearance Time (g_s), s	6.9	6.9	5.7	5.7	4.4	4.4	9.1	9.1
ın Extension Time (g_e), s	0.9	0.9	0.9	0.9	0.2	0.2	0.9	0.9
se Call Probability	1.00	1.00	1.00	1.00	0.71	0.71	1.00	1.00
Out Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ement Group Results	EB			WB			NB			SB		
oach Movement	L	T	R	L	T	R	L	T	R	L	T	R
gned Movement	5	2	12	1	6	16	3	8	18	7	4	14
sted Flow Rate (v), veh/h	236	0	0	190	0	67	110	0	0	318	0	179
sted Saturation Flow Rate (s), veh/h/ln	1757	1976	0	1811	1900	1451	1772	1976	0	1675	1900	1785
ıe Service time (g_s), s	0.0	0.0	0.0	0.0	0.0	1.1	2.4	0.0	0.0	7.1	0.0	3.4
e Queue Clearance Time (g_c), s	4.9	0.0	0.0	3.7	0.0	1.1	2.4	0.0	0.0	7.1	0.0	3.4
acity (c), veh/h	436	388		449	373	645	188	210		416	472	443
me-to-Capacity Ratio (X)	0.541	0.000	0.000	0.423	0.000	0.105	0.584	0.000	0.000	0.766	0.000	0.405
able Capacity (c_a), veh/h	1390	1481		1403	1424	1447	1151	1283		1088	1234	
of Queue (Q), veh/ln	1.6			1.3	0.0	0.2	0.9			2.2	0.0	1.1
flow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ıe Storage Ratio (RQ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ırm Delay (d_1), s/veh	14.9	0.0		14.4	0.0	6.5	17.1	0.0		14.0	0.0	12.6
mental Delay (d_2), s/veh	0.4	0.0	0.0	0.2	0.0	0.0	1.1	0.0	0.0	1.1	0.0	0.2
l Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
rol Delay (d), s/veh	15.3	0.0		14.6	0.0	6.5	18.1	0.0		15.1	0.0	12.8
l of Service (LOS)	B			B		A	B			B		B
oach Delay, s/veh / LOS	15.3		B	12.5		B	18.1		B	14.3		B
section Delay s/veh / LOS	14.5						B					

Modal Results	EB		WB		NB		SB	
strian LOS Score / LOS	2.1	B	2.3	B	2.3	B	2.1	B
le LOS Score / LOS	0.9	A	0.9	A	0.7	A	1.3	A

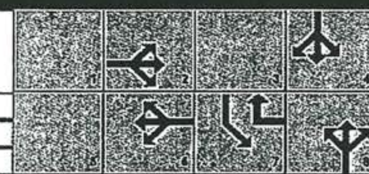
2010 HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	CPL			Duration, h	0.25
Analyst	JLM	Analysis Date	Dec 6, 2011	Area Type	Other
Jurisdiction		Time Period	Exist Noon Peak	PHF	0.92
Intersection		Analysis Year	2011	Analysis Period	1> 7:00
File Name	Waring at Culver_Noon Peak_Exist.xus				
Project Description	Noon Existing Peak				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	8	189	45	4	115	101	50	88	4	156	81	9

Signal Information										
Cycle, s	62.0	Reference Phase	2							
Offset, s	0	Reference Point	End	Green	11.3	26.0	6.7	0.0	0.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	2.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	2	2	6	6	8	8	4	4
Case Number	8.0	8.0	7.0	7.0	12.0	12.0	10.0	10.0
Phase Duration, s	17.3	17.3	17.3	17.3	12.7	12.7	32.0	32.0
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Queue Clearance Time (g_s), s	10.4	10.4	5.9	5.9	7.0	7.0	28.0	28.0
Green Extension Time (g_e), s	0.9	0.9	0.9	0.9	0.2	0.2	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	0.93	0.93	0.99	0.99
Max Out Probability	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00

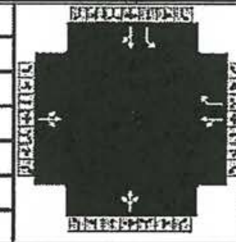
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	263	0	0	129	0	110	154	0	0	170	0	98
Adjusted Saturation Flow Rate (s), veh/h/ln	1838	0	0	1800	0	1548	1876	0	0	1707	0	1830
Queue Service time (g_s), s	1.7	0.0	0.0	0.0	0.0	1.9	5.0	0.0	0.0	4.0	26.0	2.0
Cycle Queue Clearance Time (g_c), s	8.4	0.0	0.0	3.9	0.0	1.9	5.0	0.0	0.0	4.0	26.0	2.0
Capacity (c), veh/h	395			388		932	202			716	0	768
Volume-to-Capacity Ratio (X)	0.666	0.000	0.000	0.333	0.000	0.118	0.763	0.000	0.000	0.237	0.000	0.127
Available Capacity (c_a), veh/h	933			908		1399	787			716	0	
Back of Queue (Q), veh/ln	3.4			1.5		0.4	2.2			1.3		0.7
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Storage Ratio (RQ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uniform Delay (d_1), s/veh	24.1			22.3		5.3	26.9			11.6		11.0
Incremental Delay (d_2), s/veh	0.7	0.0	0.0	0.2	0.0	0.0	2.2	0.0	0.0	0.1	0.0	0.0
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	24.8			22.5		5.3	29.1			11.7		11.1
Level of Service (LOS)	C			C		A	C			B		B
Approach Delay, s/veh / LOS	24.8	C		14.6	B		29.1	C		11.4	B	
Intersection Delay s/veh / LOS	19.0						B					

MultiModal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.1	B	2.3	B	2.3	B	2.1	B
Bicycle LOS Score / LOS	0.9	A	0.9	A	0.7	A	0.9	A

 HCS 2010™ Version 6.1 Generated: 12/6/2011 4:40:03 PM

2010 HCS Signalized Intersection Results Summary

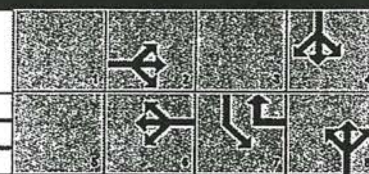
ıeral Information				Intersection Information	
ıncy	CPL			Duration, h	0.25
lyst	JLM	Analysis Date	Dec 6, 2011	Area Type	Other
sdiction		Time Period	Exist PM Peak	PHF	0.92
rsection		Analysis Year	2011	Analysis Period	1> 7:00
Name	Waring at Culver_PM Peak_Exist.xus				
ect Description	PM Exist Peak				



ıand Information	EB			WB			NB			SB		
roach Movement	L	T	R	L	T	R	L	T	R	L	T	R
ıand (*v*), veh/h	13	322	42	5	165	136	46	180	11	211	109	8

ıal Information				
e, s	75.5	Reference Phase	2	
et, s	0	Reference Point	End	
oordinated	Yes	Simult. Gap E/W	On	
e Mode	Fixed	Simult. Gap N/S	On	

Green	19.1	26.0	12.3	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	2.0	2.0	2.0	0.0	0.0	0.0



er Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
gned Phase	2	2	6	6	8	8	4	4
e Number	8.0	8.0	7.0	7.0	12.0	12.0	10.0	10.0
se Duration, s	25.1	25.1	25.1	25.1	18.3	18.3	32.0	32.0
nge Period, *(Y+Rc)*, s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Allow Headway *(MAH)*, s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
ue Clearance Time (g_s), s	17.8	17.8	8.2	8.2	12.0	12.0	28.0	28.0
en Extension Time (g_e), s	1.3	1.3	1.4	1.4	0.4	0.4	0.0	0.0
se Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Out Probability	0.02	0.02	0.00	0.00	0.00	0.00	1.00	1.00

ement Group Results	EB			WB			NB			SB		
oach Movement	L	T	R	L	T	R	L	T	R	L	T	R
gned Movement	5	2	12	1	6	16	3	8	18	7	4	14
sted Flow Rate (*v*), veh/h	410	0	0	185	0	148	258	0	0	229	0	127
sted Saturation Flow Rate (*s*), veh/h/ln	1855	0	0	1842	0	1451	1884	0	0	1792	0	1858
ue Service time (g_s), s	5.0	0.0	0.0	0.0	0.0	3.4	10.0	0.0	0.0	7.3	26.0	3.6
e Queue Clearance Time (g_c), s	15.8	0.0	0.0	6.2	0.0	3.4	10.0	0.0	0.0	7.3	26.0	3.6
acity (*c*), veh/h	520			517		868	308			617	0	640
me-to-Capacity Ratio *(X)*	0.788	0.000	0.000	0.358	0.000	0.170	0.837	0.000	0.000	0.372	0.000	0.199
lable Capacity (c_a), veh/h	778			769		1076	649			617	0	
of Queue (*Q*), veh/ln	6.8			2.6		0.9	4.5			2.8		1.5
flow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ue Storage Ratio *(RQ)*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
rm Delay (d_1), s/veh	26.8			23.3		6.8	30.6			18.6		17.4
mental Delay (d_2), s/veh	1.6	0.0	0.0	0.2	0.0	0.0	2.3	0.0	0.0	0.1	0.0	0.1
l Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
rol Delay (*d*), s/veh	28.5			23.5		6.8	32.9			18.7		17.5
l of Service (LOS)	C			C		A	C			B		B
oach Delay, s/veh / LOS	28.5	C		16.1	B		32.9	C		18.3	B	
section Delay s/veh / LOS	23.6						C					

iModal Results	EB		WB		NB		SB	
strian LOS Score / LOS	2.1	B	2.3	B	2.3	B	2.1	B
le LOS Score / LOS	1.2	A	1.0	A	0.9	A	1.1	A

North Plaza Drive_ETC Peak.txt
HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: JLM
Agency/Co.: Clark Patterson Lee
Date Performed: 11/1/2011
Analysis Time Period: PM Peak - ETC
Intersection: Northern Plaza Driveway
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2015 (ETC)
Project ID: Waring Road
East/West Street: North Plaza Drive
North/South Street: Waring Road
Intersection Orientation: NS
Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		231	16	27	252	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		231	16	27	252	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	14	0	35			
Peak Hour Factor, PHF	1.00	1.00	1.00			
Hourly Flow Rate, HFR	14	0	35			
Percent Heavy Vehicles	10	0	0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0	1	0			
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LTR				
v (vph)		27		49				
C(m) (vph)		1331		672				
v/c		0.02		0.07				
95% queue length		0.06		0.24				
Control Delay		7.8		10.8				
LOS		A		B				
Approach Delay				10.8				
Approach LOS				B				

North Plaza Drive_ETC+20 Peak.txt
HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: JLM
Agency/Co.: Clark Patterson Lee
Date Performed: 11/1/2011
Analysis Time Period:
Intersection: Northern Plaza Driveway
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2035 (ETC+20)
Project ID: Waring Road
East/West Street: North Plaza Drive
North/South Street: Waring Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		252	16	27	277	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		252	16	27	277	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	14	0	37			
Peak Hour Factor, PHF	1.00	1.00	1.00			
Hourly Flow Rate, HFR	14	0	37			
Percent Heavy Vehicles	10	0	0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0	1	0			
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LTR				
v (vph)		27		51				
C(m) (vph)		1307		650				
v/c		0.02		0.08				
95% queue length		0.06		0.25				
Control Delay		7.8		11.0				
LOS		A		B				
Approach Delay				11.0				
Approach LOS				B				

North Plaza Drive_Exist Peak.txt
HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: JLM
Agency/Co.: Clark Patterson Lee
Date Performed: 11/1/2011
Analysis Time Period: PM Peak - Exist
Intersection: Northern Plaza Driveway
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2011 (Exist)
Project ID: Waring Road
East/West Street: North Plaza Drive
North/South Street: Waring Road
Intersection Orientation: NS   Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		223	12	23	245	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		223	12	23	245	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR		LT	
Upstream Signal?		No			No	

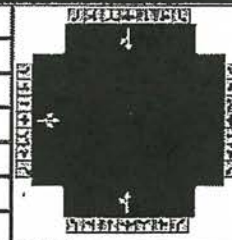
Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	10	0	31			
Peak Hour Factor, PHF	1.00	1.00	1.00			
Hourly Flow Rate, HFR	10	0	31			
Percent Heavy Vehicles	10	0	0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0	1	0			
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LTR				
v (vph)		23		41				
C(m) (vph)		1344		704				
v/c		0.02		0.06				
95% queue length		0.05		0.19				
Control Delay		7.7		10.4				
LOS		A		B				
Approach Delay				10.4				
Approach LOS				B				

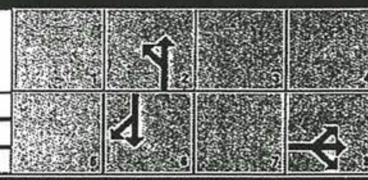
2010 HCS Signalized Intersection Results Summary

ıeral Information				Intersection Information	
ncy	CPL			Duration, h	0.25
lyst	JLM	Analysis Date	Dec 5, 2011	Area Type	Other
sdiction		Time Period	ETC AM Peak	PHF	0.92
rsection	Northland Ave	Analysis Year	2015	Analysis Period	1> 7:00
Name	Waring at Northland_AM Peak_ETC.xus				
ect Description	AM Peak - ETC				



ıand Information	EB			WB			NB			SB		
roach Movement	L	T	R	L	T	R	L	T	R	L	T	R
ıand (*v*), veh/h	10	0	47				161	116			175	26

ıal Information										
e, s	53.5	Reference Phase	2							
et, s	0	Reference Point	End	Green	30.0	12.0	0.0	0.0	0.0	0.0
oordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	3.5	0.0	0.0	0.0	0.0
e Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	0.0	0.0	0.0	0.0



er Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
gned Phase	8	8	7		2	2	1	6
e Number	12.0	12.0	0.0		8.0	8.0	0.0	4.0
se Duration, s	17.5	17.5	0.0		36.0	36.0	0.0	36.0
nge Period, *(Y+Rc)*, s	5.5	5.5	5.0		6.0	6.0	5.0	6.0
Allow Headway *(MAH)*, s	3.3	3.3	0.0		3.3	3.3	0.0	3.3
ue Clearance Time (g_s), s	3.6	3.6			7.4	7.4		5.2
ın Extension Time (g_e), s	0.1	0.1	0.0		1.1	1.1	0.0	1.1
se Call Probability	1.00	1.00			1.00	1.00		1.00
Out Probability	0.00	0.00			0.00	0.00		0.00

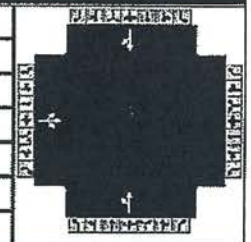
ement Group Results	EB			WB			NB			SB		
oach Movement	L	T	R	L	T	R	L	T	R	L	T	R
gned Movement	3	8	18	7	4	14	5	2	12	1	6	16
sted Flow Rate (*v*), veh/h	62	0	0	0			301	0	0	0	0	218
sted Saturation Flow Rate (*s*), veh/h/ln	1596	0	0	0			1076	0	0	0	0	1759
ıe Service time (g_s), s	1.6	0.0	0.0	0.0			2.2	0.0	0.0	0.0	0.0	3.2
e Queue Clearance Time (g_c), s	1.6	0.0	0.0	0.0			5.4	0.0	0.0	0.0	0.0	3.2
ıcity (*c*), veh/h	388						730	0				1019
me-to-Capacity Ratio *(X)*	0.160	0.000	0.000	0.000			0.412	0.000	0.000	0.000	0.000	0.214
able Capacity (c_a), veh/h	626						730	0				1019
of Queue (*Q*), veh/ln	0.5						1.5					0.9
flow Queue (Q_3), veh/ln	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
ıe Storage Ratio *(RQ)*	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
ırm Delay (d_1), s/veh	15.9						5.7	0.0				5.4
mental Delay (d_2), s/veh	0.1	0.0	0.0	0.0			1.7	0.0	0.0	0.0	0.0	0.5
Queue Delay (d_3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
rol Delay (*d*), s/veh	16.0						7.4	0.0				5.9
l of Service (LOS)	B						A					A
oach Delay, s/veh / LOS	16.0		B	0.0			7.4		A	5.9		A
section Delay s/veh / LOS		7.7						A				

Modal Results	EB		WB		NB		SB	
strian LOS Score / LOS	2.1	B	2.1	B	1.9	A	1.3	A
le LOS Score / LOS	1.7	A			2.1	B	1.9	A

 HCS 2010™ Version 6.1 Generated: 12/5/2011 3:03:50 PM

2010 HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	CPL			Duration, h	0.25
Analyst	JLM	Analysis Date	Dec 5, 2011	Area Type	Other
Jurisdiction		Time Period	ETC Noon Peak	PHF	0.92
Intersection	Northland Ave	Analysis Year	2015	Analysis Period	1> 7:00
File Name	Waring at Northland_Noon Peak_ETC.xus				
Project Description	Noon Peak - ETC				

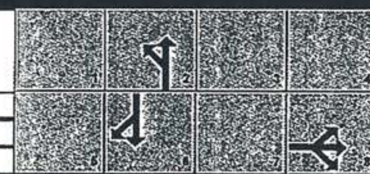


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	39	0	65				47	154			198	39

Signal Information

Cycle, s	53.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	30.0	12.0	0.0	0.0	0.0	0.0
Yellow	4.0	3.5	0.0	0.0	0.0	0.0
Red	2.0	2.0	0.0	0.0	0.0	0.0



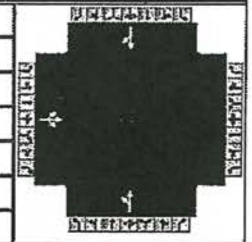
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	8	8	7		2	2	1	6
Case Number	12.0	12.0	0.0		8.0	8.0	0.0	4.0
Phase Duration, s	17.5	17.5	0.0		36.0	36.0	0.0	36.0
Change Period, (*Y+R*c), s	5.5	5.5	5.0		6.0	6.0	5.0	6.0
Max Allow Headway (*MAH*), s	3.3	3.3	0.0		3.1	3.1	0.0	3.1
Queue Clearance Time (g_s), s	4.8	4.8			4.9	4.9		5.7
Green Extension Time (g_e), s	0.2	0.2	0.0		0.9	0.9	0.0	0.9
Phase Call Probability	1.00	1.00			1.00	1.00		1.00
Max Out Probability	0.00	0.00			0.00	0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	113	0	0	0			218	0	0	0	0	258
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1729	0	0	0			1482	0	0	0	0	1833
Queue Service time (g_s), s	2.8	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	3.7
Cycle Queue Clearance Time (g_c), s	2.8	0.0	0.0	0.0			2.9	0.0	0.0	0.0	0.0	3.7
Capacity (*c*), veh/h	420						942	0				1062
Volume-to-Capacity Ratio (*X*)	0.269	0.000	0.000	0.000			0.232	0.000	0.000	0.000	0.000	0.242
Available Capacity (c_a), veh/h	679						942	0				1062
Back of Queue (*Q*), veh/ln	1.0						0.9					1.1
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
Queue Storage Ratio (*RQ*)	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
Uniform Delay (d_1), s/veh	16.4						5.3	0.0				5.5
Incremental Delay (d_2), s/veh	0.1	0.0	0.0	0.0			0.6	0.0	0.0	0.0	0.0	0.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
Control Delay (*d*), s/veh	16.5						5.9	0.0				6.0
Level of Service (LOS)	B						A					A

	EB		WB		NB		SB	
Approach Delay, s/veh / LOS	16.5	B	0.0		5.9	A	6.0	A
Intersection Delay s/veh / LOS	8.0				A			

MultiModal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.1	B	2.1	B	1.9	A	1.3	A
Bicycle LOS Score / LOS	1.7	A			1.9	A	2.0	A

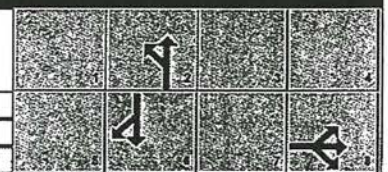
2010 HCS Signalized Intersection Results Summary



eral Information				Intersection Information	
ncy	CPL			Duration, h	0.25
lyst	JLM	Analysis Date	Dec 5, 2011	Area Type	Other
sdiction		Time Period	ETC PM Peak	PHF	0.92
rsection	Northland Ave	Analysis Year	2015	Analysis Period	1> 7:00
Name	Waring at Northland_PM Peak_ETC.xus				
ect Description	PM Peak - ETC				

nand Information	EB			WB			NB			SB		
roach Movement	L	T	R	L	T	R	L	T	R	L	T	R
nand (v), veh/h	48	0	154				45	212			280	39

nal Information										
le, s	53.5	Reference Phase	2							
et, s	0	Reference Point	End	Green	30.0	12.0	0.0	0.0	0.0	0.0
oordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	3.5	0.0	0.0	0.0	0.0
e Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	0.0	0.0	0.0	0.0



er Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
gned Phase	8	8	7		2	2	1	6
e Number	12.0	12.0	0.0		8.0	8.0	0.0	4.0
se Duration, s	17.5	17.5	0.0		36.0	36.0	0.0	36.0
nge Period, ($Y+R_c$), s	5.5	5.5	5.0		6.0	6.0	5.0	6.0
Allow Headway (MAH), s	3.3	3.3	0.0		3.1	3.1	0.0	3.1
ue Clearance Time (g_s), s	8.0	8.0			5.8	5.8		7.1
en Extension Time (g_e), s	0.4	0.4	0.0		1.2	1.2	0.0	1.2
se Call Probability	1.00	1.00			1.00	1.00		1.00
Out Probability	0.00	0.00			0.00	0.00		0.00

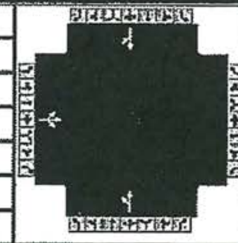
ement Group Results	EB			WB			NB			SB		
roach Movement	L	T	R	L	T	R	L	T	R	L	T	R
gned Movement	3	8	18	7	4	14	5	2	12	1	6	16
sted Flow Rate (v), veh/h	220	0	0	0			279	0	0	0	0	347
sted Saturation Flow Rate (s), veh/h/ln	1703	0	0	0			1568	0	0	0	0	1865
ue Service time (g_s), s	6.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	5.1
e Queue Clearance Time (g_c), s	6.0	0.0	0.0	0.0			3.8	0.0	0.0	0.0	0.0	5.1
acity (c), veh/h	414						988	0				1081
me-to-Capacity Ratio (X)	0.531	0.000	0.000	0.000			0.283	0.000	0.000	0.000	0.000	0.321
able Capacity (c_a), veh/h	668						988	0				1081
of Queue (Q), veh/ln	2.1						1.2					1.6
flow Queue (Q_3), veh/ln	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
ue Storage Ratio (RQ)	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
rm Delay (d_1), s/veh	17.6						5.5	0.0				5.8
mental Delay (d_2), s/veh	0.4	0.0	0.0	0.0			0.7	0.0	0.0	0.0	0.0	0.8
l Queue Delay (d_3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0.		0.0	0.0
rol Delay (d), s/veh	18.0						6.3	0.0				6.6
l of Service (LOS)	B						A					A
oach Delay, s/veh / LOS	18.0	B		0.0			6.3	A		6.6	A	
section Delay s/veh / LOS	9.4						A					

iModal Results	EB		WB		NB		SB	
estrian LOS Score / LOS	2.1	B	2.1	B	1.9	A	1.3	A
le LOS Score / LOS	1.9	A			2.0	B	2.1	B

 HCS 2010™ Version 6.1 Generated: 12/5/2011 3:03:31 PM

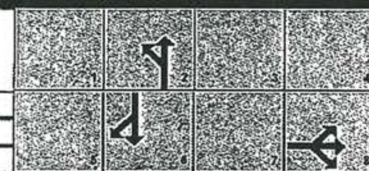
2010 HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	CPL			Duration, h	0.25
Analyst	JLM	Analysis Date	Dec 5, 2011	Area Type	Other
Jurisdiction		Time Period	ETC+20 AM Peak	PHF	0.92
Intersection	Northland Ave	Analysis Year	2035	Analysis Period	1> 7:00
File Name	Waring at Northland_AM Peak_ETC+20.xus				
Project Description	AM Peak - ETC				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	10	0	50				177	127			194	27

Signal Information										
Cycle, s	53.5	Reference Phase	2							
Offset, s	0	Reference Point	End	Green	30.0	12.0	0.0	0.0	0.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	3.5	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	0.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	8	8	7		2	2	1	6
Case Number	12.0	12.0	0.0		8.0	8.0	0.0	4.0
Phase Duration, s	17.5	17.5	0.0		36.0	36.0	0.0	36.0
Change Period, *(Y+Rc)*, s	5.5	5.5	5.0		6.0	6.0	5.0	6.0
Max Allow Headway *(MAH)*, s	3.3	3.3	0.0		3.3	3.3	0.0	3.3
Queue Clearance Time *(gs)*, s	3.7	3.7			8.4	8.4		5.6
Green Extension Time *(ge)*, s	0.1	0.1	0.0		1.2	1.2	0.0	1.2
Phase Call Probability	1.00	1.00			1.00	1.00		1.00
Max Out Probability	0.00	0.00			0.00	0.00		0.00

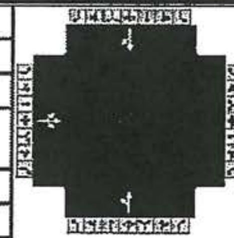
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	5	2	12	1	6	16
Adjusted Flow Rate *(v)*, veh/h	65	0	0	0			330	0	0	0	0	240
Adjusted Saturation Flow Rate *(s)*, veh/h/ln	1594	0	0	0			1073	0	0	0	0	1762
Queue Service time *(gs)*, s	1.7	0.0	0.0	0.0			2.8	0.0	0.0	0.0	0.0	3.6
Cycle Queue Clearance Time *(gc)*, s	1.7	0.0	0.0	0.0			6.4	0.0	0.0	0.0	0.0	3.6
Capacity *(c)*, veh/h	387						728	0				1021
Volume-to-Capacity Ratio *(X)*	0.168	0.000	0.000	0.000			0.454	0.000	0.000	0.000	0.000	0.235
Available Capacity *(ca)*, veh/h	626						728	0				1021
Back of Queue *(Q)*, veh/ln	0.6						1.7					1.0
Overflow Queue *(Q3)*, veh/ln	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
Queue Storage Ratio *(RQ)*	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
Uniform Delay *(d1)*, s/veh	16.0						5.8	0.0				5.5
Incremental Delay *(d2)*, s/veh	0.1	0.0	0.0	0.0			2.0	0.0	0.0	0.0	0.0	0.5
Initial Queue Delay *(d3)*, s/veh	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
Control Delay *(d)*, s/veh	16.1						7.8	0.0				6.0
Level of Service (LOS)	B						A					A
Approach Delay, s/veh / LOS	16.1	B		0.0			7.8	A		6.0	A	
Intersection Delay s/veh / LOS	8.0						A					

MultiModal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.1	B	2.1	B	1.9	A	1.3	A
Bicycle LOS Score / LOS	1.7	A			2.1	B	2.0	A

 HCS 2010™ Version 6.1 Generated: 12/5/2011 3:11:09 PM

2010 HCS Signalized Intersection Results Summary

eral Information				Intersection Information	
ncy	CPL			Duration, h	0.25
yst	JLM	Analysis Date	Dec 5, 2011	Area Type	Other
sdiction		Time Period	ETC+20 Noon Peak	PHF	0.92
section	Northland Ave	Analysis Year	2035	Analysis Period	1> 7:00
Name	Waring at Northland_Noon Peak_ETC+20.xus				
ect Description	Noon Peak - ETC+20				



iand Information	EB			WB			NB			SB		
roach Movement	L	T	R	L	T	R	L	T	R	L	T	R
and (v), veh/h	41	0	70				48	170			217	42

al Information											
e, s	53.5	Reference Phase	2								
et, s	0	Reference Point	End								
oordinated	Yes	Simult. Gap E/W	On	Green	30.0	12.0	0.0	0.0	0.0	0.0	
e Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	3.5	0.0	0.0	0.0	0.0	
				Red	2.0	2.0	0.0	0.0	0.0	0.0	

er Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
gned Phase	8	8	7		2	2	1	6
Number	12.0	12.0	0.0		8.0	8.0	0.0	4.0
e Duration, s	17.5	17.5	0.0		36.0	36.0	0.0	36.0
ige Period, $(Y+R_c)$, s	5.5	5.5	5.0		6.0	6.0	5.0	6.0
Allow Headway *(MAH)*, s	3.3	3.3	0.0		3.1	3.1	0.0	3.1
ie Clearance Time (g_s), s	5.0	5.0			5.1	5.1		6.1
n Extension Time (g_e), s	0.2	0.2	0.0		1.0	1.0	0.0	1.0
e Call Probability	1.00	1.00			1.00	1.00		1.00
Out Probability	0.00	0.00			0.00	0.00		0.00

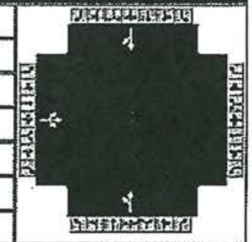
ement Group Results	EB			WB			NB			SB		
oach Movement	L	T	R	L	T	R	L	T	R	L	T	R
ned Movement	3	8	18	7	4	14	5	2	12	1	6	16
sted Flow Rate (v), veh/h	121	0	0	0			237	0	0	0	0	282
sted Saturation Flow Rate (s), veh/h/ln	1728	0	0	0			1503	0	0	0	0	1834
ie Service time (g_s), s	3.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	4.1
Queue Clearance Time (g_c), s	3.0	0.0	0.0	0.0			3.1	0.0	0.0	0.0	0.0	4.1
city (c), veh/h	420						953	0				1063
ne-to-Capacity Ratio (X)	0.287	0.000	0.000	0.000			0.249	0.000	0.000	0.000	0.000	0.265
able Capacity (c_a), veh/h	678						953	0				1063
of Queue (Q), veh/ln	1.1						1.0					1.2
low Queue (Q_3), veh/ln	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
e Storage Ratio (RQ)	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
rm Delay (d_1), s/veh	16.5						5.4	0.0				5.6
nental Delay (d_2), s/veh	0.1	0.0	0.0	0.0			0.6	0.0	0.0	0.0	0.0	0.6
Queue Delay (d_3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
ol Delay (d), s/veh	16.6						6.0	0.0				6.2
of Service (LOS)	B						A					A
oach Delay, s/veh / LOS	16.6		B	0.0			6.0		A	6.2		A
ection Delay s/veh / LOS	8.1						A					

Modal Results	EB		WB		NB		SB	
strian LOS Score / LOS	2.1	B	2.1	B	1.9	A	1.3	A
le LOS Score / LOS	1.8	A			2.0	A	2.0	B

 HCS 2010™ Version 6.1 Generated: 12/5/2011 3:13:44 PM

2010 HCS Signalized Intersection Results Summary

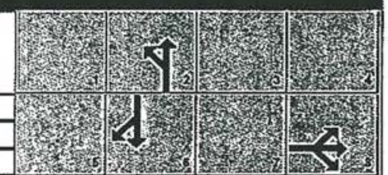
General Information				Intersection Information	
Agency	CPL			Duration, h	0.25
Analyst	JLM	Analysis Date	Dec 5, 2011	Area Type	Other
Jurisdiction		Time Period	ETC+20 PM Peak	PHF	0.92
Intersection	Northland Ave	Analysis Year	2035	Analysis Period	1> 7:00
File Name	Waring at Northland_PM Peak_ETC+20.xus				
Project Description	PM Peak - ETC+20				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	51	0	170				48	233			307	41

Signal Information			
Cycle, s	53.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	30.0	12.0	0.0	0.0	0.0	0.0
Yellow	4.0	3.5	0.0	0.0	0.0	0.0
Red	2.0	2.0	0.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	8	8	7		2	2	1	6
Case Number	12.0	12.0	0.0		8.0	8.0	0.0	4.0
Phase Duration, s	17.5	17.5	0.0		36.0	36.0	0.0	36.0
Change Period, $(Y+R_c)$, s	5.5	5.5	5.0		6.0	6.0	5.0	6.0
Max Allow Headway *(MAH)*, s	3.3	3.3	0.0		3.1	3.1	0.0	3.1
Queue Clearance Time (g_s), s	8.7	8.7			6.3	6.3		7.7
Green Extension Time (g_e), s	0.4	0.4	0.0		1.4	1.4	0.0	1.3
Phase Call Probability	1.00	1.00			1.00	1.00		1.00
Max Out Probability	0.00	0.00			0.00	0.00		0.00

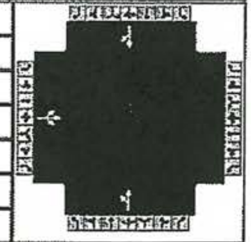
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	240	0	0	0			305	0	0	0	0	378
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1701	0	0	0			1570	0	0	0	0	1867
Queue Service time (g_s), s	6.7	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	5.7
Cycle Queue Clearance Time (g_c), s	6.7	0.0	0.0	0.0			4.3	0.0	0.0	0.0	0.0	5.7
Capacity (*c*), veh/h	413						988	0				1082
Volume-to-Capacity Ratio *(X)*	0.581	0.000	0.000	0.000			0.309	0.000	0.000	0.000	0.000	0.350
Available Capacity (c_a), veh/h	668						988	0				1082
Back of Queue (*Q*), veh/ln	2.3						1.4					1.8
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
Queue Storage Ratio *(RQ)*	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
Uniform Delay (d_1), s/veh	17.8						5.6	0.0				5.9
Incremental Delay (d_2), s/veh	0.5	0.0	0.0	0.0			0.8	0.0	0.0	0.0	0.0	0.9
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
Control Delay (*d*), s/veh	18.3						6.4	0.0				6.8
Level of Service (LOS)	B						A					A

	EB		WB		NB		SB	
Approach Delay, s/veh / LOS	18.3	B	0.0		6.4	A	6.8	A
Intersection Delay s/veh / LOS	9.7				A			

MultiModal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.1	B	2.1	B	1.9	A	1.3	A
Bicycle LOS Score / LOS	2.0	A			2.1	B	2.2	B

2010 HCS Signalized Intersection Results Summary

eral Information				Intersection Information	
ncy	CPL			Duration, h	0.25
lyst	JLM	Analysis Date	Dec 5, 2011	Area Type	Other
sdiction		Time Period	Existing AM Peak	PHF	0.92
rsection	Northland Ave	Analysis Year	2011	Analysis Period	1> 7:00
Name	Waring at Northland_AM Peak_Exist.xus				
ect Description	AM Peak - Exist				



ıand Information	EB			WB			NB			SB		
roach Movement	L	T	R	L	T	R	L	T	R	L	T	R
ıand (*v*), veh/h	6	0	43				156	112			171	22

ıal Information										
e, s	53.5	Reference Phase	2							
et, s	0	Reference Point	End	Green	30.0	12.0	0.0	0.0	0.0	0.0
oordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	3.5	0.0	0.0	0.0	0.0
e Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	0.0	0.0	0.0	0.0

er Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
gned Phase	8	8	7		2	2	1	6
e Number	12.0	12.0	0.0		8.0	8.0	0.0	4.0
se Duration, s	17.5	17.5	0.0		36.0	36.0	0.0	36.0
nge Period, $(Y+R_c)$, s	5.5	5.5	5.0		6.0	6.0	5.0	6.0
Allow Headway (*MAH*), s	3.3	3.3	0.0		3.3	3.3	0.0	3.3
ue Clearance Time (g_s), s	3.4	3.4			7.2	7.2		5.0
n Extension Time (g_e), s	0.1	0.1	0.0		1.0	1.0	0.0	1.0
e Call Probability	1.00	1.00			1.00	1.00		1.00
Out Probability	0.00	0.00			0.00	0.00		0.00

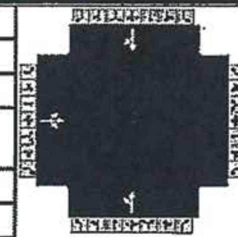
ement Group Results	EB			WB			NB			SB		
oach Movement	L	T	R	L	T	R	L	T	R	L	T	R
gned Movement	3	8	18	7	4	14	5	2	12	1	6	16
sted Flow Rate (*v*), veh/h	53	0	0	0			291	0	0	0	0	210
sted Saturation Flow Rate (*s*), veh/h/ln	1572	0	0	0			1075	0	0	0	0	1764
e Service time (g_s), s	1.4	0.0	0.0	0.0			2.2	0.0	0.0	0.0	0.0	3.0
Queue Clearance Time (g_c), s	1.4	0.0	0.0	0.0			5.2	0.0	0.0	0.0	0.0	3.0
city (*c*), veh/h	382						729	0				1022
ne-to-Capacity Ratio (*X*)	0.139	0.000	0.000	0.000			0.399	0.000	0.000	0.000	0.000	0.205
able Capacity (c_a), veh/h	617						729	0				1022
of Queue (*Q*), veh/ln	0.5						1.4					0.9
flow Queue (Q_3), veh/ln	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
e Storage Ratio (*RQ*)	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
rm Delay (d_1), s/veh	15.9						5.6	0.0				5.4
mental Delay (d_2), s/veh	0.1	0.0	0.0	0.0			1.6	0.0	0.0	0.0	0.0	0.5
Queue Delay (d_3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
ol Delay (*d*), s/veh	15.9						7.3	0.0				5.8
of Service (LOS)	B						A					A
ach Delay, s/veh / LOS	15.9		B	0.0			7.3		A	5.8		A
ection Delay s/veh / LOS			7.5						A			

Modal Results	EB		WB		NB		SB	
strian LOS Score / LOS	2.1	B	2.1	B	1.9	A	1.3	A
le LOS Score / LOS	1.6	A			2.0	B	1.9	A

 HCS 2010™ Version 6.1 Generated: 12/5/2011 3:03:45 PM

2010 HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	CPL			Duration, h	0.25
Analyst	JLM	Analysis Date	Dec 5, 2011	Area Type	Other
Jurisdiction		Time Period	Existing Noon Peak	PHF	0.92
Intersection	Northland Ave	Analysis Year	2011	Analysis Period	1> 7:00
File Name	Waring at Northland_Noon Peak_Exist.xus				
Project Description	Noon Peak - Exist				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	35	0	61				43	150			192	35

Signal Information										
Cycle, s	53.5	Reference Phase	2							
Offset, s	0	Reference Point	End	Green	30.0	12.0	0.0	0.0	0.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	3.5	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	0.0	0.0	0.0	0.0

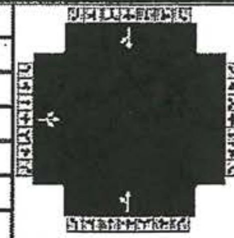
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	8	8	7		2	2	1	6
Case Number	12.0	12.0	0.0		8.0	8.0	0.0	4.0
Phase Duration, s	17.5	17.5	0.0		36.0	36.0	0.0	36.0
Change Period, ($Y+R_c$), s	5.5	5.5	5.0		6.0	6.0	5.0	6.0
Max Allow Headway (MAH), s	3.3	3.3	0.0		3.1	3.1	0.0	3.1
Queue Clearance Time (g_s), s	4.6	4.6			4.8	4.8		5.5
Green Extension Time (g_e), s	0.2	0.2	0.0		0.9	0.9	0.0	0.9
Phase Call Probability	1.00	1.00			1.00	1.00		1.00
Max Out Probability	0.00	0.00			0.00	0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	104	0	0	0			210	0	0	0	0	247
Adjusted Saturation Flow Rate (s), veh/h/ln	1745	0	0	0			1493	0	0	0	0	1855
Queue Service time (g_s), s	2.6	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	3.5
Cycle Queue Clearance Time (g_c), s	2.6	0.0	0.0	0.0			2.8	0.0	0.0	0.0	0.0	3.5
Capacity (c), veh/h	424						948	0				1075
Volume-to-Capacity Ratio (X)	0.246	0.000	0.000	0.000			0.221	0.000	0.000	0.000	0.000	0.230
Available Capacity (c_a), veh/h	685						948	0				1075
Back of Queue (Q), veh/ln	0.9						0.9					1.0
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
Queue Storage Ratio (RQ)	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
Uniform Delay (d_1), s/veh	16.3						5.3	0.0				5.5
Incremental Delay (d_2), s/veh	0.1	0.0	0.0	0.0			0.5	0.0	0.0	0.0	0.0	0.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
Control Delay (d), s/veh	16.4						5.9	0.0				6.0
Level of Service (LOS)	B						A					A
Approach Delay, s/veh / LOS	16.4		B	0.0			5.9		A	6.0		A
Intersection Delay s/veh / LOS	7.9						A					

MultiModal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.1	B	2.1	B	1.9	A	1.3	A
Bicycle LOS Score / LOS	1.7	A			1.9	A	2.0	A

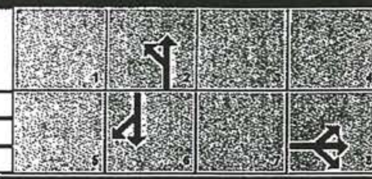
2010 HCS Signalized Intersection Results Summary

ieral Information				Intersection Information	
ncy	CPL			Duration, h	0.25
lyst	JLM	Analysis Date	Nov 2, 2011	Area Type	Other
sdiction		Time Period	Existing PM Peak	PHF	0.92
rsection	Northland Ave	Analysis Year	2011	Analysis Period	1> 7:00
Name	Waring at Northland_PM Peak_Exist.xus				
ect Description	PM Peak - Exist				



hand Information	EB			WB			NB			SB		
roach Movement	L	T	R	L	T	R	L	T	R	L	T	R
hand (v), veh/h	44	0	150				41	206			272	35

hal Information										
e, s	53.5	Reference Phase	2							
et, s	0	Reference Point	End	Green	30.0	12.0	0.0	0.0	0.0	0.0
oordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	3.5	0.0	0.0	0.0	0.0
e Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	0.0	0.0	0.0	0.0



er Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
gned Phase	8	8	7		2	2	1	6
e Number	12.0	12.0	0.0		8.0	8.0	0.0	4.0
se Duration, s	17.5	17.5	0.0		36.0	36.0	0.0	36.0
nge Period, $(Y+R_c)$, s	5.5	5.5	5.0		6.0	6.0	5.0	6.0
Allow Headway (MAH), s	3.3	3.3	0.0		3.1	3.1	0.0	3.1
ue Clearance Time (g_s), s	7.7	7.7			5.6	5.6		6.8
n Extension Time (g_e), s	0.4	0.4	0.0		1.2	1.2	0.0	1.2
se Call Probability	1.00	1.00			1.00	1.00		1.00
Out Probability	0.00	0.00			0.00	0.00		0.00

ement Group Results	EB			WB			NB			SB		
oach Movement	L	T	R	L	T	R	L	T	R	L	T	R
gned Movement	3	8	18	7	4	14	5	2	12	1	6	16
sted Flow Rate (v), veh/h	211	0	0	0			268	0	0	0	0	334
sted Saturation Flow Rate (s), veh/h/ln	1700	0	0	0			1608	0	0	0	0	1886
ue Service time (g_s), s	5.7	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	4.8
e Queue Clearance Time (g_c), s	5.7	0.0	0.0	0.0			3.6	0.0	0.0	0.0	0.0	4.8
acity (c), veh/h	413						1010	0				1093
me-to-Capacity Ratio (X)	0.510	0.000	0.000	0.000			0.266	0.000	0.000	0.000	0.000	0.305
able Capacity (c_a), veh/h	667						1010	0				1093
of Queue (Q), veh/ln	2.0						1.2					1.5
flow Queue (Q_3), veh/ln	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
ue Storage Ratio (RQ)	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
rm Delay (d_1), s/veh	17.5						5.5	0.0				5.7
mental Delay (d_2), s/veh	0.4	0.0	0.0	0.0			0.6	0.0	0.0	0.0	0.0	0.7
Queue Delay (d_3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0		0.0	0.0
rol Delay (d), s/veh	17.9						6.1	0.0				6.5
l of Service (LOS)	B						A					A
bach Delay, s/veh / LOS	17.9		B	0.0			6.1		A	6.5		A
section Delay s/veh / LOS			9.3						A			

Modal Results	EB		WB		NB		SB	
strian LOS Score / LOS	2.1	B	2.1	B	1.9	A	1.3	A
le LOS Score / LOS	1.9	A			2.0	B	2.1	B

South Plaza Drive_ETC Peak.txt
HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: JLM
Agency/Co.: Clark Patterson Lee
Date Performed: 11/1/2011
Analysis Time Period: PM Peak - ETC
Intersection: Southern Plaza Driveway
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2015 (ETC)
Project ID: Waring Road
East/West Street: Fieldwood/South Plaza Drive
North/South Street: Waring Road
Intersection Orientation: NS   Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	12	215	41	11	244	8
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	12	215	41	11	244	8
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	51	11	19	10	12	12
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	51	11	19	10	12	12
Percent Heavy Vehicles	0	0	0	0	0	33
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	12	11		81			34	
C(m) (vph)	1325	1321		486			504	
v/c	0.01	0.01		0.17			0.07	
95% queue length	0.03	0.03		0.59			0.22	
Control Delay	7.7	7.7		13.9			12.7	
LOS	A	A		B			B	
Approach Delay				13.9			12.7	
Approach LOS				B			B	

South Plaza Drive_ETC+20 Peak.txt
HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: JLM
Agency/Co.: Clark Patterson Lee
Date Performed: 11/1/2011
Analysis Time Period: PM Peak - ETC+20
Intersection: Southern Plaza Driveway
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2035 (ETC+20)
Project ID: Waring Road
East/West Street: Fieldwood/South Plaza Drive
North/South Street: Waring Road
Intersection Orientation: NS   Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	12	235	44	11	267	8
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	12	235	44	11	267	8
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	55	11	19	10	12	12
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	55	11	19	10	12	12
Percent Heavy Vehicles	0	0	0	0	0	33
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	12	11		85			34	
C(m) (vph)	1300	1295		454			476	
v/c	0.01	0.01		0.19			0.07	
95% queue length	0.03	0.03		0.68			0.23	
Control Delay	7.8	7.8		14.7			13.1	
LOS	A	A		B			B	
Approach Delay				14.7			13.1	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: JLM
Agency/Co.: Clark Patterson Lee
Date Performed: 11/1/2011
Analysis Time Period: PM Peak - Existing
Intersection: Southern Plaza Driveway
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2011 (Existing)
Project ID: Waring Road
East/West Street: Fieldwood/South Plaza Drive
North/South Street: Waring Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	9	209	37	7	236	5
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	9	209	37	7	236	5
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	47	8	15	6	9	9
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	47	8	15	6	9	9
Percent Heavy Vehicles	0	0	0	0	0	33
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	9	7		70			24	
C(m) (vph)	1337	1332		509			533	
v/c	0.01	0.01		0.14			0.05	
95% queue length	0.02	0.02		0.47			0.14	
Control Delay	7.7	7.7		13.2			12.1	
LOS	A	A		B			B	
Approach Delay				13.2			12.1	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: Askinazi
Agency/Co.: Clark Patterson Lee
Date Performed: 11/16/2012
Analysis Time Period: AM Peak ETC+20
Intersection: Waring/Northland
Jurisdiction: City of Rochester NY
Units: U. S. Customary
Analysis Year: 2035
Project ID: Waring Road Improvements
East/West Street: Northland Ave
North/South Street: Waring Road
Intersection Orientation: NS   Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	177	127			194	27
Peak-Hour Factor, PHF	0.92	0.92			0.92	0.92
Hourly Flow Rate, HFR	192	138			210	29
Percent Heavy Vehicles	4	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		Yes			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				10		50
Peak Hour Factor, PHF				0.92		0.92
Hourly Flow Rate, HFR				10		54
Percent Heavy Vehicles				4		4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			No /
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	192						64	
C(m) (vph)	1316						656	
v/c	0.15						0.10	
95% queue length	0.51						0.32	
Control Delay	8.2						11.1	
LOS	A						B	
Approach Delay							11.1	
Approach LOS							B	

HCS+: Unsignalized Intersections Release 5.6

hone: Fax:
-Mail:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

nalyst: Askinazi
gency/Co.: Clark Patterson Lee
ate Performed: 11/16/2012
nalysis Time Period: AM Peak ETC+20
ntersection: Waring/Northland
urisdiction: City of Rochester NY
nits: U. S. Customary
nalysis Year: 2035
roject ID: Waring Road Improvements
ast/West Street: Northland Ave
orth/South Street: Waring Road
ntersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

ajor Street Movements	1 L	2 T	3 R	4 L	5 T	6 R
olume	177	127			194	27
eak-Hour Factor, PHF	0.92	0.92			0.92	0.92
eak-15 Minute Volume	48	35			53	7
ourly Flow Rate, HFR	192	138			210	29
ercent Heavy Vehicles	4	--	--		--	--
edian Type/Storage	Undivided			/		
T Channelized?						
anes	0	1			1	0
onfiguration	LT				TR	
pstream Signal?		Yes			No	

inor Street Movements	7 L	8 T	9 R	10 L	11 T	12 R
olume				10		50
eak Hour Factor, PHF				0.92		0.92
eak-15 Minute Volume				3		14
ourly Flow Rate, HFR				10		54
ercent Heavy Vehicles				4		4
ercent Grade (%)		0			0	
lared Approach: Exists?/Storage			/			No /
T Channelized?						
anes				0	0	
onfiguration					LR	

Pedestrian Volumes and Adjustments

ovements	13	14	15	16
low (ped/hr)	0	0	0	0

Lane Width (ft)	12.0	12.0	12.0	12.0
Walking Speed (ft/sec)	4.0	4.0	4.0	4.0
Percent Blockage	0	0	0	0

Upstream Signal Data

		Prog. Flow vph	Sat Flow vph	Arrival Type	Green Time sec	Cycle Length sec	Prog. Speed mph	Distance to Signal feet
S2	Left-Turn	47	1700	3	14	44	35	1150
	Through	189	1700	3	8	44	35	1150
S5	Left-Turn							
	Through							

Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

	Movement 2	Movement 5
Shared ln volume, major th vehicles:	138	
Shared ln volume, major rt vehicles:	0	
Sat flow rate, major th vehicles:	1700	
Sat flow rate, major rt vehicles:	1700	
Number of major street through lanes:	1	

Worksheet 4-Critical Gap and Follow-up Time Calculation

Critical Gap Calculation

Movement		1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
t(c,base)		4.1					7.1		6.2
t(c,hv)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)		4					4		4
t(c,g)				0.20	0.20	0.10	0.20	0.20	0.10
Percent Grade				0.00	0.00	0.00	0.00	0.00	0.00
t(3,lt)		0.00					0.70		0.00
t(c,T):	1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage	4.1					6.4		6.2
	2-stage								

Follow-Up Time Calculations

Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
t(f,base)	2.20					3.50		3.30
t(f,HV)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)	4					4		4
t(f)	2.2					3.5		3.3

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

	Movement 2 V(t)	Movement 2 V(l,prot)	Movement 5 V(t)	Movement 5 V(l,prot)
V prog	189	47		

'otal Saturation Flow Rate, s (vph)	1700	1700
ırrival Type	3	3
:ffective Green, g (sec)	8	14
:ycle Length, C (sec)	44	44
ːp (from Exhibit 16-11)	1.000	1.000
'roportion vehicles arriving on green P	0.182	0.318
ı(q1)	4.0	0.8
ı(q2)	0.5	0.0
ı(q)	4.5	0.9

:omputation 2-Proportion of TWSC Intersection Time blocked

	Movement 2		Movement 5	
	V(t)	V(l,prot)	V(t)	V(l,prot)
.lpha	0.550			
›eta	0.645			
'ravel time, t(a) (sec)	22.352			
moothing Factor, F	0.112			
'roportion of conflicting flow, f	1.000	1.000		
Iax platooned flow, V(c,max)	704	164		
Iin platooned flow, V(c,min)	1000	1000		
'uration of blocked period, t(p)	0.0	0.0		
'roportion time blocked, p	0.000		0.000	

omputation 3-Platoon Event Periods	Result
(2)	0.000
(5)	0.000
(dom)	0.000
(subo)	0.000
onstrained or unconstrained?	U

roportion nblocked or minor ovements, p(x)	(1) Single-stage Process	(2) Two-Stage Process Stage I	(3) Stage II
(1)	1.000		
(4)			
(7)			
(8)			
(9)			
(10)	1.000		
(11)			
(12)	1.000		

omputation 4 and 5

ingle-Stage Process

ovement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
c,x	239					746		224
	1500					1500		1500
x	1.000					1.000		1.000
c,u,x	239					746		224
r,x	1316					378		810
plat,x	1316					378		810

wo-Stage Process

	7	8	10	11

	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2
V(c,x)								
s					1500	1500		
P(x)								
V(c,u,x)								
C(r,x)								
C(plat,x)								

Worksheet 6-Impedance and Capacity Equations

Step 1: RT from Minor St.	9	12
Conflicting Flows		224
Potential Capacity		810
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity		810
Probability of Queue free St.	1.00	0.93

Step 2: LT from Major St.	4	1
Conflicting Flows		239
Potential Capacity		1316
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity		1316
Probability of Queue free St.	1.00	0.85
Maj L-Shared Prob Q free St.		0.84

Step 3: TH from Minor St.	8	11
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	0.84	0.84
Movement Capacity		
Probability of Queue free St.	1.00	1.00

Step 4: LT from Minor St.	7	10
Conflicting Flows		746
Potential Capacity		378
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	0.84	
Maj. L, Min T Adj. Imp Factor.	0.88	
Cap. Adj. factor due to Impeding mvmnt	0.82	0.85
Movement Capacity		323

Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance

Step 3: TH from Minor St.	8	11
Part 1 - First Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		
Probability of Queue free St.		

art 2 - Second Stage		
onflicting Flows		
otential Capacity		
edestrian Impedance Factor		
ap. Adj. factor due to Impeding mvmnt		
ovement Capacity		

art 3 - Single Stage		
onflicting Flows		
otential Capacity		
edestrian Impedance Factor	1.00	1.00
ap. Adj. factor due to Impeding mvmnt	0.84	0.84
ovement Capacity		

esult for 2 stage process:		
t		
robability of Queue free St.	1.00	1.00

tep 4: LT from Minor St.	7	10
art 1 - First Stage		
onflicting Flows		
otential Capacity		
edestrian Impedance Factor		
ap. Adj. factor due to Impeding mvmnt		
ovement Capacity		

art 2 - Second Stage		
onflicting Flows		
otential Capacity		
edestrian Impedance Factor		
ap. Adj. factor due to Impeding mvmnt		
ovement Capacity		

art 3 - Single Stage		
onflicting Flows		746
otential Capacity		378
edestrian Impedance Factor	1.00	1.00
aj. L, Min T Impedance factor	0.84	
aj. L, Min T Adj. Imp Factor.	0.88	
ap. Adj. factor due to Impeding mvmnt	0.82	0.85
ovement Capacity		323

esults for Two-stage process:		
t		323

orksheet 8-Shared Lane Calculations

ovement	7 L	8 T	9 R	10 L	11 T	12 R
olume (vph)				10		54
ovement Capacity (vph)				323		810
hared Lane Capacity (vph)					656	

Worksheet 9-Computation of Effect of Flared Minor Street Approaches

Movement	7 L	8 T	9 R	10 L	11 T	12 R
C sep				323		810
Volume				10		54
Delay						
Q sep						
Q sep +1						
round (Qsep +1)						
n max						
C sh					656	
SUM C sep						
n						
C act						

Worksheet 10-Delay, Queue Length, and Level of Service

Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	192						64	
C(m) (vph)	1316						656	
v/c	0.15						0.10	
95% queue length	0.51						0.32	
Control Delay	8.2						11.1	
LOS	A						B	
Approach Delay							11.1	
Approach LOS							B	

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	0.85	1.00
v(il), Volume for stream 2 or 5	138	
v(i2), Volume for stream 3 or 6	0	
s(il), Saturation flow rate for stream 2 or 5	1700	
s(i2), Saturation flow rate for stream 3 or 6	1700	
P*(oj)	0.84	
d(M,LT), Delay for stream 1 or 4	8.2	
N, Number of major street through lanes	1	
d(rank,1) Delay for stream 2 or 5	1.3	

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

nalyst: Askinazi
gency/Co.: Clark Patterson Lee
ate Performed: 11/16/2012
nalysis Time Period: PM Peak ETC+20
ntersection: Waring/Northland
urisdiction: City of Rochester NY
nits: U. S. Customary
nalysis Year: 2035
roject ID: Waring Road Improvements
ast/West Street: Northland Ave
orth/South Street: Waring Road
ntersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

ajor Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
olume	48	233			307	41
eak-Hour Factor, PHF	0.92	0.92			0.92	0.92
ourly Flow Rate, HFR	52	253			333	44
ercent Heavy Vehicles	4	--	--		--	--
edian Type/Storage	Undivided			/		
T Channelized?						
anes	0	1			1	0
onfiguration	LT					TR
pstream Signal?		Yes			No	

inor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
olume				51		170
eak Hour Factor, PHF				0.92		0.92
ourly Flow Rate, HFR				55		184
ercent Heavy Vehicles				4		4
ercent Grade (%)		0			0	
lared Approach: Exists?/Storage			/			No /
anes				0		0
onfiguration					LR	

Delay, Queue Length, and Level of Service

pproach	NB	SB	Westbound			Eastbound		
ovement	1	4	7	8	9	10	11	12
ane Config	LT						LR	
(vph)	52						239	
(m) (vph)	1171						577	
/c	0.04						0.41	
5% queue length	0.14						2.02	
ontrol Delay	8.2						15.6	
OS	A						C	
pproach Delay							15.6	
pproach LOS							C	

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax:
E-Mail:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: Askinazi
Agency/Co.: Clark Patterson Lee
Date Performed: 11/16/2012
Analysis Time Period: PM Peak ETC+20
Intersection: Waring/Northland
Jurisdiction: City of Rochester NY
Units: U. S. Customary
Analysis Year: 2035
Project ID: Waring Road Improvements
East/West Street: Northland Ave
North/South Street: Waring Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movements	1 L	2 T	3 R	4 L	5 T	6 R
Volume	48	233			307	41
Peak-Hour Factor, PHF	0.92	0.92			0.92	0.92
Peak-15 Minute Volume	13	63			83	11
Hourly Flow Rate, HFR	52	253			333	44
Percent Heavy Vehicles	4	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT				TR	
Upstream Signal?		Yes			No	

Minor Street Movements	7 L	8 T	9 R	10 L	11 T	12 R
Volume				51		170
Peak Hour Factor, PHF				0.92		0.92
Peak-15 Minute Volume				14		46
Hourly Flow Rate, HFR				55		184
Percent Heavy Vehicles				4		4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			No /
RT Channelized?						
Lanes				0		0
Configuration					LR	

Pedestrian Volumes and Adjustments

Movements	13	14	15	16
Flow (ped/hr)	0	0	0	0

ane Width (ft)	12.0	12.0	12.0	12.0
alking Speed (ft/sec)	4.0	4.0	4.0	4.0
ercent Blockage	0	0	0	0

Upstream Signal Data

		Prog. Flow vph	Sat Flow vph	Arrival Type	Green Time sec	Cycle Length sec	Prog. Speed mph	Distance to Signal feet
2	Left-Turn	47	1700	3	14	44	35	1150
	Through	189	1700	3	8	44	35	1150
5	Left-Turn							
	Through							

orksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

	Movement 2	Movement 5
hared ln volume, major th vehicles:	253	
hared ln volume, major rt vehicles:	0	
at flow rate, major th vehicles:	1700	
at flow rate, major rt vehicles:	1700	
umber of major street through lanes:	1	

orksheet 4-Critical Gap and Follow-up Time Calculation

ritical Gap Calculation

ovement		1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
(c,base)		4.1					7.1		6.2
(c,hv)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
(hv)		4					4		4
(c,g)				0.20	0.20	0.10	0.20	0.20	0.10
ercent Grade				0.00	0.00	0.00	0.00	0.00	0.00
(3,lt)		0.00					0.70		0.00
(c,T):	1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
(c)	1-stage	4.1					6.4		6.2
	2-stage								

ollow-Up Time Calculations

ovement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
(f,base)	2.20					3.50		3.30
(f,HV)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
(HV)	4					4		4
(f)	2.2					3.5		3.3

orksheet 5-Effect of Upstream Signals

omputation 1-Queue Clearance Time at Upstream Signal

	Movement 2 V(t)	Movement 2 V(l,prot)	Movement 5 V(t)	Movement 5 V(l,prot)
prog	189	47		

Total Saturation Flow Rate, s (vph)	1700	1700
Arrival Type	3	3
Effective Green, g (sec)	8	14
Cycle Length, C (sec)	44	44
Rp (from Exhibit 16-11)	1.000	1.000
Proportion vehicles arriving on green P	0.182	0.318
g(q1)	4.0	0.8
g(q2)	0.5	0.0
g(q)	4.5	0.9

Computation 2-Proportion of TWSC Intersection Time blocked

	Movement 2		Movement 5	
	V(t)	V(l,prot)	V(t)	V(l,prot)
alpha	0.550			
beta	0.645			
Travel time, t(a) (sec)	22.352			
Smoothing Factor, F	0.112			
Proportion of conflicting flow, f	1.000	1.000		
Max platooned flow, V(c,max)	704	164		
Min platooned flow, V(c,min)	1000	1000		
Duration of blocked period, t(p)	0.0	0.0		
Proportion time blocked, p	0.000		0.000	

Computation 3-Platoon Event Periods	Result
p(2)	0.000
p(5)	0.000
p(dom)	0.000
p(subo)	0.000
Constrained or unconstrained?	U

Proportion unblocked for minor movements, p(x)	(1) Single-stage Process	(2) Two-Stage Process Stage I	(3) Stage II
p(1)	1.000		
p(4)			
p(7)			
p(8)			
p(9)			
p(10)	1.000		
p(11)			
p(12)	1.000		

Computation 4 and 5
Single-Stage Process

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
V c,x	377					712		355
s	1500					1500		1500
Px	1.000					1.000		1.000
V c,u,x	377					712		355
C r,x	1171					396		684
C plat,x	1171					396		684

Two-Stage Process

	7	8	10	11

	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2
(c,x)								
					1500	1500		
(x)								
(c,u,x)								
(r,x)								
(plat,x)								

orksheet 6-Impedance and Capacity Equations

tep 1: RT from Minor St.	9	12
onflicting Flows		355
otential Capacity		684
edestrian Impedance Factor	1.00	1.00
ovement Capacity		684
robability of Queue free St.	1.00	0.73

tep 2: LT from Major St.	4	1
onflicting Flows		377
otential Capacity		1171
edestrian Impedance Factor	1.00	1.00
ovement Capacity		1171
robability of Queue free St.	1.00	0.96
aj L-Shared Prob Q free St.		0.95

tep 3: TH from Minor St.	8	11
onflicting Flows		
otential Capacity		
edestrian Impedance Factor	1.00	1.00
ap. Adj. factor due to Impeding mvmnt	0.95	0.95
ovement Capacity		
robability of Queue free St.	1.00	1.00

tep 4: LT from Minor St.	7	10
onflicting Flows		712
otential Capacity		396
edestrian Impedance Factor	1.00	1.00
aj. L, Min T Impedance factor	0.95	
aj. L, Min T Adj. Imp Factor.	0.96	
ap. Adj. factor due to Impeding mvmnt	0.70	0.96
ovement Capacity		378

orksheet 7-Computation of the Effect of Two-stage Gap Acceptance

tep 3: TH from Minor St.	8	11
art 1 - First Stage		
onflicting Flows		
otential Capacity		
edestrian Impedance Factor		
ap. Adj. factor due to Impeding mvmnt		
ovement Capacity		
robability of Queue free St.		

Part 2 - Second Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		

Part 3 - Single Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	0.95	0.95
Movement Capacity		

Result for 2 stage process:		
a		
y		
C t		
Probability of Queue free St.	1.00	1.00

Step 4: LT from Minor St.	7	10
Part 1 - First Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		
Part 2 - Second Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		
Part 3 - Single Stage		
Conflicting Flows		712
Potential Capacity		396
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	0.95	
Maj. L, Min T Adj. Imp Factor.	0.96	
Cap. Adj. factor due to Impeding mvmnt	0.70	0.96
Movement Capacity		378
Results for Two-stage process:		
a		
y		
C t		378

Worksheet 8-Shared Lane Calculations

Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume (vph)				55		184
Movement Capacity (vph)				378		684
Shared Lane Capacity (vph)					577	

'orksheet 9-Computation of Effect of Flared Minor Street Approaches

lovement	7 L	8 T	9 R	10 L	11 T	12 R
sep				378		684
'olume				55		184
elay						
sep						
sep +1						
ound (Qsep +1)						
max						
sh					577	
UM C sep						
act						

orksheet 10-Delay, Queue Length, and Level of Service

ovement	1	4	7	8	9	10	11	12
ane Config	LT						LR	
(vph)	52						239	
(m) (vph)	1171						577	
/c	0.04						0.41	
5% queue length	0.14						2.02	
ontrol Delay	8.2						15.6	
OS	A						C	
pproach Delay							15.6	
pproach LOS							C	

orksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
(oj)	0.96	1.00
(il), Volume for stream 2 or 5	253	
(i2), Volume for stream 3 or 6	0	
(il), Saturation flow rate for stream 2 or 5	1700	
(i2), Saturation flow rate for stream 3 or 6	1700	
*(oj)	0.95	
(M,LT), Delay for stream 1 or 4	8.2	
, Number of major street through lanes	1	
(rank,1) Delay for stream 2 or 5	0.4	

APPENDIX D – ACCIDENT INFORMATION

Clark Patterson Lee
DESIGN PROFESSIONALS

BY JLM DATE 3/27/12 CHECKED BY DBA DATE 8-14-12
PROJECT WARING ROAD CALC. NO. REV.
SUBJECT ACCIDENT REANALYSIS JOB NO. SHEET NO. 1

- INITIAL CALCS DONE 12-12-11
- MCDOT COMMENTS SUGGEST EXTRAPOLATING AADT FROM 2011 PM PEAK TURNING MOVEMENT COUNTS DONE BY CPL
- ALSO HAVE "MONROE COUNTY TRAFFIC SUMMARY.XLS" WITH ADT INFO AVAILABLE. WILL NEED TO CONVERT ADT TO AADT

→ ACC/MEV = (1M)(# Acc/yr) / (365)(½ sum AADT on all approaches)

→ WILL RECALCULATE ACCIDENT RATES BASED UPON BOTH AS A CROSS CHECK

⇒ AADT = (ADT)(AXLE ADJ. FACTOR) / (SEASONAL ADJ.)

⇒ AADT = DDHV / K × D

↳ Per MCDOT → AADT = Σ INBOUND / K (for intersections

INTERSECTION CALCS

- WARING ROAD @ NORTHLAND

  - Waring
    - Urban Collector
    - ADT = 8097 west of Culver (Wed 7/21/10) } Avg. = 7682
      = 7266 South of Norton (Tues 7/13/10)
    - Seasonal Adjustment Factor = 1.100
    - Axle Adjustment Factor = 0.987

AADT = (7682)(0.987) / 1.100 = 6893

  - Northland
    - Urban Collector
    - ADT = 3016 east of Lyceum (Wed. 7/20/05)
    - Seasonal Adjustment Factor = 1.115
    - Axle Adjustment Factor = 0.988

AADT = (3016)(0.988) / 1.115 = 2673

BY JLM	DATE 3/27/12	CHECKED BY DBA	DATE 8-14-12
PROJECT WARING ROAD		CALC. NO.	REV.
SUBJECT ACCIDENT REANALYSIS		JOB NO.	SHEET NO. 2

- CPL Counts (2011 PM Peak)

$$\left.\begin{array}{l}\text{SB Waring} = 307 \\ \text{NB Waring} = 247 \\ \text{EB Northland} = 194\end{array}\right\} \Sigma = \underline{748}$$

- K Factor (Based upon values in Excel File not HCM to be more site specific)

$$\left.\begin{array}{l}\text{Waring west of Culver} = 0.0825 \\ \text{Waring south of Norton} = 0.0823\end{array}\right\} \text{avg.} = 0.0824$$

Northland = 0.0915

"Weighted" average K $= [(2 \text{ legs Waring})(0.0824) + (0.0915)$
$= \underline{0.0854}$

AADT (@ Intersect.) = 748 / 0.0854 = $\underline{8759}$

→ Accident Rate (Refer to 12-12-11 calcs for data on # acc.)

Based upon historical AADT data:

$$\text{Acc/MEV} = (1\text{M})(2\text{ acc}) / (365)(\tfrac{1}{2})[(2 \text{ legs of Waring})(6893) + 2673](3\text{yr}$$
$$= \underline{\underline{0.222}}$$

Based upon intersection AADT

$$\text{Acc/MEV} = (1\text{M})(2) / (365)(8759)(3)$$
$$= \underline{\underline{0.209}}$$

→ County wide Average for Urban Collector - Collector - Signalized = $\underline{\underline{0.53}}$

∴ WARING @ NORTHLAND $\underline{\underline{\text{BELOW}}}$ C.W. Avg.

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BY JLM DATE 3/28/12 CHECKED BY DBA DATE 8-14-12
PROJECT WARING ROAD CALC. NO. REV.
SUBJECT ACCIDENT REANALYSIS JOB NO. SHEET NO. 3

- WARING ROAD @ CULVER

  - Waring (See p. 1) AADT = 6893
  - Culver
    - Urban Minor Arterial
    - ADT = 8931 North of Waring (Wed. 7/21/10) ← use this
      = 14,321 North of Clifford (8/1/84) → too old
    - Seasonal Adj. = 1.115
    - Axle Adj = 0.986

$$AADT = (8931)(0.986)/1.115 = 7898$$

  - Woodman Park - Urban Local
    - ADT = 3295 North of Clifford (Tues. 9/1/09)
    - Seasonal Adj. = 1.068
    - Axle Adj = 0.991

$$AADT = (3295)(0.991)/1.068 = 3058$$

  - CPL Counts

EB Waring	= 377	Σ = 1248
SB Culver	= 328	
WB Culver	= 306	
NB Woodman	= 237	

  - K Factor

    Waring west of Culver = 0.0824
    Culver north of Waring = 0.0761
    Woodman north of Clifford = 0.1024
    "weighted" average K = [(2 legs of Culver)(0.0761) + 0.0824 + 0.1024] / 4
    = 0.0843

AADT (@ Intersection) = 1248 / 0.0843 = 14,805

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BY JLM DATE 3/28/12 CHECKED BY DBA DATE 8-14-12
PROJECT WARING ROAD CALC. NO. REV.
SUBJECT ACCIDENT REANALYSIS JOB NO. SHEET NO. 4

→ Accident Rate

Based upon historical AADT data:

$$Acc/MEV = (1M)(7acc) / (365)(1/2)[6893 + (2\ Culver)(7898) + 3058](3$$
$$= \underline{0.497}$$

Based upon intersection AADT

$$Acc/MEV = (1M)(7) / (365)(14{,}805)(3)$$
$$= \underline{0.432}$$

→ County Wide Avg. for Urban Minor Arterial - Collector Signalized = <u>0.44</u>

∴ DEPENDING UPON METHODOLOGY WARING @ CULVER CLOSE TO C.W. AVG. HOWEVER, USING MCDOT SUGGESTION, WHICH IS BASED UPON MOST RECENT DATA THE INTERSECTION IS <u>BELOW</u> C.W. AVG.

- <u>WARING ROAD @ SOUTH PLAZA ENT. / FIELD WOOD DR.</u>

  - WARING (see p1) = 6893
  - FIELDWOOD – no data available
  - PLAZA ENT – no data available

  } ∴ Only use int. rate

  - CPL Count
    SB Waring = 248
    WB Plaza = 70
    NB Waring = 255
    EB Fieldwood = 24
    } Σ = 597
  - K Factor
    Waring = 0.0824 (see p2)
    Fieldwood / Plaza – no data

→ AADT (intersection) = 597/0.0824 = 7246

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BY JLM DATE 3/28/12 CHECKED BY DBA DATE 8-14-12
PROJECT Waring Rd CALC. NO. REV.
SUBJECT ACCIDENT REANALYSIS JOB NO. SHEET NO. 5

→ Accident Rate

Acc/MEV = (1M)(3acc) / (365)(7246)(3)
= 0.378

→ County Wide Average for Unsignalized Urban Collector - Local St = 0.14

∴ WARING @ FIELDWOOD ABOVE C.W. Avg.

• WARING ROAD @ CENTER PLAZA ENT / ASHWOOD DR.

- Waring (See p. 1) AADT = 6893
- Ashwood
  - Urban local Street
  - ADT = 484 East of Bricker St. (Tues. 9/29/98)
  - Seasonal Adj. Factor = 1.016 (assumed - data is for 2001-03)
  - Axle Adj. Factor = 0.994 (assumed - data is for 1999-2004)

AADT = (484)(0.994) / 1.016 = 474

- Plaza Ent - no data available

- CPL Counts

SB Waring = 254
WB Plaza = 108
NB Waring = 225
EB Ashwood = 24

Σ = 611

- K Factor

Waring = 0.0824 (see p. 2)
Ashwood = 0.0992
Plaza - not available

"weighted" K (for 3 legs since plaza not avail)
= ((2 legs waring)(0.0824) + 0.0992) / 3
= 0.088

AADT (int) = 611 / 0.088 = 6944

BY JLM DATE 3/30/12 CHECKED BY DBA DATE 8-14-12
PROJECT WARING ROAD CALC. NO. REV.
SUBJECT ACCIDENT REANALYSIS JOB NO. SHEET NO. 6

→ Accident Rate

Based upon historical AADT data: not enough data

- data on Ashwood almost 15 years old
- no data on plaza drive

Based upon intersection AADT

Acc/MEV = (1M)(3acc.)/(365)(6944)(3)
= <u>0.395</u>

→ County Wide Average for Unsignalized Urban Collect - Local St = 0.1

∴ Waring @ Ashwood <u>ABOVE</u> C.W. Avg.

• <u>WARING ROAD @ NORTHERN PLAZA ENT.</u>

- Waring (See p.1) = 6893
- Plaza ent - no data available

} ∴ use only int. rate

- CPL Counts
  - SB Waring = 268
  - WB Plaza = 41
  - NB Waring = 235

  } Σ = 544
- K factor
  - Waring = 0.0824 (See p.2)
  - Plaza - no data

→ AADT (int) = 544/0.0824 = <u>6602</u>

→ Acc/MEV = (1M)(1acc)/(365)(6602)(3) = <u>0.138</u>

→ C.W. Avg = 0.14 ∴ Waring @ N. Plaza ent <u>BELOW</u> CW Avg.

Monroe County D.O.T.
Traffic Summary Report 2012

ADT=Average Daily Traffic
K Factor=2 Way Peak/ADT
D Factor=1 Way Peak/2 Way Peak

NODE NUMBER	DATE TAKEN	COMMENTS	TOWN OR CITY	ROAD NAME	CROSS ROAD	ONE WAY PEAK	TWO WAY PEAK	ADT	PHF	Day Of Week	D FACTOR	K FACTOR
185722	9/29/1998	7	CITY	ASHWOOD DR.	BRICKER ST. E OF	25	48	484		Tues	0.52	0.0992
185131	7/21/2010	5	CITY	CULVER RD.	WARING RD. N OF	353	680	8931		Wed	0.52	0.0761
~~185351~~	~~8/1/1984~~		~~CITY~~	~~CULVER RD.~~	~~CLIFFORD AVE. N OF~~	~~621~~	~~1093~~	~~14321~~	~~0.94~~		~~0.57~~	~~0.0800~~
185812	7/20/2005	5,7	CITY	NORTHLAND AVE.	LYCEUM ST. E OF	191	276	3016		Wed	0.69	0.0915
185134	7/21/2010		CITY	WARING RD.	CULVER RD. W OF	348	668	8097		Wed	0.52	0.0825
154613	7/13/2010		CITY	WARING RD.	NORTON ST. S OF	323	598	7266		Tues	0.54	0.0823
185171	9/1/2009	7	CITY	WOODMAN PK.	CLIFFORD AVE. N OF	216	337	3295		Tues	0.64	0.1024

Comments:
0)1 Way
1)Construction
2)Detour
3)Special Event
4)Wkend/Holiday
5)1 Day Count....
6)ADT use only..
7)No PHF.........
C)Class Data
D)NYSDOT Count

SEASONAL ADJUSTMENT FACTORS FOR TRAFFIC COUNT PROCESSING 2011

Based on Continuous Count Site Data $\boxed{2008 - 2010}$

WORK WEEK

FACTOR GROUP		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	29	0.901	0.917	0.971	1.014	1.038	1.044	1.059	1.054	1.021	1.021	0.984	0.954
urban	30	0.950	0.967	1.021	1.060	1.082	1.100	1.100	1.098	1.068	1.068	1.026	1.004
	31	1.004	1.023	1.076	1.111	1.129	1.162	1.145	1.146	1.120	1.120	1.071	1.059
	39	0.749	0.778	0.834	0.892	0.984	1.010	1.101	1.048	0.987	0.956	0.863	0.826
suburban	40	0.828	0.854	0.903	0.970	1.046	1.079	1.182	1.172	1.059	1.024	0.947	0.904
	41	0.926	0.946	0.984	1.063	1.116	1.158	1.277	1.329	1.143	1.103	1.050	0.998
	59	0.471	0.637	0.650	0.701	0.915	1.036	1.351	1.351	0.972	0.834	0.431	0.461
recreational	60	0.627	0.707	0.744	0.818	0.998	1.143	1.516	1.495	1.046	0.907	0.668	0.645
	61	0.939	0.792	0.869	0.980	1.098	1.275	1.727	1.672	1.132	0.994	1.487	1.075

Factor Group	% Precision with 95% Confidence
urban - 30	1.7%
suburban - 40	3.2%
recreational - 60	13.4%

For each factor group, the percent precision value is the maximum value out of all months.

The FHWA Traffic Monitoring Guide states:
The reliability levels recommended are 10 percent precision with 95 percent confidence, 95-10, for each individual season group, excluding recreational groups where no precision requirement is specified.

Section 6.2 Axle Adjustment Factors

AADT values in this publication represent vehicles. The axle adjustment factor is applied to traffic counts taken with pneumatic tube counters which register two axle impacts as one vehicle. It is used to account for vehicles with more than two axles, typically trucks with three or more axles, in the traffic stream on a particular type of road. The axle adjustment factors are developed from NYSDOT vehicle classification data collected over a six year period in eleven Regions and twelve functional classification categories of highway. The ADT is multiplied by the axle adjustment factor to obtain the AADT. Counts obtained with presence detectors such as inductive loops or acoustic sensors are not adjusted by this factor. Refer below for the axle adjustment factors which are also available on the Highway Data Services Bureau webpage: https://www.dot.ny.gov/portal/page/portal/divisions/engineering/technical-services/highway-data-services

To calculate an AADT for a short term or coverage count using an axle adjustment factor, refer to section 6.3, "Example of Estimation of AADT".

AXLE ADJUSTMENT FACTORS FOR 2011 TRAFFIC COUNT PROCESSING
BASED ON 2005 – 2010 VEHICLE CLASSIFICATION DATA

RURAL:

FC	REGION 1	2	3	4	5	6	7	8	9	10	11	STATEWIDE
01	0.794	0.794	0.794	0.794	0.785	0.732	0.797	0.794	0.793			0.794
02	0.918	0.943	0.946	0.924	0.923	0.926	0.918	0.972	0.897			0.926
06	0.963	0.957	0.954	0.955	0.946	0.965	0.952	0.966	0.962	0.958		0.958
07	0.974	0.973	0.954	0.967	0.966	0.964	0.952	0.980	0.975	0.968		0.968
08	0.984	0.975	0.975	0.967	0.971	0.979	0.968	0.982	0.979			0.975
09	0.987	0.980	0.971	0.971	0.973	0.971	0.971	0.986	0.985	0.971		0.971

URBAN:

FC	REGION 1	2	3	4	5	6	7	8	9	10	11	STATEWIDE
11	0.904	0.904	0.904	0.904	0.932	0.904	0.904	0.904	0.904	0.904	0.934	0.904
12	0.983	0.963	0.967	0.978	0.972	0.967		0.967	0.955	0.967	0.967	0.967
14	0.973	0.978	0.970	0.975	0.975	0.976	0.973	0.979	0.919	0.973	0.982	0.970
16	0.979	0.978	0.982	0.986	0.984	0.980	0.978	0.983	0.979	0.983	0.982	0.982
17	0.984	0.984	0.983	0.987	0.989	0.986	0.982	0.984	0.986	0.985	0.978	0.978
19	0.986	0.984	0.986	0.991	0.990	0.986	0.986	0.988	0.986	0.986	0.986	0.986

Blank cell indicates there are no highway segments in this FC in this region

Shaded cell indicates insufficient data (< 10 highway segments) - statewide average was used

FUNCTIONAL CLASSIFICATION (FC) CODES

RURAL	URBAN
01 Principal Arterial - Interstate	11 Principal Arterial Interstate
02 Principal Arterial - Other	12 Principal Arterial - Other Freeway or Expressway
06 Minor Arterial	14 Principal Arterial - Other
07 Major Collector	16 Minor Arterial
08 Minor Collector	17 Collector
09 Local	19 Local

WORK WEEK (WEEK DAY) SEASONAL ADJUSTMENT FACTORS FOR 2006 TRAFFIC COUNT PROCESSING

(Based on 2003 - 2005 Continuous Count Site Data)

FACTOR GROUP	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
31	0.992	1.030	1.084	1.107	1.134	1.176	1.155	1.157	1.130	1.138	1.077	1.061
30	0.931	0.967	0.999	1.048	1.084	1.127	1.115	1.115	1.072	1.074	1.023	1.012
29	0.869	0.904	0.935	0.989	1.034	1.077	1.075	1.072	1.015	1.011	0.969	0.963
STD (+/-)	0.061	0.063	0.065	0.059	0.050	0.049	0.040	0.042	0.057	0.063	0.054	0.049
41	0.879	0.943	0.986	1.031	1.123	1.211	1.300	1.294	1.147	1.084	1.002	0.973
40	0.803	0.851	0.883	0.950	1.049	1.121	1.207	1.194	1.063	1.017	0.935	0.902
39	0.727	0.759	0.779	0.869	0.975	1.031	1.115	1.095	0.980	0.949	0.867	0.830
STD (+/-)	0.076	0.092	0.104	0.081	0.074	0.090	0.092	0.100	0.083	0.067	0.068	0.071
61	0.736	0.791	0.827	0.926	1.083	1.319	1.721	1.683	1.129	0.940	0.855	0.790
60	0.652	0.689	0.717	0.798	0.999	1.205	1.581	1.537	1.071	0.884	0.750	0.713
59	0.567	0.587	0.607	0.669	0.916	1.090	1.442	1.392	1.013	0.828	0.646	0.636
STD (+/-)	0.084	0.102	0.110	0.128	0.084	0.114	0.139	0.145	0.058	0.056	0.105	0.077

Figure 5

6.2 Axle Adjustment Factors

AADT values in this publication represent vehicles. The axle adjustment factor is applied to traffic counts taken with pneumatic tube counters which register two axle impacts as one vehicle. It is used to account for vehicles with more than two axles, typically trucks with three or more axles, in the traffic stream on a particular type of road. The axle adjustment factors are developed from NYSDOT vehicle classification data collected over a six year period in eleven Regions and twelve functional classification categories of highway. The ADT is multiplied by the axle adjustment factor to obtain the AADT. Counts obtained with presence detectors such as inductive loops or acoustic sensors are not adjusted by this factor. Refer to figure 6 below for the axle adjustment factors which are also available via the internet on the NYSDOT web page specified on page 2.

To calculate an AADT for a short term or coverage count using an Axle Adjustment Factor, refer to section 6.3, "Example of Estimation of AADT".

AXLE ADJUSTMENT FACTORS FOR 2006 TRAFFIC COUNT PROCESSING
BASED ON 2000-2005 VEHICLE CLASSIFICATION DATA
REGION

FC	1	2	3	4	5	6	7	8	9	10	11	STATEWIDE
RURAL												
01	0.774	0.770	0.770	0.770	0.805	0.744	0.695	0.770	0.795			0.770
02	0.911	0.943	0.942	0.876	0.927	0.865	0.905	0.956	0.913	0.923		0.923
06	0.960	0.952	0.954	0.957	0.948	0.955	0.951	0.961	0.958	0.955		0.955
07	0.968	0.965	0.960	0.949	0.964	0.967	0.940	0.979	0.969	0.962		0.962
08	0.979	0.978	0.969	0.979	0.980	0.955	0.974	0.985	0.986	0.976		0.976
09	0.981	0.969	0.985	0.971	0.990	0.981	0.981	0.981	0.983	0.981		0.981
ALL RURAL	0.929	0.929	0.930	0.917	0.936	0.911	0.908	0.939	0.934	0.959		0.939
URBAN												
11	0.865	0.865	0.865	0.865	0.857	0.865	0.839	0.865	0.865	0.865	0.922	0.865
12	0.975	0.959	0.954	0.980	0.978	0.922		0.957	0.938	0.957	0.957	0.957
14	0.964	0.972	0.973	0.959	0.973	0.953	0.951	0.981	0.975	0.968	0.982	0.968
16	0.980	0.979	0.983	0.983	0.972	0.980	0.977	0.982	0.978	0.981	0.980	0.980
17	0.987	0.985	0.986	0.988	0.986	0.987	0.987	0.987	0.992	0.991	0.991	0.988
19	0.983	0.983	0.983	0.983	0.983	0.983	0.983	0.990	0.983	0.983	0.983	0.983
ALL URBAN	0.959	0.957	0.957	0.960	0.958	0.948	0.947	0.960	0.955	0.958	0.969	0.961
ALL FC	0.944	0.943	0.944	0.938	0.947	0.930	0.926	0.949	0.945	0.958	0.969	0.942

Yellow shading indicates there are no highway segments in this FC in this Region

Orange shading indicates that the statewide average for this FC was used or insufficient data (<10 class counts between 2000-2005)

Figure 6

This is the oldest data available on NYSDOT website - nothing for 1998.

WORK WEEK (WEEK DAY) SEASONAL ADJUSTMENT FACTORS FOR 2005 TRAFFIC COUNT PROCESSING

(Based on 2001 - 2003 Continuous Count Site Data)

FACTOR GROUP	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
31	0.967	0.994	1.009	1.031	1.057	1.095	1.109	1.115	1.060	1.062	1.007	0.991
30	0.913	0.939	0.964	0.995	1.031	1.062	1.059	1.064	1.016	1.029	0.977	0.943
29	0.859	0.884	0.919	0.959	1.005	1.029	1.009	1.013	0.972	0.996	0.947	0.895
STD (+/-)	0.054	0.055	0.045	0.036	0.026	0.033	0.050	0.051	0.044	0.033	0.030	0.048
41	0.920	0.931	0.933	1.003	1.092	1.160	1.316	1.302	1.109	1.073	1.017	0.950
40	0.833	0.857	0.876	0.950	1.043	1.101	1.210	1.216	1.058	1.022	0.945	0.884
39	0.746	0.783	0.819	0.897	0.994	1.042	1.104	1.130	1.007	0.971	0.873	0.818
STD (+/-)	0.087	0.074	0.057	0.053	0.049	0.059	0.106	0.086	0.051	0.051	0.072	0.066
61	0.778	0.801	0.848	0.884	1.082	1.270	1.904	1.860	1.195	0.997	0.851	0.781
60	0.677	0.722	0.735	0.774	1.010	1.190	1.706	1.670	1.087	0.922	0.778	0.729
59	0.576	0.643	0.622	0.664	0.938	1.110	1.508	1.480	0.979	0.847	0.705	0.677
STD (+/-)	0.101	0.079	0.113	0.110	0.072	0.080	0.198	0.190	0.108	0.075	0.073	0.052

Figure 5

6.2 Axle Adjustment Factors

AADT values in this publication represent vehicles. The axle adjustment factor is applied to traffic counts taken with pneumatic tube counters which register two axle impacts as one vehicle. It is used to account for vehicles with more than two axles, typically trucks with three or more axles, in the traffic stream on a particular type of road. The axle adjustment factors are developed from NYSDOT vehicle classification data collected over a six year period in eleven Regions and twelve functional classification categories of highway. The ADT is multiplied by the axle adjustment factor to obtain the AADT. Counts obtained with presence detectors such as inductive loops or acoustic sensors are not adjusted by this factor. Refer to figure 6 below for the axle adjustment factors which are also available via the internet on the NYSDOT web page specified on page 2.

To calculate an AADT for a short term or coverage count using an Axle Adjustment Factor, refer to section 6.3, "Example of Estimation of AADT".

AXLE ADJUSTMENT FACTORS FOR 2005 TRAFFIC COUNT PROCESSING
BASED ON 1999-2004 VEHICLE CLASSIFICATION DATA
REGION

FC	1	2	3	4	5	6	7	8	9	10	11	STATEWIDE
RURAL												
01	0.766	0.766	0.766	0.766	0.802	0.745	0.766	0.766	0.766			0.766
02	0.919	0.939	0.938	0.890	0.915	0.860	0.907	0.963	0.914	0.987		0.923
06	0.959	0.949	0.957	0.951	0.950	0.950	0.951	0.965	0.953	0.954		0.954
07	0.969	0.967	0.965	0.937	0.965	0.962	0.952	0.985	0.964	0.986		0.965
08	0.988	0.983	0.971	0.979	0.982	0.964	0.980	0.986	0.986	0.979		0.980
09	0.985	0.990	0.985	0.980	0.992	0.985	0.983	0.987	0.992	0.985		0.985
ALL RURAL	0.964	0.966	0.930	0.917	0.934	0.911	0.923	0.942	0.929	0.983		0.929
URBAN												
11	0.876	0.876	0.876	0.876	0.939	0.876	0.876	0.876	0.876	0.876	0.876	0.876
12	0.964	0.959	0.961	0.983	0.974	0.865		0.964	0.964	0.964	0.964	0.964
14	0.963	0.975	0.977	0.958	0.974	0.951	0.941	0.982	0.977	0.964	0.982	0.968
16	0.977	0.979	0.977	0.980	0.973	0.977	0.971	0.984	0.982	0.987	0.985	0.979
17	0.983	0.986	0.993	0.986	0.987	0.991	0.985	0.988	0.987	0.991	0.985	0.987
19	0.976	0.978	0.970	0.994	0.977	0.976	0.976	0.990	0.976	0.976	0.976	0.976
ALL URBAN	0.956	0.959	0.959	0.963	0.971	0.939	0.968	0.964	0.960	0.979	0.961	0.958
ALL FC	0.944	0.946	0.945	0.940	0.952	0.925	0.935	0.953	0.945	0.968	0.961	0.944

Yellow shading indicates there are no highway segments in this FC in this Region
Orange shading indicates that the statewide average for this FC was used or insufficient data (<10 class counts) between 1999-2004)

Figure 6

	EL WARING RD	150 N OF NORTO	1	3.16	3.76	0.6	2048	City	Rochester	04 City or village	16	75664	Rochester	4
) DR	260 FT EAST	WARING RD	1	0.43	0.53	0.1	2048	City	Rochester	04 City or village	19	75664	Rochester	2
D AVE	LYCEUM ST	WARING RD	1	0.71	0.94	0.23	2048	City	Rochester	04 City or village	17	75664	Rochester	4
-	GOODMAN ST N	WARING RD	1	2.34	2.61	0.27	2048	City	Rochester	04 City or village	16	75664	Rochester	4
-	WARING RD	CULVER RD	1	2.61	3.13	0.52	2048	City	Rochester	04 City or village	16	75664	Rochester	4
)	CULVER RD	NORTON ST	1	0	0.77	0.77	2048	City	Rochester	04 City or village	17	75664	Rochester	4
I PARK	CULVER RD	CLIFFORD AVE	1	0	0.25	0.25	2048	City	Rochester	04 City or village	19	75664	Rochester	2

Intersection Average Reportable Accident Rates 05-07

For Use in 2009

			Num	Rate
		Unsignalized	2	0.33
	Suburban Minor Collector/town road			
		Unsignalized	17	0.12
Urban				
	Collector/Collector			
		Signalized	20	$\boxed{0.53}$
		Unsignalized	8	0.10
	Collector/Local Street			
		Signalized	34	0.36
		Unsignalized	563	$\boxed{0.14}$
	Local Street/Local Street			
		Signalized	5	0.00
		Unsignalized	1722	0.14
	Minor Arterial/Collector			
		Signalized	65	$\boxed{0.44}$
		Unsignalized	15	0.29
	Minor Arterial/Local Street			
		Signalized	161	0.25
		Unsignalized	824	0.12
	Minor Arterial/Minor Arterial			
		Signalized	89	0.50
		Unsignalized	7	0.06
	Principal Arterial/Collector			
		Signalized	6	0.17
	Principal Arterial/Local Street			
		Signalized	36	0.11
		Unsignalized	88	0.09
	Principal Arterial/Minor Arterial			
		Signalized	12	0.30
		Unsignalized	3	0.23

Rural Towns: Clarkson, Hamlin, Mendon, Riga, Rush, Sweden, Wheatland, Ogden, Parma

Suburban Towns: Brighton, Chili, Gates, Greece, Henrietta, Irondequoit, Penfield, Perinton, Pittsford, Webster

Urban: City of Rochester

Average Rates are in ACCIDENTS per MILLION ENTERING VEHICLES.

Based on 2 Years - 8 Months of reportable accidents (1/1/05 - 8/31/07) from NYS CLASS and MCDOT Traffic Counts

Clark Patterson Lee
DESIGN PROFESSIONALS

BY JLM DATE 3/27/12 CHECKED BY ______ DATE ______

PROJECT WARING ROAD CALC. NO. ______ REV. ______

SUBJECT AADT VS. ADT JOB NO. ______ SHEET NO. ______

- ADT for Waring Road - based upon Monroe Co. Data

WARING - WEST OF CULVER = 8097 (7/21/10 - Wed.)
- SOUTH OF NORTON = 7626 (7/13/10 - Tues.)

Avg. = (8097 + 7626)/2 = 7861.5 say 7862

- **AADT** = (Traffic Count ADT)(Axle Adj. Fact) / Season Adj.

= (7862)(0.987) / (1.100)

= 7054.4 say $\boxed{7055}$

Monroe County D.O.T.
Traffic Summary Report 2012

ADT=Average Daily Traffic
K Factor=2 Way Peak/ADT
D Factor=1 Way Peak/2 Way Peak

NODE NUMBER	DATE TAKEN	TOWN OR CITY	ROAD NAME	CROSS ROAD	ONE WAY PEAK	TWO WAY PEAK	ADT	PHF	DOW	D FACTOR	K FACTOR
185134	7/21/2010	CITY	WARING RD.	CULVER RD. W OF	348	668	8097			0.52	0.082
185134	10/17/2006	CITY	WARING RD.	CULVER RD. W OF	368	646	7530	0.87	Tue	0.57	0.085
185134	8/6/2002	CITY	WARING RD.	CULVER RD. W OF	386	760	9504	0.95		0.51	0.079
185134	10/6/1998	CITY	WARING RD.	CULVER RD. W OF	766	1188	14236	0.91		0.64	0.083
185134	8/1/1984	CITY	WARING RD.	CULVER RD. W OF	372	682	9369	0.95		0.55	0.070
185134	8/1/1981	CITY	WARING RD.	CULVER RD. W OF	394	799	9892	0.00		0.49	0.080
154613	7/13/2010	CITY	WARING RD.	NORTON ST. S OF	323	598	7266			0.54	0.082
154613	10/17/2006	CITY	WARING RD.	NORTON ST. S OF	314	609	6868	0.87		0.51	0.088
154613	8/7/2002	CITY	WARING RD.	NORTON ST. S OF	375	695	8336	0.90		0.54	0.083
154613	9/1/1998	CITY	WARING RD.	NORTON ST. S OF	355	666	8259	0.96		0.53	0.080
154613	6/7/1994	CITY	WARING RD.	NORTON ST. S OF	544	666	8053	0.92		0.82	0.082
154613	4/26/1988	CITY	WARING RD.	NORTON ST. S OF	313	607	7128	0.95		0.52	0.090
154613	8/1/1984	CITY	WARING RD.	NORTON ST. S OF	365	626	8205	0.94		0.58	0.080
154613	8/1/1981	CITY	WARING RD.	NORTON ST. S OF	438	731	9064	0.00		0.60	0.080

Comments:
0)1 Way
1)Construction
2)Detour
3)Special Event

4)Wkend/Holiday
5)1 Day Count....
6)ADT use only..
7)No PHF..........

C)Class Data
D)NYSDOT Count

Chapter 6 Adjustment Factors

Section 6.1 Seasonal (Monthly) Adjustment Factors

Traffic is typically affected by the seasons of the year with it being low during the winter months and high during the summer months. Seasonal Adjustment Factors are used to remove this seasonal bias by converting the Average Daily Traffic (ADT) from short count data into Annual Average Daily Traffic AADT. AADT is the average daily traffic for the entire year.

The main objective of the continuous count program is for developing Seasonal Adjustment Factors as stated in the TMG[1]. The Seasonal Adjustment Factors are calculated using the average of three years of continuous count volume data.

The factors are grouped into three major groups according to how much the road segments are affected by the seasons of the year. These factor groups follow the suggestions of the TMG.[2] The categories are labelled:

Factor Group 30	urban traffic patterns minimally affected by the seasons coefficient of variation < 10%
Factor Group 40	suburban traffic patterns moderately affected by the seasons coefficient of variation >= 10% and < =25%
Factor Group 60	recreational traffic patterns extremely affected by the seasons coefficient of variation > 25%

Minor factor groups surround the major factor groups and are labelled +/-1 of the major factor group label. For instance, Factor Group 30 would have minor factor groups of 29 and 31. These minor factor groups are supplied to give the user a more fine-tuned calculation of the AADT.

The Seasonal Adjustment Factors abide by the recommendation of the TMG:

> **The reliability levels recommended are 10 percent precision with 95 percent confidence, 95-10, for each individual seasonal group, excluding recreation groups where no precision requirements is specified.[3]**

The following page displays a table of Seasonal Adjustment Factors used for converting short count weekday ADT into an AADT. Other Seasonal Adjustment Factor tables are located on the Highway Data Services Bureau webpage:

https://www.dot.ny.gov/highway-data-services

To calculate an AADT for a short term or coverage count using a Seasonal Adjustment Factor, refer to section 6.3, "Example of Estimation of AADT".

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[1] FHWA Traffic Monitoring Guide – 2001 pg. 3-25
[2] FHWA Traffic Monitoring Guide – 2001 pg. 3-33
[3] FHWA Traffic Monitoring Guide – 2001 pg. 3-34

SEASONAL ADJUSTMENT FACTORS FOR TRAFFIC COUNT PROCESSING 2011

Based on Continuous Count Site Data 2008 - 2010

WORK WEEK

FACTOR GROUP		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	29	0.901	0.917	0.971	1.014	1.038	1.044	1.059	1.054	1.021	1.021	0.984	0.954
urban	30	0.950	0.967	1.021	1.060	1.082	1.100	1.100	1.098	1.068	1.068	1.026	1.004
	31	1.004	1.023	1.076	1.111	1.129	1.162	1.145	1.146	1.120	1.120	1.071	1.059
	39	0.749	0.778	0.834	0.892	0.984	1.010	1.101	1.048	0.987	0.956	0.863	0.826
suburban	40	0.828	0.854	0.903	0.970	1.046	1.079	1.182	1.172	1.059	1.024	0.947	0.904
	41	0.926	0.946	0.984	1.063	1.116	1.158	1.277	1.329	1.143	1.103	1.050	0.998
	59	0.471	0.637	0.650	0.701	0.915	1.036	1.351	1.351	0.972	0.834	0.431	0.461
recreational	60	0.627	0.707	0.744	0.818	0.998	1.143	1.516	1.495	1.046	0.907	0.668	0.645
	61	0.939	0.792	0.869	0.980	1.098	1.275	1.727	1.672	1.132	0.994	1.487	1.075

Factor Group	% Precision with 95% Confidence
urban - 30	1.7%
suburban - 40	3.2%
recreational - 60	13.4%

For each factor group, the percent precision value is the maximum value out of all months.

The FHWA Traffic Monitoring Guide states:

The reliability levels recommended are 10 percent precision with 95 percent confidence, 95-10, for each individual season group, excluding recreational groups where no precision requirement is specified.

Section 6.2 Axle Adjustment Factors

AADT values in this publication represent vehicles. The axle adjustment factor is applied to traffic counts taken with pneumatic tube counters which register two axle impacts as one vehicle. It is used to account for vehicles with more than two axles, typically trucks with three or more axles, in the traffic stream on a particular type of road. The axle adjustment factors are developed from NYSDOT vehicle classification data collected over a six year period in eleven Regions and twelve functional classification categories of highway. The ADT is multiplied by the axle adjustment factor to obtain the AADT. Counts obtained with presence detectors such as inductive loops or acoustic sensors are not adjusted by this factor. Refer below for the axle adjustment factors which are also available on the Highway Data Services Bureau webpage: https://www.dot.ny.gov/portal/page/portal/divisions/engineering/technical-services/highway-data-services

To calculate an AADT for a short term or coverage count using an axle adjustment factor, refer to section 6.3, "Example of Estimation of AADT".

AXLE ADJUSTMENT FACTORS FOR 2011 TRAFFIC COUNT PROCESSING
BASED ON 2005 – 2010 VEHICLE CLASSIFICATION DATA

RURAL:

	REGION											
FC	1	2	3	4	5	6	7	8	9	10	11	STATEWIDE
01	0.794	0.794	0.794	0.794	0.785	0.732	0.797	0.794	0.793			0.794
02	0.918	0.943	0.946	0.924	0.923	0.926	0.918	0.972	0.897			0.926
06	0.963	0.957	0.954	0.955	0.946	0.965	0.952	0.966	0.962	0.958		0.958
07	0.974	0.973	0.954	0.967	0.966	0.964	0.952	0.980	0.975	0.968		0.968
08	0.984	0.975	0.975	0.967	0.971	0.979	0.968	0.982	0.979			0.975
09	0.987	0.980	0.971	0.971	0.973	0.971	0.971	0.986	0.985	0.971		0.971

URBAN:

	REGION											
FC	1	2	3	4	5	6	7	8	9	10	11	STATEWIDE
11	0.904	0.904	0.904	0.904	0.932	0.904	0.904	0.904	0.904	0.904	0.934	0.904
12	0.983	0.963	0.967	0.978	0.972	0.967		0.967	0.955	0.967	0.967	0.967
14	0.973	0.978	0.970	0.975	0.975	0.976	0.973	0.979	0.919	0.973	0.982	0.970
16	0.979	0.978	0.982	0.986	0.984	0.980	0.978	0.983	0.979	0.983	0.982	0.982
17	0.984	0.984	0.983	0.987	0.989	0.986	0.982	0.984	0.986	0.985	0.978	0.978
19	0.986	0.984	0.986	0.991	0.990	0.986	0.986	0.988	0.986	0.986	0.986	0.986

Blank cell indicates there are no highway segments in this FC in this region

Shaded cell indicates insufficient data (< 10 highway segments) - statewide average was used

FUNCTIONAL CLASSIFICATION (FC) CODES

RURAL		URBAN	
01	Principal Arterial - Interstate	11	Principal Arterial Interstate
02	Principal Arterial - Other	12	Principal Arterial - Other Freeway or Expressway
06	Minor Arterial	14	Principal Arterial - Other
07	Major Collector	16	Minor Arterial
08	Minor Collector	17	Collector
09	Local	19	Local

Waring Road - Urban Collector in Region 4

Section 6.3 Example of Estimation of AADT

Note: Information referred to in each step is indicated on the "Traffic Count Hourly Report" on page 43.

Step 1 – Establish logical termini for a traffic break on a section of highway. The rule of thumb is no more than a 10-15% deviation in traffic volume along the section.

Count Station	Route	Beginning of Section	End of Section
110069	20	New Scotland Avenue	Junction with Routes 9W & 443

Step 2 – Locate the placement of an Automatic Traffic Recorder that reasonably represents traffic volumes for the defined station.

Count Station	Reference Marker Location
110069	20-1120-2033

Step 3 – Determine the function classification of the highway section and seasonal factor group assignment.

Count Station	Functional Classification	Factor Group
110069	14 (Urban Other Principal Arterial)	30 (< 10% deviation in monthly volumes)

Step 4 – The directional AADT for the highway section is calculated by adjusting the ADT produced from the axle based count by the appropriate Seasonal Adjustment Factor (page 40) and Axle Adjustment Factor (page 41).

The work week factor is specifically applicable to traffic count data collected from 6:00 a.m. Mondays through 11:59 am Fridays. The available hourly data is averaged for each of the twenty four hours in a day. The sum of these 24 'averaged' hours constitutes the ADT value. At a minimum, two hours of data in each hour must be available for averaging.

If the count is a tube based count, calculate the Seasonally Adjusted AADT by dividing the unadjusted ADT by the seasonal adjustment factor then calculate an Axle-Factored ADT by multiplying the unadjusted ADT by the axle adjustment factor.

AADT = Traffic Count ADT x Axle Adj. Factor (if axle based) / Seasonal Adj. Factor
AADT = 8297 x 0.958 / 1.062
AADT = 7485

To obtain the total AADT for a station, sum the two directional AADTs.

ANIMAL	OUT OF CONTROL
BICYCLE	OVERTURNED
BACKING	PEDESTIRAN
FIXED OBJECT	PARKED
HEAD ON	RIGHT ANGLE
INJURY, FATAL	RIGHT TURN (TYPE 1)
INJURY, PERSONAL	RIGHT TURN (TYPE 2)
LEFT TURN (TYPE 1)	REAR END
LEFT TURN (TYPE 2)	SKIDDING
LEFT TURN (TYPE 3)	SIDE SWIPE
LEFT TURN (TYPE 4)	STOPPED
MOTORCYCLE	TREE
MOVING	

25 ACCIDENT KEY NUMBER

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FAX (585) 232-5836
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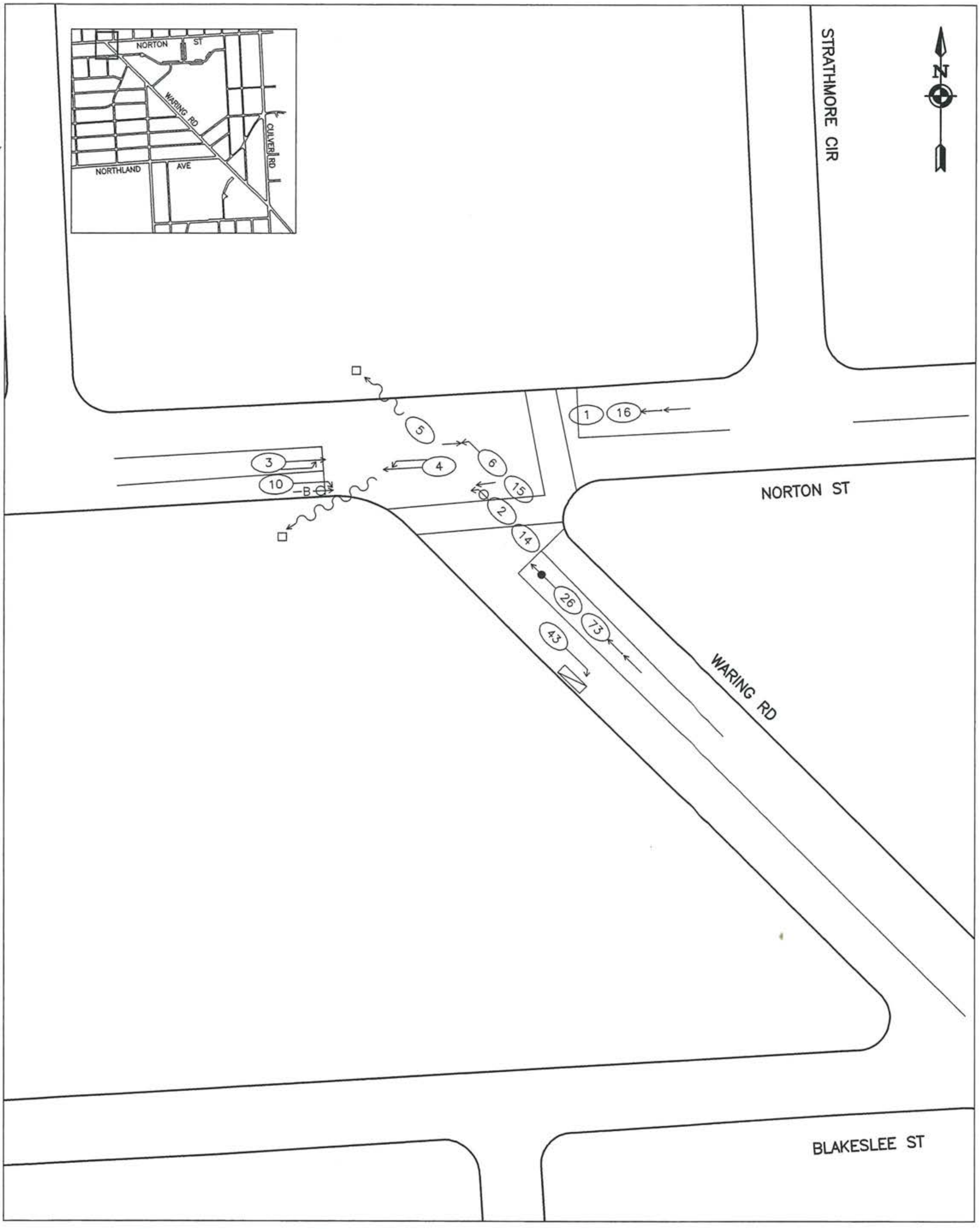
DATE: 11/11/11
DRAWN: JWS
CHECKED: DBA
SCALE: NONE
PROJ. #:12233.00

ACCIDENT SYMBOL KEY

WARING ROAD RECONSTRUCTION

CITY OF ROCHESTER, MONROE COUNTY, NEW YORK

Drawing Name: J:\PROJECTS\City of Rochester\12233 Waring Road Design\D Design\D03 Job Info\From COR 9-6-11\Accident Diagrams\Drawing2.dwg Date last accessed: 12/2/2011 12:18 PM Date last plotted: 12/2/2011 12:20 PM



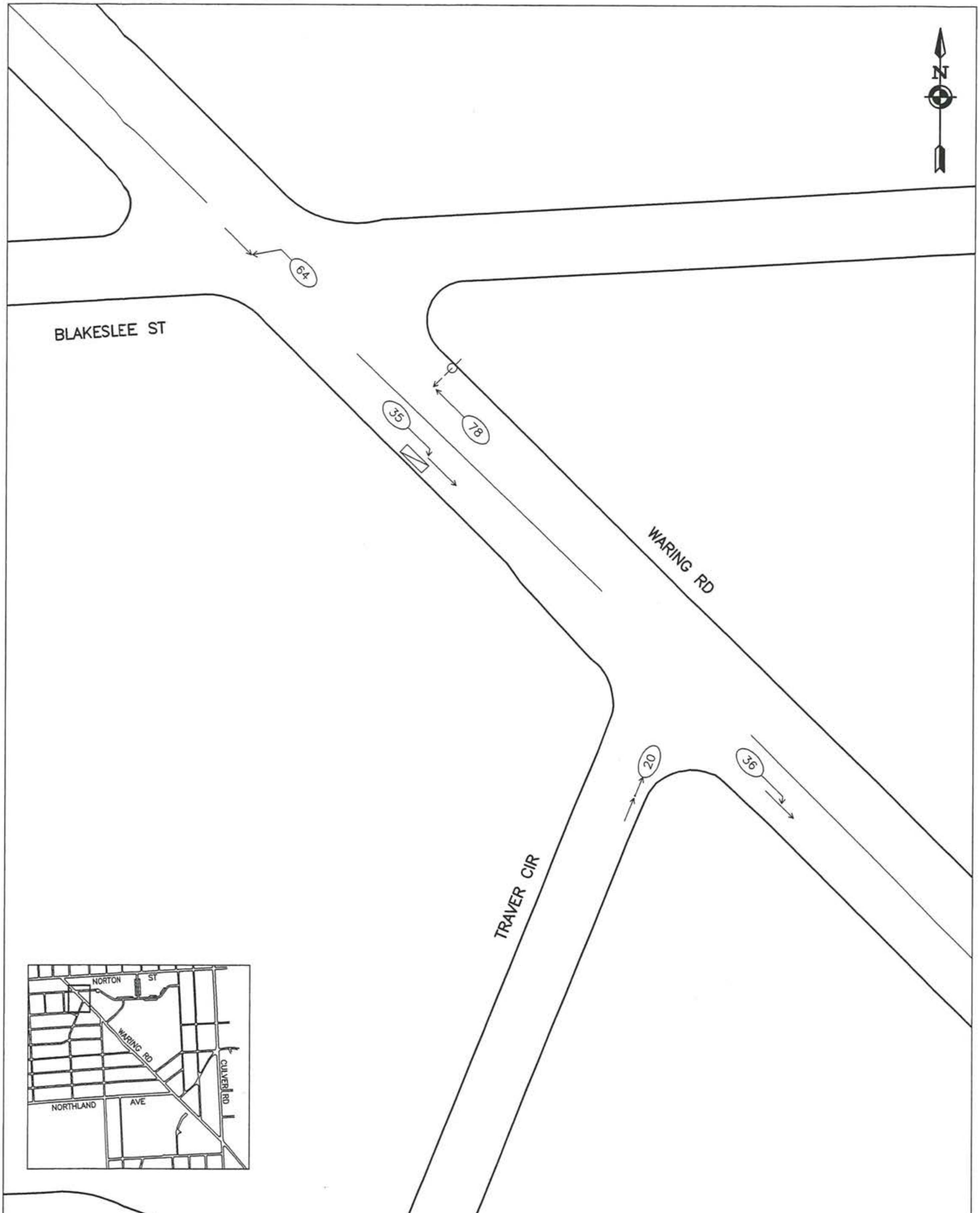
CLARK PATTERSON LEE
DESIGN PROFESSIONALS
205 ST. PAUL STREET, SUITE 500
ROCHESTER, NEW YORK 14604
TEL (800) 274-9000
FAX (585) 232-5836
www.clarkpatterson.com

DATE: 11/11/11
DRAWN: JWS
CHECKED: DBA
SCALE: 1"=50'
PROJ. #:12233.00

ACCIDENT DETAIL 1

WARING ROAD RECONSTRUCTION

CITY OF ROCHESTER, MONROE COUNTY, NEW YORK



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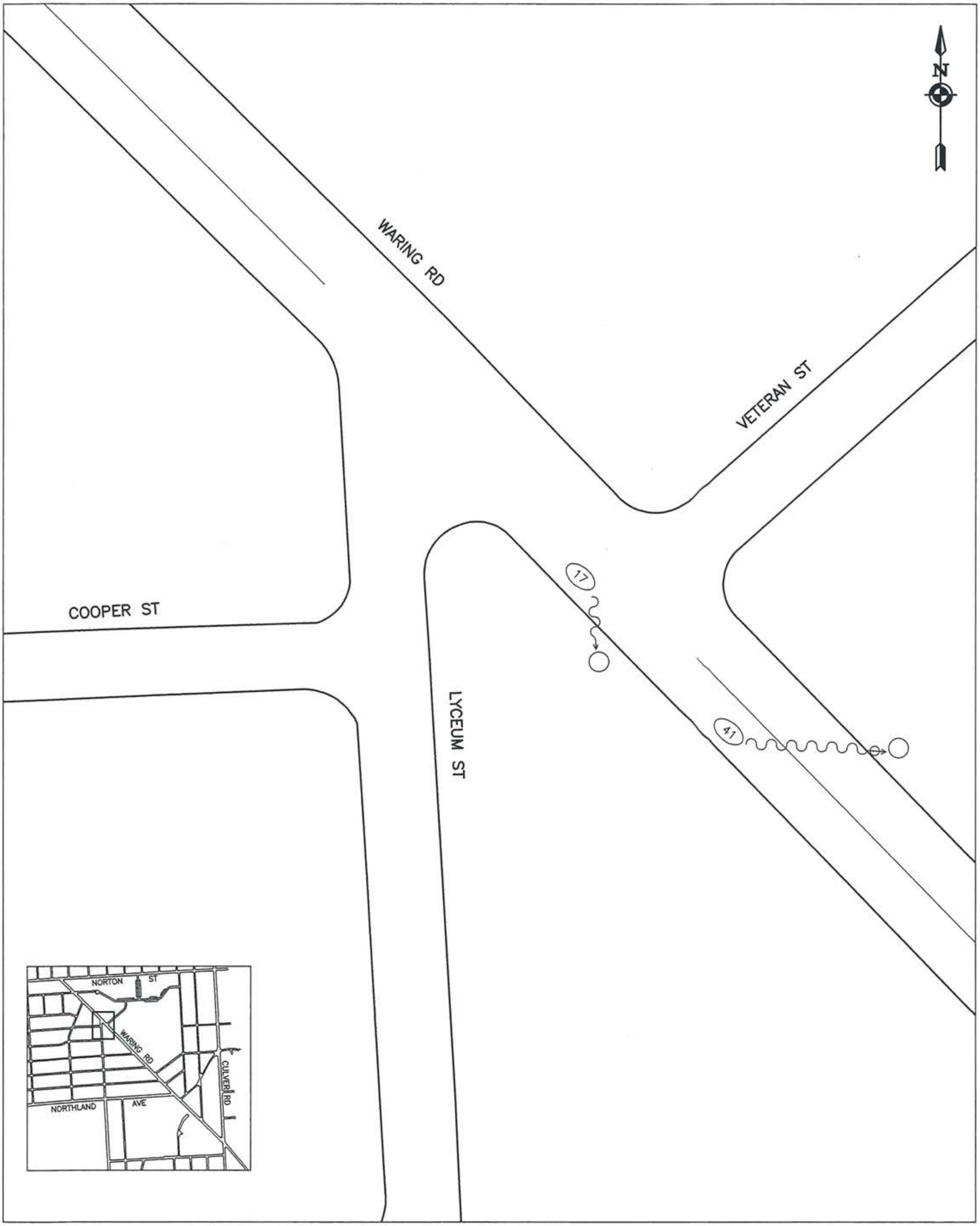
DATE: 11/11/11	ACCIDENT DETAIL 2
DRAWN: JWS	WARING ROAD RECONSTRUCTION
CHECKED: DBA	
SCALE: 1"=50'	
PROJ. #:12233.00	CITY OF ROCHESTER, MONROE COUNTY, NEW YORK



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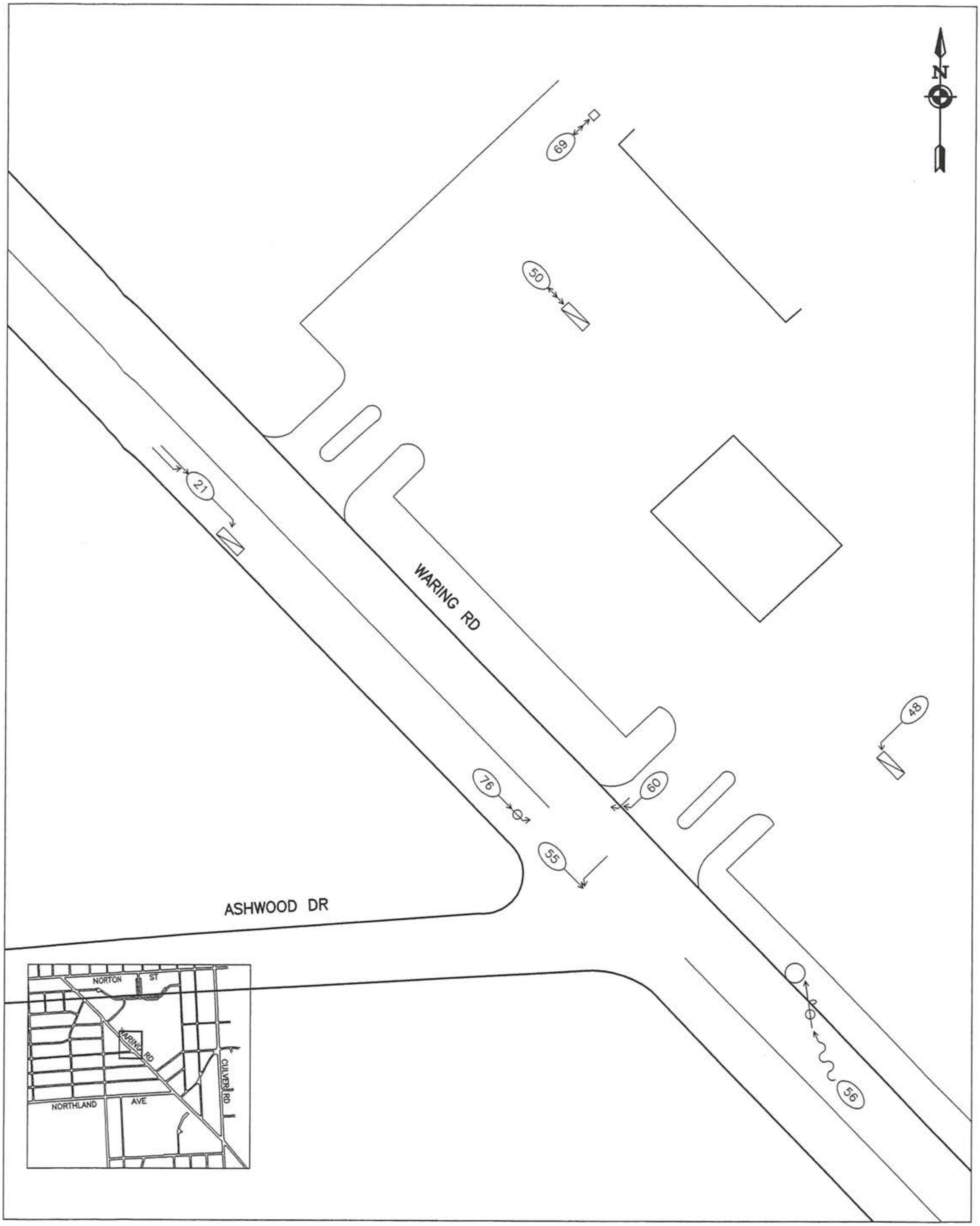
DATE: 11/11/11	
DRAWN: JWS	
CHECKED: DBA	
SCALE: 1"=50'	
PROJ. #:12233.00	

ACCIDENT DETAIL 3

WARING ROAD RECONSTRUCTION

CITY OF ROCHESTER, MONROE COUNTY, NEW YORK

Drawing Name: J:\PROJECTS\City of Rochester\12233 Waring Road Design\D Design\D03 Job Info\From COR 9-6-11\Accident Diagrams\Drawing2.dwg Date last accessed: 12/2/2011 12:18 PM Date last plotted: 12/2/2011 12:20 PM



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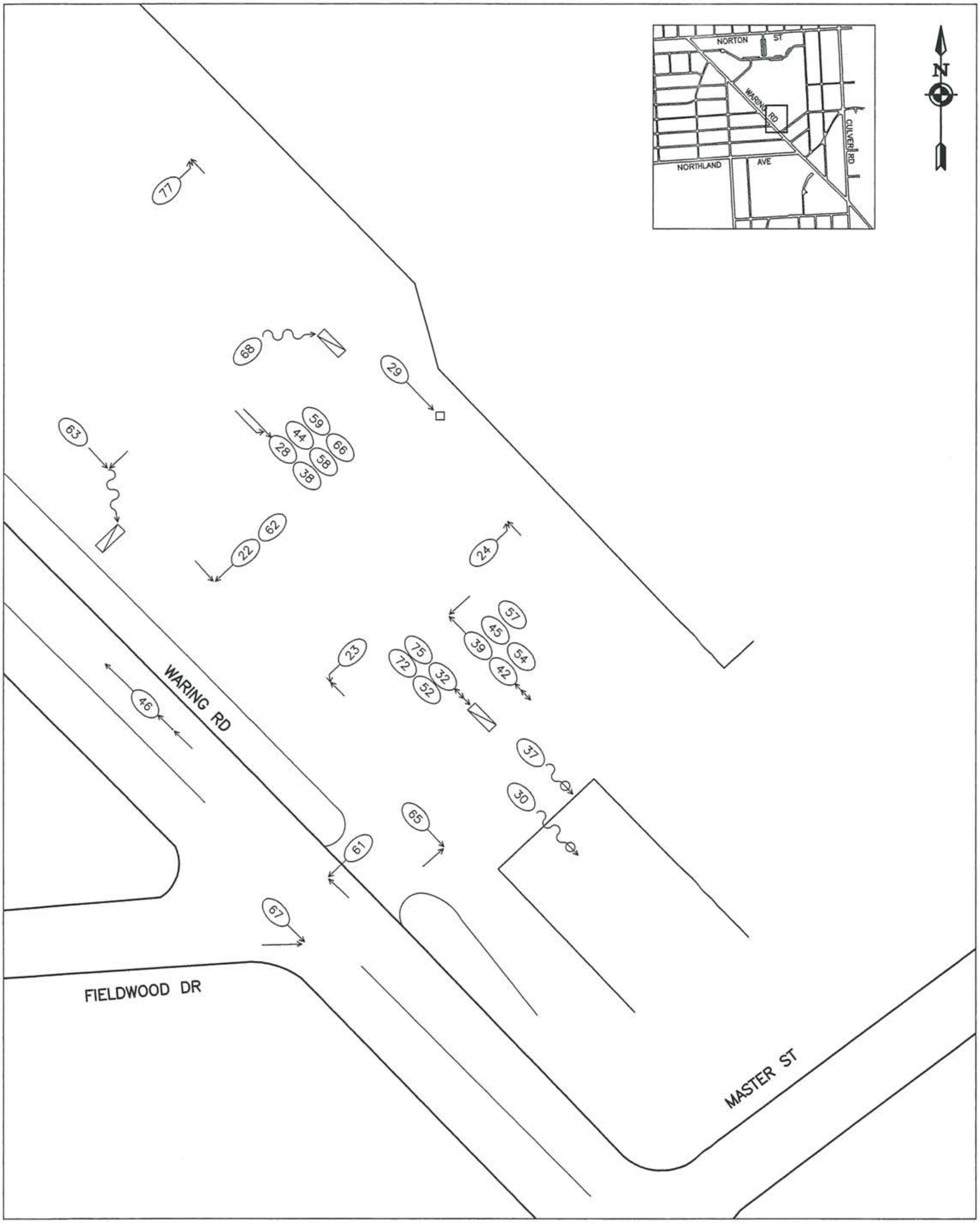
DATE: 11/11/11	ACCIDENT DETAIL 4
DRAWN: JWS	
CHECKED: DBA	WARING ROAD RECONSTRUCTION
SCALE: 1"=50'	
PROJ. #:12233.00	CITY OF ROCHESTER, MONROE COUNTY, NEW YORK



Drawing Name: J:\PROJECTS\City of Rochester\12233 Waring Road Design\D Design\D03 Job Info\From COR 9-6-11\Accident Diagrams\Drawing2.dwg   Date last accessed: 12/2/2011 12:18 PM   Date last plotted: 12/2/2011 12:20 PM

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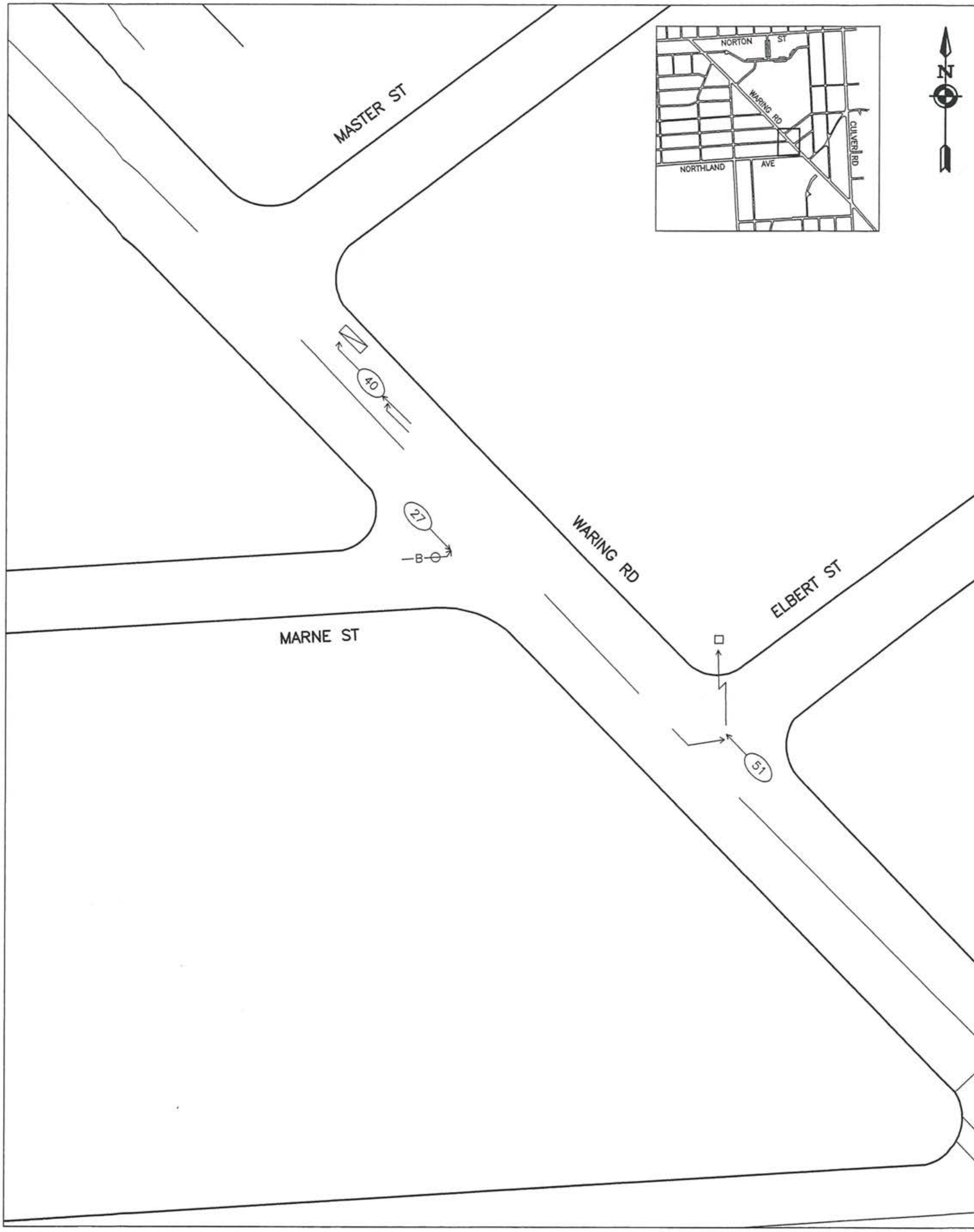
DATE: 11/11/11	ACCIDENT DETAIL 5
DRAWN: JWS	
CHECKED: DBA	WARING ROAD RECONSTRUCTION
SCALE: 1"=50'	
PROJ. #:12233.00	CITY OF ROCHESTER, MONROE COUNTY, NEW YORK



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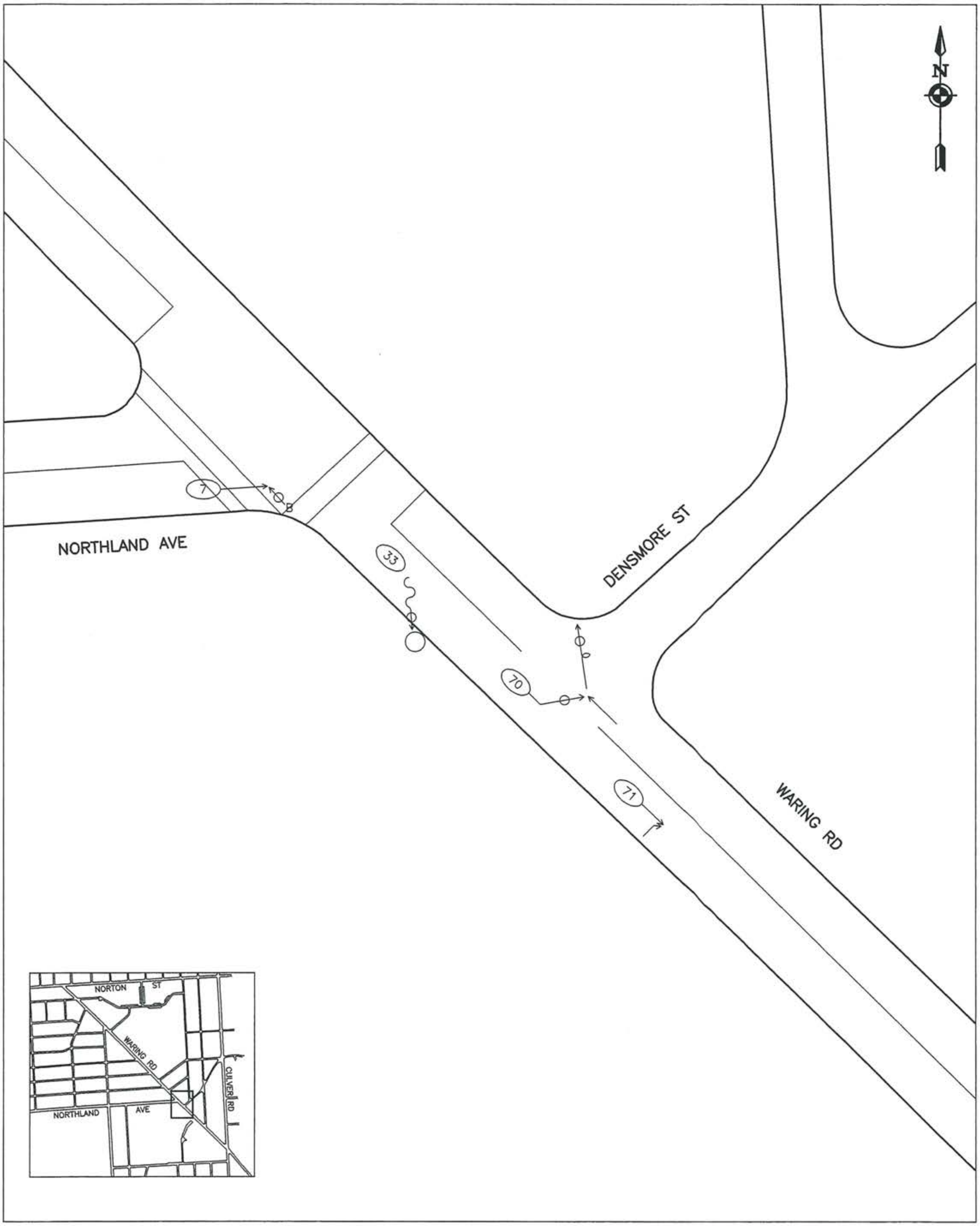
DATE: 11/11/11	ACCIDENT DETAIL 6
DRAWN: JWS	WARING ROAD RECONSTRUCTION
CHECKED: DBA	
SCALE: 1"=50'	
PROJ. #:12233.00	CITY OF ROCHESTER, MONROE COUNTY, NEW YORK



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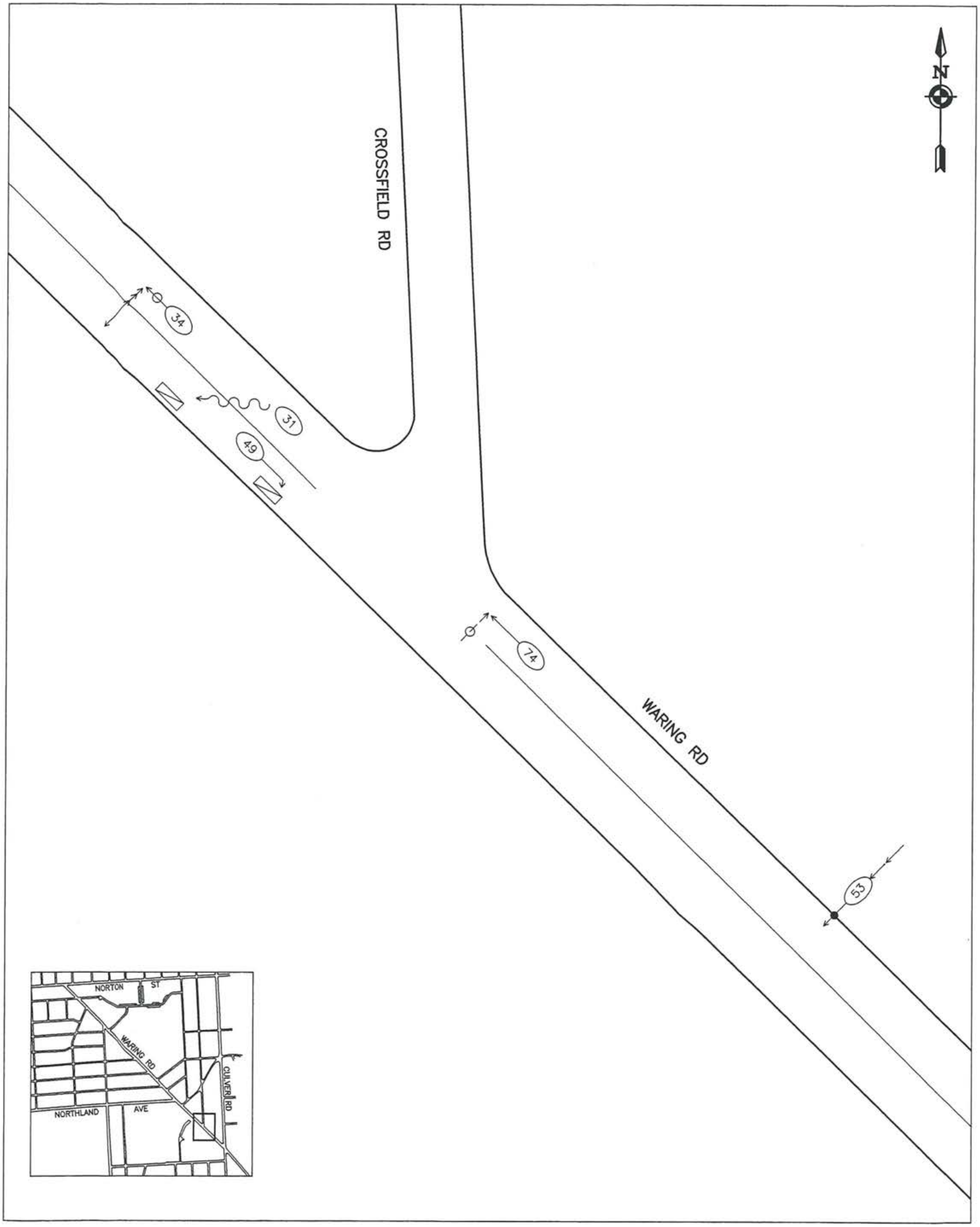
DATE: 11/11/11	ACCIDENT DETAIL 7
DRAWN: JWS	WARING ROAD RECONSTRUCTION
CHECKED: DBA	
SCALE: 1"=50'	
PROJ. #:12233.00	CITY OF ROCHESTER, MONROE COUNTY, NEW YORK

Drawing Name: J:\PROJECTS\City of Rochester\12233 Waring Road Design\D Design\D03 Job Info\From COR 9-6-11\Accident Diagrams\Drawing2.dwg Date last accessed: 12/2/2011 12:18 PM Date last plotted: 12/2/2011 12:20 PM



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ROCHESTER, NEW YORK 14604
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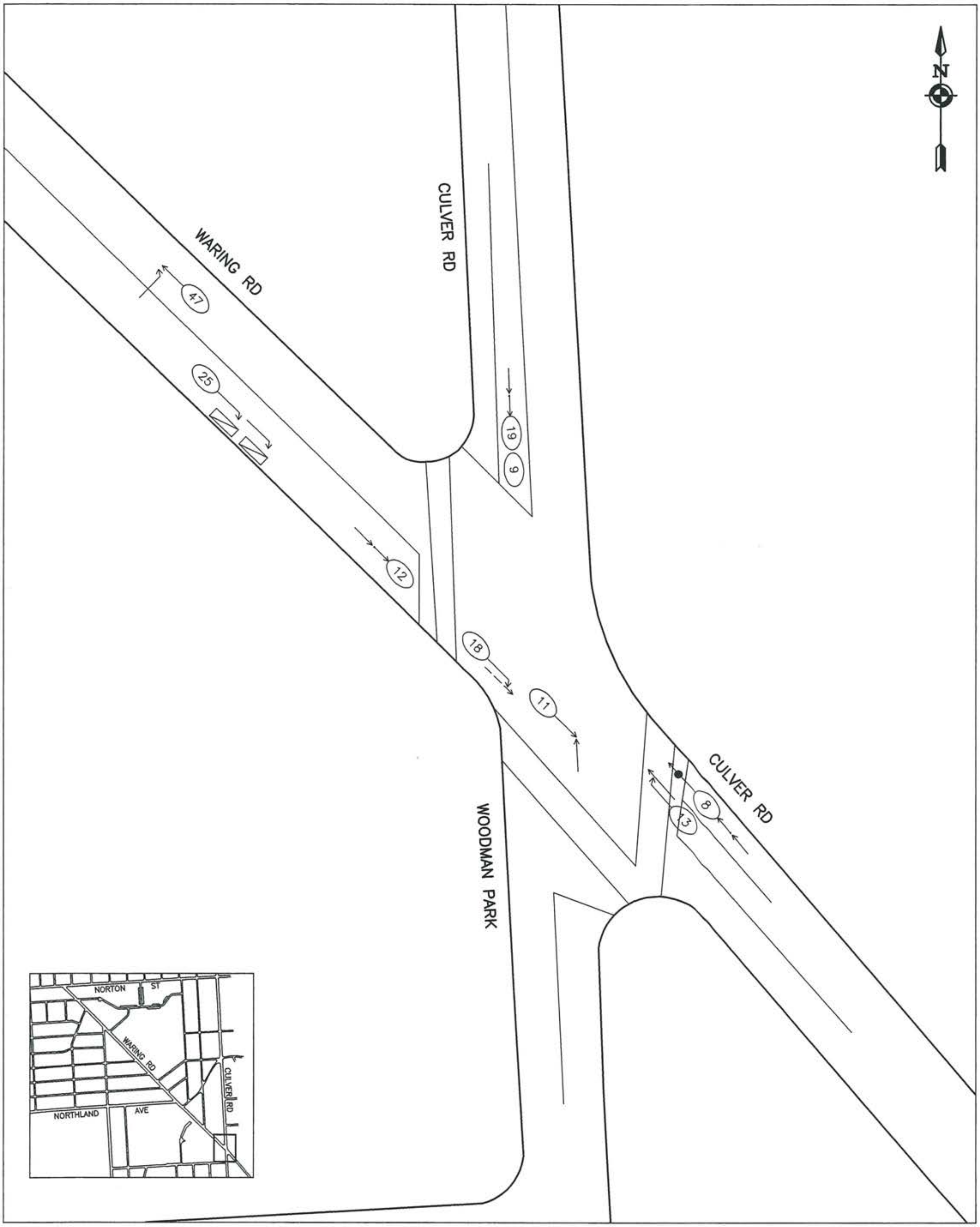
DATE: 11/11/11	ACCIDENT DETAIL 8
DRAWN: JWS	WARING ROAD RECONSTRUCTION
CHECKED: DBA	
SCALE: 1"=50'	
PROJ. #:12233.00	CITY OF ROCHESTER, MONROE COUNTY, NEW YORK



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DATE: 11/11/11	
DRAWN: JWS	
CHECKED: DBA	
SCALE: 1"=50'	
PROJ. #:12233.00	

ACCIDENT DETAIL 9

WARING ROAD RECONSTRUCTION

CITY OF ROCHESTER, MONROE COUNTY, NEW YORK

Drawing Name: J:\PROJECTS\City of Rochester\12233 Waring Road Design\D Design\D03 Job Info\From COR 9-6-11\Accident Diagrams\Drawing2.dwg Date last accessed: 12/2/2011 12:18 PM Date last plotted: 12/2/2011 12:20 PM

SUMMARY WITHOUT PLAZA #s

Total Accidents by Year

2008	9	18.4%
2009	17	34.7%
2010	14	28.6%
2011	9	18.4%
Total	*49*	

Total Injuries

0	38	77.6%
1	8	16.3%
2+	3	6.1%
Total	*49*	

Total Pedestrians

Bicycle/ Pedestrian	6	7.6%

Total Property Damage

y	45	57.0%
n	4	5.1%

Other Accident Notes

Drvr Inattention/Distraction/Impair

Hit & Run/Left Scene of Accident

Injury by Year

2008	
Death	0
Injury	3
Property	4
2009	
Death	0
Injury	0
Property	16
2010	
Death	0
Injury	3
Property	10
2011	
Death	0
Injury	2
Property	7

Total Accidents by Type

1 Other Motor Vehicle		37	75.5%
2 Pedestrian		2	4.1%
3 Bicyclist		3	6.1%
10 Other Object (Not Fixed)		2	4.1%
11 Light Support/Utility Pole		2	4.1%
14 Sign Post		0	0.0%
15 Tree		3	6.1%
16 Building/Wall		0	0.0%
	Total	*49*	

Total Accident Diagram

1 Rear End		13	27%
2 Sideswipe (same direction)		9	18%
3 Left Turn (opposite direction)		1	2%
4 Right Angle (opposite direction)		8	16%
5 Right Turn (same direction)		1	2%
6 Right Turn (opposite direction)		2	4%
7 Head On		7	14%
8 Sideswipe (opposite direction)		1	2%
9 Other		3	6%
0 Left Turn (same direction)		4	8%
99 No Info		0	0%
	Total	*49*	

Total Accident by Location

~~Waring Rd Plaza~~		~~29~~		
On Waring Road		13	27%	
On Traver Road		1	2%	
Intersections				
Waring @ Ashwood		4	8%	
Waring @ Blakeslee		2	4%	71%
Waring @ Crossfield		2	4%	35
* Waring @ Culver		7	14%	
Waring @ Densmore		1	2%	
Waring @ Elbert		1	2%	
Waring @ Fieldwood		2	4%	
Waring @ Lyceum		1	2%	
Waring @ Marne		1	2%	
Waring @ Northland		1	2%	
Waring @ Norton		12	24%	
Waring @ Traver		1	2%	
	Total	*49*		

** Waring @ Culver intx includes Woodman Park*

SUMMARY WITHOUT PLAZA #s

Traffic Control

1	None	28	35%
2	Traffic Signal	18	23%
3	Stop Sign	3	4%
		49	

Light Conditions

1	Daylight	33	42%
3	Dusk	1	1%
4	Dark-Road Lighted	15	19%
99	No Info	0	0%
		49	

Roadway Character

1	Straight and Level	42	53%
2	Straight and Grade	7	9%
		49	

Surface Condition

1	Dry	33	42%
2	Wet	7	9%
4	Snow/Ice	9	11%
		49	

Weather

1	Clear	26	33%
2	Cloudy	14	18%
3	Rain	0	0%
4	Snow	7	9%
99	No Info	2	3%
		49	

Traffic Accident Database

Waring Road, City of Rochester

CPL Report ID	Accident ID (Local Code)	Accident Date	Accident Time	Location	Accident Type	Accident Diagram	Property Damage	Vehicles	Bicyclists/ Pedestrians	Injuries	Fatalities	Traffic Control	Light Conditions	Roadway Character	Surface Conditions	Weather	Other details
1	10-164369	5/24/2010	12:22 PM	Norton @ Waring	1	1	y	2	0	0	0	2	1	1	1	1	
2	10-287750	8/26/2010	6:38 PM	Norton @ Waring	1	0	y	2	0	2	0	2	1	1	1	1	
3	10-432353	12/31/2010	8:05 PM	Norton @ Waring	1	2	y	2	0	0	0	2	4	1	2	2	Turn from wrong lane
4	09-080995	3/22/2009	10:15 AM	Norton @ Waring	1	2	y	2	0	0	0	2	1	1	1	99	Car & prop damage, H&R
5	09-300580	9/18/2009	9:05 PM	Norton @ Waring (1890 Norton)	11	9	y	1	0	0	0	2	4	1	1	1	Lost control
6	09-089641	3/29/2009	8:15 PM	Norton @ Waring	1	7	y	2	0	0	0	2	4	1	2	2	Ran red
7	08-279187	8/22/2008	4:43 PM	Northland @ Waring	3	5	n	1	1	1	0	2	1	1	1	1	Bicyclist struck
8	08-339223	10/10/2008	11:30 AM	Culver @ Waring	1	1	y	2	0	0	0	2	1	1	1	1	Incomplete stop
9	08-075012	3/7/2008	11:30 PM	Culver @ Waring	1	1	y	2	0	0	0	1	4	1	4	4	H&R
10	08-190669	6/13/2008	6:39 PM	Norton @ Waring	3	4	n	1	1	0	0	2	1	1	1	1	Bicyclist struck, H&R
11	10-198933	6/20/2010	11:45 AM	Woodman @ Waring	1	4	y	2	0	0	0	2	1	1	1	1	Ran red
12	10-356713	10/21/2010	8:15 PM	Culver @ Waring	1	1	y	2	0	0	0	2	4	1	2	2	
13	10-53675	2/21/2010	10:57 AM	Culver @ Waring	1	2	y	2	0	0	0	2	1	1	1	1	
14	09-055986	2/26/2009	11:35 PM	Norton @ Waring	1	0	y	2	0	0	0	2	4	1	1	1	Headlight blinding
15	11-203846	7/2/2011	5:35 PM	Norton @ Waring (1876 Norton)	1	6	y	2	0	0	0	2	1	1	1	1	
16	11-034315	2/3/2011	3:51 PM	Norton east of Waring	1	1	y	2	0	0	0	2	1	1	2	1	
17	11-210899	7/8/2011	12:56 AM	Waring south of Lyceum	15	7	y	1	0	0	0	1	4	1	1	1	Lost control
18	09-102813	2/12/2009	12:20 PM	Woodman @ Waring	10	8	y	1	1	0	0	2	1	1	4	99	Ped in wheelchair on road d/t s/w conditions
19	09-099982	4/8/2009	7:46 AM	Culver @ Waring	1	1	y	2	0	0	0	3	1	2	1	2	Driver distraction
20	09-281164	9/2/2009	3:00 PM	Traver south of Waring	1	1	y	2	0	0	0	1	1	1	1	1	Driver inattention
21	11-147845	5/19/2011	10:11 AM	Waring north of Ashwood	1	2	y	2	0	0	0	1	1	1	1	1	MVA d/t waiting for veh to pull into plaza
22	11-254664	8/12/2011	1:31 PM	250 Waring	1	4	y	2	0	0	0	1	1	1	1	2	MVA in plaza p-lot
23	11-268319	8/23/2011	4:09 PM	250 Waring	1	3	y	2	0	0	0	1	1	1	1	1	MVA in plaza p-lot
24	11-211269	7/8/2011	11:17 AM	250 Waring	1	3	y	2	0	0	0	1	1	1	1	1	MVA in plaza p-lot
25	11-043276	2/12/2011	12:59 PM	Waring north of Woodman (112 Waring)	1	2	y	3	0	0	0	1	1	2	4	4	CoR plow clipped parked cars on street
26	11-082962	3/21/2011	4:03 PM	Waring @ Norton	1	1	y	2	0	0	0	2	1	1	1	1	Driver distraction
27	11-271388	8/26/2011	12:10 AM	Waring @ Marne	3	4	n	1	1	1	0	3	4	1	1	1	Bicyclist xing against signal, potential fatal
28	11-074276	3/14/2011	9:57 AM	250 Waring	1	2	y	2	0	0	0	1	1	1	2	3	MVA in plaza p-lot, H&R
29	11-138638	5/11/2011	7:17 AM	250 Waring	14	7	y	1	0	0	0	1	1	1	1	1	MVA in plaza p-lot d/t sun glare, hit pole
30	11-240751	8/1/2011	9:05 AM	230 Waring	2	7	y	1	4	5	0	1	1	1	1	1	59 yo drvr w/ temp HC. Accel thru bank
31	11-023092	1/23/2011	4:17 AM	90 Waring (N of Culver)	1	7	y	2	0	0	0	1	4	2	4	4	Lost control, hit parked car
32	11-047091	2/16/2011	9:00 AM	Waring @ Master	1	9	n	2	0	0	0	1	1	1	1	2	MVA in plaza p-lot, back into parked car
33	10-430424	12/30/2010	1:05 AM	Waring south of Northland	15	7	y	1	0	1	0	1	4	1	1	2	MVA d/t drug use, hit snow bank then tree
34	10-026366	1/26/2010	9:27 AM	105 Waring (north of Crossfield)	1	4	y	2	0	1	0	1	1	2	1	2	Failure to yield from resid driveway
35	10-41449	2/9/2010	3:08 PM	475 Waring (south of Blakeslee)	1	2	y	2	0	0	0	1	1	1	1	2	RTS bus clipped door of parked car
36	10-102531	4/3/2010	7:40 PM	Waring @ Traver	1	2	y	2	0	0	0	1	1	1	1	1	Parked car pulling out hit by passing car, 17 yo drvr
37	10-109491	4/9/2010	11:52 AM	230 Waring	16	7	y	1	0	1	0	1	1	1	1	2	MVA in plaza p-lot, lost control
38	10-125265	4/22/2010	1:08 PM	230 Waring	1	8	y	2	0	0	0	1	1	1	1	2	MVA in plaza p-lot, H&R
39	10-220437	7/6/2010	3:15 PM	250 Waring	1	4	y	2	0	0	0	1	1	1	1	1	MVA in plaza p-lot
40	10-258577	8/4/2010	2:39 PM	Waring south of Masters	1	2	y	2	0	0	0	1	1	1	1	1	Hit on street prkd car d/t passing car
41	10-270079	8/13/2010	9:54 AM	Waring @ Lyceum	15	7	y	1	0	1	0	1	1	1	1	1	Lost control d/t health issue

Traffic Accident Database

Waring Road, City of Rochester

CPL Report ID	Accident ID (Local Code)	Accident Date	Accident Time	Location	Accident Type	Accident Diagram	Property Damage	Vehicles	Bicyclists/ Pedestrians	Injuries	Fatalities	Traffic Control	Light Conditions	Roadway Character	Surface Conditions	Weather	Other details
42	10-305790	9/9/2010	1:40 PM	230 Waring	1	4	y	2	0	0	0	1	1	1	1	1	MVA in plaza p-lot
43	10-321519	9/22/2010	3:29 AM	Waring south of Norton	1	1	y	2	0	0	0	1	4	1	1	1	Hit parked car, H&R
44	10-384332	11/14/2010	6:25 PM	338 Waring	1	8	y	2	0	0	0	1	4	1	2	3	Hit parked car, H&R
45	10-407658	12/6/2010	10:59 AM	262 Waring	1	4	y	2	0	0	0	1	1	1	4	4	MVA in plaza p-lot
46	10-408602	12/7/2010	11:22 AM	Waring north of Masters	10	1	y	1	0	0	0	1	1	1	4	4	Trailer of tow veh hit tow veh
47	09-006287	1/7/2009	12:41 PM	Waring north of Culver	1	4	y	2	0	0	0	1	1	2	2	2	
48	09-22615	1/23/2009	1:38 PM	300 Waring	1	4	n	2	0	0	0	1	1	1	4	2	Hit parked car
49	09-027979	1/28/2009	10:08 PM	112 Waring (north of Crossfield)	1	1	y	2	0	0	0	1	4	2	4	4	Hit parked car
50	09-35533	2/5/2009	7:47 PM	338 Waring	1	9	y	2	0	0	0	1	99	1	4	2	Hit parked car (backed into), driver distraction
51	09-036934	2/7/2009	9:04 AM	Waring @ Elbert	1	3	y	2	0	0	0	1	1	1	2	2	
52	09-040964	2/11/2009	11:05 AM	230 Waring	1	9	y	3	0	0	0	1	1	1	2	1	MVA in plaza p-lot, hit parked cars
53	09-050290	2/20/2009	10:29 PM	111 Waring (north of Culver)	1	9	y	2	0	0	0	1	4	1	4	4	MVA in driveway, rear end of both
54	09-079240	3/2/2009	4:30 PM	314 Waring	1	4	y	2	0	0	0	1	4	1	4	4	MVA in plaza p-lot
55	09-111256	4/18/2009	2:37 PM	Waring @ Ashwood	1	0	y	2	0	0	0	1	1	1	1	2	MVA at plaza driveway, H&R
56	09-117821	4/24/2009	4:53 PM	Waring @ Ashwood	11	7	y	2	0	2	0	1	1	1	1	1	Lost control d/t health issue, V2 MVA from pole
57	09-163742	6/3/2009	10:00 AM	230 Waring	1	0	y	2	0	0	0	1	1	1	1	1	MVA in plaza p-lot, hit parked cars
58	09-178413	6/15/2009	9:10 AM	250 Waring	1	5	n	2	0	0	0	1	1	1	1	1	MVA in plaza p-lot, hit parked cars
59	09-792484	6/26/2009	11:10 AM	250 Waring	1	2	y	2	0	0	0	1	1	1	1	1	MVA in plaza p-lot d/t sun glare
60	09-198802	7/1/2009	1:50 PM	250 Waring	1	6	y	2	0	0	0	1	1	1	1	2	MVA in plaza driveway, turn from wrong lane
61	09-200352	7/2/2009	4:13 PM	230 Waring	1	4	y	2	0	0	0	1	1	1	1	2	MVA at plaza driveway
62	09-208764	7/9/2009	1:18 PM	276 Waring	1	4	y	2	0	0	0	1	1	1	1	1	MVA in plaza p-lot
63	09-241425	8/3/2009	2:05 PM	250 Waring	1	4	y	3	0	0	0	1	1	1	1	1	MVA in plaza p-lot, V3 MVA parked car
64	09-289914	9/10/2009	3:40 PM	Waring @ Blakeslee	1	0	y	2	0	0	0	1	1	1	1	1	Passing car on shoulder
65	09-296010	9/15/2009	3:00 PM	240 Waring	1	4	y	2	0	0	0	1	1	1	1	1	MVA in plaza p-lot
66	09-318152	10/3/2009	10:05 AM	300 Waring	1	2	y	2	0	0	0	1	1	1	1	1	MVA in plaza p-lot
67	09-365069	11/12/2009	4:45 PM	230 Waring	1	4	y	2	0	0	0	3	3	1	1	1	
68	09-397916	12/11/2009	1:40 PM	250 Waring	1	4	y	2	0	0	0	1	1	1	4	1	MVA in plaza p-lot, hit parked car
69	08-267355	8/12/2008	10:30 PM	250 Waring	11	7	y	1	0	0	0	1	4	1	1	1	Tractor-trailer backed into OH lines
70	08-295375	9/4/2008	9:00 PM	Waring @ Densmore	1	4	y	2	0	2	0	1	4	1	1	1	rollover MVA, speeding involved
71	08-330542	10/3/2008	10:50 AM	Waring @ Crossfield	1	2	y	2	0	0	0	1	1	1	1	2	Pulling out from on-street prkg spot
72	08-361088	10/29/2008	12:00 PM	262 Waring	1	99	y	2	0	0	0	1	1	1	1	2	MVA in plaza p-lot, hit parked car, H&R
73	08-383997	11/19/2008	8:00 AM	Waring @ Norton	1	1	y	2	0	0	0	2	1	1	4	2	
74	08-389506	11/24/2008	4:52 PM	Waring @ Crossfield (50 Waring)	2	9	n	1	1	1	0	1	4	2	4	4	Ped xing w/o a crosswalk
75	08-398178	12/3/2008	3:38 PM	Waring @ Fieldwood	1	4	n	2	0	0	0	1	1	1	1	1	MVA in plaza p-lot
76	08-408068	12/13/2008	9:15 AM	Waring @ Ashwood	1	1	y	2	0	1	0	1	1	1	2	1	MVA @ plaza driveway
77	08-420878	12/26/2008	3:34 PM	250 Waring	1	0	y	2	0	0	0	1	1	1	2	2	MVA in plaza p-lot
78	11-054521	2/23/2011	3:35 PM	Waring @ Blakeslee	2	7	y	1	1	1	0	1	1	1	1	1	Ped xing w/o a crosswalk

Accident Information Source: DMV Form MV104A, City of Rochester

Notes: H&R = Hit and Run, d/t = due to, 99 = No info

APPENDIX E – GEOTECHNICAL INVESTIGATION

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MEMBER
ACEC New York

August 9, 2012
Project No. RE-12-007

Mr. David Askinazi, P.E.
Clark Patterson Lee
205 St. Paul Street, Suite 500
Rochester, New York 14604

Re: Addendum to April 2012 Geotechnical Evaluation Report for
Waring Road Improvement Project
PIN 4754.40
City of Rochester, Monroe County, New York

Dear Mr. Askinazi:

Empire Geo-Services, Inc. (Empire) has prepared this addendum to our April 3, 2012 Geotechnical Evaluation Report (Report) for the above referenced project. This addendum letter is in follow up to our recent discussions and emails regarding the recommended pavement section for the above mentioned project.

GEOTECHNICAL EVALUATION AND RECOMMENDATIONS

It is our understanding, a pavement section consisting of 1.5-inches Top, 2-inches Binder, 6-inches Base and 12-inches of Subbase overlying a geotextile fabric is being considered for reconstruction of the pavement structure located along Waring Road, based on the discussions and emails with Clark Patterson Lee and the NYSDOT.

Based on the surface subsurface conditions encountered at the test boring locations previously completed at the project site, Empire recommends an estimated effective Roadbed Soil Resilient Modulus (Mr) of 3,500 psi be used in the design analyses for the proposed new flexible asphalt concrete pavement structure located along Waring Road. As noted in the Report, this Mr value would be representative of a corresponding CBR value of about 3 to 4.

Based on the above recommended pavement section, Empire estimates approximately 4.1 Million 18 kip equivalent axle loads (EALs) for the design life of the pavement structure. Empire's estimation was determined based on the design analyses presented in the NYSDOT Thickness Design Manual for New and Reconstructed Pavement, published in October 1994. The pavement section was developed based on a 70% reliability factor. We note, the previous pavement section provided in the Report was based on an 80% reliability factor.

CLOSING

This letter presents an addendum to our April 3, 2012 Geotechnical Evaluation Report, and should be included with the Report. Recommendations and conclusions, which were previously presented and are not directly addressed by this addendum, are still applicable. Please contact the undersigned should you have any questions or wish to discuss this addendum.

Sincerely,

EMPIRE GEO-SERVICES, INC.

Wanda M. Allen, P.E.
Geotechnical Engineer

EMPIRE GEO SERVICES, INC.

A SUBSIDIARY OF SJB SERVICES, INC.

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MEMBER
ACEC New York

Geotechnical Evaluation Summary Report for Waring Road Improvement Project (PIN 4754.40) City of Rochester, Monroe County, New York

Prepared For:

Clark Patterson Lee
205 St. Paul Street
Suite 500
Rochester, New York 14604

Prepared By:

Empire Geo-Services, Inc.
535 Summit Point Drive
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STATE OF NEW YORK
JOHN JOSEPH DANZER
No. 065989
LICENSED PROFESSIONAL ENGINEER

4/3/12

Project No. RE-12-007
April 2012

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April 3, 2012
Project No. RE-12-007

Mr. David Askinazi, P.E.
Clark Patterson Lee
205 St. Paul Street
Suite 500
Rochester, New York 14604

Re: Geotechnical Evaluation Summary Report for
Waring Road Improvement Project (PIN 4754.40)
City of Rochester, Monroe County, New York

Dear Mr. Askinazi:

Pursuant to your request and authorization, Empire Geo-Services, Inc. (Empire) completed an investigation of the existing asphaltic concrete pavement structure and underlying concrete and subsurface conditions present along Waring Road in the City of Rochester, Monroe County, New York. This work was completed as part of the Waring Road Improvement Project (PIN 4754.40).

This report summarizes the investigation services completed, including the subsurface investigation data and laboratory testing data and presents recommendations for the pavement reconstruction. We have provided one (1) copy of this report, along with an electronic copy (pdf format), for your use. This work was done in general accordance with our proposal dated February 6, 2012.

Subsurface Investigation Program

General

The subsurface investigation program consisted of investigating a total of 52 locations along Waring Road between approximate Station 0+00 to Station 40+50. Twenty-six (26) conventional test borings, designated as B-1 through B-26 and twenty-six (26) core borings, designated as C-1 through C-26 were completed along Waring Road by SJB Services, Inc. (SJB), Empire's affiliated subsurface exploration company, between February 15th and February 22nd, 2012.

SJB returned to the site on March 12th and March 14th, 2012 to obtain additional samples adjacent to boring locations B-10, B-11 and B-20. These test borings are designated as B-10A, B-11A, B-11AA and B-20A.

The core/test boring locations were established on the "Boring Plan"(s), drawing numbers B-01 through B-09, dated December 2011 prepared by Clark Patterson Lee (CPL). SJB then staked the test boring locations in the field using tape measurements referenced to existing site features. In some cases, the test boring location was moved slightly from the designated location to accommodate for utilities or overhead wires. The drawings are included in Appendix A and have been modified by Empire to reflect the approximate "as drilled" locations.

The test borings were made with a Central Mine Equipment (CME) model 550 all-terrain rubber tire or CME 85 truck or CME 45 trailer mounted drill rig. In general, the borings were advanced using hollow stem auger and split spoon sampling techniques to depths varying from about 3.0 feet to 8.2 feet below existing ground surface or below the bottom of concrete. Test boring B-20A was further advanced to a depth of about 10.3 feet below the existing ground surface where auger refusal (bedrock refusal) was encountered.

Split spoon samples and Standard Penetration Tests (SPTs) were generally taken continuously from the bottom of the concrete until boring completion. In several cases, the split spoon sampling was terminated a couple of feet prior to boring completion. The split spoon samples and Standard Penetration Tests (SPTs) were completed in general accordance with *ASTM D1586 – "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils"*.

Portable coring equipment was utilized to obtain an approximate 6-inch diameter core sample of the asphaltic concrete and underlying concrete from the core locations (i.e. C-1 through C-26), prior to split spoon sampling. The underlying subbase material was then sampled after the pavement cores were extracted. The thickness of the asphalt and concrete core samples were measured and photographed in our laboratory. Refer to Table 1, included at the end of this report, for a summary of the asphalt and concrete thicknesses and the type of underlying subgrade material encountered at each core location. A description of the pavement cores are also reported on the core photographs included in Appendix C.

Pavement cores were not obtained at the test boring locations (i.e. B-1 through B-26), however, prior to split spoon sampling, the driller measured the thickness of the asphaltic concrete and underlying concrete at each location as noted on the test boring logs included in Appendix B.

The refusal material encountered in boring B-20A was cored using a NQ size double tube core barrel in accordance with *ASTM D 2113 – "Standard Practice for Rock core Drilling and Sampling of Rock for Site Investigation"*. Five (5) feet of bedrock was cored at this location after reaching auger refusal.

SJB's geologist prepared the core/test boring logs based on visual observation of the recovered soil and rock samples and review of the driller's field notes. The soil samples were described based on visual/manual estimation of the grain size distribution, along with characteristics such as color, relative density, consistency, moisture, etc. The recovered rock core sample was also described, including characteristics such as color, rock type, hardness, weathering, bedding thickness, core recovery and rock quality designation (RQD). The test boring logs are presented in Appendix B, along with general information and a key of terms and symbols used to prepare the logs.

Environmental Screening

The soil samples recovered at each core/test boring location were screened in SJB's laboratory for volatile organic compound (VOC) vapors using an Ion Science PhoCheck 1000 Photoionization Detector (PID) equipped with a 10.6 eV lamp. The PID will detect, if present, the aggregate concentration of many VOCs at the parts per million (ppm) detection scale. In addition, the soils were visually inspected for evidence of environmental degradation (i.e. discoloration, odors, etc.).

The PID readings obtained were at ambient/background levels for the recovered soil samples as noted on the subsurface logs presented in Appendix B. Evidence of petroleum or chemical staining was not observed on the recovered soils.

Laboratory Testing Program

Selected soil samples were tested in our geotechnical testing laboratory for their resistivity, redox, pH, sulfides and moisture content. In addition, several soil samples were tested by Upstate Laboratories, Inc. (Upstate) to evaluate for the presence of chlorides in the soils. The laboratory testing program included the following tests:

1. A total of twelve (12) split spoon samples obtained from various boring locations between depths of about 4 feet to 6 feet were tested for resistivity, redox, pH, sulfides and moisture content according to procedures established by the Ductile Iron Pipe Research Association (DIPRA).

2. The total of twelve (12) split spoon samples obtained generally at the same boring locations between depths of about 6 feet to 8 feet were tested for chlorides, by Upstate, using water extractable analytical methods.

The laboratory test data are presented in Appendix D.

Subsurface Conditions

The thickness of the asphaltic concrete measured at the test boring and the core boring locations ranged from about 5-inches to 7 ¼-inches. The underlying concrete varied from about 4-inches to 9-inches thick. However, in general, the thickness of the asphaltic concrete as well as the underlying concrete was typically around 6-inches.

A distinct subbase layer was generally absent beneath the concrete base. A fill soil type subgrade was generally encountered beneath the concrete base at each core/test boring location, except at C-1, C-7, C-10 and C-18. The fill consisted of varying proportions of intermixed clayey silt, silt, sand and gravel. Trace amounts of organics, asphalt, crushed stone, chinaware and/or glass were noted within the fill soils at a few of the boring locations. The fill was found to extend to depths varying from 2 feet to 8 feet below existing site grades at the boring locations. The fill soils were found to extend to boring completion at borings B-20, C-2 through C-5, C-8, C-9, C-12, C-13, C-14, C-19 through C-22 and C-24 through C-26. Accordingly, indigenous soil deposits were not recovered at these locations.

Beneath the fill or the concrete at the remaining boring locations, indigenous, silty clay, clayey silt, sandy silt and silty sand soil deposits with varying amounts of gravel were encountered. The indigenous soil deposits are classified as a CL, ML, SM and SP group soil using the Unified Soil Classification System (USCS). The SPT "N" values obtained within the indigenous soils ranged from 7 to over 50 indicating the consistency of the cohesive type soils varies from medium to hard while the relative density of the generally low to non-plastic soils varies from loose to very compact.

Trace to "and" shale rock fragments were encountered within the overburden soils encountered in the lower reaches at several of the test boring locations. In addition, gray shale rock fragments were recovered within the final split spoon sample obtained at several of the boring locations. As mentioned above, five feet of bedrock was cored at test boring location B-20A following auger refusal which was encountered at 10.3 feet. The bedrock core recovered consisted of medium gray to gray, medium hard, weathered to sound, thinly bedded to thickly bedded, Shale Rock. The bedrock was fractured at several locations throughout the rock core. The core recovery is 98% and the rock quality designation (RQD) value is 18% indicating the recovered rock core has a very poor rock mass quality.

No freestanding water was observed in the test holes following the completion of sampling operations. Groundwater, if present, may not have had sufficient time to accumulate in the boring holes within the time that had elapsed from the completion of drilling operations and the time of measurement.

A few soil samples were described as very moist at varying location and depths. According, it is possible some perched groundwater may be encountered in the more permeable fill and indigenous soils, which overlie the less permeable soil or rock. Perched groundwater conditions can be particularly prevalent during and following heavy or extended periods of precipitation and during seasonally wet periods.

Refer to the core/test boring logs included in Appendix B for additional more detailed classification of the soil and groundwater conditions encountered.

Evaluation, Considerations and Recommendations

Based on the site conditions, the intended new pavement use and our analysis of subgrade conditions encountered in the core/test borings, the following considerations and recommendations are provided for designing and reconstructing the pavement structure along Waring Road.

<u>General</u>

The test boring data suggests the upper fill and indigenous soils, which are currently and will be the new pavement structure subgrades vary in composition ranging from loose to firm granular silt, sand and gravel to soft to medium cohesive clayey silt soils. The subgrade support characteristics of the upper subgrade soils are therefore expected to vary based on their variable composition and relative density or consistency. The drainage characteristics of these subgrade soils are also variable ranging from good (i.e. granular gravel and sand soils) to very poor (i.e. clayey sand and clayey silt soils).

Accordingly it should be expected that some localized undercutting will be necessary to prepare suitable firm and stable subgrades for the pavement reconstruction. The site preparation for the pavement construction should include the removal of the existing pavement structure and any organic type soil, in addition to other surface structures.

In all cases we recommend that the existing soil subgrades be proof-rolled and evaluated prior to the placement of the subbase course for the new pavement structure construction, as described in more detail below. In addition, the surface of the existing fill soil subgrades should be thoroughly compacted with numerous passes of a vibratory smooth drum roller (i.e. 10 tons or greater) to further consolidate this fill, prior to placement of the new pavement subbase.

Placement and compaction of all subgrade fill, to raise site grades or as use for backfill in undercut areas, should be observed and tested by a representative of Empire (i.e. by our affiliated materials testing company, SJB Services, Inc.)

<u>Pavement Design</u>

As mentioned above, the upper fill and indigenous soils vary in composition and density. Accordingly, we would recommend an estimated effective Roadbed Soil Resilient Modulus (Mr) of 3,500 psi be used in the design analyses for proposed new flexible asphalt concrete pavement structure located along Waring Road. This Mr value would be representative of a corresponding CBR value of about 3 to 4. CPL estimated a pavement structure design life of approximately 5.4 Million 18 kip equivalent axle loads (EALs).

Using the above target EALs, a recommended pavement section was developed and analyzed using a computer program developed by Empire, based on the design analyses presented in the NYSDOT Thickness Design Manual for New and Reconstructed Pavement, published in October 1994. The pavement section was developed based on an 80% reliability factor.

Our recommendations for the new pavement structure, as presented below, are based on the subgrade conditions encountered in the core/test borings, and are based on a pavement structure design life in the range of approximately 5.3 Million 18 kip equivalent axle loads (EALs). The design EALs provided to Empire by CPL are based on an approximate 50-year design life.

Waring Road Asphalt Concrete Pavement:

- 1.5 inches – Top Course
- 3.0 inches – Binder Course
- 5.0 inches – Base Course
- 15 inches – Subbase Course*
- Geotextile
- Prepared Subgrade

** It may be necessary to increase the subbase thickness in some areas to improve subgrade conditions and to promote drainage to underdrains, etc, as discussed below.*

We also note that increasing the Subbase Course from 15-inches to 16-inches will increase the design life to about 6.2 Million EAL's.

Pavement Materials

Materials for the above pavement structure components should consist of the following:

1. Asphalt Concrete Top Course - NYSDOT Standard Specifications, Item No. 403.198202 - Hot Mix Asphalt, Type 7F Top Course (High Friction).

2. Asphalt Concrete Binder Course - NYSDOT Standard Specifications, Item No. 403.138902 - Hot Mix Asphalt, Type 3 Binder Course.

3. Asphalt Concrete Binder Course – NYSDOT Standard Specifications, Item No. 403.118902 – Hot Mix Asphalt, Type 1 Base Course

4. Subbase Course – NYSDOT Standard Specifications, Item No. 304.12 - Type 2 Subbase, with the following gradation requirements.

Sieve Size Distribution	Percent Finer by Weight
2 inch	100
¼ inch	25-60
No. 40	5-40
No. 200	0-10

5. Stabilization Geotextile - Woven polypropylene stabilization/separation geotextile (i.e., Mirafi 500X or suitable equivalent).

Prior to placing the subbase course materials, the subgrade surface should be prepared in accordance with the recommendations provided below. Proper grading and drainage of the pavement structure is recommended to help limit potential frost action and improve pavement structure life and performance.

The installation of underdrains and/or edge drains is recommended to drain the pavement subbase course and subgrades in order to limit the potential for frost action and improve pavement structure performance and design life. Alternatively, the pavement subbase course could also daylight/drain to an adjacent perimeter drainage swale. Accumulation of water on pavement subgrades should be avoided by grading the subgrade to a slope of at least 3 percent to allow drainage to the underdrains or drainage swales.

Subbase Material

We recommend that the subbase material used for reconstruction of the roadway generally be a crusher run, quarried limestone or dolostone product, complying with NYSDOT Standard Specifications, Item No. 304.12 - Type 2 Subbase.

Reclaimed Asphalt Pavement (RAP) obtained from milling of the existing pavement structure would also be acceptable for subbase material provided the material complies with NYSDOT Standard Specifications, Section 304-2.02 and generally meets the above gradation for subbase.

If existing subbase or RAP materials are used for the subbase layer, they should generally be placed in the lower half of the design subbase course. We would recommend the remaining portion of the subbase course be new subbase material as discussed above.

The Subbase Stone should be compacted to a minimum of 95 percent of the maximum dry density as measured by the modified Proctor test (ASTM D1557). Placement of subbase stone should not exceed a maximum loose lift thickness of 6 to 9 inches with the exception of subgrade undercuts, which can be placed in a single or initial lift not exceeding 12 inches. It may be necessary to reduce the lift thickness depending on the type of compaction equipment used so that the required density is attained. The Subbase Stone should have a moisture content within two percent of the optimum moisture content at the time of compaction.

Pavement Construction Considerations

The site preparation work should be performed during dry periods to minimize potential degradation of the subgrade soils and undercuts which may be required to establish a stable subgrade for construction. It should be understood that some of the existing fill and indigenous subgrade soils can be sensitive and be expected to degrade and lose strength when they are wet and disturbed by construction equipment traffic.

Accordingly, efforts should be made to maintain the subgrades in a dry and stable condition at all times, and minimize construction traffic directly over these soils. These efforts should include proper grading to divert surface runoff away from the construction areas, sloping of the subgrade and "sealing" of the surface, at the end of each day or when rain is anticipated, with a smooth drum roller to promote runoff, and restricting construction equipment traffic from traveling directly over the subgrade surfaces, especially when they are wet.

Any subgrades, including existing fill and indigenous soil subgrades or new fill subgrades, which become damaged, rutted or unstable should be undercut and repaired as necessary prior to placement of the suitable granular fill/subbase courses.

Existing asphalt pavement, as well as any surface slabs, vegetation, topsoil, soils containing organics, demolition rubble, or otherwise wet, soft, or unsuitable material should be removed. Following removal of the surface materials and excavation to the proposed subgrades, the exposed subgrades should be proof-rolled. As mentioned above, the surface of the existing fill soil subgrades should also be thoroughly compacted. The subgrade compaction and proof-rolling should be performed, prior to any required fill placement and ground improvement, using a vibratory smooth drum roller weighing at least 10 tons. The roller should be operated in the vibratory mode for compacting the subgrades and in the static mode for proof rolling. The roller should complete at least four (4) passes over the exposed subgrades for the compaction/densification operation and at least two (2) passes for the proof rolling evaluation.

The subgrade proof-rolling and compaction should be done under the guidance of, and observed by, a representative of Empire. Any areas, which appear wet, loose, soft, unstable or otherwise unsuitable, should be undercut. Over excavation, which may be required as the result of the proof-rolling, should be performed based on evaluation of the conditions by Empire. Any required undercuts/over-excavations should be backfilled with additional Subbase material.

The pavement construction can proceed on suitable subgrade soils following the proof-rolling and compaction evaluation. Installation of adjacent geotextile panels should have minimum overlap of 18 inches. Construction of the asphaltic concrete courses (i.e., base, binder and top) should be performed in accordance with NYSDOT Standard Specification Section 400. In addition, placement of asphalt concrete courses should not be permitted on wet or snow covered surfaces or when the subgrade surface is less than 40° F.

Concluding Remarks

This letter report was prepared to assist with the design and reconstruction of Waring Road located in the City of Rochester, Monroe County, New York. This work was completed as part of the Waring Road Improvement Project (PIN 4754.40). This letter report has been prepared for the exclusive use of the Clark Patterson Lee and other members of the design team, for specific application to this site and this project only.

The recommendations were prepared based on Empire Geo-Services, Inc.'s understanding of the proposed project, as described herein, and through the application of generally accepted soils and foundation engineering practices. No warranties, expressed or inferred, are made by the conclusions, opinions, recommendations or services provided. Important information regarding the use and interpretation of this report is presented in Appendix E.

If you have any questions or wish to discuss this information, please do not hesitate to contact our office at any time. Thank you for considering Empire Geo-Services, Inc. for this work.

Respectfully Submitted:

EMPIRE GEO-SERVICES, INC.

Wanda M. Allen, P.E.	John J. Danzer, P.E.
Geotechnical Engineer	Senior Geotechnical Engineer and Project Reviewer

TABLE

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A SUBSIDIARY OF SJB SERVICES, INC

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Henrietta, New York 14467
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PAVEMENT CORE SUMMARY

CORE NO.	PAVEMENT THICKNESS	CORE DISCRIPTION	SUBGRADE MATERIAL
C-1	6-1/2" Asphalt 5-1/2" Concrete 12 inches	2" Asphalt Top Coarse 1-3/4" Asphalt Top Coarse 1-1/4" Asphalt Top Coarse 1-1/2" Asphalt Binder Coarse Note: Drillers auger through 5-1/2" of Concrete	Grayish brown Clayey SILT, containing seams of fine Sand
C-2	7-1/4" Asphalt 7-3/4" Concrete 15 inches	1-3/4" Asphalt Top Coarse 1-1/4" Asphalt Top Coarse 4-1/4" Asphalt Binder Coarse 7-3/4" Concrete	2" Gravel
C-3	5-1/2" Asphalt 6-1/2" Concrete 12 inches	1-1/2" Asphalt Top Coarse 1-5/8" Asphalt Top Coarse 2-3/8" Asphalt Binder Coarse Note: Drillers auger through 6-1/2" of Concrete	Tan Clayey SILT, little Gravel, little fine Sand
C-4	5-1/2" Asphalt 5-1/2" Concrete 11 inches	1-1/2" Asphalt Top Coarse 1-3/4" Asphalt Top Coarse 2-1/4" Asphalt Binder Coarse 5-1/2" Concrete	Brown SILT, little fine Sand
C-5	5-1/2" Asphalt 6-1/2" Concrete 12 inches	1-3/4" Asphalt Top Coarse 1-3/4" Asphalt Top Coarse 2" Asphalt Binder Coarse 6-1/2" Concrete	Brown fine to medium SAND and GRAVEL, little Silt
C-6	6" Asphalt 6" Concrete 12 inches	1-1/2" Asphalt Top Coarse 1-3/4" Asphalt Top Coarse 2-3/4" Asphalt Binder Coarse 6" Concrete	Brown SAND and GRAVEL
C-7	5" Asphalt 7" Concrete 12 inches	1-1/4" Asphalt Top Coarse 1-1/2" Asphalt Top Coarse 2-1/4" Asphalt Binder Coarse 7" Concrete	Brown Clayey SILT, trace sand
C-8	5" Asphalt 6" Concrete 11 inches	1-1/4" Asphalt Top Coarse 1-3/4" Asphalt Top Coarse 2" Asphalt Binder Coarse 6" Concrete	Brown SILT, little Gravel, little fine Sand, trace clay
C-9	6-1/4" Asphalt 5-3/4" Concrete 12 inches	1-3/4" Asphalt Top Coarse 1-1/2" Asphalt Top Coarse 3" Asphalt Binder Coarse 5-3/4" Concrete	Brown SAND and GRAVEL, trace silt
C-10	6-1/4" Asphalt 6-1/2" Concrete 12-3/4 inches	1-3/4" Asphalt Top Coarse 2" Asphalt Top Coarse 2-1/2" Asphalt Binder Coarse 6-1/2" Concrete	Grayish brown SILT, trace sand, trace clay
C-11	6" Asphalt 6" Concrete 12 inches	1-1/2" Asphalt Top Coarse 1-3/4" Asphalt Top Coarse 2-3/4" Asphalt Binder Coarse 6" Concrete	Brown SAND and GRAVEL, little Asphalt fragments

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PAVEMENT CORE SUMMARY

CORE NO.	PAVEMENT THICKNESS	CORE DISCRIPTION	SUBGRADE MATERIAL
C-12	6" Asphalt 6-1/2" Concrete 12-1/2 inches	2" Asphalt Top Coarse 2" Asphalt Top Coarse 2" Asphalt Binder Coarse 6-1/2" Concrete	Brown SAND and GRAVEL
C-13	5-3/4" Asphalt 6-3/4" Concrete 12-1/2 inches	1-1/4" Asphalt Top Coarse 2" Asphalt Top Coarse 2-1/2" Asphalt Binder Coarse 6-3/4" Concrete	Black to brown SAND, some Gravel, little Clayey Silt, trace asphalt
C-14	6" Asphalt 7" Concrete 13 inches	2" Asphalt Top Coarse 1-3/4" Asphalt Top Coarse 2-1/4" Asphalt Binder Coarse 7" Concrete	Brown SAND and GRAVEL, trace silt
C-15	6-1/4" Asphalt 6" Concrete 12-1/4 inches	1" Asphalt Top Coarse 2-7/8" Asphalt Top Coarse 2-3/8" Asphalt Binder Coarse 6" Concrete	Brown SAND and GRAVEL, trace silt
C-16	5-3/4" Asphalt 7-3/4" Concrete 13-1/2 inches	1-1/2" Asphalt Top Coarse 1-3/4" Asphalt Top Coarse 2-1/2" Asphalt Binder Coarse 7-3/4" Concrete	Brown SAND and GRAVEL
C-17	6-1/4" Asphalt 5-3/4" Concrete 12 inches	1-3/4" Asphalt Top Coarse 1-3/4" Asphalt Top Coarse 2-3/4" Asphalt Binder Coarse 5-3/4" Concrete	Brown SAND and GRAVEL
C-18	6" Asphalt 6-3/4" Concrete 12-3/4 inches	1-1/2" Asphalt Top Coarse 2-1/4" Asphalt Top Coarse 2-1/4" Asphalt Binder Coarse 6-3/4" Concrete	Brown fine SAND, some Silt, little Gravel, trace clay
C-19	6-3/4" Asphalt 8" Concrete 14-3/4 inches	2-1/4" Asphalt Top Coarse 1-3/4" Asphalt Top Coarse 2-3/4" Asphalt Binder Coarse 8" Concrete	Grayish brown to brown Clayey SILT, some fine Sand, little Gravel
C-20	6" Asphalt 8" Concrete 14 inches	1-1/4" Asphalt Top Coarse 2-1/2" Asphalt Top Coarse 2-1/4" Asphalt Binder Coarse 8" Concrete	Brown Silty SAND, some Gravel
C-21	6-3/4" Asphalt 6" Concrete 12-3/4 inches	2" Asphalt Top Coarse 1-3/4" Asphalt Top Coarse 3" Asphalt Binder Coarse 6" Concrete	Grayish brown SILT, some fine Sand, little Gravel, trace clay
C-22	6-3/4" Asphalt 8" Concrete 14-3/4 inches	1-3/4" Asphalt Top Coarse 2-1/4" Asphalt Top Coarse 2-3/4" Asphalt Binder Coarse 8" Concrete	Brown Silty SAND, some Gravel, trace clay

EMPIRE GEO SERVICES, INC.
A SUBSIDIARY OF SJB SERVICES, INC

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PAVEMENT CORE SUMMARY			
CORE NO.	**PAVEMENT THICKNESS**	**CORE DISCRIPTION**	**SUBGRADE MATERIAL**
C-23	5" Asphalt 7" Concrete 12 inches	1" Asphalt Top Coarse 2" Asphalt Top Coarse 2" Asphalt Binder Coarse 7" Concrete	Brown Silty SAND, little Gravel
C-24	7-1/2" Asphalt 8-1/2" Concrete 16 inches	1-1/2" Asphalt Top Coarse 2-1/2" Asphalt Top Coarse 3-1/2" Asphalt Binder Coarse 8-1/2" Concrete	Grayish brown Silty SAND and GRAVEL, trace clay
C-25	5" Asphalt 7-1/2" Concrete 12-1/2 inches	1-1/2" Asphalt Top Coarse 1-1/2" Asphalt Top Coarse 2" Asphalt Binder Coarse 7-1/2" Concrete	Grayish brown Clayey SILT, some fine Sand
C-26	5-1/4" Asphalt 7-1/4" Concrete 12-1/2 inches	1-1/4" Asphalt Top Coarse 1-3/4" Asphalt Top Coarse 2-1/4" Asphalt Binder Coarse 7-1/4" Concrete	Brown Clayey SILT, some fine Sand, trace gravel

DATE

STARTED ______

FINISHED ______

SHEET ____ OF ____

SERVICES, INC.

SJB SERVICES, INC.
SUBSURFACE LOG

PROJ. No. ______

HOLE No. ______

SURF. ELEV. ______

G.W. DEPTH ______

PROJECT ______ LOCATION ______

DEPTH (ft)	SAMPLES	SAMPLE No.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	BLOWS ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	3	3	4	8	7	10	3" TOPSOIL	Groundwater at 10' upon completion, and 5' 24 hrs. after completion
								15	Brown SILT, some Sand, trace clay, ML (Moist-Loose)	
								50/.5		
5									Gray SHALE, medium hard, weathered, thin bedded, some fractures	Run#1, 2.5'-5.0' 95% Recovery 50% RQD

1 2 3 4 5 6 7 *(numbered features explained on reverse)* 8 9 10

TABLE I

	Split Spoon Sample
	Shelby Tube Sample
	Geoprobe Macro-Core
	Auger or Test Pit Sample
	Rock Core

TABLE II

Identification of soil type is made on basis of an estimate of particle sizes, and in the case of fine grained soils also on basis of plasticity.

Soil Type	Soil Particle Size	
Boulder	>12"	Coarse Grained (Granular)
Cobble	3" - 12"	
Gravel - Coarse	3" - 3/4"	
- Fine	3/4" - #4	
Sand - Coarse	#4 - #10	
- Medium	#10 - #40	
- Fine	#40 - #200	
Silt - Non Plastic (Granular) Clay - Plastic (Cohesive)	<#200	Fine Grained

TABLE III

The following terms are used in classifying soils consisting of mixtures of two or more soil types. The estimate is based on weight of total sample.

Term	Percent of Total Sample
"and"	35 - 50
"some"	20 - 35
"little"	10 - 20
"trace"	less than 10

(When sampling gravelly soils with a standard split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter.)

TABLE IV

The relative compactness or consistency is described in accordance with the following terms:

Granular Soils Term	Blows per Foot, N	Cohesive Soils Term	Blows per Foot, N
Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Firm	10 - 30	Medium	4 - 8
Compact	30 - 50	Stiff	8 - 15
Very Compact	>50	Very Stiff	15 - 30
		Hard	>30

Large particles in the soils will often significantly influence the blows per foot ecorded during the penetration test)

TABLE V

Varved	Horizontal uniform layers or seams of soil(s).
Layer	Soil deposit more than 6" thick.
Seam	Soil deposit less than 6" thick.
Parting	Soil deposit less than 1/8" thick.
Laminated	Irregular, horizontal and angled seams and partings of soil(s).

ABLE VI

Rock Classification Term		Meaning
Hardness	- Soft	Scratched by fingernail
	- Medium Hard	Scratched easily by penknife
	- Hard	Scratched with difficulty by penknife
	- Very Hard	Cannot be scratched by penknife
Weathering	- Very Weathered	Judged from the relative amounts of disintegration, iron staining, core recovery, clay seams, etc.
	- Weathered	
	- Sound	

Rock Classification Term		Meaning	
Bedding	- Laminated	(<1")	Natural breaks in Rock Layers
	- Thin Bedded	(1" - 4")	
	- Bedded	(4" - 12")	
	- Thick Bedded	(12" - 36")	
	- Massive	(>36")	

(Fracturing refers to natural breaks in the rock oriented at some angle to the rock layers)

GENERAL INFORMATION & KEY TO SUBSURFACE LOGS

The Subsurface Logs attached to this report present the observations and mechanical data collected by the driller at the site, supplemented by classification of the material removed from the borings as determined through visual identification by technicians in the laboratory. It is cautioned that the materials removed from the borings represent only a fraction of the total volume of the deposits at the site and may not necessarily be representative of the subsurface conditions between adjacent borings or between the sampled intervals. The data presented on the Subsurface Logs together with the recovered samples provide a basis for evaluating the character of the subsurface conditions relative to the project. The evaluation must consider all the recorded details and their significance relative to each other. Often analyses of standard boring data indicate the need for additional testing or sampling procedures to more accurately evaluate the subsurface conditions. Any evaluation of the contents of this report and recovered samples must be performed by qualified professionals. The following information defines some of the procedures and terms used on the Subsurface Logs to describe the conditions encountered, consistent with the numbered identifiers shown on the Key opposite this page.

1. The figures in the Depth column define the scale of the Subsurface Log.

2. The Samples column shows, graphically, the depth range from which a sample was recovered. See Table I for descriptions of the symbols used to represent the various types of samples.

3. The Sample No. is used for identification on sample containers and/or Laboratory Test Reports.

4. Blows on Sampler - shows the results of the "Penetration Test", recording the number of blows required to drive a split spoon sampler into the soil. The number of blows required for each six inches is recorded. The first 6 inches of penetration is considered a seating drive. The number of blows required for the second and third 6 inches of penetration is termed the penetration resistance, N.

5. Blows on Casing - Shows the number of blows required to advance the casing a distance of 12 inches. The casing size, hammer weight, and length of drop are noted at the bottom of the Subsurface Log. If the casing is advanced by means other than driving, the method of advancement will be indicated in the Notes column or under the Method of Investigation at the bottom of the Subsurface Log. Alternatively, sample recovery may be shown in this column, or other data consistent with the column heading.

6. All recovered soil samples are reviewed in the laboratory by an engineering technician, geologist or geotechnical engineer, unless noted otherwise. Visual descriptions are made on the basis of a combination of the driller's field descriptions and noted observations together with the sample as received in the laboratory. The method of visual classification is based primarily on the Unified Soil Classification System (ASTM D 2487) with regard to the particle size and plasticity (See Table No. II), and the Unified Soil Classification System group symbols for the soil types are sometimes included with the soil classification. Additionally, the relative portion, by weight, of two or more soil types is described for granular soils in accordance with "Suggested Methods of Test for Identification of Soils" by D.M. Burmister, ASTM Special Technical Publication 479, June 1970. (See Table No. III). Description of the relative soil density or consistency is based upon the penetration records as defined in Table No. IV. The description of the soil moisture is based upon the relative wetness of the soil as recovered and is described as dry, moist, wet and saturated. Water introduced into the boring either naturally or during drilling may have affected the moisture condition of the recovered sample. Special terms are used as required to describe soil deposition in greater detail; several such terms are listed in Table V. When sampling gravelly soils with a standard two inch diameter split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter. The presence of boulders and large gravel is sometimes, but not necessarily, detected by an evaluation of the casing and sampler blows or through the "action" of the drill rig as reported by the driller.

7. Rock description is based on review of the recovered rock core and the driller's notes. Frequently used rock classification terms are included in Table VI.

8. The stratification lines represent the approximate boundary between soil types and the transition may be gradual. Solid stratification lines delineate apparent changes in soil type, based upon review of recovered soil samples and the driller's notes. Dashed lines convey a lesser degree of certainty with respect to either a change in soil type or where such change may occur.

9. Miscellaneous observations and procedures noted by the driller are shown in this column, including water level observations. It is important to realize the reliability of the water level observations depends upon the soil type (water does not readily stabilize in a hole through fine grained soils), and that any drill water used to advance the boring may have influenced the observations. The ground water level will fluctuate seasonally, typically. One or more perched or trapped water levels may exist in the ground seasonally. All the available readings should be evaluated. If definite conclusions cannot be made, it is often prudent to examine the conditions more thoroughly through test pit excavations or groundwater observation wells.

10. The length of core run is defined as the length of penetration of the core barrel. Core recovery is the length of core recovered divided by the core run. The RQD (Rock Quality Designation) is the total length of pieces of NX core exceeding 4 inches divided by the core run. The size core barrel used is also noted in the Method of Investigation at the bottom of the Subsurface Log.

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;TART 2/16/2012
-INISH 2/16/2012
;HEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-1
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD
PROJ. NO.: RE-12-007
LOCATION: ROCHESTER, NEW YORK

EPTH T.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
								ASPHALTIC CONCRETE	Driller notes approximately
								CONCRETE	6" of Asphaltic Concrete
		1	2					Brown-Grey Clayey SILT, tr.sand, tr.oganics	and 6" of Concrete
				2				(moist, FILL)	
2.5		2	3					Grey-Brown Silty CLAY, little Fine Sand	
				4				(moist, stiff, CL)	All soil samples screened
					5				using photo-ionization
						7	9		detector. All samples
		3	5					Brown Fine SAND, little Silt, contains seams of	read < 0.1 ppm (BKG)
5				5				Clayey Silt (v.moist, loose, SM)	Background
					5				
						6	10		No petroleum odors
		4	10					Greyish-Brown SILT, little Fine Sand	observed
				10				(moist, firm, ML)	
7.5					11				
						10	21		
								Boring Complete at 8.0'	No free standing water encountered at boring completion.
10									
12.5									
15									
17.5									
20									

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: B. FULLER

DRILL RIG TYPE : CME-550

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 2/17/2012
FINISH 2/17/2012
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-2
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD
PROJ. NO.: RE-12-007
LOCATION: ROCHESTER, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	5" of Asphaltic Concrete
	1	2					Dark Brown to Brown Clayey SILT, tr.sand	and 6" of Concrete
			2				(moist, FILL)	
2.5	2	3					Brown SILT, little Fine Sand (moist, loose, ML)	
			5					All soil samples screened
				5				using photo-ionization
					7	10		detector. All samples
	3	4					Greyish-Brown Clayey SILT, tr.sand	read < 0.1 ppm (BKG)
5			4				(v.moist, stiff, ML)	Background
				7				
					7	11		No petroleum odors
	4	7						observed
			9					
7.5				12			Brown Fine SAND, little Silt (wet, firm, SM)	
					12	21		
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: B. FULLER

DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. B-3
START	2/15/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/15/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD   LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	6" of Asphaltic Concrete
								and 9" of Concrete
2.5	1	12					Brown Fine SAND, little Silt (moist, FILL)	
			12					All soil samples screened
				6			Tan Silty CLAY, little Gravel, tr.sand (moist, CL)	using photo-ionization
					5	18		detector. All samples
	2	2					Greyish-Brown SILT, little Fine Sand	read < 0.1 ppm (BKG)
5			3				(moist, loose, ML)	Background
				5				
					8	8		No petroleum odors
	3	8						observed
			16				Grades to little Rock fragments	Refusal
7.5				50/0.4		REF		
							Boring Complete at 8.0'	No free standing water
								encountered at boring
10								completion.
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW   CLASSIFIED BY: Geologist

DRILLER: B. FULLER   DRILL RIG TYPE: CME-550

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 2/17/2012
FINISH 2/17/2012
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-4
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD
LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
								ASPHALTIC CONCRETE	Driller notes approximately
								CONCRETE	5" of Asphaltic Concrete
		1	2					Brown SILT, little Fine Sand, tr.clay (moist, FILL)	and 6" of Concrete
				2					
2.5		2	4					Brown Clayey SILT, little Fine Sand	
				5				(moist, stiff, ML)	All soil samples screened
					6				using photo-ionization
						7	11		detector. All samples
		3	6					Brown Fine SAND, little Silt, little Gravel	read < 0.1 ppm (BKG)
5				10				(moist, firm, SP)	Background
					12				
						14	22		No petroleum odors
		4	14						observed
				12				Grades to some Silt, tr.shale fragments	
7.5					16				
						24	28		
								Boring Complete at 8.0'	No free standing water encountered at boring completion.
10									
12.5									
15									
17.5									
20									

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 2/15/2012
FINISH 2/15/2012
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

SJB SERVICES, INC.

HOLE NO. B-5
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD
LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	6" of Asphaltic Concrete
	1	8					Brown SAND and GRAVEL (moist, FILL)	and 6" of Concrete
			5				Brown SAND and Fine Gravel, little Clayey Silt	
2.5	2	5					(moist, SP)	
			4					All soil samples screened
				4				using photo-ionization
					16	8	(loose)	detector. All samples
	3	8					Brown Fine SAND, little Gravel, little Silt	read < 0.1 ppm (BKG)
5			10				(moist, firm, SM)	Background
				10				
					11	20		No petroleum odors
	4	11					Greyish Brown SILT, little Fine Sand	observed
			19				(moist, compact, ML)	
7.5				29				
					50/0.3	48		
							Boring Complete with Sample Spoon	No free standing water
							Refusal at 7.8'	encountered at boring
10								completion.
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: B. FULLER

DRILL RIG TYPE : CME-550

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 2/15/2012
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SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-6
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD
LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	5.5" of Asphaltic Concrete
	1	5					Brown SAND and GRAVEL (moist, FILL)	and 6.5" of Concrete
			5				Tan Clayey SILT, little Gravel, tr.sand (moist, FILL)	
2.5	2	15					Brown Fine SAND, some Silt, little Gravel	
			16				(moist, firm, SM)	All soil samples screened
				13				using photo-ionization
					11	29		detector. All samples
	3	14						read < 0.1 ppm (BKG)
5			10					Background
				12				
					13	22		No petroleum odors
	4	14						observed
			14				Grades to little Weathered Shale fragments	Refusal
7.5				50/0.4		REF		
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: B. FULLER

DRILL RIG TYPE : CME-550

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE	
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SJB SERVICES, INC.
SUBSURFACE LOG

SJB SERVICES, INC.

HOLE NO.	B-7
SURF. ELEV	
G.W. DEPTH	See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	5" of Asphaltic Concrete
	1	3					Grey Clayey SILT, little Gravel, little Sand (moist, FILL)	and 6.5" of Concrete
			3				Brown Clayey SILT, little Fine Sand (moist, FILL)	
2.5	2	4						
			5				Grades to little Fine Gravel	All soil samples screened
				7				using photo-ionization
					7	12		detector. All samples
	3	5					Brown SILT, some Gravel, little Fine Sand	read < 0.1 ppm (BKG)
5			5				(moist, firm, ML)	Background
				9				
					12	14		No petroleum odors
	4	11						observed
			15				Grades to "and" SAND	
7.5				18				
					11	33	(compact)	
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE: CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE	
START	2/17/2012
FINISH	2/17/2012
SHEET	1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

SERVICES, INC.

HOLE NO. B-8
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	All soil samples screened using photo-ionization detector. All samples read < 0.1 ppm (BKG) Background
	1	2					Greyish Brown SILT, little Fine Sand, tr.gravel	
			2				(moist, ML)	
2.5	2	8					Greyish Brown Silty SAND, some highly Weathered	
			30				Shale fragments (moist, compact, SM)	
				20				
					17	50		No petroleum odors observed
	3	30						
5			50/0.1			REF	Grades to little highly weathered Shale fragments (v.compact)	
	4	50/0.1				REF	Grey SHALE Fragments (moist)	
7.5								REF = Sample Spoon Refusal
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. B-9
START	2/16/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/16/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	6" of Asphaltic Concrete
	1	20					Brown SAND and GRAVEL (moist, FILL)	and 6" of Concrete
			11				Brown Clayey SILT, some Gravel, tr.sand (moist, FILL)	
2.5	2	11						
			39				Brown SAND and GRAVEL, tr.sand	All soil samples screened
				11			(moist, FILL)	using photo-ionization
					12	50		detector. All samples
	3	6					Greyish Brown Sandy SILT, little highly Weathered	read < 0.1 ppm (BKG)
5			8				Shale fragments (moist, compact, SM)	Background
				26				
					47	34		No petroleum odors
	4	50/0.3				REF	Grades to "and" Weathered Shale fragments	observed
7.5								REF = Sample Spoon
								Refusal
							Boring Complete at 8.0'	No free standing water
								encountered at boring
10								completion.
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. B-10
START	2/16/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/16/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller moved Borehole 6'
							CONCRETE	due to 15" Sewer Line
	1	3					Brown SAND and GRAVEL, tr.silt	
			3				(v.moist, FILL)	Driller notes approximately
2.5	2	3					Greyish Brown SILT, little Gravel, tr.sand	6" of Asphaltic Concrete
			3				(moist, firm, ML)	and 7" of Concrete
				8				
					12	11		
	3	23					Grades to little Highly Weathered Shale fragments	
5			28				(v.compact)	
				44				
					46	72		
	4	50/0.3				REF	Greyish Brown SHALE fragments (moist)	
								REF = Sample Spoon
7.5								Refusal
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								All soil samples screened using photo-ionization detector. All samples read < 0.1 ppm (BKG) Background
15								No petroleum odors observed
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 3/12/2012
FINISH 3/14/2012
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-10A
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD
LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	6" of Asphaltic Concrete
	1	2					Brown SAND and GRAVEL, tr.silt	and 4" of Concrete
			4				(moist, FILL)	
2.5	2	5					Tan SILT, tr.sand (moist, firm, ML)	All soil samples screened
			5					using photo-ionization
				15				detector. All samples
					50/0.3	20		read < 0.1 ppm (BKG)
	3	9					Grades to tr.weathered Shale (v.compact)	Background
5			17					
				45				No petroleum odors
					50/0.4	62		observed
	4	50/0.4				REF	Greyish Brown SHALE fragments (moist)	
								REF = Sample Spoon
7.5								Refusal
							Boring Complete with Auger	No free standing water
							Refusal at 7.9'	encountered at boring
10								completion.
12.5								
								No petroleum odors
15								observed
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: B. FULLER

DRILL RIG TYPE : CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

SJB SERVICES, INC.
SUBSURFACE LOG

DATE
START 2/16/2012
FINISH 2/16/2012
SHEET 1 OF 1

HOLE NO. B-11
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD
LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE CONCRETE	Driller notes approximately 6" of Asphaltic Concrete and 6" of Concrete
	1	8	16				Brown-Black SAND and GRAVEL, tr.chinaware, tr.glass (moist, FILL)	
2.5	2	50/0.4				REF		REF = Sample Spoon Refusal
	3	7	10	14	25	24	Greyish Brown SILT, tr.sand (moist, firm, ML)	All soil samples screened using photo-ionization detector. All samples read < 0.1 ppm (BKG) Background
5								
	4	50	50/0.1			REF	Grades to little Highly Weathered Shale fragments (v.compact)	No petroleum odors observed
7.5								
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: B. FULLER

DRILL RIG TYPE: CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. B-11A
START	3/12/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	3/12/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	50					ASPHALTIC CONCRETE	Driller notes approximately
			33				CONCRETE	6" of Asphaltic Concrete
				15			Brown SAND and Gravel, tr.silt (moist, FILL)	and 4" of Concrete
					5	48		
2.5	2	4					Greyish Brown SILT, tr.sand (moist, firm, ML)	
			5					REF = Sample Spoon
				13				Refusal
					23	18		
	3	50/0.4				REF		
5							Boring Complete with Sample Spoon Refusal at 4.4'	No free standing water encountered at boring completion.
7.5								All soil samples screened using photo-ionization detector. All samples read < 0.1 ppm (BKG) Background
10								No petroleum odors observed
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

SJB SERVICES, INC.
SUBSURFACE LOG

DATE
START 3/14/2012
FINISH 3/14/2012
SHEET 1 OF 1

HOLE NO. B-11AA
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
								Driller Augered to 4.0' before sampling. See Log from 3/12/12 for soil description of material encountered above 4.0'
2.5								
	1	17						
5			39					REF = Sample Spoon Refusal
				50/0.4		REF		
	2	50/0.3				REF	Contains tr.weathered Shale fragments	
7.5								
							Boring Complete with Auger Refusal at 7.6'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 2/16/2012
FINISH 2/16/2012
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-12
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD
LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	6" of Asphaltic Concrete
	1	3					Brown SAND and GRAVEL, tr.silt (moist, FILL)	and 6" of Concrete
			8					
2.5	2	8					Becomes Gray	All soil samples screened
			7					using photo-ionization
				7				detector. All samples
					6	14		read < 0.1 ppm (BKG)
	3	6					Grey f-c SAND, tr.silt, tr.gravel	Background
5			5				(moist, FILL)	
				4				No petroleum odors
					4	9		observed
	4	6					Brown to Grey SILT and SHALE fragments	
			50/0.4			REF	(moist, v.compact, ML)	
7.5								REF = Sample Spoon
								Refusal
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: B. FULLER

DRILL RIG TYPE: CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE START	2/17/2012	**SJB SERVICES, INC. SUBSURFACE LOG**	HOLE NO. B-13
FINISH	2/17/2012		SURF. ELEV
SHEET	1 OF 1		G.W. DEPTH See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	6" of Asphaltic Concrete
	1	8					Brown SAND and GRAVEL, some Crushed Stone,	and 6" of Concrete
			17				tr.clayey Silt (moist, FILL)	
2.5	2	17					Brown SILT, some Fine Sand, tr.gravel	
			13				(moist, firm, ML)	All soil samples screened
				10				using photo-ionization
					12	23		detector. All samples
	3	10						read < 0.1 ppm (BKG)
5			10				Becomes Gray-Brown	Background
				13				
					17	23		No petroleum odors
	4	27						observed
			42					
7.5				47				
					50	89	(v.compact)	
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

ATE		**SJB SERVICES, INC.**	HOLE NO. B-14
TART	2/17/2012	**SUBSURFACE LOG**	SURF. ELEV
INISH	2/17/2012		G.W. DEPTH See Notes
HEET	1 OF 1		

ROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

ROJ. NO.: RE-12-007

EPTH	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	6" of Asphaltic Concrete
	1	3					Dark Brown SAND, some Gravel, little Silt, tr.organics	and 6" of Concrete
			7				(moist, FILL)	
2.5	2	9						All soil samples screened
			8					using photo-ionization
				7				detector. All samples
					7	15		read < 0.1 ppm (BKG)
	3	7					Greyish Brown SILT, tr.sand (moist, firm, ML)	Background
5			11					
				11				No petroleum odors
					8	22		observed
	4	13					Grades to tr.clay	
			30					
7.5				30				
					35	60	(v.compact)	
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
2.5								
15								
7.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE			
START	2/17/2012	**SJB SERVICES, INC.**	HOLE NO. B-15
FINISH	2/17/2012	**SUBSURFACE LOG**	SURF. ELEV
SHEET	1 OF 1		G.W. DEPTH See Notes

PROJECT: WARING ROAD — LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	5" of Asphaltic Concrete
	1	6					Brown SAND and GRAVEL (moist, FILL)	and 6" of Concrete
			7				Black-Brown Sandy SILT, some Gravel (moist, FILL)	
2.5	2	10					Greyish Brown SILT, tr.sand, tr.clay (moist, firm, ML)	All soil samples screened
			11					using photo-ionization
				10				detector. All samples
					12	21		read < 0.1 ppm (BKG)
	3	8					Grades to tr.gravel	Background
5			7					
				9				No petroleum odors
					9	16		observed
	4	10						
			14					
7.5				33				
					45	47	(compact)	
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW — CLASSIFIED BY: Geologist

DRILLER: B. FULLER — DRILL RIG TYPE: CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. B-16
START	2/21/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/21/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD — LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	6" of Asphaltic Concrete
	1	2					Black to Brown SAND and GRAVEL, some Clayey Silt	and 7" of Concrete
			4				(moist, FILL)	
2.5	2	4					Brown Clayey SILT, some Gravel, little Fine Sand	
			5				(moist, FILL)	All soil samples screened
				5				using photo-ionization
					3	10		detector. All samples
	3	2						read < 0.1 ppm (BKG)
5			2				Grades to little Fine Gravel	Background
				2				
					8	4		No petroleum odors
	4	5						observed
			5				Greyish-Brown SILT, tr.sand, tr.clay	
7.5				4			(moist, loose, ML)	
					8	9		
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW — CLASSIFIED BY: Geologist

DRILLER: B. FULLER — DRILL RIG TYPE: CME-45

METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. B-17
START	2/17/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/17/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE CONCRETE	Driller notes approximately 6" of Asphaltic Concrete and 6" of Concrete
	1	3	7				Brown SAND and GRAVEL, tr.silt (moist, FILL)	
2.5	2	10	13	15	17	28	Brown Fine SAND and SILT, little Gravel (moist, firm, SM)	All soil samples screened using photo-ionization detector. All samples read < 0.1 ppm (BKG) Background
5	3	13	14	14	13	28	Grades to some Gravel	No petroleum odors observed
7.5	4	12	17	12	50/0.3	29	Greyish Brown SILT, tr.sand, tr.gravel (moist, firm, ML)	
10							Boring Complete with Sample Spoon Refusal at 7.8'	No free standing water encountered at boring completion.
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE	
START	2/21/2012
FINISH	2/21/2012
SHEET	1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-18
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD
LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	6" of Asphaltic Concrete
	1	4					Brown SAND and GRAVEL (moist, FILL)	and 8" of Concrete
			6				Brown Clayey SILT, little Gravel, tr.sand	
2.5	2	6					(moist, FILL)	
			10				Greyish Brown Fine SAND and SILT, little Gravel	All soil samples screened
				13			(moist, firm, SM)	using photo-ionization
					16	23		detector. All samples
	3	15						read < 0.1 ppm (BKG)
5			12				Grades to some Gravel	Background
				16				
					13	28		No petroleum odors
	4	15						observed
			9					
7.5				9				
					12	18		
							Boring Complete at 8.2'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: B. FULLER

DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

SJB SERVICES, INC.
SUBSURFACE LOG

DATE
START 2/20/2012
FINISH 2/20/2012
SHEET 1 OF 1

HOLE NO. B-19
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	6" of Asphaltic Concrete
	1	5					Brown Silty SAND, little Gravel (moist, FILL)	and 6" of Concrete
			6					
2.5	2	10						All soil samples screened
			16				Greyish Brown Clayey SILT, some Gravel, tr.sand	using photo-ionization
				19			(moist, hard, ML)	detector. All samples
					19	35		read < 0.1 ppm (BKG)
	3	14					Grey Silty SAND, little Gravel (moist, firm, SM)	Background
5			10					
				11				No petroleum odors
					12	21		observed
	4	12						
			13					
7.5				12				
					17	25		
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE	
START	2/21/2012
FINISH	2/21/2012
SHEET	1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO.	B-20
SURF. ELEV	
G.W. DEPTH	See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE CONCRETE	Driller notes approximately 6" of Asphaltic Concrete and 6" of Concrete
	1	1	3				Brown Silty SAND and GRAVEL (moist, FILL)	
2.5	2	3	6	6	3	12	Greyish Brown Clayey SILT, tr.sand, tr.organics (moist, FILL)	All soil samples screened using photo-ionization detector. All samples read < 0.1 ppm (BKG) Background
5	3	6	5	4	3	9	Brown Silty SAND, some Gravel, tr.clay (v.moist, FILL)	No petroleum odors observed
7.5	4	1	2	4	7	6	Brown Sandy SILT, some Gravel, tr.clay (moist, FILL)	
10							Boring Complete at 8.0'	No free standing water encountered at boring completion.
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE START	3/12/2012	**SJB SERVICES, INC. SUBSURFACE LOG**	HOLE NO. B-20A
FINISH	3/12/2012		SURF. ELEV
SHEET	1 OF 1		G.W. DEPTH See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
								Refer to B-20 for description of upper 8 feet.
2.5								
5								
7.5								Soil sample screened using photo-ionization detector. All samples read < 0.1 ppm (BKG) Background
	1	3	6	21	50/0.3	27	Grey Silty SAND and Shale fragments (moist, firm, SM)	No petroleum odors observed
10	2	50/0.3					Medium Grey to Grey ROCHESTER SHALE, medium hard, weathered to sound, thinly bedded to bedded. Fractured from 10.6' to 10.9' Fractured from 11.3' to 12.3' Fractured from 12.7' to 13.1'	RUN #1: 10.3' - 15.3' REC = 98% RQD = 18%
12.5								
15							Boring Complete at 15.3'	No free standing water encountered at boring completion.
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		SJB SERVICES, INC.	HOLE NO. B-21
START	2/20/2012	SUBSURFACE LOG	SURF. ELEV
FINISH	2/20/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	6" of Asphaltic Concrete
	1	5					Brown SAND and GRAVEL (moist, FILL)	and 6" of Concrete
			6				Greyish Brown Clayey SILT, some Gravel, little Fine	
2.5	2	6					Sand (moist, FILL)	
			10				Greyish Brown SILT and Fine Sand, some Gravel,	All soil samples screened
				12			tr.clay (moist, firm, ML)	using photo-ionization
					13	22		detector. All samples
	3	12						read < 0.1 ppm (BKG)
5			11					Background
				11				
					15	22		No petroleum odors
	4	12						observed
			14					
7.5				19			(compact)	
					20	33		
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE	
START	2/20/2012
FINISH	2/20/2012
SHEET	1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

SERVICES, INC.

HOLE NO. B-22
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE CONCRETE	Driller notes approximately 6" of Asphaltic Concrete and 6" of Concrete
	1	3	3				Brown Clayey SILT, little Gravel, little Sand (moist, FILL)	
2.5	2	9	8	7	7	15	Brown Sandy SILT, some Gravel, tr.clay (moist, FILL)	All soil samples screened using photo-ionization detector. All samples read < 0.1 ppm (BKG) Background
5	3	7	9	11	11	20	Greyish Brown Fine SAND, some Silt, some Gravel (moist, firm, SM)	No petroleum odors observed
7.5	4	8	7	8	8	15		
10							Boring Complete at 8.0'	No free standing water encountered at boring completion.
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

)ATE
;TART 2/20/2012
:INISH 2/20/2012
;HEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-23
SURF. ELEV
G.W. DEPTH See Notes

'ROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
'ROJ. NO.: RE-12-007

EPTH r.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
								ASPHALTIC CONCRETE	Driller notes approximately
								CONCRETE	6" of Asphaltic Concrete
		1	6					Greyish Brown Silty SAND, some Gravel, tr.clay	and 6" of Concrete
				11				(moist, FILL)	
2.5		2	12						
				17				Greyish Brown Clayey SILT, little Fine Sand	All soil samples screened
					18			(moist, hard, ML)	using photo-ionization
						8	35		detector. All samples
		3	10					Greyish Brown Fine SAND and Silt, little Gravel	read < 0.1 ppm (BKG)
5				11				(moist, firm, SM)	Background
					10				
						13	21		No petroleum odors
		4	11						observed
				10				(v.moist)	
7.5					10				
						11	20		
								Boring Complete at 8.0'	No free standing water encountered at boring completion.
10									
12.5									
15									
17.5									
20									

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. B-24
START	2/20/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/20/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

SERVICES, INC.

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
	↕							ASPHALTIC CONCRETE	Driller notes approximately
								Brown Silty SAND, little Gravel, tr.clay (moist, FILL)	6" of Asphaltic Concrete
		1	2						
				4					
2.5		2	5					Greyish Brown Clayey SILT, little Fine Sand, tr.gravel	All soil samples screened
				6				(moist, stiff, ML)	using photo-ionization
					6				detector. All samples
						8	12		read < 0.1 ppm (BKG)
		3	8					Brown Fine SAND, some Gravel, little Silt	Background
5				16				(moist, compact, SP)	
					16				No petroleum odors
						12	32		observed
		4	9						
				10				Grades to little Clayey Silt (firm)	
7.5					11				
						18	21		
								Boring Complete at 8.0'	No free standing water encountered at boring completion.
10									
12.5									
15									
17.5									
20									

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 2/20/2012
FINISH 2/20/2012
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-25
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD
LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	6" of Asphaltic Concrete
	1	6					Brown SAND and GRAVEL (moist, FILL)	and 6" of Concrete
			17				Brown SILT, little Fine Sand (moist, ML)	
2.5	2	11					Brown Fine SAND and SILT (moist, firm, SM)	All soil samples screened
			14					using photo-ionization
				15				detector. All samples
					15	29		read < 0.1 ppm (BKG)
	3	7					Greyish Brown Silty SAND, some Gravel, tr.clay	Background
5			3				(v.moist, loose, SM)	
				4				No petroleum odors
					5	7		observed
	4	7					Brown Fine SAND and SILT, tr.gravel	
			9				(wet, firm, SM)	
7.5				9				
					9	18		
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW
CLASSIFIED BY: Geologist

DRILLER: B. FULLER
DRILL RIG TYPE: CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE			
START	2/20/2012	**SJB SERVICES, INC.**	HOLE NO. B-26
FINISH	2/20/2012	**SUBSURFACE LOG**	SURF. ELEV
SHEET	1 OF 1		G.W. DEPTH See Notes

PROJECT: WARING ROAD | LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							ASPHALTIC CONCRETE	Driller notes approximately
							CONCRETE	6" of Asphaltic Concrete
	1	6					Brown Silty SAND, some Gravel, tr.clay (moist, FILL)	and 6" of Concrete
			2					
2.5	2	11					Brown Clayey SILT, little Fine Sand, tr.gravel	
			6				(moist, stiff, ML)	All soil samples screened
				6				using photo-ionization
					4	12		detector. All samples
	3	4						read < 0.1 ppm (BKG)
5			8				Brown Sandy SILT, some Gravel, tr.clay	Background
				9			(moist, firm, ML)	
					11	17		No petroleum odors
	4	15						observed
			18					
7.5				14				
					13	32	(compact)	
							Boring Complete at 8.0'	No free standing water encountered at boring completion.
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: B. FULLER

DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

)ATE		**SJB SERVICES, INC.**	HOLE NO. C-1
;TART	2/16/2012	**SUBSURFACE LOG**	SURF. ELEV
·INISH	2/16/2012		G.W. DEPTH See Notes
;HEET	1 OF 1	SERVICES, INC.	

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

EPTH T.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							6 1/2" ASPHALTIC CONCRETE	
							5.5" CONCRETE	
	1	5					Greyish Brown Clayey SILT, contains seams of Fine	
			5				Sand (moist, stiff, ML)	
2.5				7				
					7	12		
							Boring Complete at 3.0'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-550

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.** **SUBSURFACE LOG**	HOLE NO. C-2
START	2/17/2012		SURF. ELEV
FINISH	2/17/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							7 1/4" ASPHALTIC CONCRETE	Driller notes approximately
							7 3/4" CONCRETE	2" Gravel Subbase
	1	8					GRAVEL SUBBASE	
			4				Greyish Brown Clayey SILT, tr.sand	
2.5				4			(moist, FILL)	
					2	8		
							Boring Complete at 3.0'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. C-3
START	2/15/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/15/2012		G.W. DEPTH See Notes
SHEET	1 OF 1	SERVICES, INC.	

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							5 1/2" ASPHALTIC CONCRETE	
							6 1/2" CONCRETE	
	1	5					Tan Clayey SILT, little Gravel, little Fine Sand	
			5				(moist, FILL)	
2.5				7				
					4	12		
							Boring Complete at 3.0'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-550

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 2/17/2012
FINISH 2/17/2012
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. C-4
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD
LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							5 1/2" ASPHALTIC CONCRETE	
							5 1/2" CONCRETE	
	1	2					Brown SILT, little Fine Sand (v.moist, FILL)	
			2					
2.5				4				
					5	6		
							Boring Complete at 3.0'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: B. FULLER

DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. C-5
START	2/15/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/15/2012		G.W. DEPTH See Notes
SHEET	1 OF 1	SERVICES, INC.	

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
								5 1/2" ASPHALTIC CONCRETE	
								6 1/2" CONCRETE	
		1	11					Brown Firm to Medium SAND and GRAVEL, little Silt	
				14				(moist, FILL)	
2.5					19				
						23	33		
								Boring Complete at 3.0'	No free standing water encountered at boring completion.
5									
7.5									
10									
2.5									
15									
7.5									
20									

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-550

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE START 2/15/2012 FINISH 2/15/2012 SHEET 1 OF 1	**SJB SERVICES, INC.** **SUBSURFACE LOG**	HOLE NO. C-6 SURF. ELEV G.W. DEPTH See Notes

PROJECT: WARING ROAD — LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							6" ASPHALTIC CONCRETE	
							6" CONCRETE	
	1	8					Brown SAND and GRAVEL (moist, FILL)	
			9				Brown Clayey SILT, little Gravel, tr.sand	
2.5				11			(moist, v.stiff, ML)	
					9	20		
							Boring Complete at 3.0'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW — CLASSIFIED BY: Geologist

DRILLER: B. FULLER — DRILL RIG TYPE : CME-550

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. C-7
START	2/17/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/17/2012	SERVICES, INC.	G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							5" ASPHALTIC CONCRETE	
							7" CONCRETE	
	1	6					Brown Clayey SILT, tr.sand (moist, stiff, ML)	
			5					
2.5				5				
					5	10		
							Boring Complete at 3.0'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE	
START	2/15/2012
FINISH	2/15/2012
SHEET	1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

SJB SERVICES, INC.

HOLE NO. C-8
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD
LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							5" ASPHALTIC CONCRETE	
							6" CONCRETE	
	1	6					Brown SILT, little Gravel, little Fine Sand, tr.clay	
			37				(moist, FILL)	
2.5				14				
					15	51		
							Boring Complete at 3.0'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: B. FULLER

DRILL RIG TYPE : CME-550

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. C-9
START	2/16/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/16/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							6 1/4" ASPHALTIC CONCRETE	
							5 3/4" CONCRETE	
	1	6					Brown SAND and GRAVEL, tr.silt	
			6				(v.moist, FILL)	
2.5				7				
					5	13		
							Boring Complete at 3.0'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE: CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 2/16/2012
FINISH 2/16/2012
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

SERVICES, INC.

HOLE NO. C-10
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD
LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							6 1/4" ASPHALTIC CONCRETE	
							6 1/2" CONCRETE	
	1	6					Greyish Brown SILT, tr.sand, tr.clay	
			4				(moist, firm, ML)	
2.5				10				
					20	14		
							Boring Complete at 3.1'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE

START	2/17/2012	**SJB SERVICES, INC.**	HOLE NO.	C-11
FINISH	2/17/2012	**SUBSURFACE LOG**	SURF. ELEV	
SHEET	1 OF 1		G.W. DEPTH	See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							6" ASPHALTIC CONCRETE	
							6" CONCRETE	
	1	8					Brown SAND and GRAVEL, little Asphalt fragments	
			17				(v.moist, FILL)	
2.5	2	22						
			32					
				19				
					17	51		
	3	7					Greyish Brown SILT, little Gravel, little Fine Sand	
5			7				(moist, firm, ML)	REF = Sample Spoon
				16				Refusal
					30	23		
							Grey SHALE fragments (moist)	
	4	50/0.4				REF		
							Boring Complete with Sample	No free standing water
7.5							Spoon Refusal at 6.4'	encountered at boring
								completion
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE	
START	2/16/2012
FINISH	2/16/2012
SHEET	1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. C-12
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							6" ASPHALTIC CONCRETE	
							6 1/2" CONCRETE	
	1	3					Brown SAND and GRAVEL (moist, FILL)	
			8					
2.5				14			Grey Clayey SILT, some Gravel, little sand	
					12	22	(moist, FILL)	
							Boring Complete at 3.3'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		SJB SERVICES, INC. SUBSURFACE LOG	HOLE NO. C-13
START	2/17/2012		SURF. ELEV
FINISH	2/17/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD — LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							5 3/4" ASPHALTIC CONCRETE	
							6 3/4" CONCRETE	
	1	6					Black-Brown SAND, some Gravel, little Clayey Silt,	
			9				tr.asphalt (moist,FILL)	
2.5				6				
					4	15		
							Boring Complete at 3.1'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW — CLASSIFIED BY: Geologist

DRILLER: B. FULLER — DRILL RIG TYPE: CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. C-14
START	2/17/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/17/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							6" ASPHALTIC CONCRETE	
							7" CONCRETE	
	1	2					Brown SAND and GRAVEL, tr.silt (v.moist, FILL)	
			8					
2.5				14				
					13	22		
							Boring Complete at 3.3'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

)ATE		SJB SERVICES, INC.	HOLE NO. C-15
;TART	2/17/2012	SUBSURFACE LOG	SURF. ELEV
=INISH	2/17/2012		G.W. DEPTH See Notes
;HEET	1 OF 1		

SERVICES, INC.

'PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
'PROJ. NO.: RE-12-007

EPTH	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							6 1/4" ASPHALTIC CONCRETE	
							6" CONCRETE	
	1	5					Brown SAND and GRAVEL, tr.silt (moist, FILL)	
			5					
2.5				6			Brown Clayey SLT, tr.sand (moist, ML)	
					7	11		
							Boring Complete at 3.0'	No free standing water encountered at boring completion.
5								
7.5								
10								
2.5								
15								
7.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE START 2/17/2012 FINISH 2/17/2012 SHEET 1 OF 1	**SJB SERVICES, INC.** **SUBSURFACE LOG**	SJB SERVICES, INC.	HOLE NO. C-16 SURF. ELEV G.W. DEPTH See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							5 3/4" ASPHALTIC CONCRETE	
							7 3/4" CONCRETE	
	1	3					Brown SAND and GRAVEL (moist, FILL)	
			5				Brown Clayey SILT, little Fine Sand (moist, ML)	
2.5				7				
					9	12		
							Boring Complete at 3.3'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. C-17
START	2/22/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/22/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD   LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							6 1/4" ASPHALTIC CONCRETE	
							5 3/4" CONCRETE	
	1	3					Brown SAND and GRAVEL (moist, FILL)	
			3				Tan Clayey SILT, little Fine Sand, tr.fine Gravel	
2.5				3			(moist, medium, ML)	
					4	6		
							Boring Complete at 3.0'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW   CLASSIFIED BY: Geologist

DRILLER: B. FULLER   DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. C-18
START	2/21/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/21/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							6" ASPHALTIC CONCRETE	
							6 3/4" CONCRETE	
	1	6					Brown Fine SAND, some Silt, little Gravel, tr.clay	
			6				(moist, firm, SM)	
2.5				7				
					12	13		
							Boring Complete at 3.1'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE START 2/21/2012 FINISH 2/21/2012 SHEET 1 OF 1	**SJB SERVICES, INC.** **SUBSURFACE LOG**	SJB SERVICES, INC.	HOLE NO. C-19 SURF. ELEV G.W. DEPTH See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
								6 3/4" ASPHALTIC CONCRETE	
								8" CONCRETE	
		1	4					Greyish Brown to Brown Clayey SILT, some Fine	
				4				Sand, little Gravel (v.moist, FILL)	
2.5					4				
						4	8		
								Boring Complete at 3.0'	No free standing water encountered at boring completion.
5									
7.5									
10									
12.5									
15									
17.5									
20									

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE: CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		SJB SERVICES, INC. SUBSURFACE LOG	HOLE NO.	C-20
START	2/21/2012		SURF. ELEV	
FINISH	2/21/2012		G.W. DEPTH	See Notes
SHEET	1 OF 1			

PROJECT: WARING ROAD   LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							6" ASPHALTIC CONCRETE	
							8" CONCRETE	
	1	7					Brown Silty SAND, some Gravel (moist, firm, FILL)	
			7					
2.5				5				
					8	12		
							Boring Complete at 3.3'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW   CLASSIFIED BY: Geologist

DRILLER: B. FULLER   DRILL RIG TYPE: CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. C-21
START	2/20/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/20/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							6 3/4" ASPHALTIC CONCRETE	
							6" CONCRETE	
	1	6					Greyish Brown SILT, some Fine Sand, little Gravel,	
			6				tr.clay (moist, FILL)	
2.5				6				
					8	12		
							Boring Complete at 3.1'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC. SUBSURFACE LOG**	HOLE NO. C-22
START	2/20/2012		SURF. ELEV
FINISH	2/20/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD   LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							6 3/4" ASPHALTIC CONCRETE	
							8" CONCRETE	
	1	5					Brown Silty SAND, some Gravel, tr.clay	
			8				(moist, firm, FILL)	
2.5				8				
					10	16		
							Boring Complete at 3.2'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW   CLASSIFIED BY: Geologist

DRILLER: B. FULLER   DRILL RIG TYPE: CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 2/20/2012
FINISH 2/20/2012
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

SJB SERVICES, INC.

HOLE NO. C-23
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
								5" ASPHALTIC CONCRETE	
								7" CONCRETE	
		1	4					Brown Silty SAND, little Gravel (moist, FILL)	
				4					
2.5					6			Greyish Brown Silty CLAY, tr.sand	
						6	10	(moist, CL)	
								Boring Complete at 3.0'	No free standing water encountered at boring completion.
5									
7.5									
10									
12.5									
15									
17.5									
20									

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
DRILLER: B. FULLER DRILL RIG TYPE : CME-45
METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE		**SJB SERVICES, INC.**	HOLE NO. C-24
START	2/20/2012	**SUBSURFACE LOG**	SURF. ELEV
FINISH	2/20/2012		G.W. DEPTH See Notes
SHEET	1 OF 1		

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK

PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							7 1/2" ASPHALTIC CONCRETE 8 1/2" CONCRETE	
	1	6					Greyish Brown Silty SAND and GRAVEL, tr.clay	
2.5			8				(moist, FILL)	
				7				
					3	15		
							Boring Complete at 3.5'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE

START 2/20/2012

FINISH 2/20/2012

SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

SJB SERVICES, INC.

HOLE NO. C-25

SURF. ELEV

G.W. DEPTH See Notes

PROJECT: WARING ROAD

PROJ. NO.: RE-12-007

LOCATION: ROCHESTER, NEW YORK

DEPTH FT.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
								5" ASPHALTIC CONCRETE 7 1/2" CONCRETE	
		1	4					Greyish Brown Clayey SILT, some Fine Sand (moist, FILL)	
				5					
2.5					17				
						10	22		
								Boring Complete at 3.1'	No free standing water encountered at boring completion.
5									
7.5									
10									
12.5									
15									
17.5									
20									

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: B. FULLER

DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE			
START	2/20/2012	**SJB SERVICES, INC.**	HOLE NO. C-26
FINISH	2/20/2012	**SUBSURFACE LOG**	SURF. ELEV
SHEET	1 OF 1		G.W. DEPTH See Notes

PROJECT: WARING ROAD LOCATION: ROCHESTER, NEW YORK
PROJ. NO.: RE-12-007

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	SOIL OR ROCK CLASSIFICATION	NOTES
							5 1/4" ASPHALTIC CONCRETE 7 1/4" CONCRETE	
	1	4					Brown Clayey SILT, some Fine Sand, tr.gravel	
			4				(moist, FILL)	
2.5				4				
					4	8		
							Boring Complete at 3.1'	No free standing water encountered at boring completion.
5								
7.5								
10								
12.5								
15								
17.5								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: B. FULLER DRILL RIG TYPE : CME-45

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-1	TOTAL CORE LENGTH = 6-1/2" CORE DIAMETER = 5.70" TOTAL ASPHALT = 6-1/2" 1st Asphalt Top Layer = 2" 2nd Asphalt Top Layer = 1-3/4" 3rd Asphalt Top Layer = 1-1/4" 4th Asphalt Binder Layer = 1-1/2" Note: Drillers auger through 5-1/2" of CONCRETE

: The ruler presented in the photographs is intended as a reference scale only. The dimension of ·es may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-2	TOTAL CORE LENGTH = 15" CORE DIAMETER = 5.70" TOTAL ASPHALT = 7-1/4" 1st Asphalt Top Layer = 1-3/4" 2nd Asphalt Top Layer = 1-1/4" 3rd Asphalt Binder Layer = 4-1/4" TOTAL CONCRETE = 7-3/4"

)TE: The ruler presented in the photographs is intended as a reference scale only. The dimension of : cores may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-3	TOTAL CORE LENGTH = 5-1/2" CORE DIAMETER = 5.70" TOTAL ASPHALT = 5-1/2" 1st Asphalt Top Layer = 1-1/2" 2nd Asphalt Top Layer = 1-5/8" 3rd Asphalt Binder Layer = 2-3/8" Note: Drillers auger through 6-1/2" of CONCRETE

: The ruler presented in the photographs is intended as a reference scale only. The dimension of
·es may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-4	TOTAL CORE LENGTH = 11" CORE DIAMETER = 5.70" TOTAL ASPHALT = 5-1/2" 1st Asphalt Top Layer = 1-1/2" 2nd Asphalt Top Layer = 1-3/4" 3rd Asphalt Binder Layer = 2-1/4" TOTAL CONCRETE = 5-1/2"

)TE: The ruler presented in the photographs is intended as a reference scale only. The dimension of : cores may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-5	TOTAL CORE LENGTH = 12" CORE DIAMETER = 5.70" TOTAL ASPHALT = 5-1/2" 1st Asphalt Top Layer = 1-3/4" 2nd Asphalt Top Layer = 1-3/4" 3rd Asphalt Binder Layer = 2" TOTAL CONCRETE = 6-1/2"

: The ruler presented in the photographs is intended as a reference scale only. The dimension of
es may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-6	TOTAL CORE LENGTH = 12" CORE DIAMETER = 5.70" TOTAL ASPHALT = 6" 1st Asphalt Top Layer = 1-1/2" 2nd Asphalt Top Layer = 1-3/4" 3rd Asphalt Binder Layer = 2-3/4" TOTAL CONCRETE = 6" NOTE: Top 1" of Concrete is broken up

TE: The ruler presented in the photographs is intended as a reference scale only. The dimension of cores may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-7	TOTAL CORE LENGTH = 12" CORE DIAMETER = 5.70" TOTAL ASPHALT = 5" 1st Asphalt Top Layer = 1-1/4" 2nd Asphalt Top Layer = 1-1/2" 3rd Asphalt Binder Layer = 2-1/4" TOTAL CONCRETE = 7" NOTE: Top 1-1/2" of Concrete is broken up

: The ruler presented in the photographs is intended as a reference scale only. The dimension of 'es may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-8	TOTAL CORE LENGTH = 11" CORE DIAMETER = 5.70" TOTAL ASPHALT = 5" 1st Asphalt Top Layer = 1-1/4" 2nd Asphalt Top Layer = 1-3/4" 3rd Asphalt Binder Layer = 2" TOTAL CONCRETE = 6" NOTE: Top 2" of Concrete is broken up

)TE: The ruler presented in the photographs is intended as a reference scale only. The dimension of : cores may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-9	TOTAL CORE LENGTH = 12" CORE DIAMETER = 5.70" TOTAL ASPHALT = 6-1/4" 1st Asphalt Top Layer = 1-3/4" 2nd Asphalt Top Layer = 1-1/2" 3rd Asphalt Binder Layer = 3" TOTAL CONCRETE = 5-3/4"

: The ruler presented in the photographs is intended as a reference scale only. The dimension of es may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-10	TOTAL CORE LENGTH = 12-3/4" CORE DIAMETER = 5.70" TOTAL ASPHALT = 6-1/4" 1st Asphalt Top Layer = 1-3/4" 2nd Asphalt Top Layer = 2" 3rd Asphalt Binder Layer = 2-1/2" TOTAL CONCRETE = 6-1/2" NOTE: Concrete layer is broken up

)TE: The ruler presented in the photographs is intended as a reference scale only. The dimension of : cores may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-11	**TOTAL CORE LENGTH = 12"** **CORE DIAMETER = 5.70"** **TOTAL ASPHALT = 6"** **1st Asphalt Top Layer = 1-1/2"** **2nd Asphalt Top Layer = 1-3/4"** **3rd Asphalt Binder Layer = 2-3/4"** **TOTAL CONCRETE = 6"** **NOTE: Concrete layer is broken up**

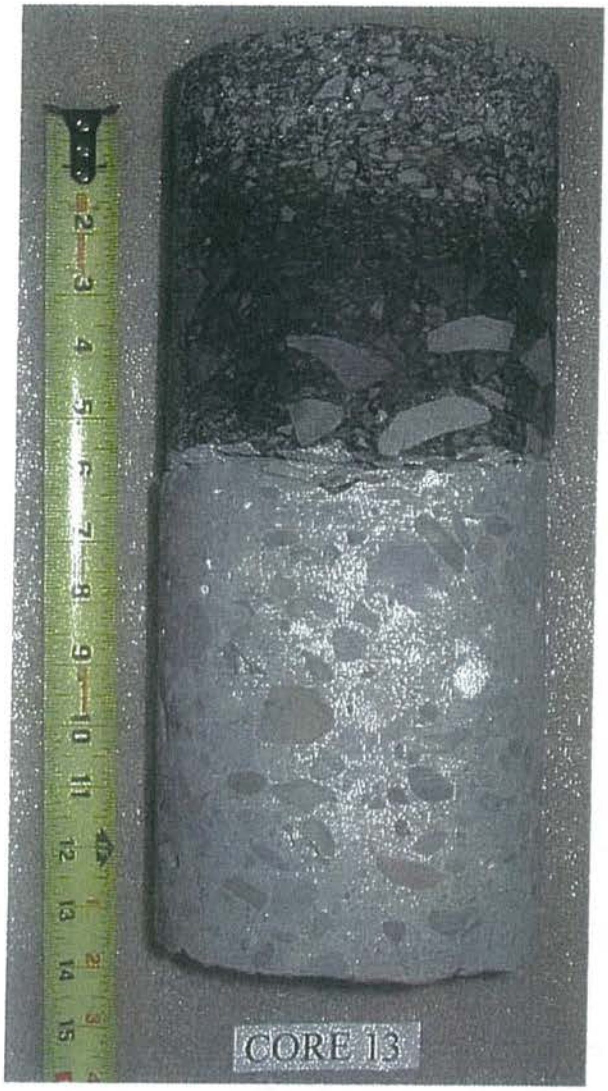
: The ruler presented in the photographs is intended as a reference scale only. The dimension of es may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-12	TOTAL CORE LENGTH = 12-1/2" CORE DIAMETER = 5.70" TOTAL ASPHALT = 6" 1st Asphalt Top Layer = 2" 2nd Asphalt Top Layer = 2" 3rd Asphalt Binder Layer = 2" TOTAL CONCRETE = 6-1/2" NOTE: 1" of Concrete is broken up, approximately 1" from the top of the concrete layer

)TE: The ruler presented in the photographs is intended as a reference scale only. The dimension of : cores may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY



CORE NUMBER	DESCRIPTION
C-13	TOTAL CORE LENGTH = 12-1/2" CORE DIAMETER = 5.70" TOTAL ASPHALT = 5-3/4" 1st Asphalt Top Layer = 1-1/4" 2nd Asphalt Top Layer = 2" 3rd Asphalt Binder Layer = 2-1/2" TOTAL CONCRETE = 6-3/4"

: The ruler presented in the photographs is intended as a reference scale only. The dimension of
·es may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-14	TOTAL CORE LENGTH = 13" CORE DIAMETER = 5.70" TOTAL ASPHALT = 6" 1st Asphalt Top Layer = 2" 2nd Asphalt Top Layer = 1-3/4" 3rd Asphalt Binder Layer = 2-1/4" TOTAL CONCRETE = 7" NOTE: Top 1/2" of Concrete is broken up

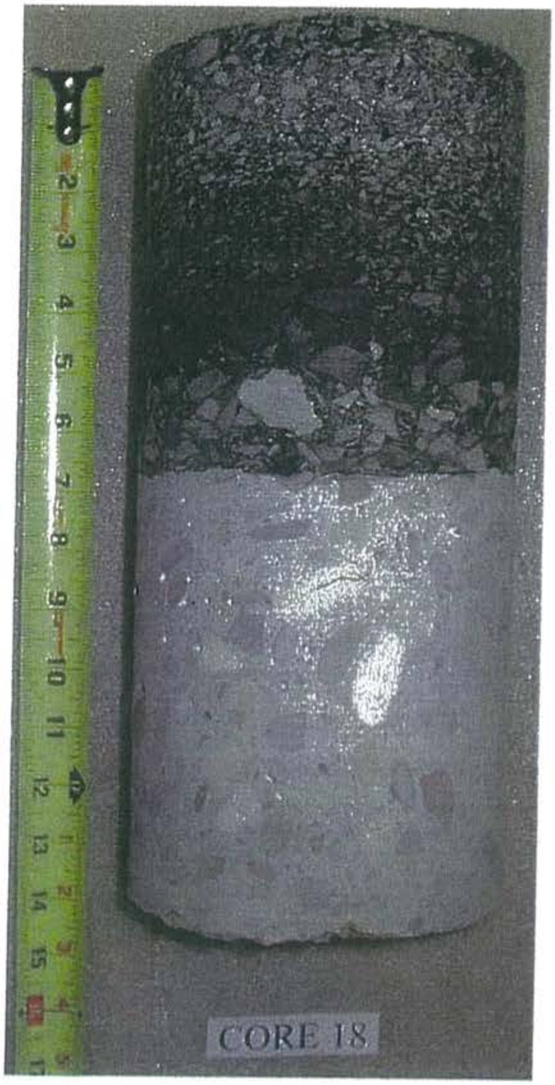
)TE: The ruler presented in the photographs is intended as a reference scale only. The dimension of : cores may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-16	TOTAL CORE LENGTH = 13-1/2" CORE DIAMETER = 5.70" TOTAL ASPHALT = 5-3/4" 1st Asphalt Top Layer = 1-1/2" 2nd Asphalt Top Layer = 1-3/4" 3rd Asphalt Binder Layer = 2-1/2" TOTAL CONCRETE = 7-3/4" NOTE: Bottom 2- 3/4" of Concrete is broken up

: The ruler presented in the photographs is intended as a reference scale only. The dimension of ·es may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY



CORE NUMBER	DESCRIPTION
C-18	TOTAL CORE LENGTH = 12-3/4" CORE DIAMETER = 5.70" TOTAL ASPHALT = 6" 1st Asphalt Top Layer = 1-1/2" 2nd Asphalt Top Layer = 2-1/4" 3rd Asphalt Binder Layer = 2-1/4" TOTAL CONCRETE = 6-3/4"

)TE: The ruler presented in the photographs is intended as a reference scale only. The dimension of : cores may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-19	TOTAL CORE LENGTH = 14-3/4" CORE DIAMETER = 5.70" TOTAL ASPHALT = 6-3/4" 1st Asphalt Top Layer = 2-1/4" 2nd Asphalt Top Layer = 1-3/4" 3rd Asphalt Binder Layer = 2-3/4" TOTAL CONCRETE = 8" NOTE: Concrete layer is broken up

: The ruler presented in the photographs is intended as a reference scale only. The dimension of
es may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-20	TOTAL CORE LENGTH = 14" CORE DIAMETER = 5.70" TOTAL ASPHALT = 6" 1st Asphalt Top Layer = 1-1/4" 2nd Asphalt Top Layer = 2-1/2" 3rd Asphalt Binder Layer = 2-1/4" TOTAL CONCRETE = 8" NOTE: Concrete is highly fractured throughout length

)TE: The ruler presented in the photographs is intended as a reference scale only. The dimension of : cores may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-22	TOTAL CORE LENGTH = 14-3/4" CORE DIAMETER = 5.70" TOTAL ASPHALT = 6-3/4" 1st Asphalt Top Layer = 1-3/4" 2nd Asphalt Top Layer = 2-1/4" 3rd Asphalt Binder Layer = 2-3/4" TOTAL CONCRETE = 8" NOTE: Top 4-1/4" of Concrete is broken up

: The ruler presented in the photographs is intended as a reference scale only. The dimension of es may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-23	TOTAL CORE LENGTH = 12" CORE DIAMETER = 5.70" TOTAL ASPHALT = 5" 1st Asphalt Top Layer = 1" 2nd Asphalt Top Layer = 2" 3rd Asphalt Binder Layer = 2" TOTAL CONCRETE = 7"

)TE: The ruler presented in the photographs is intended as a reference scale only. The dimension of : cores may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-24	TOTAL CORE LENGTH = 16" CORE DIAMETER = 5.70" TOTAL ASPHALT = 7-1/2" 1st Asphalt Top Layer = 1-1/2" 2nd Asphalt Top Layer = 2-1/2" 3rd Asphalt Binder Layer = 3-1/2" TOTAL CONCRETE = 8-1/2" NOTE: Concrete layer is broken up

: The ruler presented in the photographs is intended as a reference scale only. The dimension of es may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-25	TOTAL CORE LENGTH = 12-1/2" CORE DIAMETER = 5.70" TOTAL ASPHALT = 5" 1st Asphalt Top Layer = 1-1/2" 2nd Asphalt Top Layer = 1-1/2" 3rd Asphalt Binder Layer = 2" TOTAL CONCRETE = 7-1/2"

)TE: The ruler presented in the photographs is intended as a reference scale only. The dimension of : cores may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.
RE-12-007
WARING ROAD
ROCHESTER, NEW YORK
CORE SUMMARY

CORE NUMBER	DESCRIPTION
C-26	TOTAL CORE LENGTH = 12-1/2" CORE DIAMETER = 5.70" TOTAL ASPHALT = 5-1/4" 1st Asphalt Top Layer = 1-1/4" 2nd Asphalt Top Layer = 1-3/4" 3rd Asphalt Binder Layer = 2-1/4" TOTAL CONCRETE = 7-1/4" NOTE: Top ½" of Concrete is broken up

: The ruler presented in the photographs is intended as a reference scale only. The dimension of
es may not be reflected accurately in the photos, refer to the description for accurate information.

SJB SERVICES, INC.

Rochester Office
535 Summit Point Drive
Henrietta, NY 14467

LABORATORY D.I.P.R.A. TESTS

Project: Waring Road Improvement Project PIN # 4754.40

Project Number: RE-12-007

Town /City: Rochester N.Y.

Date: 4-2-2012

Client: Clark Patterson Lee

Technician: William Gilmore

Summary of Laboratory Analysis Soil

Lab ID:	Location:	Resistivity (Ohm-cm)	Redox (mv)	PH	Sulfides (+,T,-)	% Moisture Content (wet, moist, dry)	TOTAL POINTS
		Points	*Points*	*Points*	*Points*	*Points*	
12-220	B-1	*9,000*	*-59.6*	*7.05*	-	*Moist (7.5%)*	**6**
	Depth = 4' – 6'	*0*	*5*	*0*	*0*	*1*	
12-221	B-2	*7,000*	*25.6*	*7.12*	-	*Moist (8.2%)*	**5**
	Depth = 4' – 6'	*0*	*4*	*0*	*0*	*1*	
12-222	B-5	*6,500*	*32.9*	*7.44*	-	*Moist (6.9%)*	**5**
	Depth = 4' – 6'	*0*	*4*	*0*	*0*	*1*	
12-223	B-7	*5,800*	*41.6*	*7.01*	-	*Moist (7.6%)*	**5**
	Depth = 4' – 6'	*0*	*4*	*0*	*0*	*1*	
12-224	B-10	*10,000*	*-72.3*	*7.99*	-	*Moist (7.8%)*	**6**
	Depth = 4' – 6'	*0*	*5*	*0*	*0*	*1*	
12-225	B-11	*11,000*	*-86.9*	*6.58*	-	*Moist (7.1%)*	**6**
	Depth = 4' – 6'	*0*	*5*	*0*	*0*	*1*	
12-226	B-17	*8,500*	*-24.6*	*6.72*	-	*Moist (8.0%)*	**6**
	Depth = 4' – 6'	*0*	*5*	*0*	*0*	*1*	

Per the Ductile Iron Pipe Research Association (DIPRA), point totals 10 or greater should be considered for Cathodic Protection.

Rochester Office
535 Summit Point Drive
Henrietta, NY 14467

LABORATORY D.I.P.R.A. TESTS

Summary of Laboratory Analysis Soil

Project:	Waring Road Improvement Project PIN # 4754.40	**Page:**	2 of 2
Client:	Clark Patterson Lee		

Lab ID:	Location:	Resistivity (Ohm-cm)	Redox (mv)	PH	Sulfides (+,T,-)	% Moisture Content (wet, moist, dry)	**TOTAL POINTS**
		Points	*Points*	*Points*	*Points*	*Points*	
12-227	B-18	7,500	-9.2	6.22	-	*Moist (7.5%)*	**6**
	Depth = 4' – 6'	*0*	*5*	*0*	*0*	*1*	
12-228	B-21	6,500	34.9	7.42	-	*Moist (8.2%)*	**5**
	Depth = 4' – 6'	*0*	*4*	*0*	*0*	*1*	
12-229	B-24	7,900	-18.9	6.91	-	*Moist (7.1%)*	**6**
	Depth = 4' – 6'	*0*	*5*	*0*	*0*	*1*	
12-230	B-25	8,200	-21.3	6.88	-	*Moist (6.7%)*	**6**
	Depth = 4' – 6'	*0*	*5*	*0*	*0*	*1*	
12-231	B-27	7,400	-7.5	7.46	-	*Moist (6.3%)*	**6**
	Depth = 4' – 6'	*0*	*5*	*0*	*0*	*1*	

Per the Ductile Iron Pipe Research Association (DIPRA), point totals 10 or greater should be considered for Cathodic Protection.

Upstate Laboratories, Inc.

Shipping: 6034 Corporate Dr. * E. Syracuse, NY 13057-1017 * (315) 437-0255 * Fax (315) 437-1209
Mailing: Box 169 * Syracuse, NY 13206
Albany (518) 459-3134 * Binghamton (607) 239-4413 * Buffalo (716) 972-0371
Rochester (866) 437-0255 * New Jersey (908) 581-4285

Mr. Charles Guzzetta
SJB/EmpireGeo Services, Inc.
535 Summit Point Dr.
Henrietta, NY 14467

Friday, March 16, 2012

RE: Analytical Report:
Waring Road Reconstruction

Order No.: U1203105

Dear Mr. Charles Guzzetta:

Upstate Laboratories, Inc. received 12 sample(s) on 3/7/2012 for the analyses presented in the following report.

All analytical results relate to the samples as received by the laboratory.

All analytical data conforms with standard approved methodologies and quality control. Our quality control narrative will be included should any anomalies occur.

We have included the Chain of Custody Record as part of your report. You may need to reference this form for a more detailed explanation of your samples. Samples will be disposed of approximately one month from final report date.

Should you have any questions regarding these tests, please feel free to give us a call.

Thank you for your patronage.

Sincerely,

UPSTATE LABORATORIES, INC.
AJS (PFF)
Anthony J. Scala
President/CEO

Upstate Laboratories, Inc.

Analytical Report Date: *16-Mar-12*

CLIENT: SJB/EmpireGeo Services, Inc. **Lab Order:** U1203105
Project: Waring Road Reconstruction

Lab ID: U1203105-001 **Collection Date:** 3/7/2012 8:00:00 AM
Client Sample ID: B-1 (6ft-8ft) **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CHLORIDE SOILS BY EPA 9251			CL_S_AUTO			Analyst: **KLS**
Chloride	356	20.0	Q	mg/Kg	1	3/13/2012

Lab ID: U1203105-002 **Collection Date:** 3/7/2012 8:00:00 AM
Client Sample ID: B-2 (6ft-8ft) **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CHLORIDE SOILS BY EPA 9251			CL_S_AUTO			Analyst: **KLS**
Chloride	63.8	20.0	Q	mg/Kg	1	3/13/2012

Lab ID: U1203105-003 **Collection Date:** 3/7/2012 8:00:00 AM
Client Sample ID: B-5 (6ft-8ft) **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CHLORIDE SOILS BY EPA 9251			CL_S_AUTO			Analyst: **KLS**
Chloride	87.0	20.0	Q	mg/Kg	1	3/13/2012

Lab ID: U1203105-004 **Collection Date:** 3/7/2012 8:00:00 AM
Client Sample ID: B-7 (6ft-8ft) **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CHLORIDE SOILS BY EPA 9251			CL_S_AUTO			Analyst: **KLS**
Chloride	316	20.0	Q	mg/Kg	1	3/13/2012

Lab ID: U1203105-005 **Collection Date:** 3/7/2012 8:00:00 AM
Client Sample ID: B-10 (6ft-8ft) **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CHLORIDE SOILS BY EPA 9251			CL_S_AUTO			Analyst: **KLS**
Chloride	210	20.0	Q	mg/Kg	1	3/13/2012

Approved By: PFF **Date:** 3-16-12

Qualifiers:

#	Accreditation not offered by NYS DOH for this parameter	*	Low Level
**	Value exceeds Maximum Contaminant Value	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
Q	Outlying QC recoveries were associated with this parameter	S	Spike Recovery outside accepted recovery limits

Upstate Laboratories, Inc.

Analytical Report **Date:** *16-Mar-12*

CLIENT: SJB/EmpireGeo Services, Inc. **Lab Order:** U1203105
Project: Waring Road Reconstruction

Lab ID: U1203105-006 **Collection Date:** 3/7/2012 8:00:00 AM
Client Sample ID: B-11 (6ft-8ft) **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CHLORIDE SOILS BY EPA 9251			CL_S_AUTO			Analyst: **KLS**
Chloride	76.4	20.0	Q	mg/Kg	1	3/13/2012

Lab ID: U1203105-007 **Collection Date:** 3/7/2012 8:00:00 AM
Client Sample ID: B-17 (6ft-8ft) **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CHLORIDE SOILS BY EPA 9251			CL_S_AUTO			Analyst: **KLS**
Chloride	154	20.0	Q	mg/Kg	1	3/13/2012

Lab ID: U1203105-008 **Collection Date:** 3/7/2012 8:00:00 AM
Client Sample ID: B-18 (6ft-8ft) **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CHLORIDE SOILS BY EPA 9251			CL_S_AUTO			Analyst: **KLS**
Chloride	406	20.0	Q	mg/Kg	1	3/13/2012

Lab ID: U1203105-009 **Collection Date:** 3/7/2012 8:00:00 AM
Client Sample ID: B-21 (6ft-8ft) **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CHLORIDE SOILS BY EPA 9251			CL_S_AUTO			Analyst: **KLS**
Chloride	131	20.0	Q	mg/Kg	1	3/13/2012

Lab ID: U1203105-010 **Collection Date:** 3/7/2012 8:00:00 AM
Client Sample ID: B-24 (6ft-8ft) **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CHLORIDE SOILS BY EPA 9251			CL_S_AUTO			Analyst: **KLS**
Chloride	169	20.0	Q	mg/Kg	1	3/13/2012

Approved By: PFF **Date:** 3-16-12

Qualifiers:

#	Accreditation not offered by NYS DOH for this parameter	*	Low Level
**	Value exceeds Maximum Contaminant Value	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
Q	Outlying QC recoveries were associated with this parameter	S	Spike Recovery outside accepted recovery limits

Upstate Laboratories, Inc.

Analytical Report Date: *16-Mar-12*

CLIENT: SJB/EmpireGeo Services, Inc. **Lab Order:** U1203105

Project: Waring Road Reconstruction

Lab ID: U1203105-011 **Collection Date:** 3/7/2012 8:00:00 AM

Client Sample ID: B-25 (6ft-8ft) **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CHLORIDE SOILS BY EPA 9251			CL_S_AUTO			Analyst: **KLS**
Chloride	436	20.0	Q	mg/Kg	1	3/13/2012

Lab ID: U1203105-012 **Collection Date:** 3/7/2012 8:00:00 AM

Client Sample ID: B-26 (6ft-8ft) **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CHLORIDE SOILS BY EPA 9251			CL_S_AUTO			Analyst: **KLS**
Chloride	366	20.0	Q	mg/Kg	1	3/13/2012

Approved By: PEF **Date:** 3-16-12

Qualifiers:

#	Accreditation not offered by NYS DOH for this parameter	*	Low Level
**	Value exceeds Maximum Contaminant Value	B	Analyte detected in the associated Method Blank
B	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
Q	Outlying QC recoveries were associated with this parameter	S	Spike Recovery outside accepted recovery limits

(315) 437 0255 Fax 437 1209

Client: SJB - ROCHESTER EMPIRE GEO		Client Project # / Project Name: WARING ROAD RECONSTRUCTION
Client Contact: CHUCK GUZZETTA	Phone #: 585 359-2730	Site Location (city/state): ROCHESTER, NY

Special Turnaround Time: STD (Lab Notification required)

Sample Location:	Date	Time	Matrix	Grab or Comp.	ULI Internal Use Only U1203105	No. of Containers	1) Chlorides	2)	3)	4)	5)	6)	7)	8)	9)	10)	Remarks
B-1, B-2, B-5,	3/7/12	8:00 AM	SOIL	G	1	12	X										B1 (6'-8')
B-7, B-10 B-11					2	1	X										B2 (6'-8')
B-17, B-18, B-21,					3	1	X										B5 (6'-8')
B-24, B-25, B-26					4	1	X										B7 (6'-8')
(6' TO 8' DEPTH)					5	1	X										B10 (6'-8')
12 samples					6	1	X										B11 (6'-8')
12 TESTS TO BE PERFORMED					7	1	X										B17 (6'-8')
					8	1	X										B18 (6'-8')
					9	1	X										B21 (6'-8')
					10	1	X										B24 (6'-8')
					11	1	X										B25 (6'-8')
					12	1	X										B26 (6'-8')

Parameter and method	sample bottle: type	size	pres.
CHLORIDES USEPA 325.2 or 300.1	GLASS	4 oz	COOL 4°C

Sampled by: (Please Print) SSB Drill Crew

Company: SSB / EMPIRE

ULI Internal Use Only
Delivery (check one):
☐ ULI Sampled
☒ Pickup ☐ Dropoff
☐ CC ____

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[signature]	3/7/12	1045	[signature]
			Received by: (Signature)
			Received by: (Signature)
[signature]	3/7/12	12:15pm	Rec'd for Lab by: (Signature) BMeash

Note: The numbered columns above cross-reference with the numbered columns in the upper right-hand corner.

Syracuse Rochester Buffalo Albany Binghamton Fair Lawn (NJ)

GEOTECHNICAL REPORT LIMITATIONS

Empire Geo-Services, Inc. (Empire) has endeavored to meet the generally accepted standard of care for the services completed, and in doing so is obliged to advise the geotechnical report user of our report limitations. Empire believes that providing information about the report preparation and limitations is essential to help the user reduce geotechnical-related delays, cost over-runs, and other problems that can develop during the design and construction process. Empire would be pleased to answer any questions regarding the following limitations and use of our report to assist the user in assessing risks and planning for site development and construction.

PROJECT SPECIFIC FACTORS: The conclusions and recommendations provided in our geotechnical report were prepared based on project specific factors described in the report, such as size, loading, and intended use of structures; general configuration of structures, roadways, and parking lots; existing and proposed site grading; and any other pertinent project information. Changes to the project details may alter the factors considered in development of the report conclusions and recommendations. *Accordingly, Empire cannot accept responsibility for problems which may develop if we are not consulted regarding any changes to the project specific factors that were assumed during the report preparation.*

SUBSURFACE CONDITIONS: The site exploration investigated subsurface conditions only at discrete test locations. Empire has used judgment to infer subsurface conditions between the discrete test locations, and on this basis the conclusions and recommendations in our geotechnical report were developed. It should be understood that the overall subsurface conditions inferred by Empire may vary from those revealed during construction, and these variations may impact on the assumptions made in developing the report conclusions and recommendations. *For this reason, Empire should be retained during construction to confirm that conditions are as expected, and to refine our conclusions and recommendations in the event that conditions are encountered that were not disclosed during the site exploration program.*

USE OF GEOTECHNICAL REPORT: Unless indicated otherwise, our geotechnical report has been prepared for the use of our client for specific application to the site and project conditions described in the report. *Without consulting with Empire, our geotechnical report should not be applied by any party to other sites or for any uses other than those originally intended.*

CHANGES IN SITE CONDITIONS: Surface and subsurface conditions are subject to change at a project site subsequent to preparation of the geotechnical report. Changes may include, but are not limited to, floods, earthquakes, groundwater fluctuations, and construction activities at the site and/or adjoining properties. *Empire should be informed of any such changes to determine if additional investigative and/or evaluation work is warranted.*

MISINTERPRETATION OF REPORT: The conclusions and recommendations contained in our geotechnical report are subject to misinterpretation. *To limit this possibility, Empire should review project plans and specifications relative to geotechnical issues to confirm that the recommendations contained in our report have been properly interpreted and applied.*

Subsurface exploration logs and other report data are also subject to misinterpretation by others if they are separated from the geotechnical report. This often occurs when copies of logs are given to contractors during the bid preparation process. *To minimize the potential for misinterpretation, the subsurface logs should not be separated from our geotechnical report and the use of excerpted or incomplete portions of the report should be avoided.*

OTHER LIMITATIONS: Geotechnical engineering is less exact than other design disciplines, as it is based partly on judgement and opinion. For this reason, our geotechnical report may include clauses that identify the limits of Empire's responsibility, or that may describe other limitations specific to a project. These clauses are intended to help all parties recognize their responsibilities and to assist them in assessing risks and decision making. Empire would be pleased to discuss these clauses and to answer any questions that may arise.

APPENDIX F – INPUT FROM STAKE HOLDERS

**PUBLIC INFORMATION
MEETING MINUTES
WARING ROAD
IMPROVEMENT PROJECT
PC: 12101**

DATE: **May 17, 2012**
TIME: **7:00 PM.**
LOCATION **Waring Community Center**
SUBJECT: **Public Informational Meeting**

Official Attendees:

NAME	REPRESENTING	EMAIL	PHONE
Lisa Reyes	City of Rochester	reyesl@cityofrochester.gov	428-6354
Scott Leathersich	MCDOT	sleathersich@monroecounty.gov	753-7748
David Askinazi	Clark Patterson Lee	daskinazi@clarkpatterson.com	454-7600
Dan Duprey	Clark Patterson Lee	dduprey@clarkpatterson.com	454-7600

For additional attendees: see attached sign in sheet

Lisa Reyes opened the meeting by welcoming the attendees and introducing the design team. Lisa then turned the meeting over to Dave Askinazi from Clark Patterson Lee. Dave gave a presentation of the project that included the following topics:

- Project Objectives
- Project History
- Existing conditions
- Adjacent Projects
- Project Alternatives and Improvements
- Project Schedule

The preferred alternative includes 11ft travel lanes, 5ft bike lanes and a single parking lane along the southbound side of the roadway for a total pavement width of 40ft. The preferred alternative also included a 32ft wide section (11ft travel lanes, 5ft bike lanes) in the vicinity of the Waring Road plaza where no parking is permitted. The group had no objections to this configuration.

Dave also described a sub-alternative in the vicinity of the Waring Road Plaza that includes a single center (two-way) left turn lane and two travel lanes. Pavement widening (from 40ft to 43ft) would be necessary if this sub-alternative included 5ft wide bike lanes in the vicinity of the Waring Road Plaza. At this point the preferred alternative does not include this sub alternative.

The rest of the presentation followed the attached power point slides.

205 St. Paul St., Suite 500
Rochester, NY 14604
clarkpatterson.com
585.454.7600 TEL
585.454.7618 FAX

The following summarizes the additional questions and comments from the group.

Q Will the Waring Road plaza entrances remain at their current locations?
A Yes, the design team has been in contact with the plaza owners and they have specifically requested that the plaza driveway entrances remain at their current locations because the lease agreements with their tenants prohibit any modification to the plaza access points.

Q Can the pavement section transitioned from separate bike lanes and travel lanes outside the limits of the Plaza to a section containing 14ft wide shared use lanes with the center turn lane at the Plaza?
A The transition from dedicated bike lanes to shared use lanes and back to dedicated lanes would be awkward and undesirable.

The foregoing constitutes our understanding of matters discussed and conclusions reached. If there are any errors or omissions in the basic discussion, please notify the author in writing within seven days.

Respectfully submitted,

Clark Patterson Lee

David Askinazi, P.E.
Principal Associate

Attachments: sign in sheets, and power point presentation slides

cc: Official Attendees

Waring Road Public Meeting #1 - Sign in Sheet

Thursday, May 17, 2012

Name	Firm/Organization	Phone #	Email
Scott Leathersich	Monroe County DOT	585-753-7748	sleathersich@monroecounty.gov
~~Jim McIntosh~~	~~City of Rochester~~	~~585-428-6828~~	~~mcintoshj@cityofrochester.gov~~
~~Al Giglio~~	~~City of Rochester~~	~~585-428-7164~~	~~agiglio@cityofrochester.gov~~
Lisa Reyes	City of Rochester	585-428-6354	reyesl@cityofrochester.gov
Dan Duprey	Clark Patterson Lee	585-454-7600x1033	dduprey@clarkpatterson.com
Dave Askinazi	Clark Patterson Lee	585-454-7600x1062	daskinazi@clarkpatterson.com
Marilyn & Bill Zaccaria		585-467-8478	
Deane Hopkins		266-2525	
James Wolk	WPC	381-3480	
Rich DeSarra			rdscommerochester.rr.com
Paul Ferrara		467-4007	
Scott Leathersich	MCDOT	753-7748	—
Isabelle Mazzy	71 Master St	467-9064	
NAWCYB/1466	SSWARLIC	266 638	
Debra Siplin		288-7412	
Luke Leege	Rochester Management	467-2442	lleege@rochestermanagement.com
Milton Phillips			

Clark Patterson Lee
DESIGN PROFESSIONALS

COMMUNITY ADVISORY GROUP
MEETING MINUTES
WARING ROAD
IMPROVEMENT PROJECT
PC: 12101

DATE: **March 1, 2012**
TIME: **7:00 P.M.**
LOCATION **Waring Road Baptist Church**
SUBJECT: **Community Advisory Group**

Official Attendees:

NAME	REPRESENTING	EMAIL	PHONE
Lisa Reyes	City of Rochester	reyesl@cityofrochester.gov	428-6354
Al Giglio	City of Rochester	agiglio@cityofrochester.gov	428-7164
Julie Beckley	City of Rochester	beckleyj@cityofrochester.gov	428-6863
Scott Leathersich	MCDOT	sleathersich@monroecounty.gov	753-7748
Tom Frys	MCDOT	tfrys@monroecounty.gov	753-7741
Dawn Taylor	NENA	dawn227@gmail.com	288-2647
Andy Taylor	NENA	ange114@frontiernet.net	288-2647
Sam Catazano	NENA		319-3527
Donna York	NENA	dyork46@yahoo.com	288-5301
Terry Rosenthal	NENA		288-5301
Richard DeSarra	Rochester Cycling Alliance	rdscomm@rochester.rr.com	
Glenn Cerosaletti	Rochester Cycling Alliance	gcer@admin.rochester.edu	654-6268
James Lukens	RCSD	james.lukens@rcsdk12.org	
David Askinazi	Clark Patterson Lee	daskinazi@clarkpatterson.com	454-7600
Dan Duprey	Clark Patterson Lee	dduprey@clarkpatterson.com	454-7600
Kevin Kelley	Clark Patterson Lee	kkelley@clarkpatterson.com	454-7600

Al Giglio opened the meeting by welcoming the attendees. He then turned the meeting over to Dave Askinazi from Clark Patterson Lee. Dave gave a presentation on the overview of the project, some of the existing conditions that have been documented, and the conceptual alternatives that are currently being explored. See attached Power Point slides.

Dave Askinazi asked the group if there were any concerns over reducing the on-street parking to one side of the road given the low parking utilization along the roadway. The group did not feel the reduction of on-street parking was a concern. The general consensus was that a single parking lane on the west side of Waring Road would be appropriate.

Much of the discussion related to the presentation referred to the potential arrangement of lanes in a newly designed roadway. The group considered the different alternatives that are being

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evaluated for accommodating bicycles (14-foot shared use lanes with sharrows, and 5-foot bicycle lanes with 11-foot vehicle travel lanes) and the implications on the travel lanes and parking lanes. The general consensus was that dedicated bike lanes are preferred over shared use lanes, although consideration should be given to the impact on street tree root systems, which may be damaged by digging adjacent to the curbs in order to install new curbs at the current curb offset or location. Dave Askinazi also described a sub-alternative in the vicinity of the Waring Road Plaza that includes a single center (two-way) left turn lane and two travel lanes. On-street parking is currently not allowed in this vicinity and this sub-alternative would maintain this condition. This sub-alternative would not allow for bike lanes though this section of the project without further widening the existing pavement.

The following summarizes the additional questions and comments from the group.

Comment: According to MCDOT, the accident rate *alone* does not justify the need for a two-way left turn lane in front of the plaza, but other factors may be considered.

Q Much of the plaza is used by government workers, which may have peak traffic times other than the standard morning and afternoon peak hours. Have counts been collected for those times?
A No, but even if the peak for the traffic exiting the driveways did not match the standard rush hour roadway peaks (which were counted), it would be unlikely that this would yield a low level of service because of the offset in the peaks.

Q Does the two-way left turn lane option present other costs beyond just striping?
A The initial answer to this question was no, but after further consideration, there would be additional cost if the bike lanes were maintained along with the center turn lane. The new pavement would also be installed wider than the existing pavement.

Q Are the bumpouts bad for snow plows?
A The plow drivers sometimes complain but they are getting used to them. The benefits outweigh the plowing issues.

Q Will bumpouts interfere with bike lanes?
A No, the bumpouts will be 7 feet from the curb, 1 less foot than the 8 foot wide parking lane. The bike lane will begin outside of the parking lane.

Q Would bike lanes be on both sides of the road?
A Yes, both sides, and bikes would need to ride with traffic (not against traffic) on their respective side of the road.

Comment: Most residents seem to prefer the dedicated bike lane option. The City currently does not have too many dedicated bike lanes (only about 6 miles to date) and there will likely be more as future projects are completed.

Comment: Most cyclists feel more comfortable and prefer riding in a bike lane.

Q Will all sidewalks be replaced?

A This has not been determined yet but sections of sidewalk that are in good condition and that are not in conflict with the proposed construction will be considered for retention.

Comment: Bump outs are not desirable because they cause problems related to plowing. Currently, the sidewalk plows, coupled with the road plows, create a large pile of snow on the short section of sidewalk between the perpendicular sidewalk and the curb (in the bump out). So even if the sidewalks on Waring are plowed, crossing the road requires turning onto the short section of a perpendicular sidewalk in the bump out, then down the sidewalk ramp to the crosswalk. The amount of snow piled up in this section is very difficult to overcome with a walker or wheelchair. Extending the sidewalks with bump outs will make this condition worse.

Response: This appears to be mainly a plowing issue. Al Giglio will discuss this with the City's street maintenance division.

Q Will sidewalks be lowered at the plaza driveways?

A Yes, the goal would be to reduce the steepness of the driveway aprons to allow vehicles to enter the plaza at a reasonable and normal speed. Currently vehicles have to navigate the aprons at a very slow rate to avoid bottoming out which in turn creates potential rear end accidents at the plaza driveways.

Comment: At the bus stop on Fernwood Park near Waring, students wait for the bus and have a narrow area to stand. Students are often seen standing in the pavement area on Waring Road. This bus stop needs more space and better lighting.

Response: The design team will visit the site to observe this condition and make recommendations for additional improvements.

Comment: Consider not putting a bump out at Waring/Culver which may block a turning lane.

Response: The bump out design will not block any required turn lanes.

Comment: Encourage the plaza owners to consider adding bike racks, which would complement the new bike lanes or sharrows in the roadway.

The foregoing constitutes our understanding of matters discussed and conclusions reached. If there are any errors or omissions in the basic discussion, please notify the author in writing within seven days.

Respectfully submitted,

Clark Patterson Lee

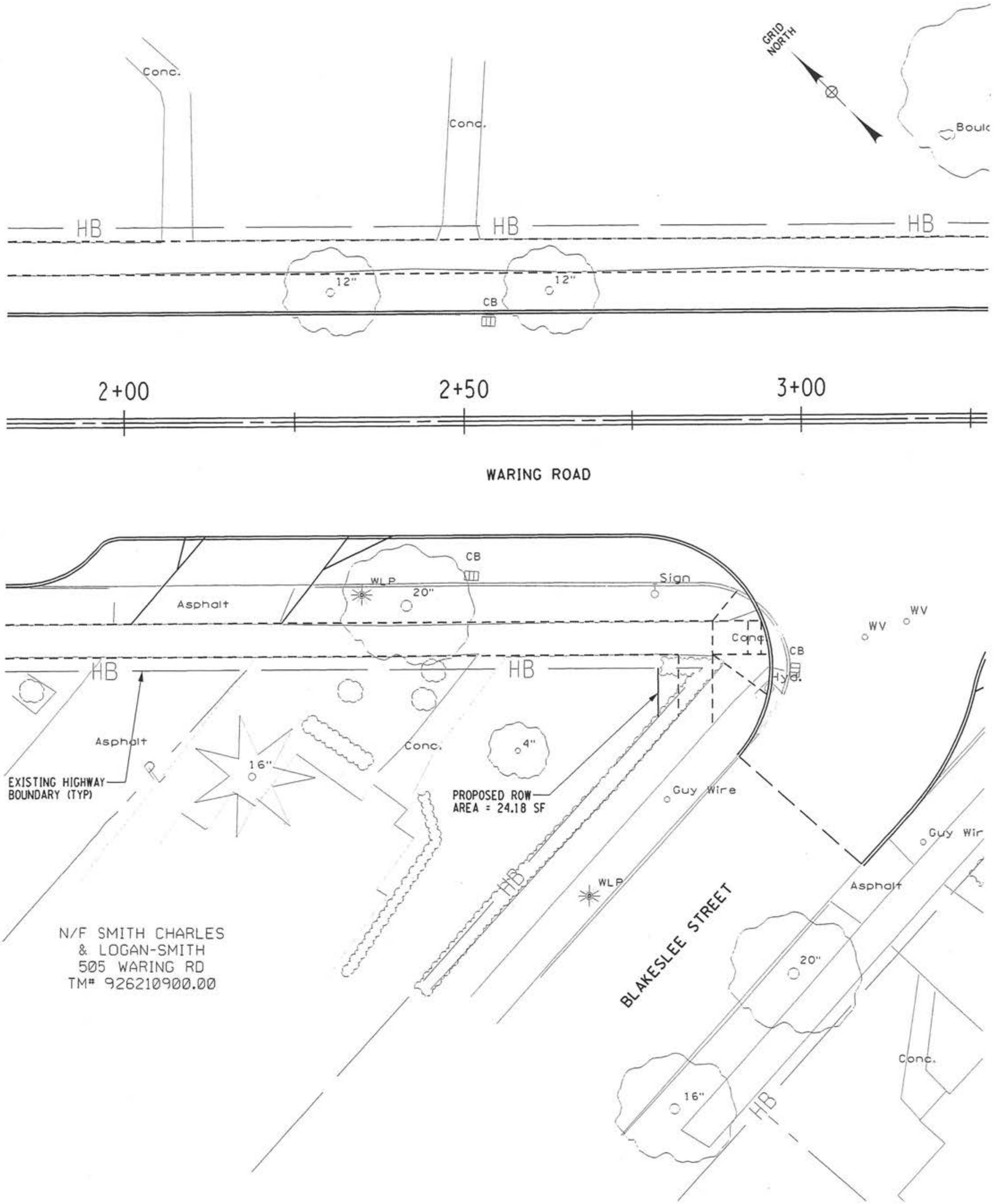
David Askinazi, P.E.
Principal Associate

Attachments: sign in sheets, and power point presentation slides

cc: Official Attendees

APPENDIX G – RIGHT OF WAY INFORMATION

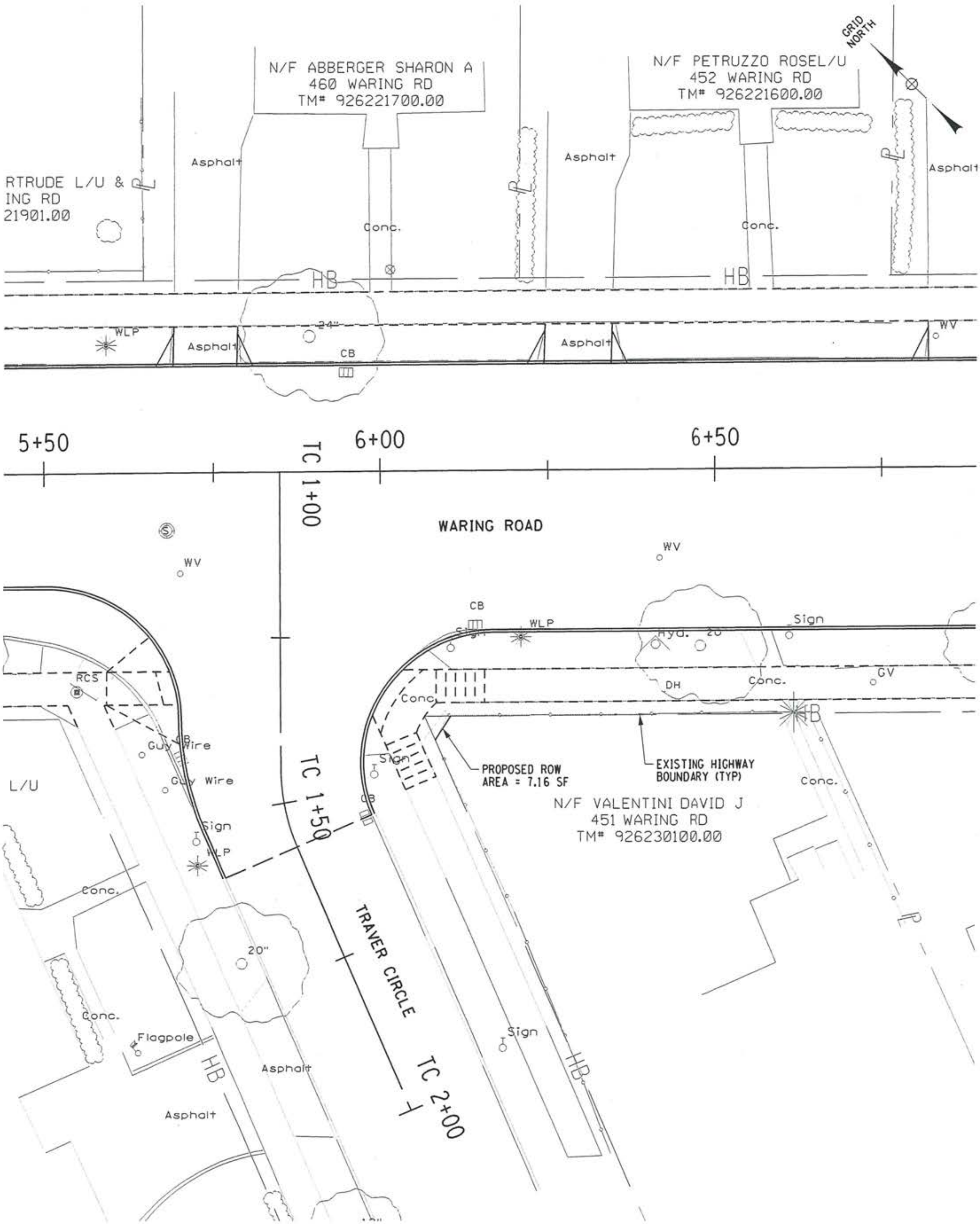
ADDRESS	OWNER NAMES	TAX MAP NUMBER	TYPE OF TAKING	AREA (SF)
505 Waring Road	N/F Smith Charles & Logan-Smith	926210900.00	Fee	24.18
451 Waring Road	Valentino David J	926230100.00	Fee	7.16
106 Waring Road	Vazquez Julio & Maria T	927912500.00	Fee	175.02



WARING ROAD

ROW TAKINGS SKETCH

PROPERTY:
505 WARING RD

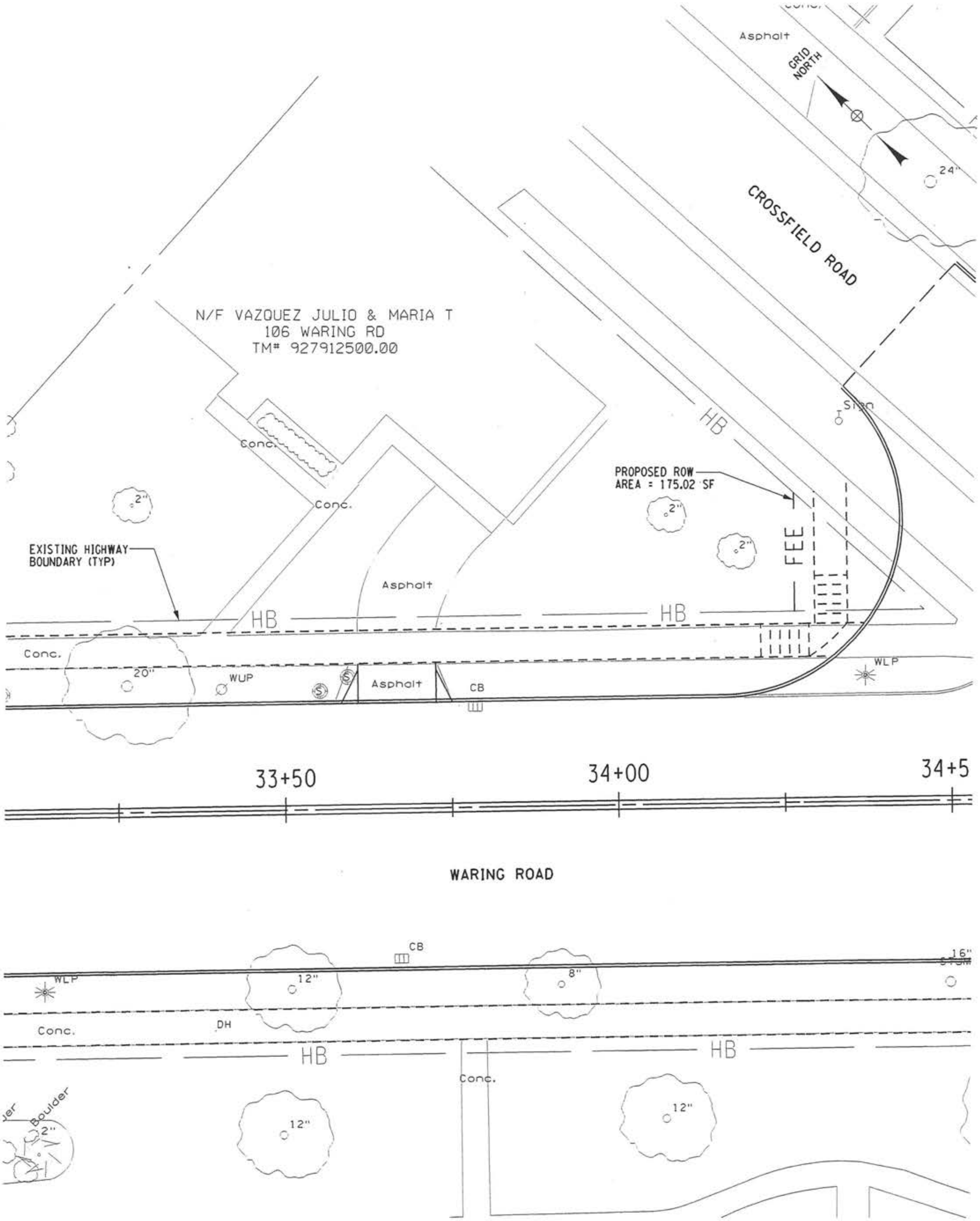


WARING ROAD

ROW TAKINGS SKETCH

PROPERTY:
451 WARING RD

FILE NAME = J:\PROJECTS\City of Rochester\12233 Waring Road Design\D Design\D08 CAD\Bentley\MicroStation\Highway\Preliminary Design\General Plans and Profiles\ROW Sketches\451 Waring Rd.dgn
DATE/TIME = 7/3/2012 2:30:56 PM
USER = $USER$



WARING ROAD
ROW TAKINGS SKETCH
PROPERTY: 106 WARING RD

APPENDIX H – ENGINEERS ESTIMATE

Waring Road Planning Estimate - Alternative 2

11/13/2012

Item Number	Description	Unit	ENGINEERS ESTIMATE Quantity	Unit Cost	Total Cost	CITY - STREET Quantity	Cost	CITY - WATER Quantity	Cost
203.02	UNCLASSIFIED EXCAVATION AND DISPOSAL	CY	17385	$ 19.00	$ 330,318.52	17385	$ 330,318.52		$ -
203.03	EMBANKMENT IN PLACE	CY	1000	$ 9.00	$ 9,000.00	1000	$ 9,000.00		$ -
203.07	SELECT GRANULAR FILL	CY	3234	$ 27.00	$ 87,307.88	654	$ 17,649.00	2580	$ 69,658.88
304.11	STONE BEDDING	CY	126	$ 35.00	$ 4,418.51	126	$ 4,418.51		$ -
203.25	SAND BACKFILL	CY	1096	$ 25.00	$ 27,412.15		$ -	1096	$ 27,412.15
206.02	TRENCH AND CULVERT EXCAVATION	CY	5246	$ 22.00	$ 115,404.67	1569	$ 34,522.89	3676	$ 80,881.78
304.11	SUBBASE COURSE	CY	7186	$ 40.00	$ 287,425.19	7186	$ 287,425.19		$ -
402.098202	ASPHALT TOP COURSE	TON	1605	$ 120.00	$ 192,600.80	1605	$ 192,600.80		$ -
402.198902	ASPHALT BINDER COURSE	TON	2044	$ 105.00	$ 214,669.64	2044	$ 214,669.64		$ -
402.378902	ASPHALT BASE COURSE	TON	5429	$ 105.00	$ 570,054.98	5429	$ 570,054.98		$ -
407.0101	TACK COAT	GAL	1724	$ 9.00	$ 15,511.70	1724	$ 15,511.70		$ -
412.08	TEMPORARY ASPHALT	SF	22698	$ 4.50	$ 102,141.00	5088	$ 22,896.00	17610	$ 79,245.00
490.30	MILLING	SY	1872	$ 3.75	$ 7,020.00	1872	$ 7,020.00		$ -
520.50140008	SAW CUTTING, ASPHALT PAVEMENT, ASPHALT SURFACE COURSE, CONCRETE PAVEMENT OR ASPHALT OVERLAY ON CONCRETE PAVEMENT	LF	1908	$ 8.00	$ 15,264.00	1908	$ 15,264.00		$ -
603.98100804	POLYVINYL CHLORIDE (PVC) SEWER PIPE & FITTINGS 8" DIAMETER	LF	954	$ 60.00	$ 57,240.00	954	$ 57,240.00		$ -
604.301911	RECTANGULAR DRAINAGE STRUCTURE TYPE S FOR #11 WELDED FRAME	LF	239	$ 450.00	$ 107,550.00	239	$ 107,550.00		$ -
605.XX	6" UNDERDRAIN PIPE	LF	9220	$ 3.50	$ 32,270.00	9220	$ 32,270.00		$ -
605.XX	UNDERDRAIN FILTER STONE	CY	768	$ 40.00	$ 30,720.00	768	$ 30,720.00		$ -
608.0101	CONCRETE SIDEWALKS AND DRIVEWAYS	CY	669	$ 350.00	$ 234,251.54	669	$ 234,251.54		$ -
608.020102	HOT MIX ASPHALT (HMA) SIDEWALKS, DRIVEWAYS	TON	268	$ 175.00	$ 46,900.00	268	$ 46,900.00		$ -
608.21	EMBEDDED DETECTABLE WARNING UNITS	SY	40	$ 350.00	$ 14,000.00	40	$ 14,000.00		$ -
609.01	STONE CURB	LF	9220	$ 24.00	$ 221,280.00	9220	$ 221,280.00		$ -
610.0203	ESTABLISH TURF	ACRE	1	$ 7,000.00	$ 8,590.91	1.23	$ 8,590.91		$ -
613.XX	TREES	EACH	80	$ 400.00	$ 32,000.00	80	$ 32,000.00		$ -
613.02	PLACING TOPSOIL - TYPE A	CY	495	$ 40.00	$ 19,800.00	495	$ 19,800.00		$ -
619.01	BASIC WORK ZONE TRAFFIC CONTROL	LS	1	$ 100,000.00	$ 100,000.00	0.76	$ 76,000.00	0.24	$ 24,000.00
625.01	SURVEY OPERATIONS	LS	1	$ 50,000.00	$ 50,000.00	0.76	$ 38,000.00	0.24	$ 12,000.00
637.11	ENGINEER'S OFFICE	MO	24	$ 1,000.00	$ 24,000.00	19	$ 19,000.00	5	$ 5,000.00
645.5101	GROUND MOUNTED SIGN PANELS WITHOUT Z BARS	SF	300	$ 50.00	$ 15,000.00	300	$ 15,000.00		$ -
645.81	TYPE A SIGN POSTS	EACH	30	$ 150.00	$ 4,500.00	30	$ 4,500.00		$ -
647.01	REMOVAL OF SIGNS - SIZE A (0 TO 10 SQUARE FEET)	EACH	150	$ 150.00	$ 22,500.00	150	$ 22,500.00		$ -
655.1111	WELDED FRAME & RETICULINE GRATE 11	EACH	53	$ 750.00	$ 39,750.00	53	$ 39,750.00		$ -
655.1502	MANHOLE FRAME & COVER	EACH	38	$ 400.00	$ 15,200.00	38	$ 15,200.00		$ -
655.XXXX	STORM WATER QUALITY DEVICES	LS	1	$ 100,000.00	$ 100,000.00	1	$ 100,000.00		$ -
663.XXXX	PVCO WATER PIPE, 6"	LF	198	$ 95.00	$ 18,810.00		$ -	198	$ 18,810.00
663.XXXX	PVCO WATER PIPE, 8"	LF	4550	$ 105.00	$ 477,750.00		$ -	4550	$ 477,750.00
663.06XX	WATER SERVICE PIPE	LF	2244	$ 45.00	$ 100,980.00		$ -	2244	$ 100,980.00
663.1006	RESILIENT WEDGE VALVE & VALVE BOX, 6"	EACH	11	$ 1,400.00	$ 15,400.00		$ -	11	$ 15,400.00
663.1008	RESILIENT WEDGE VALVE & VALVE BOX, 8"	EACH	22	$ 1,800.00	$ 39,600.00		$ -	22	$ 39,600.00
663.1301	HYDRANT	EACH	11	$ 3,500.00	$ 38,500.00		$ -	11	$ 38,500.00
663.2001	IRON WATER MAIN FITTINGS (3-8 INCH DIAMETER)	LBS	3100	$ 9.00	$ 27,900.00		$ -	3100	$ 27,900.00
663.25xx	WATER SERVICE CONNECTION	EACH	68	$ 600.00	$ 40,800.00		$ -	68	$ 40,800.00
663.26xx	CURB STOP & CURB BOX	EACH	68	$ 250.00	$ 17,000.00		$ -	68	$ 17,000.00
663.42	REMOVE AND DISPOSE OF EXISTING WATER VALVE & VALVE BOX	EACH	68	$ 375.00	$ 25,500.00		$ -	68	$ 25,500.00
663.46	REMOVE AND STORE EXISTING HYDRANT	EACH	11	$ 500.00	$ 5,500.00		$ -	11	$ 5,500.00
670.11xx	LIGHT MAST ARMS	EACH	65	$ 2,000.00	$ 130,000.00	65	$ 130,000.00		$ -
670.50XXXX	LUMINAIRES	EACH	65	$ 500.00	$ 32,500.00	65	$ 32,500.00		$ -
680.XX	TRAFFIC SIGNAL INSTALLATIONS (1 Intersection)	LS	1	$ 115,000.00	$ 115,000.00	1	$ 115,000.00		$ -
685.01	WHITE EPOXY REFLECTORIZED PAVEMENT STRIPES - 15 MILS	LF	18970	$ 6.00	$ 113,820.00	18970	$ 113,820.00		$ -
685.02	YELLOW EPOXY REFLECTORIZED PAVEMENT STRIPES - 15 MILS	LF	11100	$ 6.00	$ 66,600.00	11100	$ 66,600.00		$ -
685.04	WHITE EPOXY REFLECTORIZED PAVEMENT SYMBOLS - 15 MILS	EACH	60	$ 150.00	$ 9,000.00	60	$ 9,000.00		$ -
				TOTAL:	$ 4,428,761.47		$ 3,322,823.67		$ 1,105,937.81

Waring Road Planning Estimate - Alternative 3

8/10/2012

			ENGINEERS ESTIMATE			CITY - STREET		CITY - WATER	
Item Number	Description	Unit	Quantity	Unit Cost	Total Cost	Quantity	Cost	Quantity	Cost
203.02	UNCLASSIFIED EXCAVATION AND DISPOSAL	CY	18191	$ 19.00	$ 345,635.80	18191	$ 345,635.80		$ -
203.03	EMBANKMENT IN PLACE	CY	1000	$ 9.00	$ 9,000.00	1000	$ 9,000.00		$ -
203.07	SELECT GRANULAR FILL	CY	3234	$ 27.00	$ 87,307.88	654	$ 17,649.00	2580	$ 69,658.88
304.11	STONE BEDDING	CY	126	$ 35.00	$ 4,418.51	126	$ 4,418.51		$ -
203.25	SAND BACKFILL	CY	1096	$ 25.00	$ 27,412.15		$ -	1096	$ 27,412.15
206.02	TRENCH AND CULVERT EXCAVATION	CY	5246	$ 22.00	$ 115,404.67	1569	$ 34,522.89	3676	$ 80,881.78
304.11	SUBBASE COURSE	CY	7700	$ 40.00	$ 308,000.00	7700	$ 308,000.00		$ -
402.098202	ASPHALT TOP COURSE	TON	1745	$ 120.00	$ 209,359.36	1745	$ 209,359.36		$ -
402.198902	ASPHALT BINDER COURSE	TON	2222	$ 105.00	$ 233,348.45	2222	$ 233,348.45		$ -
402.378902	ASPHALT BASE COURSE	TON	5953	$ 105.00	$ 625,044.00	5953	$ 625,044.00		$ -
407.0101	TACK COAT	GAL	1890	$ 9.00	$ 17,008.00	1890	$ 17,008.00		$ -
412.08	TEMPORARY ASPHALT	SF	22698	$ 4.50	$ 102,141.00	5088	$ 22,896.00	17610	$ 79,245.00
490.30	MILLING	SY	1872	$ 3.75	$ 7,020.00	1872	$ 7,020.00		$ -
520.50140008	SAW CUTTING, ASPHALT PAVEMENT, ASPHALT SURFACE COURSE, CONCRETE PAVEMENT OR ASPHALT OVERLAY ON CONCRETE PAVEMENT	LF	1908	$ 8.00	$ 15,264.00	1908	$ 15,264.00		$ -
603.98100804	POLYVINYL CHLORIDE (PVC) SEWER PIPE & FITTINGS 8" DIAMETER	LF	954	$ 60.00	$ 57,240.00	954	$ 57,240.00		$ -
604.301911	RECTANGULAR DRAINAGE STRUCTURE TYPE S FOR #11 WELDED FRAME	LF	239	$ 450.00	$ 107,550.00	239	$ 107,550.00		$ -
605.XX	6" UNDERDRAIN PIPE	LF	9220	$ 3.50	$ 32,270.00	9220	$ 32,270.00		$ -
605.XX	UNDERDRAIN FILTER STONE	CY	768	$ 40.00	$ 30,720.00	768	$ 30,720.00		$ -
608.0101	CONCRETE SIDEWALKS AND DRIVEWAYS	CY	669	$ 350.00	$ 234,251.54	669	$ 234,251.54		$ -
608.020102	HOT MIX ASPHALT (HMA) SIDEWALKS, DRIVEWAYS	TON	214	$ 175.00	$ 37,450.00	214	$ 37,450.00		$ -
608.21	EMBEDDED DETECTABLE WARNING UNITS	SY	40	$ 350.00	$ 14,000.00	40	$ 14,000.00		$ -
609.01	STONE CURB	LF	9220	$ 24.00	$ 221,280.00	9220	$ 221,280.00		$ -
610.0203	ESTABLISH TURF	ACRE	1.23	$ 7,000.00	$ 8,590.91	1.23	$ 8,590.91		$ -
613.XX	TREES	EACH	80	$ 400.00	$ 32,000.00	80	$ 32,000.00		$ -
613.02	PLACING TOPSOIL - TYPE A	CY	495	$ 40.00	$ 19,800.00	495	$ 19,800.00		$ -
619.01	BASIC WORK ZONE TRAFFIC CONTROL	LS	1	$ 100,000.00	$ 100,000.00	0.76	$ 76,000.00	0.24	$ 24,000.00
625.01	SURVEY OPERATIONS	LS	1	$ 50,000.00	$ 50,000.00	0.76	$ 38,000.00	0.24	$ 12,000.00
637.11	ENGINEER'S OFFICE	MO	24	$ 1,000.00	$ 24,000.00	19	$ 19,000.00	5	$ 5,000.00
645.5101	GROUND MOUNTED SIGN PANELS WITHOUT Z BARS	SF	300	$ 50.00	$ 15,000.00	300	$ 15,000.00		$ -
645.81	TYPE A SIGN POSTS	EACH	30	$ 150.00	$ 4,500.00	30	$ 4,500.00		$ -
647.01	REMOVAL OF SIGNS - SIZE A (0 TO 10 SQUARE FEET)	EACH	150	$ 150.00	$ 22,500.00	150	$ 22,500.00		$ -
655.1111	WELDED FRAME & RETICULINE GRATE 11	EACH	53	$ 750.00	$ 39,750.00	53	$ 39,750.00		$ -
655.1502	MANHOLE FRAME & COVER	EACH	38	$ 400.00	$ 15,200.00	38	$ 15,200.00		$ -
655.XXXX	STORM WATER QUALITY DEVICES	LS	1	$ 100,000.00	$ 100,000.00	1	$ 100,000.00		$ -
663.XXXX	PVCO WATER PIPE, 6"	LF	198	$ 95.00	$ 18,810.00		$ -	198	$ 18,810.00
663.XXXX	PVCO WATER PIPE, 8"	LF	4550	$ 105.00	$ 477,750.00		$ -	4550	$ 477,750.00
663.06XX	WATER SERVICE PIPE	LF	2244	$ 45.00	$ 100,980.00		$ -	2244	$ 100,980.00
663.1006	RESILIENT WEDGE VALVE & VALVE BOX, 6"	EACH	11	$ 1,400.00	$ 15,400.00		$ -	11	$ 15,400.00
663.1008	RESILIENT WEDGE VALVE & VALVE BOX, 8"	EACH	22	$ 1,800.00	$ 39,600.00		$ -	22	$ 39,600.00
663.1301	HYDRANT	EACH	11	$ 3,500.00	$ 38,500.00		$ -	11	$ 38,500.00
663.2001	IRON WATER MAIN FITTINGS (3-8 INCH DIAMETER)	LBS	3100	$ 9.00	$ 27,900.00		$ -	3100	$ 27,900.00
663.25xx	WATER SERVICE CONNECTION	EACH	68	$ 600.00	$ 40,800.00		$ -	68	$ 40,800.00
663.26xx	CURB STOP & CURB BOX	EACH	68	$ 250.00	$ 17,000.00		$ -	68	$ 17,000.00
663.42	REMOVE AND DISPOSE OF EXISTING WATER VALVE & VALVE BOX	EACH	68	$ 375.00	$ 25,500.00		$ -	68	$ 25,500.00
663.46	REMOVE AND STORE EXISTING HYDRANT	EACH	11	$ 500.00	$ 5,500.00		$ -	11	$ 5,500.00
670.11xx	LIGHT MAST ARMS	EACH	65	$ 2,000.00	$ 130,000.00	65	$ 130,000.00		$ -
670.50XXXX	LUMINAIRES	EACH	65	$ 500.00	$ 32,500.00	65	$ 32,500.00		$ -
680.XX	TRAFFIC SIGNAL INSTALLATIONS (1 Intersection)	LS	1	$ 115,000.00	$ 115,000.00	1	$ 115,000.00		$ -
685.01	WHITE EPOXY REFLECTORIZED PAVEMENT STRIPES - 15 MILS	LF	26970	$ 6.00	$ 161,820.00	26970	$ 161,820.00		$ -
685.02	YELLOW EPOXY REFLECTORIZED PAVEMENT STRIPES - 15 MILS	LF	11100	$ 6.00	$ 66,600.00	11100	$ 66,600.00		$ -
685.04	WHITE EPOXY REFLECTORIZED PAVEMENT SYMBOLS - 15 MILS	EACH	60	$ 150.00	$ 9,000.00	60	$ 9,000.00		$ -
				TOTAL:	$ 4,595,126.27		$ 3,489,188.46		$ 1,105,937.81

Waring Road Planning Estimate - Alternative 4

11/13/2012

Item Number	Description	Unit	ENGINEERS ESTIMATE Quantity	Unit Cost	Total Cost	CITY - STREET Quantity	Cost	CITY - WATER Quantity	Cost
203.02	UNCLASSIFIED EXCAVATION AND DISPOSAL	CY	8487	$ 19.00	$ 161,246.43	8487	$ 161,246.43		$ -
203.03	EMBANKMENT IN PLACE	CY	3000	$ 9.00	$ 27,000.00	3000	$ 27,000.00		$ -
203.07	SELECT GRANULAR FILL	CY	3234	$ 27.00	$ 87,307.88	654	$ 17,649.00	2580	$ 69,658.88
304.11	STONE BEDDING	CY	126	$ 35.00	$ 4,418.51	126	$ 4,418.51		$ -
203.25	SAND BACKFILL	CY	1096	$ 25.00	$ 27,412.15		$ -	1096	$ 27,412.15
206.02	TRENCH AND CULVERT EXCAVATION	CY	5246	$ 22.00	$ 115,404.67	1569	$ 34,522.89	3676	$ 80,881.78
304.11	SUBBASE COURSE	CY	4590	$ 40.00	$ 183,603.85	4590	$ 183,603.85		$ -
402.098202	ASPHALT TOP COURSE	TON	1745	$ 120.00	$ 209,359.36	1745	$ 209,359.36		$ -
402.198902	ASPHALT BINDER COURSE	TON	2222	$ 105.00	$ 233,348.45	2222	$ 233,348.45		$ -
402.378902	ASPHALT BASE COURSE	TON	8642	$ 105.00	$ 907,360.20	8642	$ 907,360.20		$ -
407.0101	TACK COAT	GAL	3115	$ 9.00	$ 28,039.20	3115	$ 28,039.20		$ -
412.08	TEMPORARY ASPHALT	SF	22698	$ 4.50	$ 102,141.00	5088	$ 22,896.00	17610	$ 79,245.00
490.30	MILLING	SY	11423	$ 8.00	$ 91,387.02	11423	$ 91,387.02		$ -
502.0031	PCC PAVEMENT-UNREINFORCED, LEVEL 1, CLASS HEC, TYPE 1	CY	195	$ 290.00	$ 56,562.16		$ -	195	$ 56,562.16
520.50140008	SAW CUTTING, ASPHALT PAVEMENT, ASPHALT SURFACE COURSE, CONCRETE PAVEMENT OR ASPHALT OVERLAY ON CONCRETE PAVEMENT	LF	1908	$ 8.00	$ 15,264.00	1908	$ 15,264.00		$ -
603.98100804	POLYVINYL CHLORIDE (PVC) SEWER PIPE & FITTINGS 8" DIAMETER	LF	954	$ 60.00	$ 57,240.00	954	$ 57,240.00		$ -
604.301911	RECTANGULAR DRAINAGE STRUCTURE TYPE S FOR #11 WELDED FRAME	LF	239	$ 450.00	$ 107,550.00	239	$ 107,550.00		$ -
605.XX	6" UNDERDRAIN PIPE	LF	9220	$ 3.50	$ 32,270.00	9220	$ 32,270.00		$ -
605.XX	UNDERDRAIN FILTER STONE	CY	768	$ 40.00	$ 30,720.00	768	$ 30,720.00		$ -
608.0101	CONCRETE SIDEWALKS AND DRIVEWAYS	CY	669	$ 350.00	$ 234,150.00	669	$ 234,150.00		$ -
608.020102	HOT MIX ASPHALT (HMA) SIDEWALKS, DRIVEWAYS	TON	535	$ 175.00	$ 93,625.00	535	$ 93,625.00		$ -
608.21	EMBEDDED DETECTABLE WARNING UNITS	SY	40	$ 350.00	$ 14,000.00	40	$ 14,000.00		$ -
609.01	STONE CURB	LF	4149	$ 24.00	$ 99,576.00	4149	$ 99,576.00		$ -
609.02	STONE CURB REPLACEMENT (IN MILLING AND RESURFACING AREAS, INCL Excav and Backfill)	LF	5071	$ 35.00	$ 177,485.00	5071	$ 177,485.00		$ -
610.0203	ESTABLISH TURF	ACRE	4	$ 7,000.00	$ 25,772.73	3.68	$ 25,772.73		$ -
613.XX	TREES	EACH	80	$ 400.00	$ 32,000.00	80	$ 32,000.00		$ -
613.02	PLACING TOPSOIL - TYPE A	CY	1485	$ 40.00	$ 59,400.00	1485	$ 59,400.00		$ -
619.01	BASIC WORK ZONE TRAFFIC CONTROL	LS	1	$ 100,000.00	$ 100,000.00	0.76	$ 76,000.00	0.24	$ 24,000.00
625.01	SURVEY OPERATIONS	LS	1	$ 50,000.00	$ 50,000.00	0.76	$ 38,000.00	0.24	$ 12,000.00
637.11	ENGINEER'S OFFICE	MO	24	$ 1,000.00	$ 24,000.00	19	$ 19,000.00	5	$ 5,000.00
645.5101	GROUND MOUNTED SIGN PANELS WITHOUT Z BARS	SF	300	$ 50.00	$ 15,000.00	300	$ 15,000.00		$ -
645.81	TYPE A SIGN POSTS	EACH	30	$ 150.00	$ 4,500.00	30	$ 4,500.00		$ -
647.01	REMOVAL OF SIGNS - SIZE A (0 TO 10 SQUARE FEET)	EACH	150	$ 150.00	$ 22,500.00	150	$ 22,500.00		$ -
655.1111	WELDED FRAME & RETICULINE GRATE 11	EACH	53	$ 750.00	$ 39,750.00	53	$ 39,750.00		$ -
655.1502	MANHOLE FRAME & COVER	EACH	38	$ 400.00	$ 15,200.00	38	$ 15,200.00		$ -
655.XXXX	STORM WATER QUALITY DEVICES	LS	1	$ 100,000.00	$ 100,000.00	1	$ 100,000.00		$ -
663.XXXX	PVCO WATER PIPE, 6"	LF	198	$ 95.00	$ 18,810.00		$ -	198	$ 18,810.00
663.XXXX	PVCO WATER PIPE, 8"	LF	4550	$ 105.00	$ 477,750.00		$ -	4550	$ 477,750.00
663.06XX	WATER SERVICE PIPE	LF	2244	$ 45.00	$ 100,980.00		$ -	2244	$ 100,980.00
663.1006	RESILIENT WEDGE VALVE & VALVE BOX, 6"	EACH	11	$ 1,400.00	$ 15,400.00		$ -	11	$ 15,400.00
663.1008	RESILIENT WEDGE VALVE & VALVE BOX, 8"	EACH	22	$ 1,800.00	$ 39,600.00		$ -	22	$ 39,600.00
663.1301	HYDRANT	EACH	11	$ 3,500.00	$ 38,500.00		$ -	11	$ 38,500.00
663.2001	IRON WATER MAIN FITTINGS (3-8 INCH DIAMETER)	LBS	3100	$ 9.00	$ 27,900.00		$ -	3100	$ 27,900.00
663.25xx	WATER SERVICE CONNECTION	EACH	68	$ 600.00	$ 40,800.00		$ -	68	$ 40,800.00
663.26xx	CURB STOP & CURB BOX	EACH	68	$ 250.00	$ 17,000.00		$ -	68	$ 17,000.00
663.42	REMOVE AND DISPOSE OF EXISTING WATER VALVE & VALVE BOX	EACH	68	$ 375.00	$ 25,500.00		$ -	68	$ 25,500.00
663.46	REMOVE AND STORE EXISTING HYDRANT	EACH	11	$ 500.00	$ 5,500.00		$ -	11	$ 5,500.00
670.11xx	LIGHT MAST ARMS	EACH	65	$ 2,000.00	$ 130,000.00	65	$ 130,000.00		$ -
670.50XXXX	LUMINAIRES	EACH	65	$ 500.00	$ 32,500.00	65	$ 32,500.00		$ -
680.XX	TRAFFIC SIGNAL INSTALLATIONS (1 Intersection)	LS	1	$ 115,000.00	$ 115,000.00	1	$ 115,000.00		$ -
685.01	WHITE EPOXY REFLECTORIZED PAVEMENT STRIPES - 15 MILS	LF	26970	$ 6.00	$ 161,820.00	26970	$ 161,820.00		$ -
685.02	YELLOW EPOXY REFLECTORIZED PAVEMENT STRIPES - 15 MILS	LF	11100	$ 6.00	$ 66,600.00	11100	$ 66,600.00		$ -
685.04	WHITE EPOXY REFLECTORIZED PAVEMENT SYMBOLS - 15 MILS	EACH	60	$ 150.00	$ 9,000.00	60	$ 9,000.00		$ -
				TOTAL:	$ 4,907,253.59		$ 3,744,753.63		$ 1,162,499.96

APPENDIX I – INITIAL PROJECT PROPOSAL

MEMORANDUM
DEPARTMENT OF TRANSPORTATION

TO: Mary Bell, Regional Real Estate Officer
Jim Church, Director of Project Management Bureau
Dianne Kenneally, Local Program Bureau
Kevin Miller, Acting Regional Environmental Engineer
Owen Shevlin, Director of Program Management Bureau
Rob Slaver, Regional Planning Manager
Ed Welsh, Regional Program Manager

for FROM: Dan Hallowell, Regional Planning and Program Manager Rob Slaver

SUBJECT: ***Initial Project Proposal – PIN 4754.40***
Waring Road Improvements
City of Rochester, Monroe County

DATE: October 1, 2008

This project is now being progressed consistent with Regional Program and Project Management procedures. The attached IPP is provided for your information. The project Manager will authorize and secure funding as needed. If you have any questions or comments, please contact Rob Slaver at (585) 272-3352.

DH/RJS/jee
Attachment

pc: Project File
Ric,k Papaj, Project Manager

(JE/Slaver/475440.doc)

TRANSPORTATION PROJECT REPORT

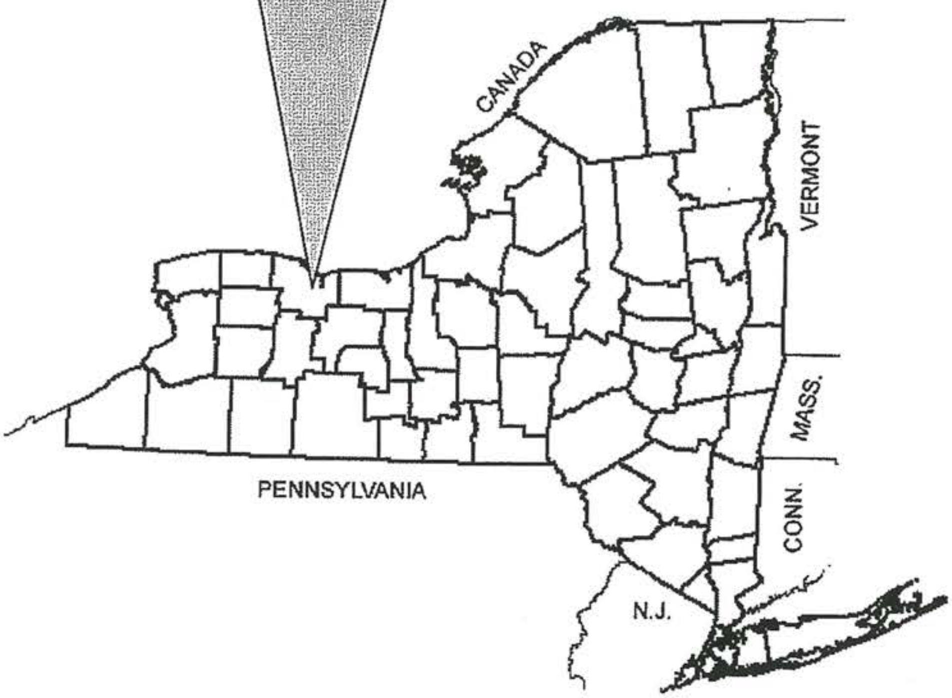
INITIAL PROJECT PROPOSAL

August 2008

PIN 475440

Waring Road Improvements

City of Rochester
Monroe County



U.S. Department of Transportation Federal Highway Administration

NEW YORK STATE DEPARTMENT OF TRANSPORTATION
DAVID A. PATERSON, Governor ASTRID C. GLYNN, Commissioner

PIN: 475440

PROJECT NAME: Waring Road from Culver Road to Norton Street

MUNICIPALITY: City of Rochester **COUNTY:** Monroe

ROUTE/SH #: NA

LIMITS: **Milepoints (2005):** NA
Reference Markers: NA

PROJECT LENGTH: 0.77 **CENTERLINE MILES:** 0.77 **LANE MILES:** 1.54

FEDERAL AID SYSTEM: Non-NHS **FUNCTIONAL CLASS:** Urban Collector

EXISTING AADT: 9,500

PERCENT TRUCKS: TBD

EXISTING CHARACTERISTICS OF CONCERN: This roadway appears to have base failure with a considerable amount of alligator cracking, poor ride quality, and increasingly demanding corrective maintenance needs.

ELEMENT	MEASURE/INDICATOR
Surface Rating	Sufficiency Rating is '5' (NYSDOT scale)

PROBLEM DESCRIPTION: In addition to the poor surface condition, the roadway has no clearly defined bikeway although bike traffic is moderate.

PROJECT OBJECTIVES: This project would restore pavement to improve ride quality, correct alignment problems, and make the roadway accessible to bicycle riders. It is noted that the roadway is 38' wide with two travel lanes. Shoulders are not striped and available for parking. However, because demand for parking is low due to the availability of off-street parking, the roadway width could be reduced to make enough space to accommodate an on-street bike space.

PROJECT ELEMENT(S) TO BE INVESTIGATED:

- ☐ Deck/minor Br. Rehab.
- ☐ Major Bridge Rehab.
- ☐ Highway Resurface
- ☐ Appurtenance
- ☐ Traffic Control
- ☐ Bridge Replace., New Location
- ☐ Bridge Replace., Existing Loc.
- ☒ Highway Reconstruction
- ☐ Large Culvert RH/RP
- ☐ Other: Multi-use Trail

PRIORITY RESULTS: ☒ Mobility & Reliability ☐ Safety ☐ Security ☐ Economic Competitiveness ☐ Environmental Stewardship

FUNDING SOURCE ☐ 100% State ☒ Federal

ENVIRONMENTAL RECOMMENDED CLASSIFICATION:

PROJECTED ENVIRONMENTAL PROCESS:				
NEPA:	☐ No Federal Funds	☒ Class II, CE ☐ CE/Auto ☐ CE/Prog ☐ CE/Doc	☐ Class III, EA ☐ SAFTEA-LU Applies	☐ Class I, EIS ☐ SAFTEA-LU Applies
SEQR:	☐ Exempt	☒ Type II	☐ Non-Type II ☐ EA -or-	☐ EIS

The following Checklist will be prepared during preliminary engineering:

☒ NEPA Checklist
☐ Regional Environmental Checklist
☐ Landscape Architectural/Environmental Services IPP Report

MPO INVOLVEMENT: ☐ No ☒ Yes TIP Name: Waring Road Improvements
TIP Number: H07-10

TIP AMENDMENT REQUIRED: ☒ No ☐ Yes, Needed by:

STIP STATUS: ☒ On STIP ☐ Not on STIP

MOU STATUS: This PIN is not included in the 2005/2010 MOU.

NOTES ON SPECIAL CIRCUMSTANCES: Scoping, design and construction are to be administered by the City of Rochester. The sponsor's project manager is James R. McIntosh, City Engineer (585 428 6828).

SPECIAL TECHNICAL ACTIVITES REQUIRED: Detailed pavement evaluation based on cores and investigation of roadside drainage needs are prerequisites to confirming scope, cost, and schedule parameters. A State-Local agreement will be required to allow for reimbursement of sponsor expenditures consistent with the applicable Federal Aid Program.

PLANNED PUBLIC INVOLVEMENT: A Public Involvement Plan will be developed during preliminary engineering and will be implemented throughout final design and construction.

WORKZONE SAFETY & MOBILITY: The Region has determined that the subject project is not significant per 23 CFR 630.1010. A Transportation Management Plan (TMP) consisting of a temporary traffic control plan will be prepared during preliminary engineering. Transportation operations and public information components of the TMP will be considered during final design.

PROBABLE SCHEDULE AND COST: Scoping would begin in September of 2008. Preliminary engineering would begin in December of 2008. Final design would begin in December of 2009. The PS&E would be produced in October of 2010 for a bid opening in December of 2010. Contract award would occur in January of 2011 and construction would be completed in July of 2012. The estimated cost of the project is $4.426m with City funds only for construction phase costs.

DESIRED LETTING: 12/7/10 **DESIRED CONSTRUCTION COMPLETION:** 7/30/12

SCHEDULED QUALIFIERS:

- ☒ Public Hearing
- ☐ Major Permits
- ☒ Consultant
- ☒ RoW
- ☐ CMAQ determination
- ☒ State-Local Agreement

PROGRAMMING:

Project Phase	Activity Duration	Estimated Cost	Fund Source	Obligation Date
Scoping	3 months	$ 47,000	FA (FLEX)	9/4/2008
Preliminary Engineering	12 months	$ 233,000	FA (FLEX)	12/4/2008
Final Design	10 months *	$ 186,000	FA (FLEX)	12/3/2009
RoW Incidentals	22 months	$ 25,000	FA (FLEX)	12/4/2008
RoW Acquisitions	10 months *	$ 75,000	FA (FLEX)	12/3/2009
Construction	18 months **	$3,510,000	City	10/7/10
Inspection/Administration	18 months **	$ 351,000	City	10/7/10
TOTAL		$4,426,000		

* to PS&E ** from award

BASIS OF ESTIMATE: Sponsor application to NYSDOT.

PROJECT CATEGORY: ☐ Simple ☒ Moderate ☐ Complex

STATEWIDE SIGNIFICANCE: ☒ No ☐ Yes
Remarks:

ASSET MANAGEMENT (OPTIONAL): ☐ Applies ☒ Not Applicable

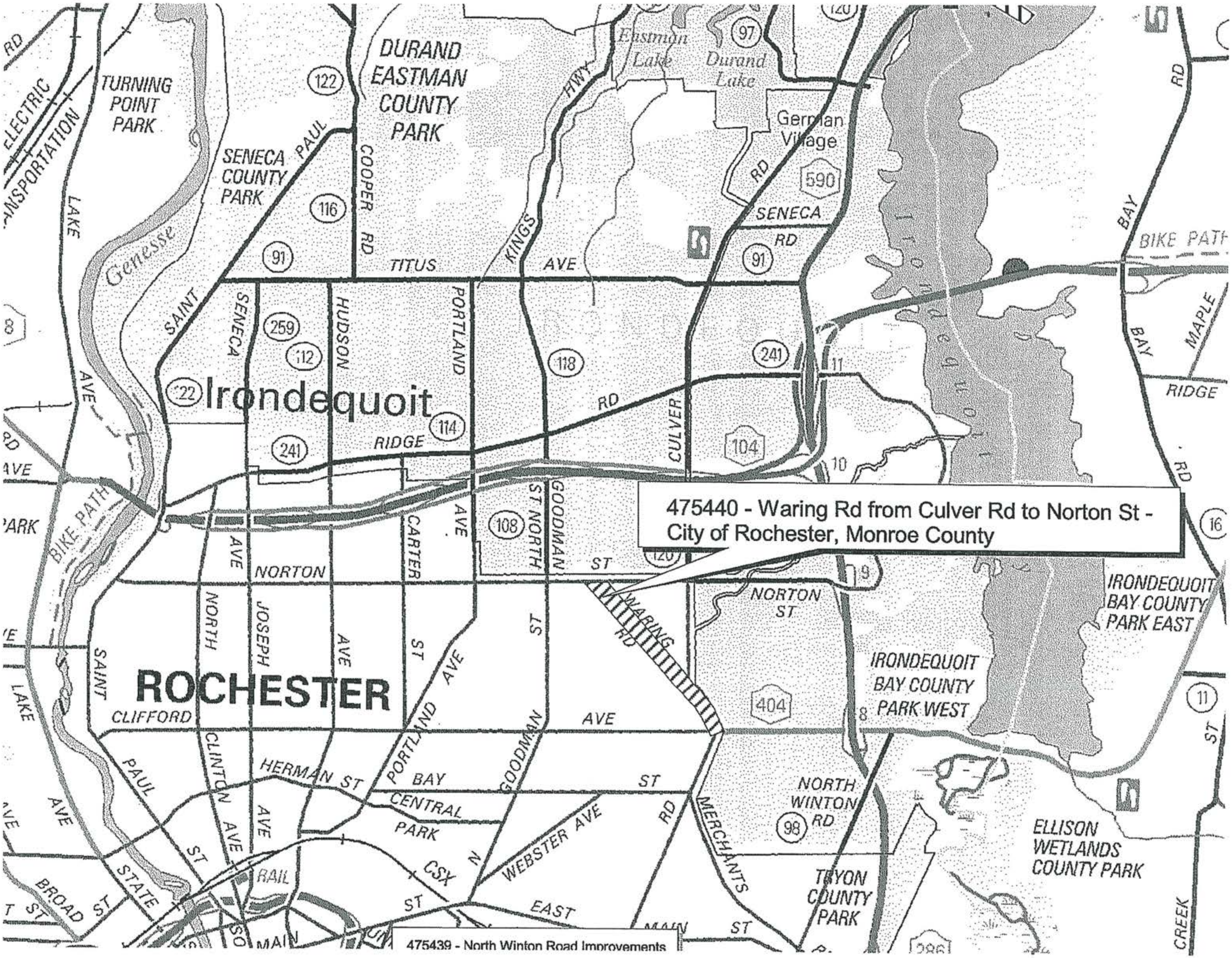
AM Team	IPP Initiator (Yes/No)	Asset Specific Cost Share ($M)	Asset Team Specific Cost/Scope/Schedule/Concurrence (Team Chair Signature)

ASSIGNED PROJECT MANAGER: Rick Papaj

FUNCTIONAL AREA: Regional Planning and Program Management

PHONE: 585 272-3417

IPP PREPARED BY: Edwin Welsh (For the sponsor) **DATE:** 8/13/08


475440 - Waring Rd from Culver Rd to Norton St -
City of Rochester, Monroe County
475439 - North Winton Road Improvements
Irondequoit
ROCHESTER
DURAND EASTMAN COUNTY PARK
TURNING POINT PARK
SENECA COUNTY PARK
IRONDEQUOIT BAY COUNTY PARK EAST
IRONDEQUOIT BAY COUNTY PARK WEST
ELLISON WETLANDS COUNTY PARK
TRYON COUNTY PARK
German Village
WARING RD
NORTON ST
CULVER

APPENDIX J – BEYOND PRESERVATION FORM AND NARRATIVE

Beyond Preservation Project Review
PAVEMENT

Form BP-1PM

Filename →	P475440A_Waring Rd	Fund Allocation Type →	Statewide Prioritization
475440	Title:	Waring Road Improvement Project	
Enter PIN ↑ Descriptn →	Waring Road Improvements from Norton Street to Culver Road.		

Project Identification

GIS Code:	Enter
BIN:	N/A
NHS:	No
NHS+:	No
Funct. Class:	17-U Coll

Location/Traffic

Begin Descr:	Norton Street		
End Descr:	Culver Road		
BMP:	0.00	0.75	EMP
Lanes:	2	6,893	AADT
CLMiles:	0.75	4%	% Trucks
Lane Mi:	1.50	276	# Trucks

Project Admin

County:	MNR
Owner:	City or Village
Sponsor:	City or Village
On-System:	No

Cost & Schedule

Constr ($M):	$5.400 ←
Total ($M):	$6.850
LetYr (yyyy):	2015
Let By:	Local

Condition/Distress Information

Current Rating:	5	
Dom Distress:	Ag: Allig-Genl	
Rut Depth (in):	0.0	
Avg IRI (in/mi):	220	Rough
Click →		to reset IRI

SAMT Review Routing

Pavement:	Select
Structure:	Select
Safety:	Select
Mobility:	Select
Sustainblty:	Select
Mandate:	Select
Lead Team:	Select

Fund Source ($M)

STP	$0.700
Select	Enter
Select	Enter
Select	Enter
Select	Enter
Select	Enter
Total ($M)	$0.700

Work History and Timing

Last Work Yr/Type:	2010	Mill & Fill
Plan Work Yr/Type:	2015	Recon
Existing Pavement Type:		Asphalt
Years at Current Rating:		7
Yrs until Work is Triggered:		3
Year at Start of Window:		2015
Years Float to Letting:		0

The sum of Fund Sources should equal Construction ($M)

Review Tracking

	Sponsor Name	Date
BP Form Submitted by/Date:		
Reviewed by RAMT - Date:		
Reviewed by SPMT - Date:		
Reviewed by SSMT - Date:		
Reviewed by Safety - Date:		
Reviewed by Sustain/Others - Date:		
CPT Endorsement - Date:		
CPDC Approval - Date:		
Priority Tier:		**Select**

Cost Effectiveness/Scope Index

$/VMT:	$1,045
Typical Unit $K/LM:	$1,000
$K/LM : Unit $/LM	3.60

Pavement Ranking Index

Triage Test:	**Check NHS+**
Pavement Condition:	1.92
Cost and Scope:	0.09
Facility Importance:	0.94
Pavement Index:	**2.96**

475440 Waring Road Improvement Project

Ranking Index Calculation
Pavement

Triage Gate 0%

Criteria	Value	Gate	Check NHS+
NHS +	No	No	Check
Letting Year Proposed:	2015	Let Yr IN	
Year at Start of Window:	2015	Window	OK
Yrs to Work Trigger:	3	0	← Yrs Float to Letting
Planned Work Type:	Recon	5	OK
		↑ Current Rating	

Pavement Condition 25%

Criteria	Project	Score	Weight	Points
Surface Rating:	5	10.0	10%	1.00
Dominant Distress:	Ag: Allig-Genl	6.0	5%	0.30
Ride Quality (IRI in/mi):	220	6.2	10%	0.62

Cost and Scope 30%

Criteria	Project	Score	Weight	Points
$/VMT:	$1,045	0.5	20%	0.09
Scope Index:	3.60	0.0	10%	0.00

Facility Importance 45%

Criteria	Project	Score	Weight	Points
Functional Class:	17-U Coll	2.0	25%	0.50
AADT:	6,893	2.2	15%	0.32
Number of Trucks:	276	2.4	5%	0.12
% Trucks:	4%			

High	**Pavement Ranking Index=**	**2.96**
Mid	**Prioritiy Tier =**	
Low		

Beyond Preservation Project Review
NARRATIVE SHEET

Section A: Project Description

Project Type ("X" one):	X	← System Renewal		← Modernization

Project PIN:	**4754.40**	**Project Name:**	**Waring Road Improvements Project**

Project Scope:	Roadway rehabilitation for a 0.76 mile section of Urban Collector located in a residential section of the City of Rochester. Project Limits along Waring Road are from Norton Street to Culver Road.
Project Objectives:	(1) Address geometric deficiencies to improve traffic flow and facilitate traffic operations, including improved bicycle traffic along the corridor. (2) Restore pavement to very good condition and ride-ability using cost effective pavement treatments which provide a service life of 50 years. (3) Strategically upgrade pedestrian facilities, including sidewalks and crosswalks, along the corridor. (4) Provide an adequate amount of on-street parking facilities to meet the needs of the current and future land uses while balancing the needs of alternate forms of transportation such as bicycling. (5) Provide a safe and efficient shared roadway for motorists and bicyclists along the entire corridor that meet current design standards and comply with local master plans. (6) Improve the overall safety and aesthetics of the corridor, and calm traffic by: a. Upgrading street lighting b. Increasing green space along the roadway where feasible c. Improve the urban streetscape by infilling new trees along the curb lawn d. Improve the visual appeal of the roadway and the adjacent neighborhood

Section B: Project Context

1. Describe how the proposed project provides critical links to the area the project serves (examples are multi-modal connections, large residential areas, emergency routes, freight routes, employment centers etc). Discuss type and magnitude of link.

Waring Road provides a critical link to the area by connecting 12 separate residential side streets to the surrounding community. Waring Road is an important commuter route in the north east section of the City which not only serves the immediate area but also the Town of Irondequoit located immediately to the north and east of the project limits. Waring Road also serves as the only access point to a large commercial shopping plaza located near the center of the project limits along Waring Road.

Norton Village Park and Recreational Facility operated and maintained by the City of Rochester, is located just north of the plaza on Waring Road. The facility has a dedicated entrance and parking lot off Waring Road.

The Rochester Genesee Regional Transportation Authority (RGRTA) operates a single route through the corridor – Route 6-Clifford Avenue. Bus stops are located periodically along the southbound direction of Waring Road.

Waring Road is within the Rochester City School District. Northeast and Northwest College Preparatory High Schools, Douglass Campus, is located at 940 Fernwood Park. The athletic fields are adjacent to the project corridor south of Northland Avenue. Sidewalks exist along the project corridor and are used by students from the adjacent neighborhoods, and students regularly use the RGRTA busses along Waring Road to commute to and from school.

As an Urban Collector, Waring Road is an important emergency access route which provides access to various residential neighborhoods as well as the Waring Road Plaza. Emergency vehicles regularly use Waring Road for direct access to adjacent dwellings and businesses as well as a connection to adjacent streets.

2. Describe other factors influencing the priority of this project such as preserving, enhancing or supporting significant economic competitiveness, social equity/community viability and environmental conditions.

Roadway rehabilitation projects are an essential part of the City's Master Plan which is intended to foster economic growth and competitiveness for businesses located in the City. The Waring Road Plaza exists in the center of the project corridor on the east side of Waring Road and consists of the following businesses: Family Dollar, M&T Bank, US Post Office, Rochester Works, H&R Block, Monroe County WIC Program and Citizens Bank. Fino's Klassy Clippers barber shop exists on the east side of Waring Road at the corner of Blakeslee Street and Waring Road. These businesses are all heavily dependent on the safety and efficiency of the Warring Road corridor. Maintaining safe and efficient roadway corridors and infrastructure helps preserve and improve social equity and community viability for urban communities and enhances quality of life factors such as property values and community cohesion.

3. How is this project part of an overall corridor strategy? How does the project serve users between communities, within a community (residential, business, commuters) or both? Explain.

The Waring Road Improvement Project is not part of a specific corridor plan, however The City of Rochester's 2010 Renaissance Plan does include several policies and goals related to transportation improvements that apply to this project, including:

- Creating a public infrastructure system that positively contributes to the physical, social and economic development objectives of the Greater Rochester Community. (Campaign Five)
- Encourage an integrated transportation system that is safe, efficient, and meets the transportation requirements of our businesses, industries and citizens. (Campaign Six)
- Ensure adequate parking resources or facilities that balance the protection of neighborhoods and residences with the need to sustain the economic viability and vitality of commercial areas. (Campaign Eight)
- Promote the creation of a safe, reliable and aesthetically pleasing transportation system that facilitates the movement of people and goods throughout our community and connects

neighborhoods while encouraging alternatives to automobile transportation. (Campaign Eight)

The Waring Road Improvement project does serve users between the City of Rochester and the Town of Irondequoit as an important commuter route into the Center City. Waring Road also serves as a critical link to the area by connecting 12 separate residential side streets to the surrounding community and to the many businesses located along Waring Road.

4. Describe unique mobility requirements. Specifically, describe if/how the project improves the convenience, access, connectivity and/or completes a gap to public transportation, bicycle/pedestrian network, or multimodal system.

There are no dedicated facilities for bicyclists along Waring Road. Cyclists are allowed to share the road with other vehicles but there is no signage that identifies Waring Road as a shared road environment. The wide pavement, lack of on-street parking definition and low utilization provide an informal bicycling environment. In January of 2011, the City adopted its Bicycle Master Plan which outlines the City's desire to expand biking and identify long-range opportunities for improving facilities throughout the City. The plan identified the existing conditions for bicyclists in Rochester as well as recommendations for enhancing streets to accommodate bicyclists in a cost effective manner. Waring Road was identified as having a bicyclist level of service rating of "D" which reflects the roadway's bike lane/paved shoulder width, outside lane width, traffic volume/speed/type, pavement surface condition and presence of on-street parking. Additionally, the plan identified Waring Road as a likely candidate for roadway restriping to accommodate bicyclists. The proposed improvements include the establishment of dedicated 5ft wide bike lanes along Waring Road which will improve the convenience for bicycle transportation.

Portions of Waring Road are also included in the Safe Routes to School Network in the City which provides safe walking routes to schools, identifies appropriate locations for crossing guards and associated traffic control signage. Sections of sidewalk along the project corridor are in poor condition and will be identified for replacement further enhancing pedestrian convenience and access.

Section C: Safety and System Optimization Considerations

1. If the project involves safety improvements, indicate if it addresses a High Accident Location (PIL/SDL) within the project limits. Identify the crash rate and expected reduction in crashes as applicable. Indicate if a Highway Safety Investigation has been conducted for this location and provide the study number. Identify the benefit/cost ratio for the safety improvements if known.

While there are no high accident locations along the corridor, we have identified a pattern of accidents along the corridor which would be addressed by the proposed improvements.

The pavement is poorly delineated in regards to the travelled roadway and on-street parking areas. On-street parking is underutilized and has led to vehicles using the space to pass other waiting/turning vehicles on the curb side resulting in sideswipe accidents. Narrowing the width of the motorized vehicular travel way, providing a clear pavement edge line and decreasing the amount of underutilized on-street parking will help decrease sideswipe accidents along the corridor.

Providing curb extensions along the road where on-street parking is permitted to better define the travel way and protect the on-street parking spaces from being encroached upon by through traffic will help decrease sideswipe accidents along the corridor. Also, The curb extensions can help define where parking is not permitted in locations such as bus stops, corner clearances and at cross walks.

2. What is the risk, cost and impact to the community if the bridge and pavement at this location is closed or restricted? Describe any special community concerns for addressing safety at this location.

Closing the pavement along Waring Road would be unacceptable to the residents and businesses located along Waring Road. Road closure would also disrupt commuter patterns and increase response times for emergency services. Road closure would also force local traffic to utilize the surrounding roadway network creating additional congestion along those roads and increasing travel times.

3. Describe any ITS-related, mobility and/or optimization benefits derived from this project. Indicate if the project maintains or improves information detection and dissemination capabilities (include how this impacts/supports 511). Describe any reduction in delay or improved LOS for the site.

Signal coordination between the Culver Road/Waring Road intersection and the Northland Avenue/Waring Road intersection is planned with the installation of PVC traffic conduit and fiber optic communications cable between these intersections should a signal be warranted at Northland Avenue in the future. The proposed improvements will not create any reduction in delay or provide any improvement in LOS along Waring Road.

Section D: Cost Effectiveness and BP Data

1. Describe any cost-sharing, special or innovative fund sources, local matches, leveraging of private funds, etc. that are contributing to the funding of this project.

The City of Rochester will be responsible for a 5% local match of State and Federal Funds under the standard Locally Administered Federal Aid Program for all eligible portions of the roadway improvements. The City also plans to replace the existing water main along the project due to its age and condition. The water main replacement will be 100% City funded.

2. How has the project scope been focused to achieve the most cost effective solution?

A pavement preservation alternative was developed which explored the possibility of rehabilitating the existing pavement where possible by milling the existing asphalt overlay and preserving the existing concrete base. The analysis shows that attempting to preserve the concrete base would require maintain the existing profile. The installation of new 7 ¼ inch high granite curbs would in turn cause significant grading outside the ROW due to the need to maintain positive drainage along the highway boundary. The additional cost of this work along with significant ROW mapping costs to acquire temporary easements along the project all add up to higher total project costs when compared to a reconstruction option that allows the lowering of the profile and a smaller project foot print that essentially remains within the existing highway boundary. The proposed pavement section has been recommended based on traffic projections and number of Equivalent Single Axle Loads (ESAL's) over the projected life of the pavement. This allows an efficient and cost effective pavement section to be designed for the project.

3. Have you checked the data loaded to the BP Form for accuracy and completeness? Please identify and explain any data modifications. Please explain if the shortest detour length is not used.
The data has been checked and appears to be accurate and complete.

Reviewer Notes: