

## 5. DESCRIPTION OF THE RECOMMENDED ROUTE

### 5.1 Introduction

Chapter 5 provides a detailed description of the Recommended Route (2002). Section 5.2 provides a comparison between the Recommended Route (2002) and the Recommended Plan (1997) and Section 5.3 describes the features of the Preliminary Design. Chapter 6 outlines the environmental protection strategies for the major impacts associated with the route, recommended mitigating measures, and commitments to further work. The Recommended Route (2002) is shown on Exhibit 5-1.

Based on identified transportation related problems the construction of a new alignment for Highway 7 between Kitchener and Guelph has been identified as a high safety and expansion priority. Environmental approval of the recommended alignment will allow for pre engineering activities including property acquisition, to proceed positioning the project for advancement to the Ministry's multi year capital construction program.

Following environmental approval an order in council will be prepared designating the alignment as a Controlled-Access King's Highway under the Public Transportation and Highway Improvement Act (PTHIA) RSO 1990 c. P. 50, s.36 and shall be registered in the proper land registry offices. All of the provisions and regulations of the PTHIA will apply to the proposed highway including those related to corridor control and the issuance of building and land use permits.

The designated alignment will also support other provincial and municipal planning initiatives. Knowledge of the firm future location for Highway 7, and interchanges with the highway will allow:

- the province to proceed with planning for improvements to other highway corridors influenced by Highway 7, such as the extension of Highway 6 north of Guelph;
- local municipalities to proceed with local land use planning.

## 5.2 Comparison of Recommended Route (2002) and Recommended Plan (1997)

This section provides a summary of the differences between the Recommended Plan (1997) and the Recommended Route (2002). A summary comparison of the Recommended Plan (1997) and the Recommended Route (2002) for key factor areas is presented in Exhibit 5-2. In order to provide consistency with the evaluation process described in Chapter 4, the comparison is summarized by the study area section, i.e. west, central and east. Exhibit 5-3 provides a comparison between the wetland impacts that would have been caused by the Recommended Plan (1997) and those caused by the Recommended Route (2002).

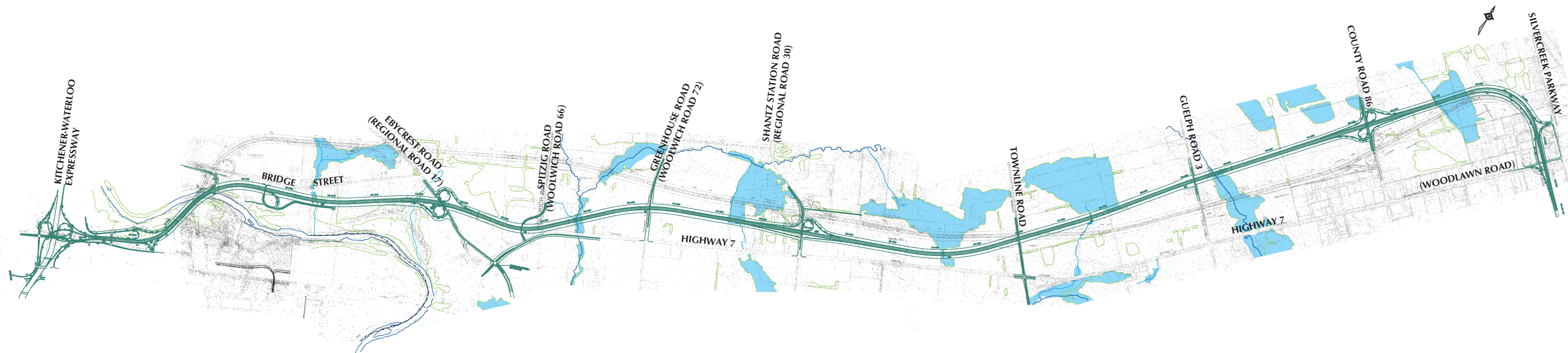
### *West Section (Kitchener to Woolwich Street)*

The Recommended Route (2002) and the Recommended Plan (1997) would both start at the KWE. The KWE / Highway 7 interchange included in the Recommended Route (2002) would have access to Wellington Street via interchange ramps, as opposed to being the continuation of the highway that was proposed with the Recommended Plan (1997). The Recommended Route (2002) would provide an interchange that has both a local and a freeway to freeway function. The interchange concept would require more property than the Recommended Plan (1997), however it would address concerns raised by the ratepayers association. The KWE / Highway 7 interchange is described in more detail in Section 5.3.1. Both alignments would have an interchange with Shirley Avenue / Riverbend Drive.


Both alignments would cross the Grand River at approximately the same location. The Recommended Route (2002) alignment would be a longer crossing because the angle of the crossing is flatter. However, the Recommended Route (2002) will now be parallel to the south side of Bridge Street in contrast to the Recommended Plan (1997) that extended north of Bridge Street and crossed through part of the Bloomingdale-Rosendale Wetland. The Recommended Route (2002) has been shifted out of more productive agricultural land, avoids the core Bloomingdale-Rosendale Wetland block, and avoids the Hindu Temple. In order to access the properties between New Highway 7 and the Grand River, the partial interchange at Bridge Street includes a service road on the south side of New Highway 7.


### *Central Section (Woolwich Street to Townline Road)*

Both routes are located north of existing Highway 7 and cross land which is predominately in agricultural use. The Recommended Route (2002) has been shifted further south compared to the Recommended Plan (1997). The southerly shift will cause less impacts to wetlands and will result in a single (rather than double) Hopewell Creek crossing. The number and area of farm parcels affected is similar, but fragmentation of farm fields has increased because of the greater deviation from lot lines. Existing Highway 7 will continue to provide local access to nursery mall operations and allow farm equipment movement to be separated from the new roadway facility.



**LEGEND**

 **RECOMMENDED ROUTE (2002)**

 **RECOMMENDED PLAN (1997)**

*East Section (Townline Road to the Hanlon Expressway)*

In this section, the Recommended Route (2002) has been shifted further north relative to the Recommended Plan (1997). The north shift has increased protection of the core Ellis Creek Wetland block and has reduced fragmentation of the Marden Wetland while maintaining the required connection with the Hanlon Expressway. The change in alignment moved the centreline further from some farm lot lines, increasing the extent of some property severances. The ramps that connect with Silvercreek Parkway have been shifted onto the right-of-way of Curtis Drive. The other modification to the interchange is that the left turns from the exit ramp from northbound Hanlon Expressway to northbound Silvercreek Parkway will not be allowed. Drivers destined for Highway 6 north will continue to be directed along Woodlawn Road, which is designated as a connecting link.

**Exhibit 5-2: Summary Comparison of the Recommended Plan (1997) and the Recommended Route (2002) by Key Factor Group**

<b>Grouping / Factor</b>	<b>Recommended Plan (1997)</b>	<b>Recommended Route (2002)</b>
<b>Socio Economic Environment</b>		
Community Facilities removed	Hindu Temple	None
Residences displaced	10	11
Businesses displaced	2 (at Bruce Street Extension)	5 (at Bruce Street Extension and at Wellington / Victoria connector road on west side of KWE)
Commercial / Industrial area required	About 14 ha	About 13 ha
Noise sensitive areas subject to increase greater than 10dBa	4	7
<b>Natural Environment</b>		
Total wetland removed	About 20 ha	About 8 ha
PSW wetland crossed	About 10 ha	About 6.5 ha
Upland forest vegetation affected	About 18 ha	About 13 ha
Core area crossings / fragmentation	Crosses Grand River with major structure.  Fragmentation at 5 wetland areas (B-R, Hopewell riparian, Townline, Ellis, Marden).	Crosses Grand River with major structure – similar location.  Fragmentation (somewhat reduced) at Marden. Greatly reduced intrusion and avoids core areas at other wetlands.



<b>Grouping / Factor</b>	<b>Recommended Plan (1997)</b>	<b>Recommended Route (2002)</b>
Hopewell Creek	Double crossing (west and east branch) about 550 m north of existing Highway 7.	Single crossing of Hopewell Creek about 150 m north of existing Highway 7.
<b>Agriculture</b>		
Agricultural land required	About 140 ha	About 144 ha (includes about 15 ha of idle agricultural land)
Speciality crop operations affected	4	3
Dairy/Livestock Operations	9 blocks crossed	8 blocks crossed, but greater fragmentation
Capital Investment Effects	13 operations affected	11 operations affected
Severances	13 properties, with about 10 experiencing greater cross lot fragmentation	12 properties identified with significant severances
Ratio of owner-operated to leased parcels crossed by alignment	About 1.4 to 1	About 1.6 to 1
<b>Transportation</b>		
Level of Service	C	C
Conflicts with agricultural equipment	None	None
Ability to stage construction	Good	Good
Compatibility with existing and future network	Good	Good
Ability to accommodate future transit	Good  (not an indicator in 1997, however ability to accommodate fits with this alternative)	Good
Potential loss of business during construction	Low	Low

**Exhibit 5-3: Comparison Between Wetland Impacts of Recommended Plan (1997) and Recommended Route (2002)**

Area	Recommended Plan (1997)	Recommended Route (2002)
Grand River Crossing – Bloomingdale Rosendale (B-R) Wetland  Chainage 20+000 to Reg. Rd. 17	<ul style="list-style-type: none"> <li>• Crossing orientation resulted in impact to a core portion of the wetland with extensive groundwater discharge – north of Bridge Street.</li> <li>• About 7.1 ha of B-R wetland affected – major fragmentation</li> </ul>	<ul style="list-style-type: none"> <li>• Crossing orientation adjusted - reduces fragmentation of Grand River floodplain wetland pocket relative to 1997 alignment, and avoids the B-R wetland north of Bridge Street. Longer bridge required.</li> <li>• Minor B-R tolerant riparian marsh crossing south of Bridge St. – about 0.4 ha</li> </ul>
Hopewell Creek  Chainage 26+900	<ul style="list-style-type: none"> <li>• Double crossing - west branch and main creek.</li> </ul>	<ul style="list-style-type: none"> <li>• Single crossing of main branch, closer to Highway 7. West riparian side has been disturbed by farm activity.</li> </ul>
Hopewell Riparian Woodland/Wetland  Chainage 27+700	<ul style="list-style-type: none"> <li>• Crossed and fragmented south portion of the wetland block.</li> <li>• Removal of about 3 ha of wetland.</li> </ul>	<ul style="list-style-type: none"> <li>• Shifted about 200 m south - now crosses just south tip of wetland lobe.</li> <li>• Removes about 0.6 ha of wetland.</li> </ul>
Townline West Wetland  Chainage 30+000	<ul style="list-style-type: none"> <li>• Unevaluated at the time.</li> <li>• Centrally fragmented by alignment.</li> <li>• Removal of about 4.3 ha of core wetland.</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluated as provincially significant (PSW) by MNR (including Townline East wetland) based on information provided during current MTO review.</li> <li>• Shifted about 250 m south out of core wetland area – crosses narrow wetland tip 100 m north of Highway 7.</li> <li>• Removal of only about 0.2 ha of wetland (edge).</li> <li>• Crosses southeast edge of Townline East block (about 1 ha – revised from previous 3 ha intrusion noted in evaluation with further alignment refinement)</li> </ul>
Ellis Creek Wetland PSW  Chainage 33+300	<ul style="list-style-type: none"> <li>• Centrally fragmented by alignment.</li> <li>• Removal of about 3 ha of wetland.</li> </ul>	<ul style="list-style-type: none"> <li>• Shifted about 300 m north out of core wetland block (section north of Highway 7)</li> <li>• Removal of about 2 ha of wetland, with significantly reduced fragmentation.</li> </ul>
Marden Wetland PSW  Chainage 36+000	<ul style="list-style-type: none"> <li>• Centrally fragmented by alignment.</li> <li>• Removal of about 3 ha of wetland.</li> </ul>	<ul style="list-style-type: none"> <li>• Shifted about 65 m north.</li> <li>• Removal of about 3.5 ha, but retains larger portion of wetland block to south.</li> </ul>
Forested Vegetation along route (not wetland)	<ul style="list-style-type: none"> <li>• About 18 ha affected</li> </ul>	<ul style="list-style-type: none"> <li>• About 13 ha affected.</li> </ul>

### 5.3 Preliminary Design Features

The Recommended Route (2002) will be a four lane divided highway in a nominal 100 m right-of-way extending from the KWE in Kitchener to the Hanlon Expressway in Guelph. The route will be fully grade separated with interchanges at the KWE, Shirley Avenue, Bridge Street (partial), Ebycrest Road, Shantz Station Road, County Road 86 and Woodlawn Road. All other roads would be crossed with grade separations (bridges).

The route will cross the Grand River, Hopewell Creek and Ellis Creek on structures that will essentially span the valleys. The route will pass through a previously disturbed area of the Townline West wetland and one portion of the Marden wetland, and will avoid other wetland areas including Hopewell Riparian and Ellis Creek wetlands. Surplus lands adjacent to the right-of-way present the opportunity for natural environmental enhancements, which are discussed in more detail in Chapter 6.

The Recommended Route (2002) will require severances from agricultural properties, including impacts on two sheep farming operations and one dairy operation where the buildings will be separated from the majority of the land.

There will be residential property requirements throughout the length of the alignment. No known heritage buildings will require removal as a result of the construction of the Recommended Route. An archaeological survey is being carried out for the preliminary design and any sites identified will be documented and if required further field work will be carried out prior to construction.

The Recommended Route (2002) provides the corridor with a long term transportation solution to support the planned growth in Kitchener / Waterloo and Guelph. Based on the traffic projections prepared during the MTO Review, the Recommended Route (2002) is expected to provide a good level of service to beyond 2028.

The Recommended Route (2002) is illustrated in this section on Plates 1 through 24 at a scale of 1:5000. These plan and profile plates have been developed to a “preliminary design” level of detail. The detail is such that subsequent consideration of detailed design and construction alternatives can be essentially contained within the identified right-of-way as illustrated on the plates except for specific locations where storm water management facilities will be required beyond the 100 m right-of-way. Storm water management facilities are also shown on the preliminary design plates. Where refinements to these preliminary plans are necessary due to specific conditions determined during detailed design, they will be finalized through discussions with potentially affected property owners and the appropriate government agencies (refer to Section 6.2).

The Preliminary Design is based on mapping prepared in 1994, which is not digital. However, it was scanned so that the Preliminary Design could be carried out using computer aided design. The accuracy of the mapping will have to be confirmed when the project proceeds to detailed design.

### 5.3.1 Roadway

The new Highway 7 will be located north of and parallel to existing Highway 7 between the cities of Kitchener and Guelph. It will connect existing Highway 85 (Kitchener-Waterloo Expressway (KWE)) at Wellington Street in Kitchener to existing Highway 6 (Hanlon Expressway) at Woodlawn Road (existing Highway 7) in Guelph.

The proposed highway will have an interchange at the KWE which will provide both freeway to freeway movements, and access to the local road network. Wellington Street will connect with Shirley Avenue across the KWE. There will be no direct access to Wellington Street from the Recommended Route (2002). There will be access between Victoria Street and Wellington Street via two new connector roads on either side of the KWE. A new road will be constructed, connecting Riverbend Drive to Shirley Avenue.

The alignment will extend parallel to existing Shirley Avenue before it curves northerly to cross the Grand River. The alignment will parallel Bridge Street (R.R. 52) to Ebycrest Road (R.R. 17). There will be a partial interchange at Bridge Street and a full interchange at Ebycrest Road. The Recommended Route (2002) will generally run parallel to and north of existing Highway 7. The variation of distance from the existing highway depends largely on the need to avoid natural environment features in the rural central section. The Recommended Route (2002) will have an interchange with Shantz Station Road (R.R. 30) and grade separations with Spitzig Road, Greenhouse Road, Townline Road and Guelph Road 3. There will be a full interchange with County Road 86. East of County Road 86, the proposed highway will curve south to connect to the Hanlon Expressway at Woodlawn Road in the City of Guelph. The interchange ramps at Woodlawn Road / Silvercreek Parkway, and the structure at Woodlawn Road are considered to be part of the Highway 7 project. The Recommended Route is illustrated on Exhibit 5-1. The interchanges are discussed later in this section.

The highway will be a four lane divided controlled access freeway for its entire length. All intersecting roads, with the exception of Curtis Drive in Guelph, will be grade separated. Curtis Drive will be closed. The cross section will be rural, with a 22 m grassed median, with the exception of a short section within the City of Kitchener that will have an urban cross section with a concrete barrier median. The urban section will extend from station 20+000 to 21+200. The entire length will have provision for a future 6 lane cross section, with the additional 2 lanes being constructed in the median.

There will be 7 interchanges along the proposed alignment, located at:

- KWE (freeway)/Wellington Street (local)
- Riverbend Drive/Shirley Avenue
- Bridge Street (partial)
- Ebycrest Road (Regional Road 17)
- Shantz Station Road (Regional Road 30)
- County Road 86
- Woodlawn Road

These interchanges are described below.

### **KWE/Wellington Street**

Plate 1 shows the proposed KWE / Wellington Street interchange. The existing Wellington Street interchange must be modified in order to provide access to and from New Highway 7. This interchange must also provide access to the local network. As discussed in Section 4.2.2., the interchange was modified so there would be no direct access from Highway 7 to Wellington Street within the City of Kitchener. The interchange concept is shown schematically on Exhibit 5- 4.



The interchange will function with a freeway to freeway component as well as a local component. For the purposes of discussion, the existing KWE is a north-south highway and proposed Highway 7 is an east-west road. The freeway to freeway component includes direct ramps from Highway 7 westbound to KWE northbound and southbound and to Highway 7 eastbound from KWE northbound and southbound. The proposed interchange is shown on Exhibit 5-4, the freeway to freeway ramps are shown in green. In order to accommodate the freeway to freeway ramps, the following ramps will be closed:

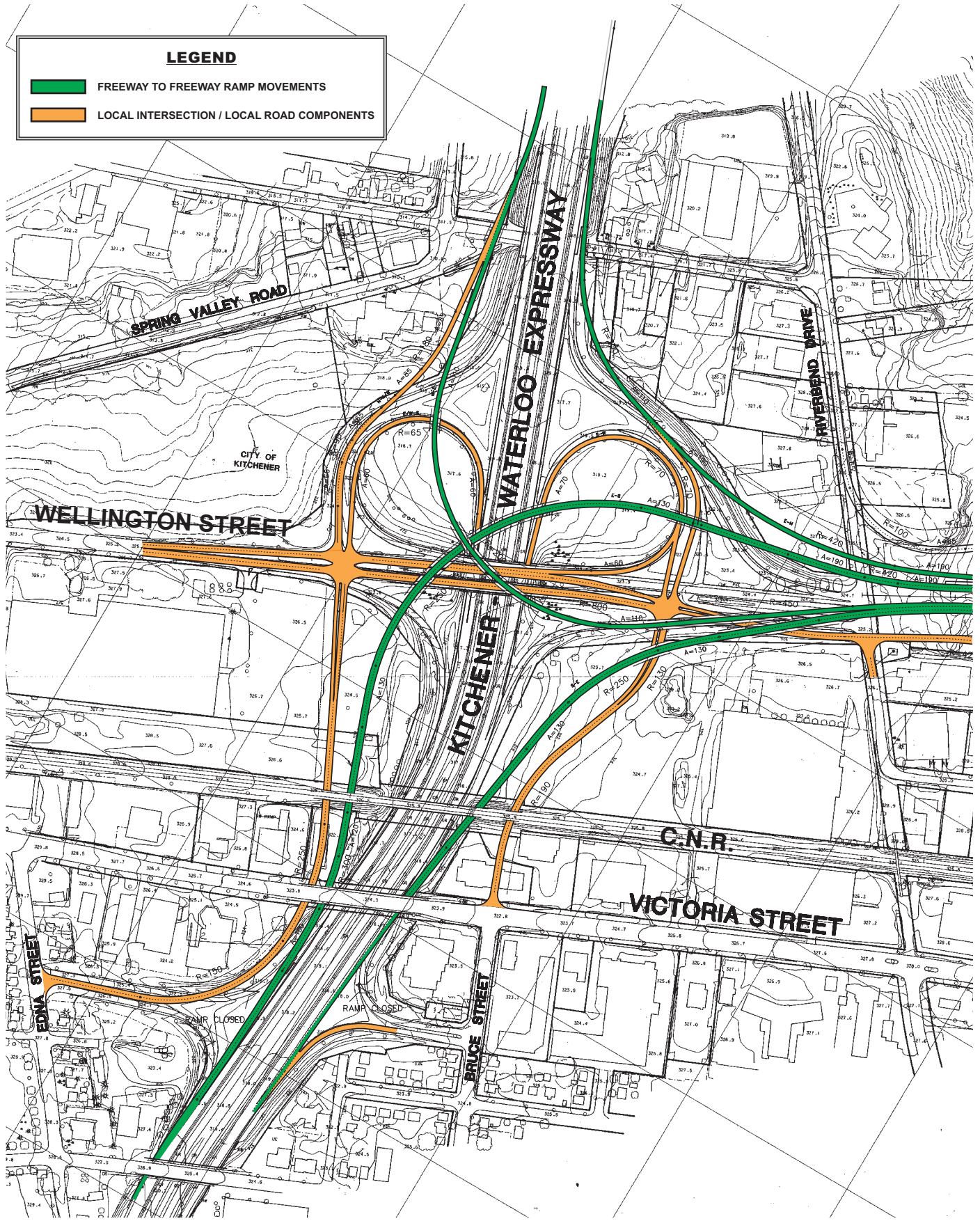
- Bruce Street to northbound KWE
- Northbound KWE to eastbound Wellington Street
- Eastbound Wellington Street to southbound KWE
- Southbound KWE to Edna Street
- Edna Street to southbound KWE

The local component of the interchange will provide an alternative route to the closed ramps. The local component will maintain the existing Wellington Street interchange and will provide a connection in the KWE corridor for travel between Victoria Street and Wellington Street / Shirley Avenue. Wellington Street will be modified by eliminating the direct ramps to / from the south. The eastbound Wellington Street to southbound KWE ramp will be combined with the westbound Wellington to southbound KWE ramp, located in the northwest quadrant of the interchange. The northbound KWE to eastbound ramp will be replaced by either the Bruce Street extension or the Highway 7 / Shirley Avenue interchange.

There are two ‘connector roads’ proposed on each side of the KWE. These roads will provide access under the railway between Victoria and Wellington Street. This local function is currently being provided by the KWE. Traffic that previously accessed northbound KWE from Victoria Street will use the Bruce Street extension, and then access the KWE via the ramp in the northeast quadrant. Similarly, access to Edna Street from southbound KWE will be provided by the connector road on the west side of the KWE, which is an extension of the southbound exit ramp to Wellington Street. Both connector roads are proposed to be two lane, two way roads. Traffic signals or modifications to existing signals will be required at both ends of both ‘connector roads’.

**LEGEND**

-  FREEWAY TO FREEWAY RAMP MOVEMENTS
-  LOCAL INTERSECTION / LOCAL ROAD COMPONENTS



**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH**

**PROPOSED HIGHWAY 7 /  
KWE INTERCHANGE**

**EXHIBIT  
5-4**

### **Riverbend Drive/Shirley Avenue**

Plate 1 shows the proposed interchange of Highway 7 with Riverbend Drive. Riverbend Drive will pass under Highway 7 via two new two-lane structures and ramps will permit all moves. All ramps will be single lane and will terminate at unsignalized intersections. The interchange configuration is unique and is described as follows. On the north side of Highway 7 the exit ramp for westbound traffic will be a direct exit. The on-ramp for westbound traffic will be a modified inner loop ramp with a 45 m radius. On the south side the exit ramp from the west will be a 'button hook' configuration with a 50 m radius terminating at Shirley Avenue. The on-ramp for eastbound traffic will access the Highway via a direct ramp with a 130 m radius.

### **Bridge Street**

Plate 4 shows the proposed partial interchange of Highway 7 at Bridge Street. Highway 7 will pass under a new service road which connects to Bridge Street via a new two-lane bridge. A ramp will allow traffic from eastbound Highway 7 to access Bridge Street, via the service road.

The proposed exit ramp will be a single lane and the proposed service road will be two lanes. The exit ramp terminal will intersect the service road at an unsignalized intersection. An entrance ramp from Bridge Street will allow traffic to access westbound Highway 7 from the Bridgeport area.

### **Ebycrest Road 17 (R.R. 17)**

Plate 8 shows the proposed Parclo A-2 interchange of Highway 7 with Ebycrest Road via a new two-lane structure. Highway 7 will pass under Ebycrest Road and the ramps will permit all moves between the two roadways.

All ramps will be single lane; exit ramps will have the provision to be widened to two lanes at the ramp terminal intersection with Ebycrest Road. Ramp terminal intersections will be controlled by unsignalized intersections.

### **Shantz Station Road (R.R. 30)**

Plates 12 and 14 show the proposed partial Parclo A-4 (to the north) and Diamond (to the south) interchange of Highway 7 with Shantz Station Road. Highway 7 will pass under Shantz Station Road via a new two-lane structure and the ramps will permit all moves between the two roadways.

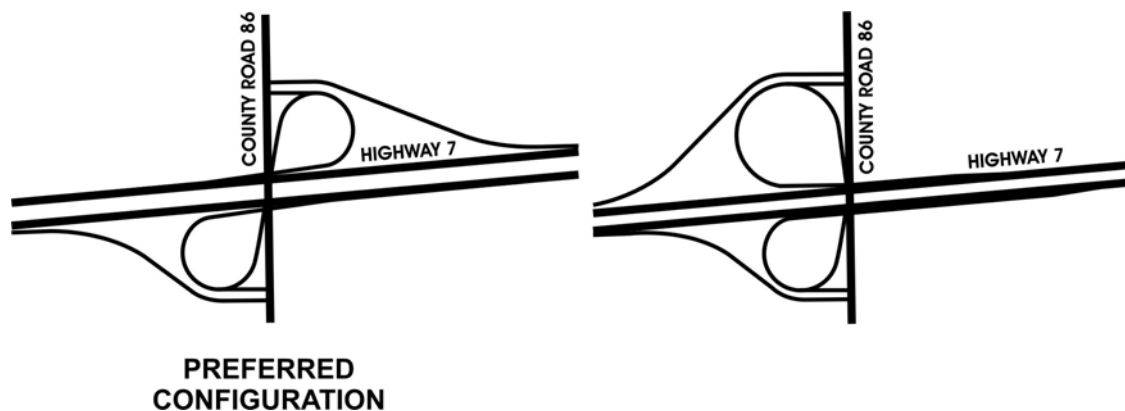
All ramps will be single lane; exit ramps will have the provision to be widened to two lanes at the ramp terminal intersection with Shantz Station Road. Ramp terminal intersections will be controlled by unsignalized intersections.

### **County Road 86**

Plate 22 shows the proposed Parclo A-2 interchange of Highway 7 with County Road 86 including the provision for future directional ramps in the northwest and southeast quadrant. Highway 7 will pass under County Road 86 via a new four-lane structure and the ramps will permit all moves between the two roadways. MTO proposes to build

initially, only the ramps in the northeast and southwest quadrants, but will protect property for the ramps in the northwest and southeast quadrants. The latter ramps may be built in the future, when required to respond to traffic volumes and / or operating conditions.

As part of the preliminary design process and in response to a request from a landowner, consideration was given to an alternative configuration for this interchange. The alternative layout would have moved the ramps from the northeast quadrant to the northwest quadrant. This interchange configuration would require more land, and there would be conflicts with opposing traffic movements. There would a conflict with traffic exiting the E-N/S ramp (southbound) and the traffic entering the N-E ramp. Northbound traffic wanting to access the westbound on ramp would be required to make a left turn across the southbound lanes, and similarly the traffic from the E-N/S ramp would be required to make a left turn to travel northbound on County Road 86. With the recommended alternative configuration, these conflicts would be avoided.



All ramps will be single lane; exit ramps will have the provision to be widened to two lanes at the ramp terminal intersection with County Road 86. Ramp terminal intersections will be controlled by unsignalized intersections.

### **Woodlawn Road / Hanlon Expressway (Highway 6)**

Presently, the Hanlon Expressway terminates at Woodlawn Road (existing Highway 7) at a T-intersection. Motorists wishing to continue north on Highway 6 will be directed to follow the designated Connecting Link easterly on Woodlawn Road, as they are today. The Hanlon Expressway is a controlled access facility with at-grade signalized intersections. MTO has completed the preliminary design and environmental assessment for upgrading the Hanlon Expressway from the Speed River northerly to Woodlawn Road, to a fully controlled access facility, with interchanges and grade separations. MTO also has a long-term objective to upgrade the remainder of the Hanlon Expressway from the Speed River southerly to Highway 401.

Plate 24 shows the proposed interchange of Highway 7 with the Hanlon Expressway. Two new structures will carry the new highway over existing Woodlawn Road. The proposed interchange provides continuity of the provincial highway system, and allows access to the local road network. There will be two structures over Woodlawn Road: a 2



lane structure for southbound traffic and a 4 lane structure for northbound traffic. The S-E/W (northbound Highway 6 to Woodlawn Road) and E/W-N (Woodlawn Road to westbound Highway 7) moves will be facilitated with single lane ramps with ramp terminal intersections on Silvercreek Parkway, north of Woodlawn Road. The exit ramp will be a channelized right turn only. This will direct traffic back to Woodlawn Road, the Highway 6 Connecting Link. The compulsory right turn was developed in response to requests from the Township of Guelph-Eramosa, and the County of Wellington. The N-E/W (eastbound Highway 7 to Woodlawn Road) and E/W-S (Woodlawn Road to southbound Highway 6) moves will be facilitated with single lane ramp terminals on Woodlawn Road. The N-E/W exit ramp will be widened to 2 lanes at the ramp terminal intersection with Woodlawn Road. The entrance ramp will have channelization for the W-S move at the ramp terminal intersection with Woodlawn Road.

Both the ramp terminals on Woodlawn Road and Silvercreek Parkway will be controlled with traffic signals.

In section 5.3.9 there is discussion with regard to the possible future interchange with Highway 6 (north). The preliminary design of Highway 7 does not preclude the development of an interchange with a future extension of the Hanlon Expressway.

During detail design, there may be further opportunity to reduce or eliminate edge impact to the Townline East Wetland / Woodlot by an alignment shift to the south.

### **Preliminary Pavement Design**

Preliminary recommendations for the pavement structure were provided by the Southwestern Region Geotechnical Section as follows:

#### ***Highway 7 (main alignment) - KWE to Hanlon Expressway***

Highway 7 between Kitchener and Guelph meets the criteria for Alternative Bid Freeway Paving contracts as set out in MTO standards. Two preliminary main line pavement designs are as follows:

220 mm Hot Mix Asphaltic Concrete (40 mm Superpave 12.5 FC2 over 3 x 60 mm Superpave 19.0)  
100 mm Open Graded Drainage Layer  
100 mm Heavy Duty Binder  
150 mm Granular A  
400 mm Granular B Type III

OR

240 mm Portland Cement Concrete  
100 mm Open Graded Drainage Layer  
250 mm Granular A

***Highway 7 Ramps***

Provide for:

180 mm Hot Mix Asphaltic Concrete (40 mm Superpave 12.5 FC1 over 50 mm Superpave 19.0 over 90 mm Superpave 25.0)  
90 mm HL3  
150 mm Granular A  
450 mm Granular B Type III

***Crossing Roads***

Provide for:

130 mm Hot Mix Asphalt Concrete (Superpave 12.5)  
150 mm Granular 'A'  
450 mm Granular 'B' Type III

Sources for granular material will be investigated during detail design.

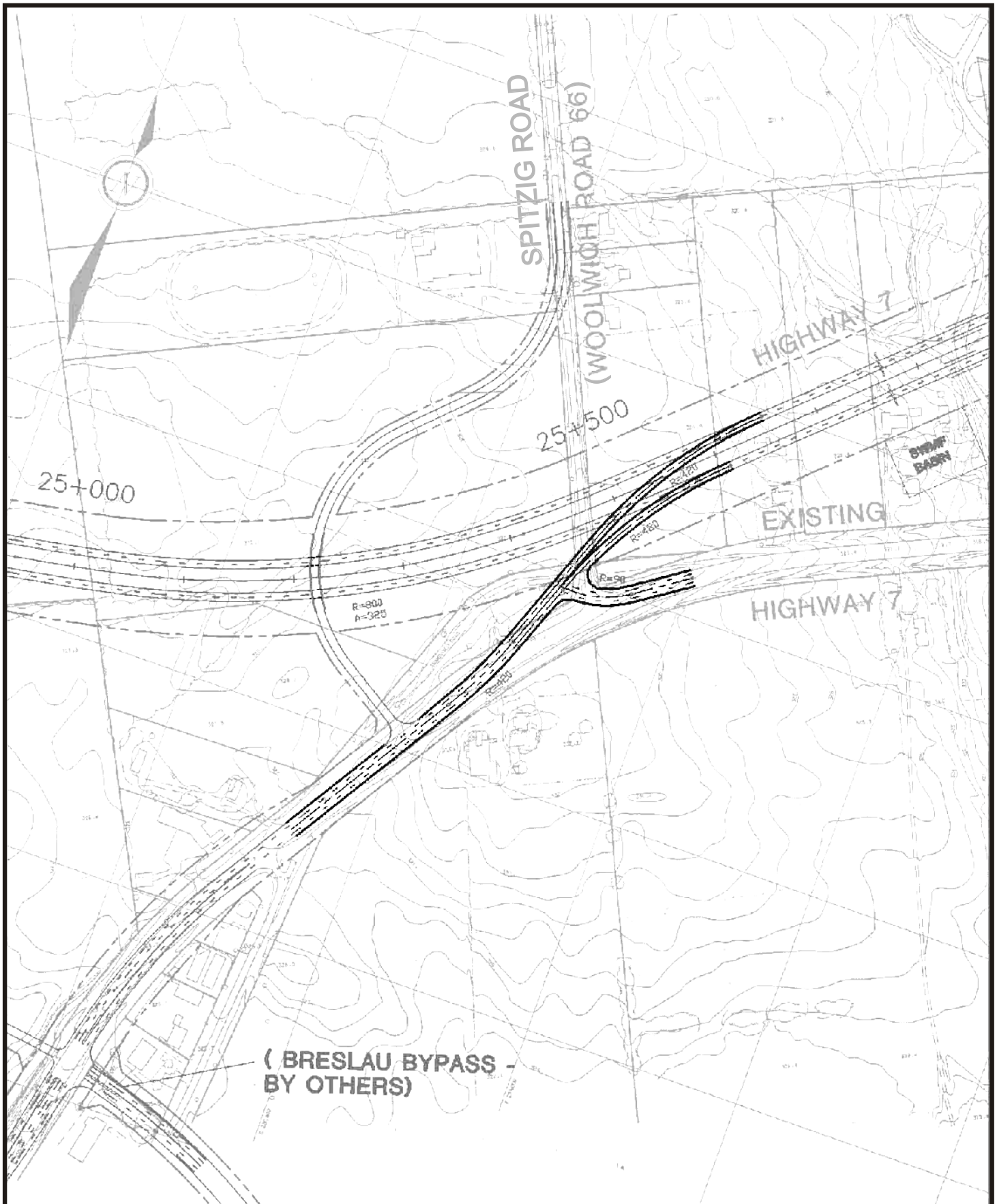
**Staging**

A number of staging alternatives were considered for the Recommended Route. Each of the alternatives would be divided into three staging sections:

- West from KWE in Kitchener to the Ebycrest Road (R.R. 17) interchange in Woolwich Township
- Central from the Ebycrest Road (R.R. 17) interchange to County Road 86 interchange at the Guelph city limits
- East from the County Road 86 interchange to Woodlawn Road/Highway 6 in Guelph

These sections were chosen as they generally correspond to different geometric conditions along existing Highway 7 with similar traffic characteristics: the west end to Hopewell Creek (5 lane urban arterial and 4 lane rural highway section), Hopewell Creek to Guelph city limit (2 lane rural highway section), and Guelph city limit to Highway 6 (5 lane urban arterial section).

The staging must be user/driver friendly, i.e. the built sections must be easily accessible before the entire freeway is completed. Relief to the central rural section as a first stage of construction would provide the greatest benefit to the corridor. The disadvantage to staging the central section first is to be able to provide direct access to the Recommended Route (2002) from existing Highway 7. There is an opportunity to provide reasonable access to the Recommended Route (2002) at the west end of the central section, in the vicinity of Spitzig Road. A preliminary review of the geometry, both horizontal and vertical indicates that there is a potential connection between existing and New Highway 7, however this option should be investigated further during detail design. The potential connection is shown on Exhibit 5-5. If a temporary connection is not feasible at Spitzig Road, then the first stage could be extended to the interchange at Ebycrest Road. At the



**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH**

**HIGHWAY 7 STAGING AT  
SPITZIG ROAD (WOOLWICH ROAD 66)**

**EXHIBIT  
5-5**

east end of the central section, the end point of stage one would be the County Road 86 interchange. The first stage of construction, assuming a traditional construction approach would require 2 to 3 years. The estimated construction cost for Stage 1 (central section) is \$56 million (2002 dollars).

The second stage of the highway construction would be to build from the KWE to the New Highway 7 in the central section. The second stage will require the construction of complex structures including the structures associated with the KWE interchange and the Grand River crossing. New structures or modifications to existing structures at the KWE interchange would be constructed while maintaining existing traffic on the Kitchener-Waterloo Expressway, Victoria Street, Wellington Street and the railway. The interchange structures would require 3 to 4 years to construct, the Grand River crossing approximately two construction seasons. Overall, the second stage would require a 4 to 5 year schedule to complete. The estimated cost for the Stage 2 is \$80 million (\$30 million for the KWE interchange) (2002 dollars).

The third stage would be to construct the section from County Road 86 to Woodlawn Road. The third stage of construction would include the new interchange with Woodlawn Road and would require 2 years for construction. The estimated construction cost is \$11 million (2002 dollars).

Details related to staging will be developed during detail design.

### 5.3.2 Structures

Structures will be required at the interchanges (as noted in the previous section), at crossing roads to provide continuity in the local road system, and at the following water crossings:

- Grand River
- Hopewell Creek
- Ellis Creek

Structures are required at the following locations:

1. E-S ramp / Connector Road under Victoria Street.
2. E-S ramp / Connector Road under CN Rail.
3. E-S ramp over KWE and Wellington Street.
4. E-S ramp over Wellington-N ramp and S-Wellington ramp.
5. N-E ramp / N-Wellington ramp over Guelph Street.
6. N-E ramp over Wellington-S ramp.
7. N-E ramp over E-S ramp and KWE.
8. N-E ramp over Wellington Street / Shirley Ave.
9. S-E ramp under CN.
10. S-E ramp over Bruce Street Extension.
11. S-E ramp over Shirley Ave.
12. E-N ramp over Guelph Street (or extension of existing structure).

13. Bruce Street Extension under CN Rail.
14. Wellington Street over KWE - modifications to west abutment
15. Proposed re-alignment of Riverbend Drive under future Highway 7 (2).
16. Future Highway 7 over Grand River (2).
17. Service Road over future Highway 7 (W-Bridge ramp).
18. Ebycrest Road (Regional Road 17) over future Highway 7.
19. Realigned Spitzig Road (Woolwich Road 66) over future Highway 7.
20. Future Highway 7 over Hopewell Creek (2).
21. Greenhouse Road (Woolwich Road 72) over future Highway 7.
22. Shantz Station Road (Regional Road 30) over future Highway 7.
23. Townline Road over future Highway 7.
24. Guelph Road 3 over future Highway 7.
25. Future Highway 7 over Ellis Creek (2).
26. County Road 86 over future Highway 7.
27. Future Highway 7 over Woodlawn Road (2).

Structural planning sheets for each of the structures are included in the Preliminary Design Criteria in Appendix G.

### **5.3.3 Preliminary Design Criteria**

The preliminary design criteria has been prepared and is included in Appendix G. The design criteria describes the proposed standards for the new roadways as well as for the crossing roads, the structures associated with the proposed highway and interchange ramps. Other remarks include: existing and future traffic, adjacent projects, river crossings, railway crossings, signing, traffic signals, utilities, property and staging.

### **5.3.4 Drainage and Stormwater Management**

As part of the preliminary design of the proposed Highway 7, a Drainage and Storm Water Management Report has been prepared to document and size all required transverse culverts and all storm water management facilities (Appendix H).

The following sections summarize the analyses and recommendations as they apply to the transverse culverts and storm water management. The proposed bridges across the Grand River, Hopewell Creek and Ellis Creek are identified in Section 5.3.2 and structural planning sheets are included in Appendix G.

#### **Transverse Drainage**

In addition to the Grand River, Hopewell Creek and Ellis Creek, the proposed Highway 7 will cross eleven watercourses. A detailed review was completed to determine the location and size of the transverse culverts that will serve these watercourses. A key component of the review was the identification of the sections of the highways that will drain to each of the culverts.

Based on the overall drainage concept, hydrologic models were then used to estimate design flows for both existing and future flows at a point in each watercourse, immediately downstream of the highway.

Design criteria were then set for the transverse culverts. The criteria were established in accordance with MTO Directive B-100 and the Ontario Highway Bridge Design Code. The key design criteria are listed as follows:

1. Where fish or wildlife passage is required, install box culverts with minimum dimensions of 1.8 x 3.0 metre, otherwise the culverts shall have a minimum diameter of 1.2 metres. In areas where fish habitat is an issue, site-specific solutions will be developed, in consultation with the appropriate agencies. (Box culverts may be the starting point, however, each water course will be considered on its own merits);
2. Convey the 50-year peak flow such that the ratio of the depth of water upstream of the culvert to the diameter of the culvert (H/D) does not exceed 1.2;
3. Convey the 50-year peak flow with a minimum freeboard of 1.0 metres to the edge of pavement, and convey the 100-year peak flow such that the highway is not overtopped.
4. Where the catchment area exceeds 125 ha, either convey the Regional Storm peak flow without overtopping the highway or ensure that there is no increase in upstream flood risk

Based on the completed analyses, circular culverts ranging in diameter from 1200 mm to 1800 mm will satisfy the design criteria for all locations. However, to provide for wildlife and fish passage, as noted above the starting point would be for box culverts (1.8 x 3.0 metres) to be constructed at the following five locations: 22+800, 24+000, 27+620, 30+100 and 35+980. (Site-specific solutions will be developed, in consultation with the appropriate agencies, but each water course crossing will be considered on its own merits).

Three of the culverts will have catchment areas exceeding 125 ha. In all cases the proposed culverts will convey the Regional Storm peak flow without overtopping the highway.

### **Storm Water Management**

Storm water management facilities will be required to provide treatment in accordance with MOE guidelines, and to ensure that any increase in downstream erosion potential or flood risk is kept to a minimum. The storm water management facilities have been designed to accommodate the 4-lane divided highway.

Alternative management practices were screened leading to the recommendations that either storm water Wet Ponds or flat-bottomed water quality swales be constructed to serve runoff from the proposed highway. The screening is described in more detail in Appendix H. Wet Ponds are the preferred practice. However, flat-bottomed swales will be constructed where the highway catchment areas are less than 5.0 ha or where grading constraints render Wet Ponds infeasible.

West Nile virus has been identified as a health risk in Ontario. Areas of shallow, stagnant water are prime breeding areas for mosquitoes. In order to minimize the risk of West Nile virus, each of the wet ponds will be designed to be drained, if necessary. Therefore each pond will include a valved outlet. Design criteria that minimizes the risk for West Nile virus should be included for wet ponds for this project.

The Wet Ponds will be designed to meet the following criteria:

1. Water Quality: Permanent Pool in accordance with the requirements of MOE Protection Level One;
2. Erosion Potential: Extended detention for runoff generated by a 25 mm design storm;
3. Flood Risk: Control 100-year peak flow to receiving watercourse to existing level, unless discharging to the Grand River where peak flow control is not required.

The flat-bottomed swales will also be designed to meet MOE design criteria. Two types are proposed: simple flat-bottomed swales and enhanced swales. The preferred sites have been identified on Exhibits 3.2-3.13 in the Stormwater Management Appendix (Appendix H). The flat-bottomed swales are proposed where the 2-year velocity in the swale is less than 0.5 m/s. The enhanced swales with widened bottoms and micro pools will be utilized where the 2-year velocity exceeds 0.5 m/s.

A total of 13 Wet Ponds are proposed. Runoff from approximately 84% of the highway will be treated by the ponds, with the remainder treated by the swales. The majority of the ponds are situated adjacent to the proposed right-of-way and are typically greater than 15 m from the edge of pavement of the highway. Ponds that do not achieve the enhanced clear zone, i.e. within interchanges, will be protected with guide rail. Wet Ponds 6, 13 and 14 are within interchange configurations.

With the exception of Basin 8 (located on the north side of the alignment, west of Shantz Station Road), all of the Wet Ponds will meet the design objectives. The peak 100-year outflow of 1.3 m<sup>3</sup>/s from Basin 8, compares to an existing 100-year peak flow of 0.5 m<sup>3</sup>/s. The increase is considered acceptable, as it will be attenuated by the wetland (Hopewell Creek riparian Woodlot/Wetland) that the basin is discharging to.

The ownership, operation and maintenance of the storm water management facilities is the responsibility of the highway authority.

### 5.3.5 Operations

A description of future traffic conditions is outlined in Section 3.4 for the p.m. peak hour.

Existing traffic signals will be maintained at Edna Street / proposed west connector road, Wellington Street / N-E/W ramp and at Bruce Street / Victoria Street. New traffic signals are proposed at:

- Wellington Street / Shirley Avenue and the Bruce Street Extension / KWE ramp terminal

- Woodlawn Road at N-E/W and E/W-S ramp terminals

Traffic projections for the remaining ramp terminals and crossing roads indicate that acceptable level of service will be maintained without traffic signals.

### 5.3.6 Right-of-Way Requirements

The right-of-way requirements for Highway 7 are shown on the preliminary design plans. A nominal 100 m right-of-way is required. The right-of-way varies according to the extent of cut or fill required. Property acquisition will also be required for:

- the realignment of intersecting roadways
- construction of interchanges
- revisions at Riverbend Drive Shirley Avenue
- construction of stormwater management facilities
- new ramp from Victoria Street (Kitchener) and ramps to Silvercreek Parkway (Guelph)

There are three locations where remnant parcels of land, north of the Recommended Route (2002), could be landlocked: East of Spitzig Road (Woolwich Road 66), west of Shantz Station Road (Regional Road 30), and east of Shantz Station Road. It may be possible to provide access to these parcels by providing private lanes or public roads, depending on the specific circumstances.

The land locked area east of Spitzig Road involves three properties which front on existing Highway 7 and will be severed by the new highway. Access has been proposed by a lane or road adjacent to the proposed highway right-of-way as shown on Plate 10.

The land west of Shantz Station Road has been identified as a potential natural environment enhancement area. MTO is prepared to consider plantings for habitat enhancement adjacent to wetlands, subject to the availability of property, and the ability to ensure appropriate management of the sites in the future.

The land locked area east of Shantz Station Road involves property belonging to two different landowners. Access has been proposed via a laneway between two properties having frontage on Shantz Station Road. The owner of one property adjoining the proposed access has objected to having a new laneway opened at this location. In the absence of such an access, it is likely that MTO will be required to purchase the remnant parcels. MTO is seeking approval for the access laneway shown on Plate 14. However, MTO is prepared to consider alternative solutions during detail design.

As the time for construction approaches, MTO will purchase the necessary property for the undertaking. In some cases, it may be necessary to buy an entire property rather than just the portion which falls within the right-of-way. In these cases, any landlocked parcels and any property which is surplus to highway requirements will be disposed of according to standard MTO policy.



### **5.3.7 Corridor Control**

#### **5.3.7.1 Assumptions, Designations and Transfers**

New Highway 7 is to be designated as a Controlled Access Highway (CAH) from the interchange with the KWE in Kitchener to the connection with the Hanlon Expressway in Guelph.

Temporary assumptions of portions of municipal roads will be required to carry out construction. Portions of roadways not required for highway purposes will be reverted to the municipalities upon completion of construction.

Roads affected are:

- Wellington Street
- Riverbend Drive
- Shirley Avenue
- Bridge Street (Regional Road 52)
- Ebycrest Road (Regional Road 17)
- Spitzig Road (Woolwich Road 66)
- Greenhouse Road (Woolwich Road 72)
- Shantz Station Road (Regional Road 30)
- Townline Road
- Guelph Road 3
- County Road 86
- Woodlawn Road

Permanent assumptions include the existing alignment of Riverbend Drive that crosses the proposed right-of-way and Curtis Drive across the proposed right-of-way. Both road allowances will be closed. Riverbend Drive will be relocated to the east, as shown on Plate 1.

It is anticipated that upon completion of New Highway 7, the existing Highway 7 will be transferred to the Regional Municipality of Waterloo and the County of Wellington.

#### **5.3.7.2 Utilities**

Local utilities, such as watermain, sewers, telephone, etc. are located within the roadway rights-of-way in urban areas (Kitchener and Guelph). In rural areas the utilities are limited to aerial hydro and telephone lines. Utility authorities will need to be contacted during the detail design phase.

The following specific utilities have been identified within the limits of this project:

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Kitchener-Wilmot Hydro Electric:	Underground hydro ducts may require relocation at the Wellington Street interchange. Aerial lines located along Wellington Street, River Road and Shirley Avenue may require relocation.
305 mm Sanitary Sewer and Forcemain:	The existing 305 mm gravity sanitary sewer adjacent to the existing S-E ramp of the KWE interchange will be relocated onto an easement on the property of the former Kaufman Footwear, beside the proposed retaining wall. The gravity sewer flows into a forcemain that will also be relocated between the proposed S-E ramp and the northbound lanes of the KWE.
Ontario Hydro:	High tension tower lines west of Silvercreek Parkway and north of Woodlawn Road would be adjacent to the highway. Relocation or raising of some towers may be necessary.
Bell Mobility:	Bell Mobility transmission tower located on farm property (GT-2) adjacent to the proposed route east of Townline Road.

### 5.3.7.3 Railways

One of the major constraints to traffic flow between Victoria Street and Wellington Street is the railway located between the two roads in the vicinity of the KWE. The Recommended Route includes three new crossings of the railway.

In the EA Report 1997, three construction methods for building the rail crossing were assessed for the Bruce Street extension, including:

- tunnelling;
- conventional detouring; and
- temporary trestling

The latter was recommended as the most practical and feasible solution. A rigid frame type structure would be required. With the Recommended Route (2002), this method will be applied to the locations where ramps / connector roads cross under the Guelph subdivision on either side of the KWE.

Staging of construction would allow for only one line to be closed at any one time so that rail operations within the corridor can be maintained. It has been assumed that it will be possible to close one line for up to 48 hours. It has also been assumed that a flagman, supplied by CN, would be on site to direct train operations at all times during construction work.

On the Hanlon Expressway in Guelph, there are two crossings of CPR spur lines south of Woodlawn Road and north of Speedvale Avenue. In MTO's Environmental Study Report (1994) for upgrading of the Hanlon Expressway, it is recommended that the rail line closest to Speedvale Avenue be grade separated, and that the more northerly crossing be closed. This issue will be considered further during the detail design stage for future work on the Hanlon Expressway.

### **5.3.8 Cost Estimate**

Capital construction cost estimates and property cost estimates were carried out using 2002 dollars. The capital construction cost was estimated using quantity unit prices which were representative of unit prices in the Region of Waterloo. The total program value is estimated to be approximately \$147 million (Appendix I).

Structure costs account for approximately \$76 million of the total program value, including approximately, \$21 million for the KWE / Highway 7 interchange structures, \$23 million to construct the Grand River crossing structures in Kitchener and \$ 6.8 million for the Ellis Creek crossing structure.

The cost for property for the recommended alternative is approximately \$ 11 million. This estimate is based on a per hectare cost for property.

### 5.3.9 Other Preliminary Design Features

#### Future Interchange with Highway 6

Section 5.3.1 provides a description of the interchange proposed at Highway 6 (Hanlon Expressway). This interchange, which is shown on Plate 24, provides continuity of the existing provincial highway system, and allows access to the existing local road network. However, there may be changes to this road network in the future.

In the early 1970's, MTO carried out a planning study for the extension of the Hanlon Expressway, from Woodlawn Road northerly to connect with Highway 6 at Marden. In 1975, MTO designated an alignment for this extension. Since the planning work was completed before the Environmental Assessment Act came into effect, it will be necessary for MTO to conduct a planning and environmental assessment study for the extension of the Hanlon Expressway. The Guelph and Area Transportation Study (GATS), completed in 1994, recommended that this extension be carried forward for further study.

Recognizing the strong possibility of a future extension of the Hanlon Expressway, and the strong municipal interest in the extension, the Project Team has prepared a conceptual layout for a future interchange. The concept is presented in Exhibit 5-6. The concept proves that it would be feasible to construct a freeway-to-freeway interchange, providing all moves between Highway 6 and Highway 7. MTO is not seeking approval for the future interchange at this time. The interchange will be part of the planning study for Highway 6 north of Woodlawn Road. However, the northbound structure carrying the Hanlon Expressway over Woodlawn Road, described in Section 5.3.1 and shown on Plate 24, will be designed and constructed to be compatible with the future interchange.

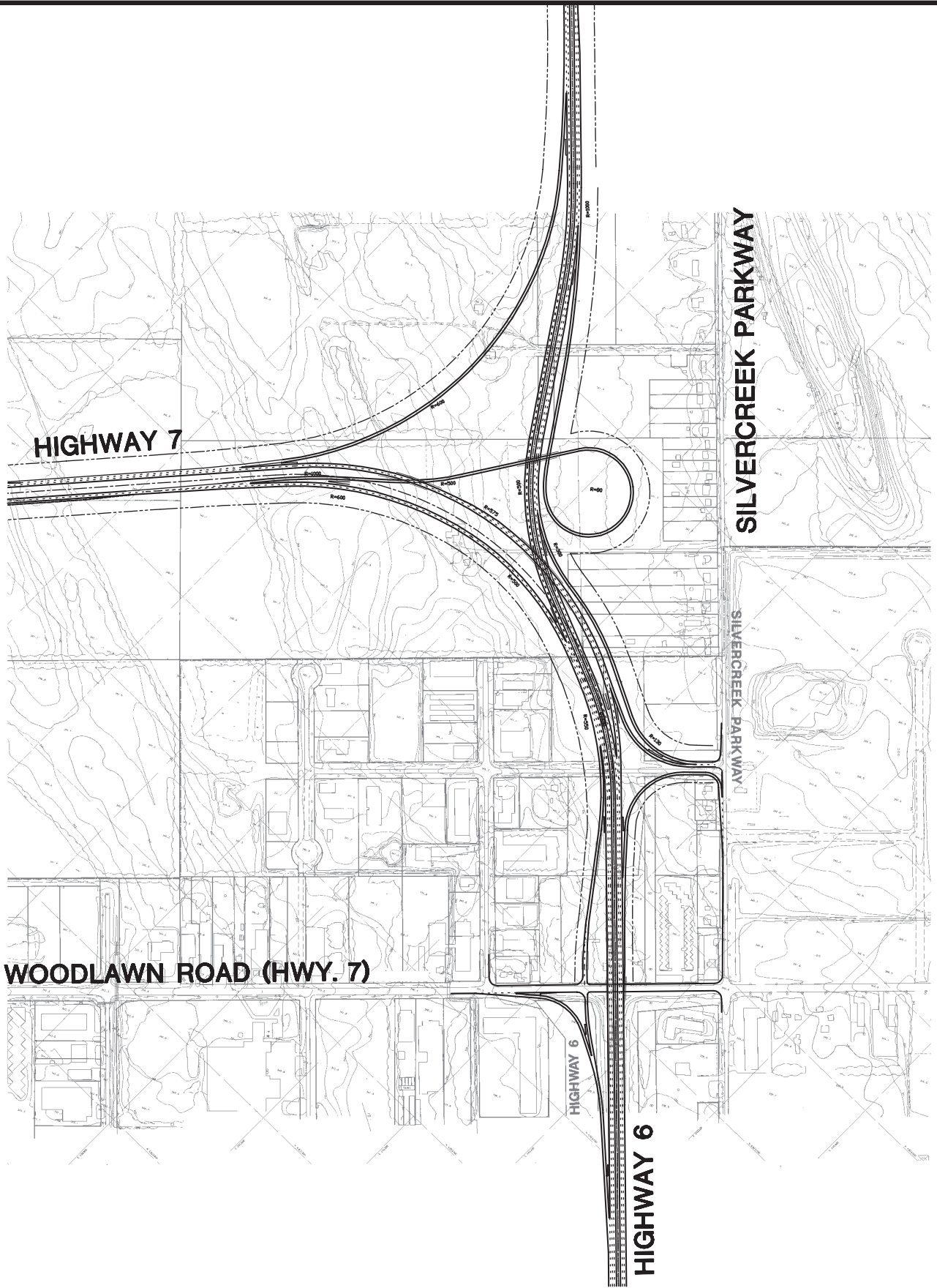
#### Transit and Bicycle Paths

There will be no special provision for transit or bicycles within the new Highway 7 right-of-way. However, buses will be able to travel more efficiently on new Highway 7. as noted in Section 5.3.7.1, existing Highway 7 will be transferred to municipal control following construction of the new highway. With the new highway in place, the lower traffic volumes on the existing highway will make it more attractive to cyclists in the future.

### 5.4 Future Work Activities

The following future work activities are beyond the scope of this study:

- Design and staging requirements for the CN Rail underpasses (Connector roads between Victoria Street and Wellington Street on both sides of the KWE). To be designed by CN and approved by the MTO.
- Establish preliminary need and justification for Hanlon Expressway (Highway 6) extension from Woodlawn Road and carry out Environmental Assessment. A long range transportation plan for the Guelph area has been completed (GATS), which identifies the corridor for protection.



**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH**

**FUTURE HANLON NORTH INTERCHANGE  
WITH HIGHWAY 7**

**EXHIBIT  
5-6**

- The Region of Waterloo is planning a realignment of Regional Road 17 around the community of Breslau. The MTO previously committed (in the 1997 Report) to construct the realignment of Regional Road 17 from the Recommended Route to existing Highway 7 if the realignment of Regional Road 17 south of existing Highway 7 is not constructed when the Recommended Route is built. As of 2003, the section south of existing Highway 7 was under construction.

## 5.5 Maintenance Features

Highway maintenance activities are carried out in accordance with the provisions of applicable environmental legislation, approved government policy, and interministerial protocols. As such, the Ministry of Transportation's policy for the level of maintenance service to be provided on the provincial highway system has been described through a series of maintenance quality standards. Maintenance quality standards establish an economic level of maintenance which will ensure that the Ministry's investment in the highway infrastructure is protected and allow for safe highway operation.

The major activities involved in maintaining the highway revolve around the two major seasons, summer and winter.

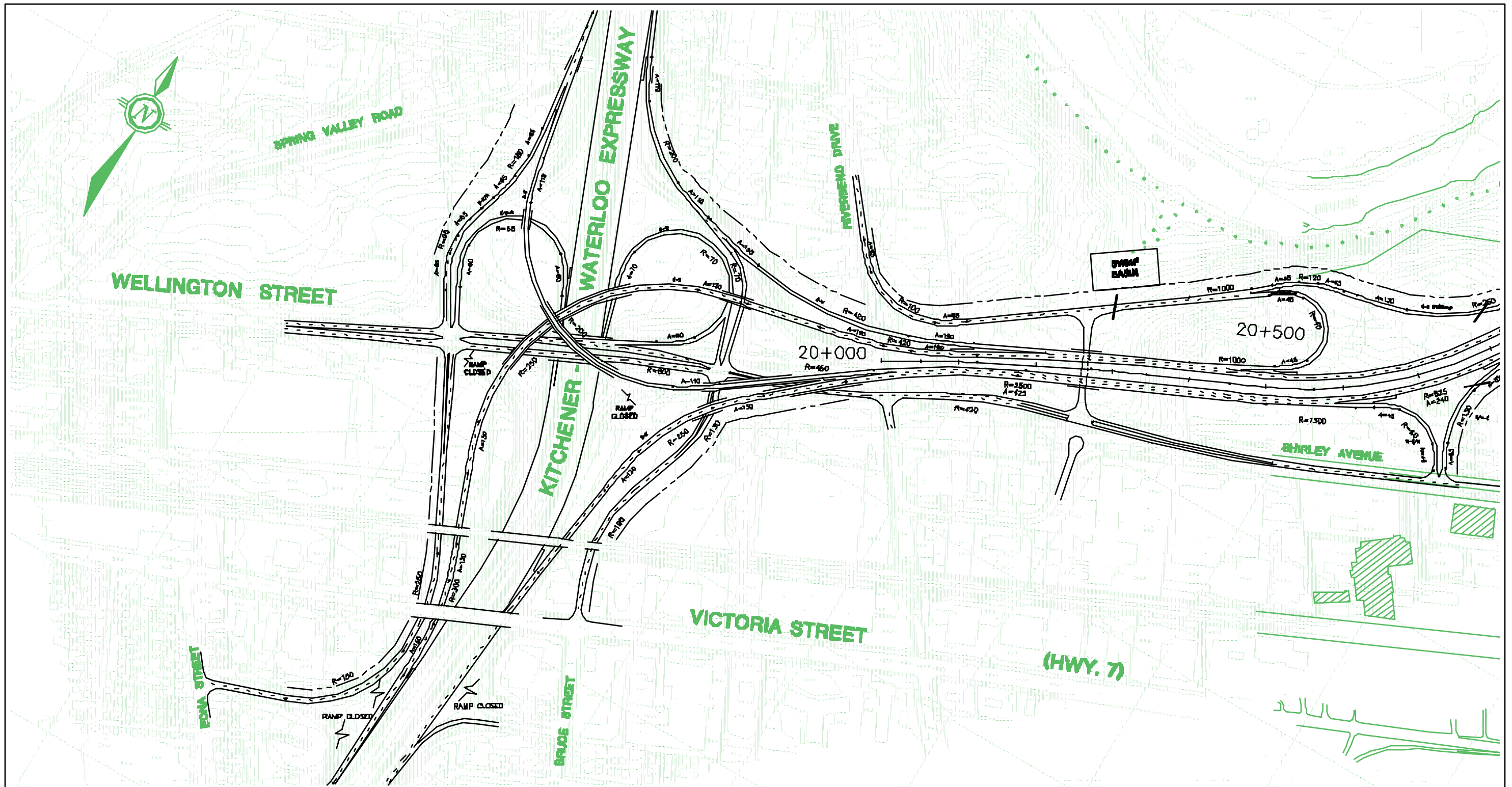
Summer maintenance practices include numerous activities such as pavement marking, debris pick-up, shoulder grading, pavement repairs, vegetation control, etc. and these will be carried out in accordance with standard procedures.

During the winter months the main activities include road patrol, snow removal and ice control to provide a safe operating environment for the highway users under most weather conditions. Winter maintenance service levels for snow and ice control have been established based on Winter Average Daily Traffic (WADT) volumes. Based on the projected traffic volumes, the proposed Highway 7 will be maintained at the appropriate level for this type of highway.

The Ministry of Transportation has a good record with regard to trying to minimize the environmental effects from its maintenance activities, primarily in the area of weed spraying and de-icing operations.

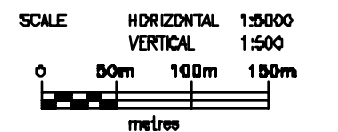
MTO currently uses herbicides in limited applications for the control of noxious weeds as required by the Noxious Weeds Act. The spraying of herbicides is limited to agricultural areas where a concentration of noxious weeds is noted, and /or in response to complaints. The handling and application of herbicides are controlled by the Pesticides Act.

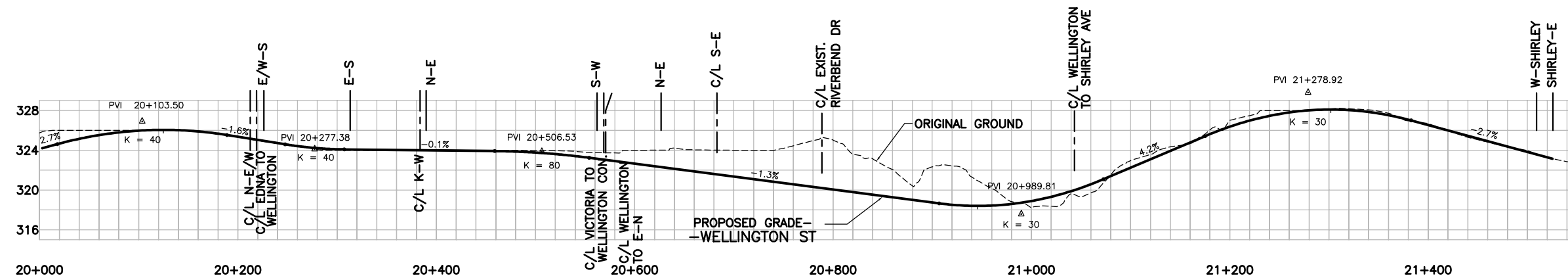
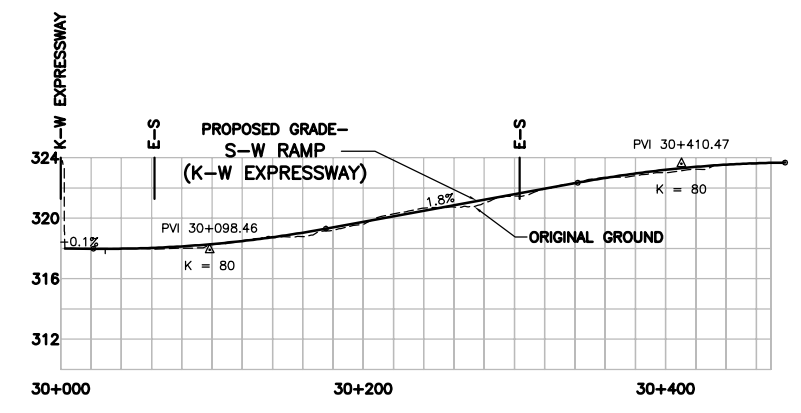
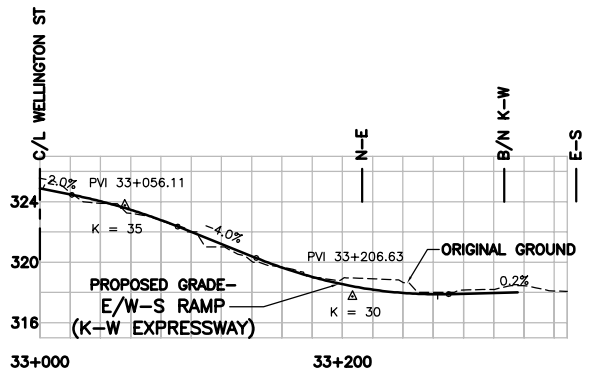
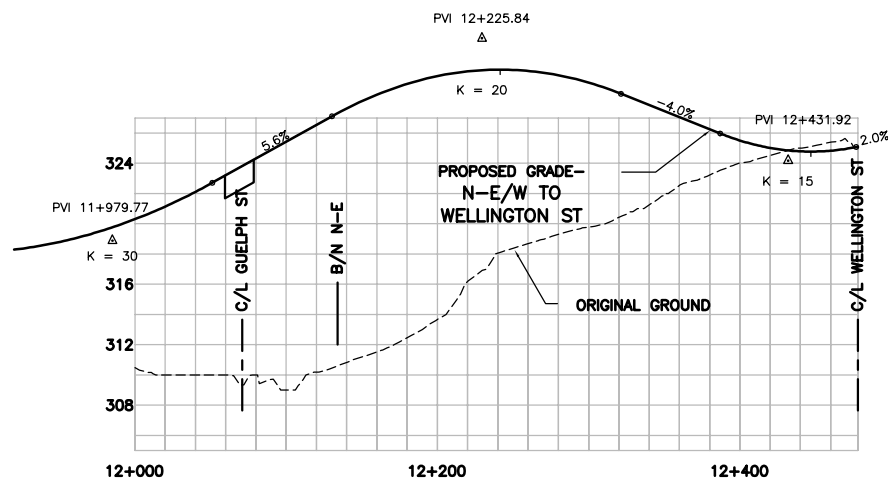
Road salt is among the most effective snow and ice control materials available for winter road safety. Its effects on vegetation, water quality and soils are also recognized. Environment Canada has recently (2001) add road salt to the list of priority substances requiring management. MTO employs and recognizes the importance of best salt management practices. MTO will continue to investigate ways to control and reduce salt usage while ensuring highway safety.



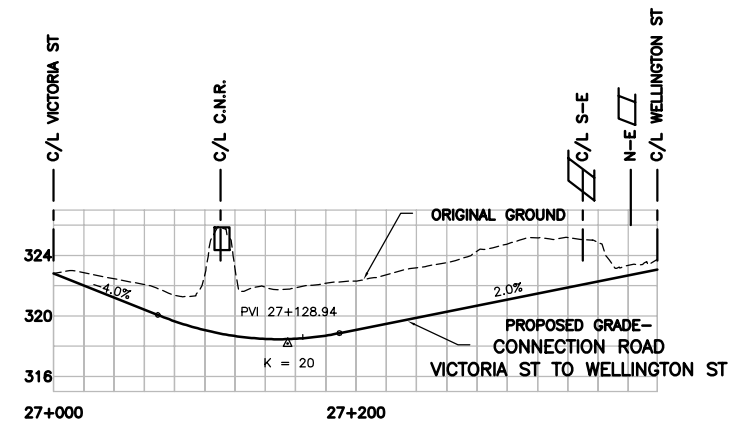
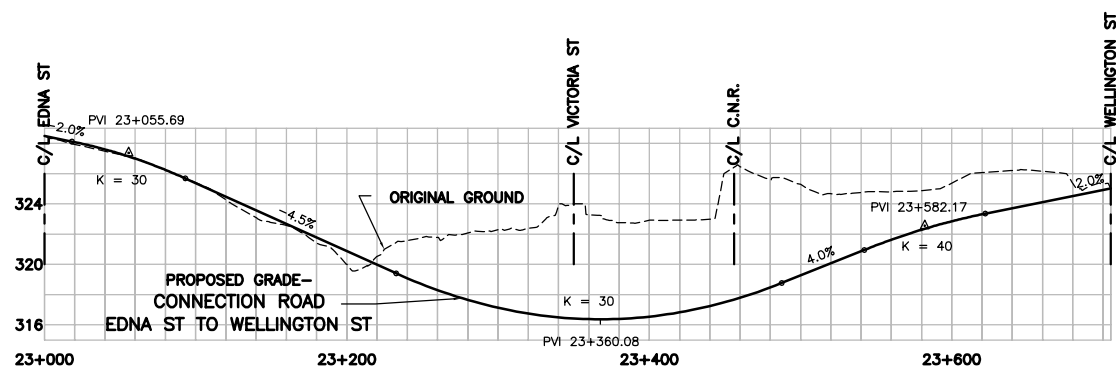
# HIGHWAY 7 PLANNING STUDY KITCHENER TO GUELPH RECOMMENDED ROUTE (2002)

PLATE  
**1**



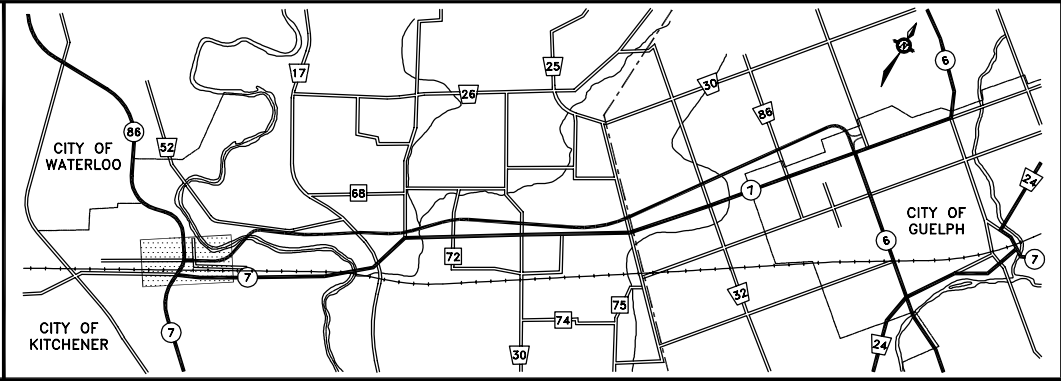
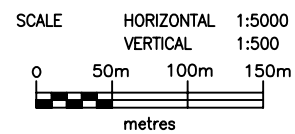


**Wellington Street**

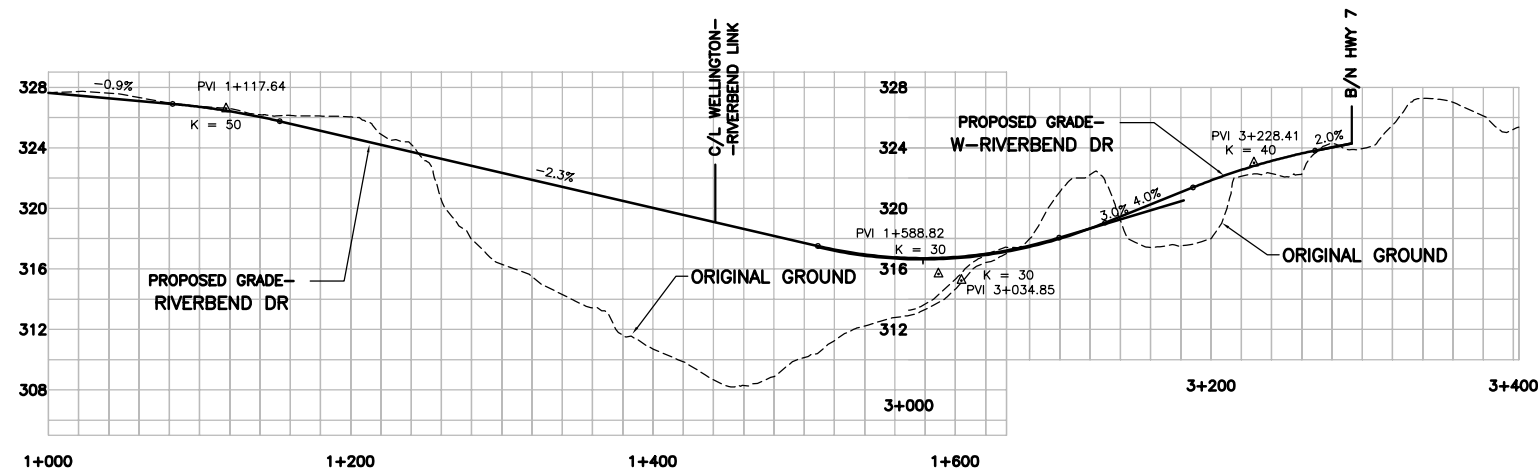


**PLATE  
2A**

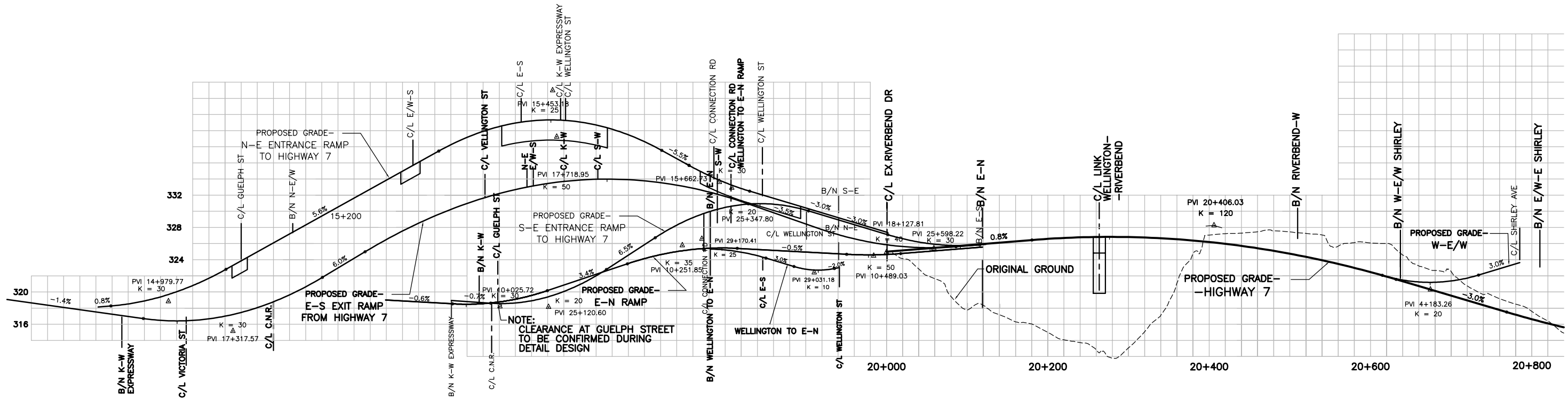
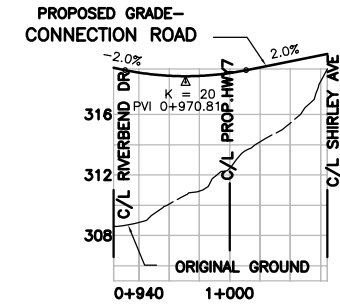
**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH  
RECOMMENDED ROUTE (2002)**







Riverbend Drive



# HIGHWAY 7 PLANNING STUDY KITCHENER TO GUELPH RECOMMENDED ROUTE (2002)

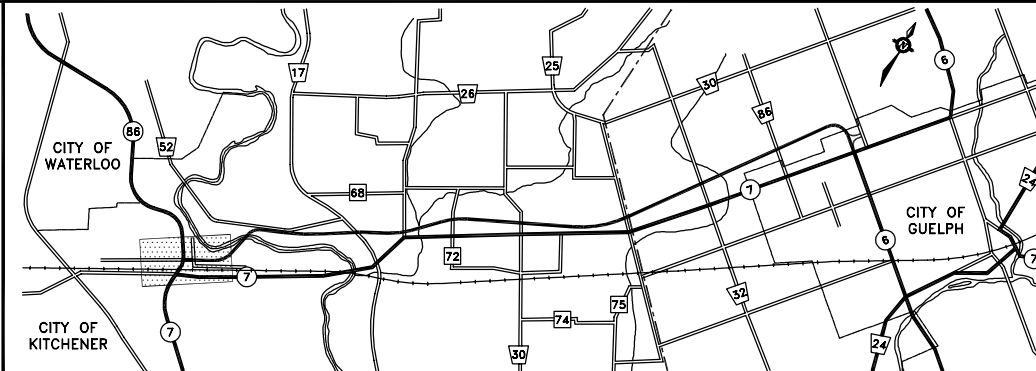
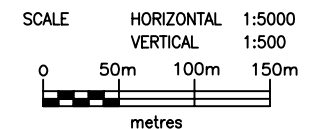
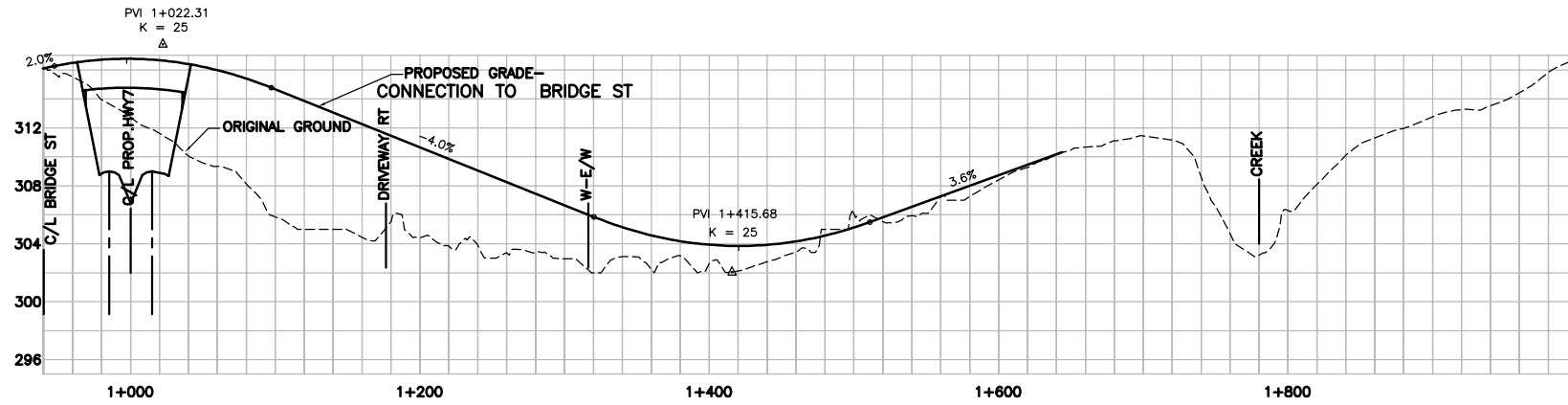
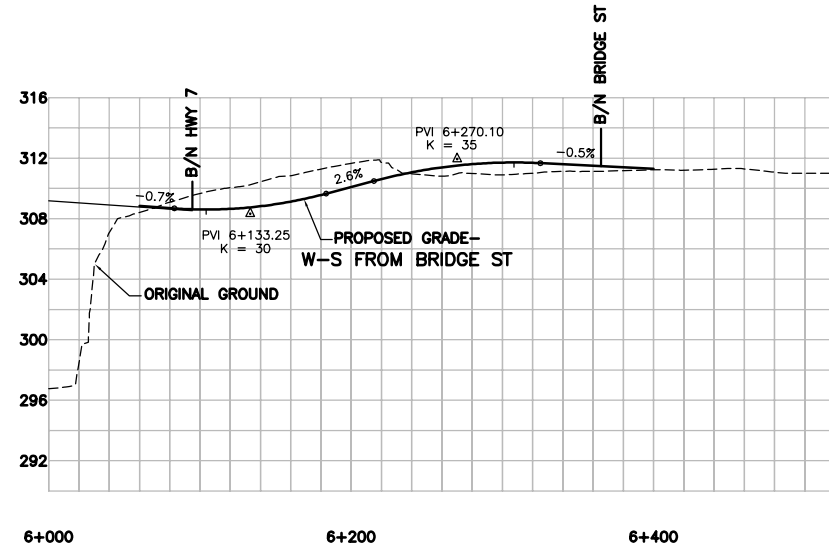
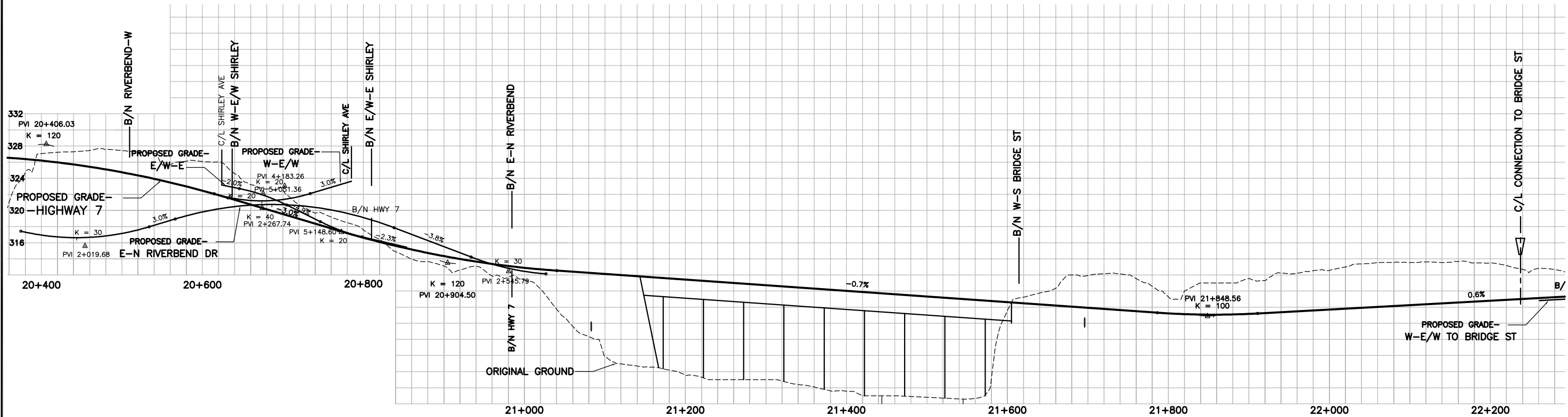


PLATE  
2B



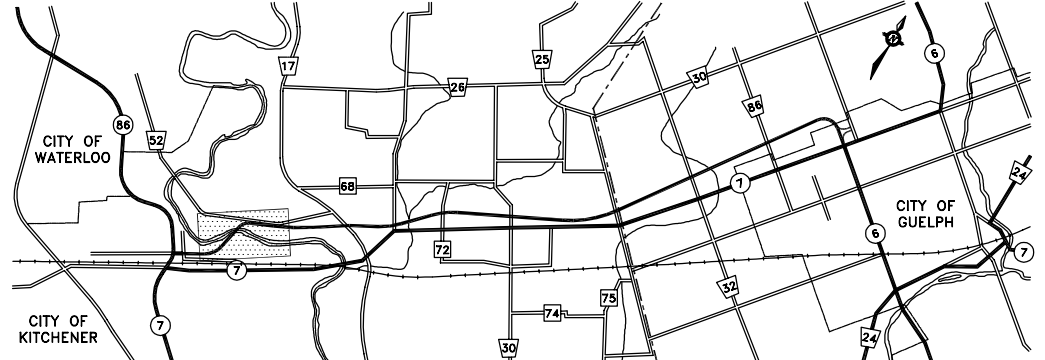
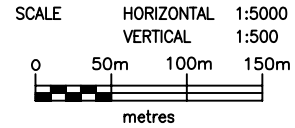


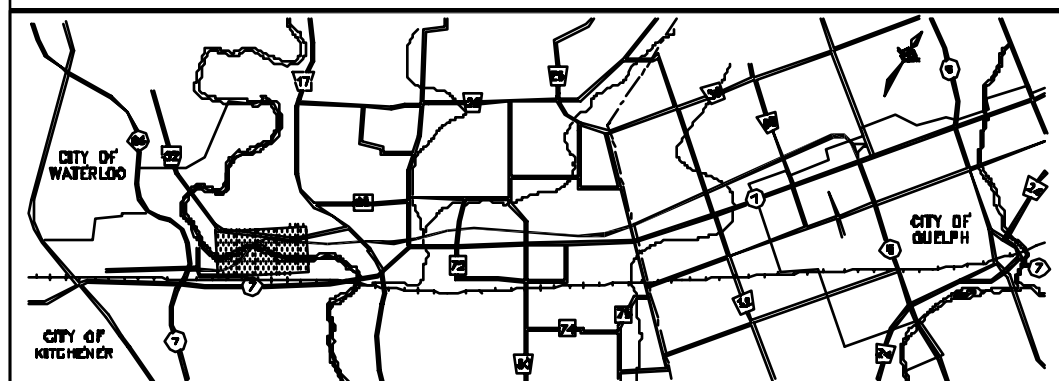
**Connection to Bridge Street**



**PLATE  
3**

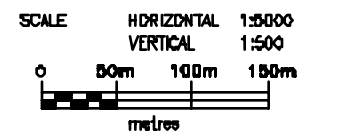
**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH  
RECOMMENDED ROUTE (2002)**





**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH  
RECOMMENDED ROUTE (2002)**

**PLATE  
4**



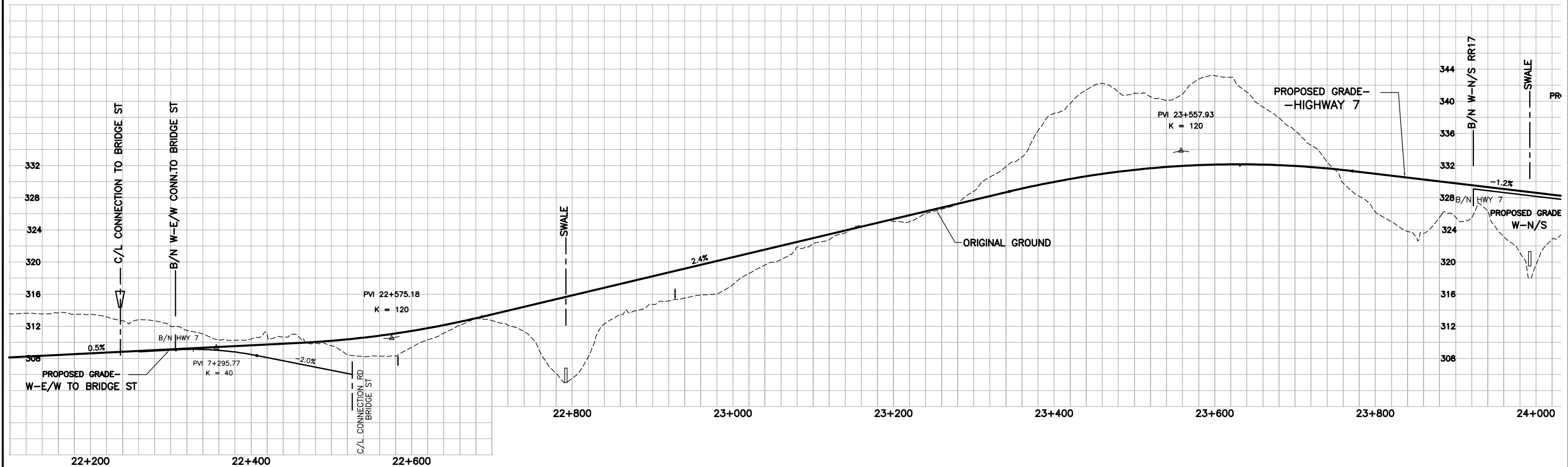
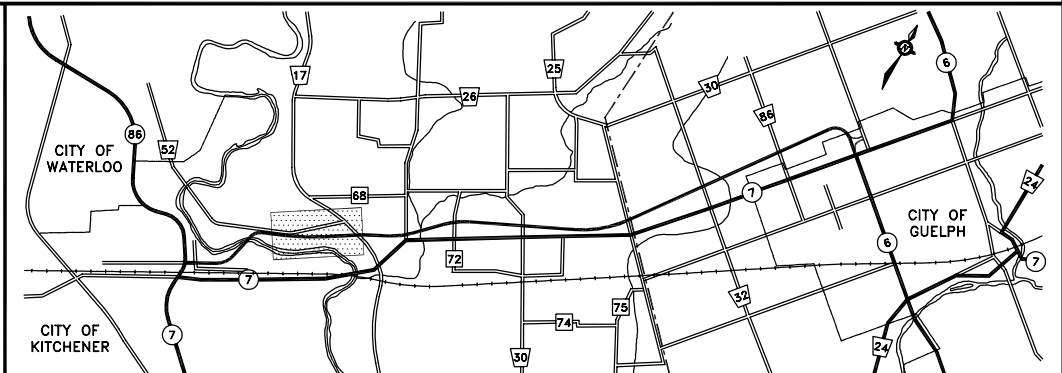
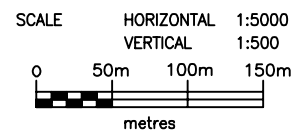
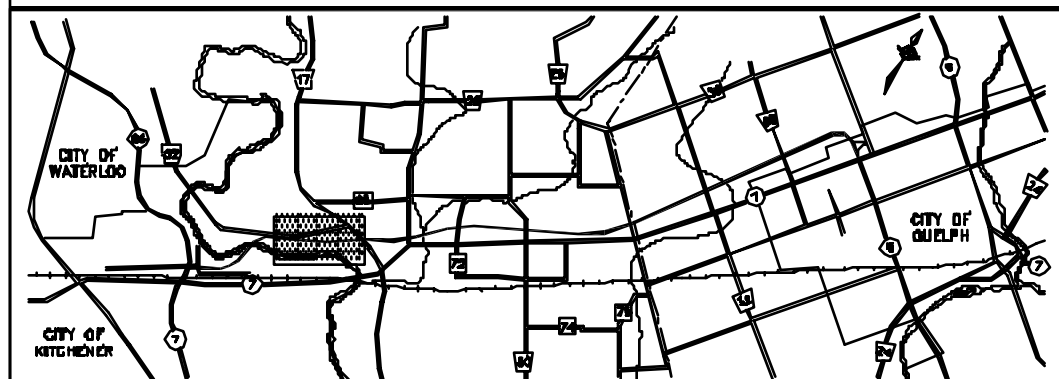
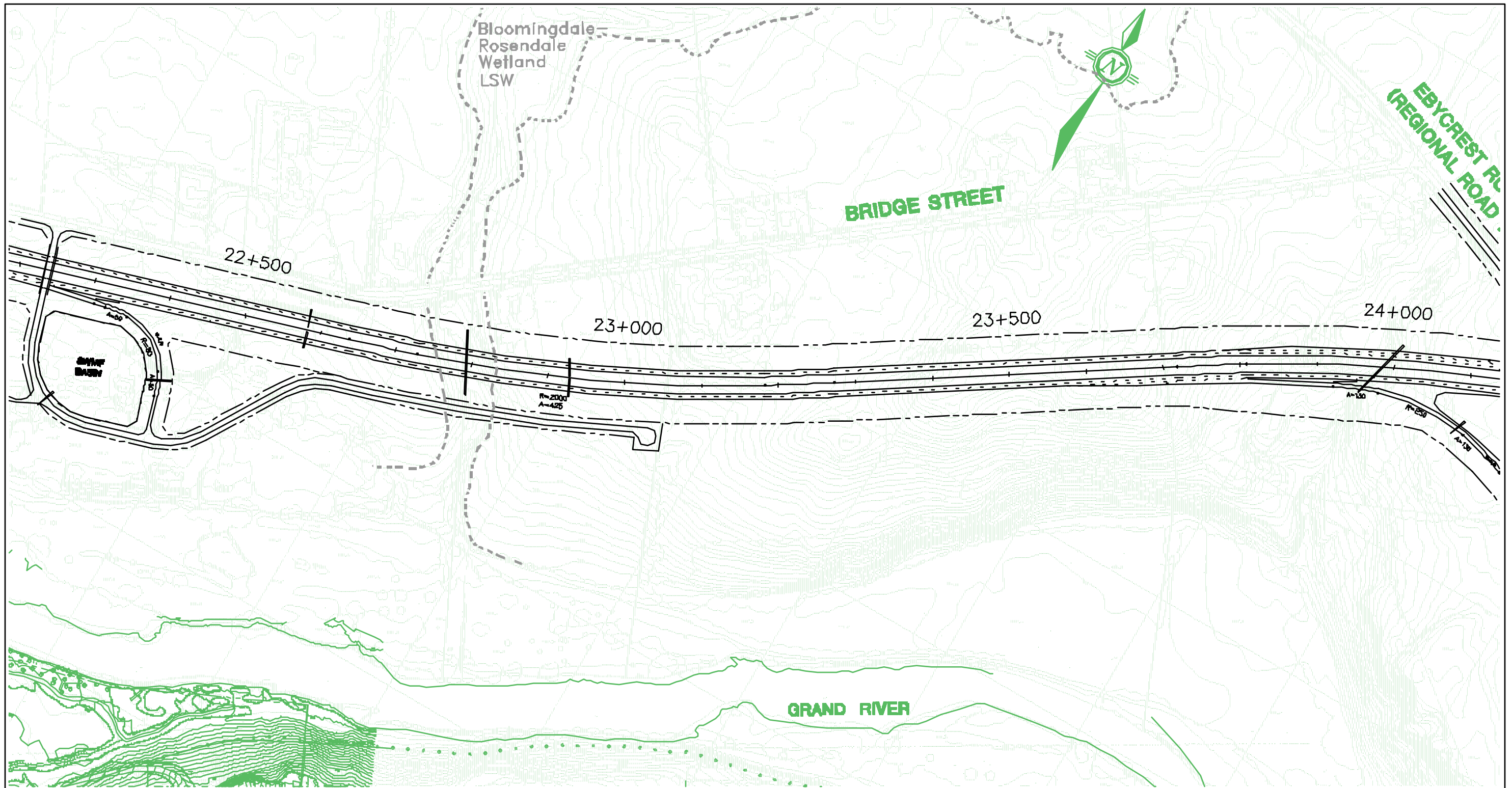


PLATE  
**5**

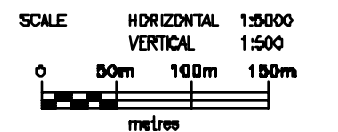
# HIGHWAY 7 PLANNING STUDY KITCHENER TO GUELPH RECOMMENDED ROUTE (2002)



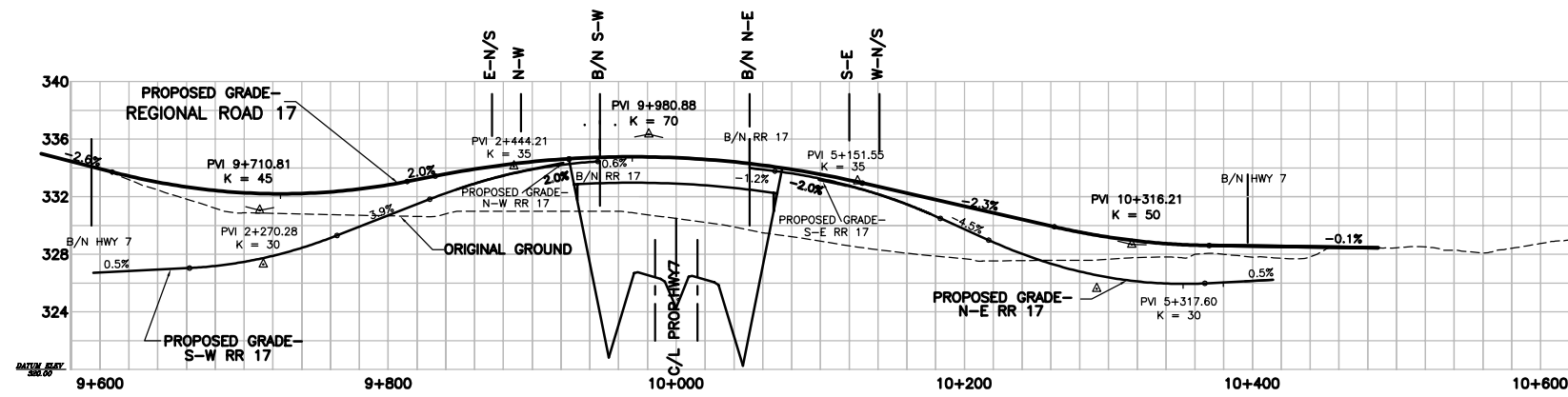


**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH  
RECOMMENDED ROUTE (2002)**

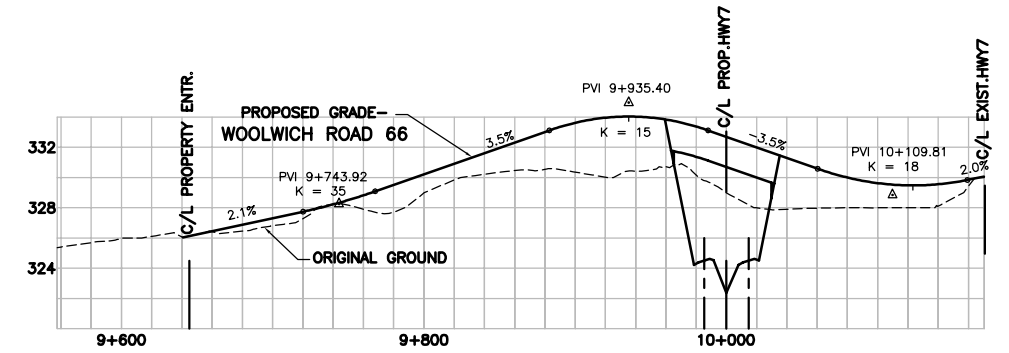
**PLATE  
6**



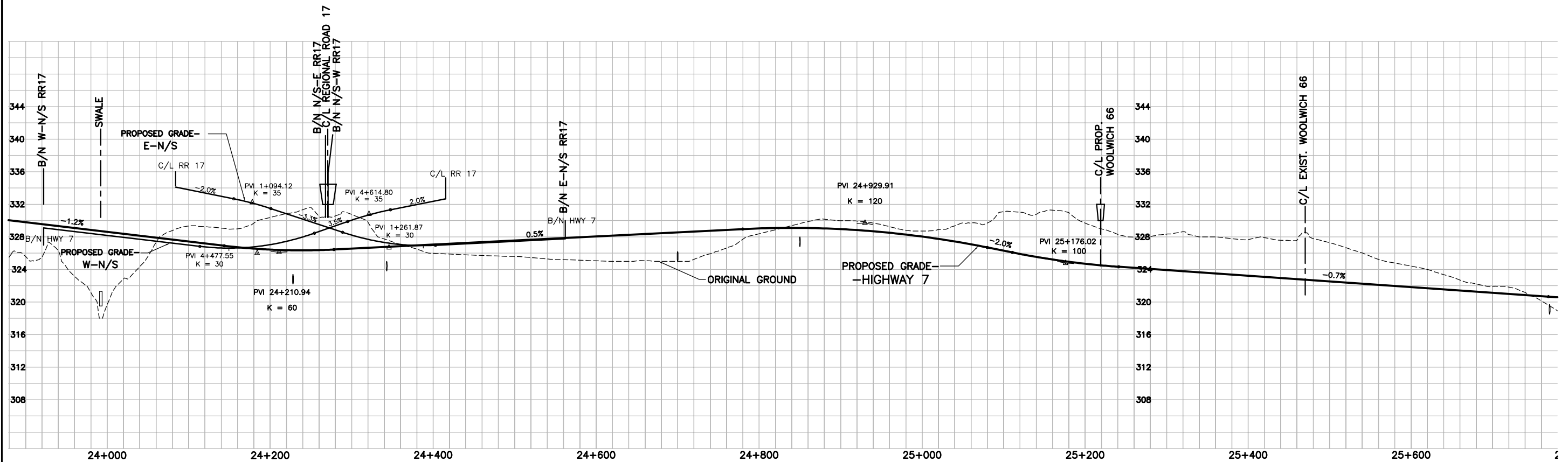




**Regional Road 17**

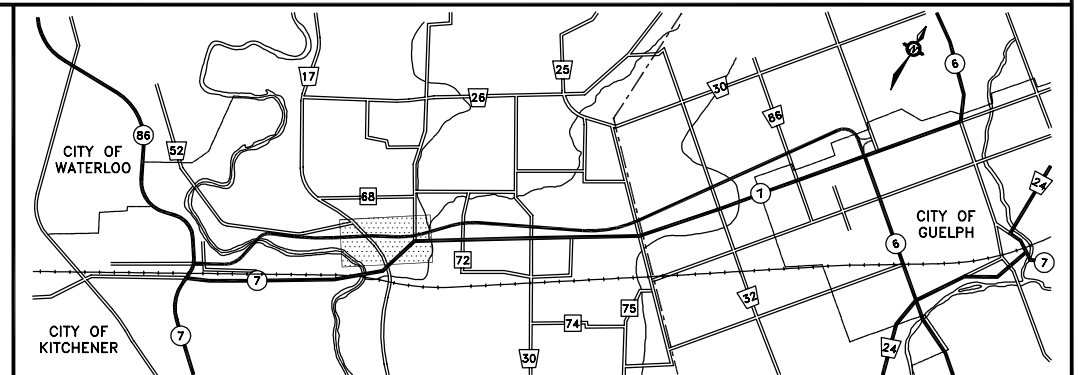
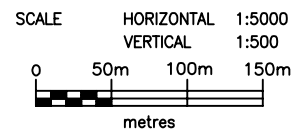


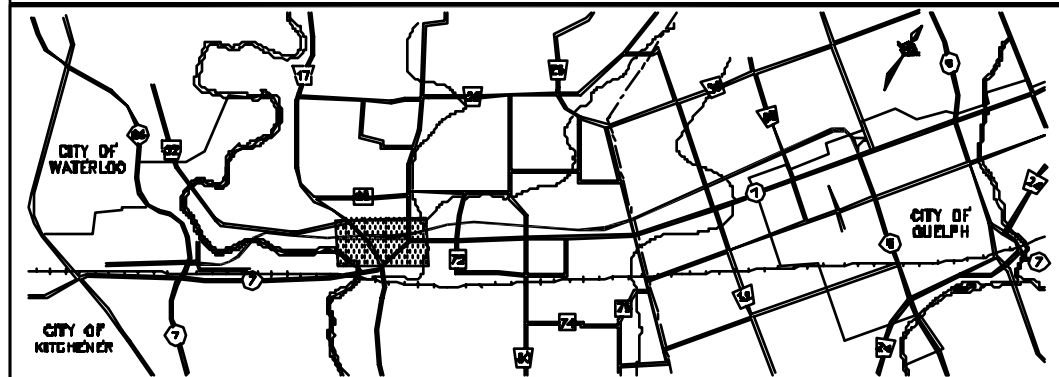
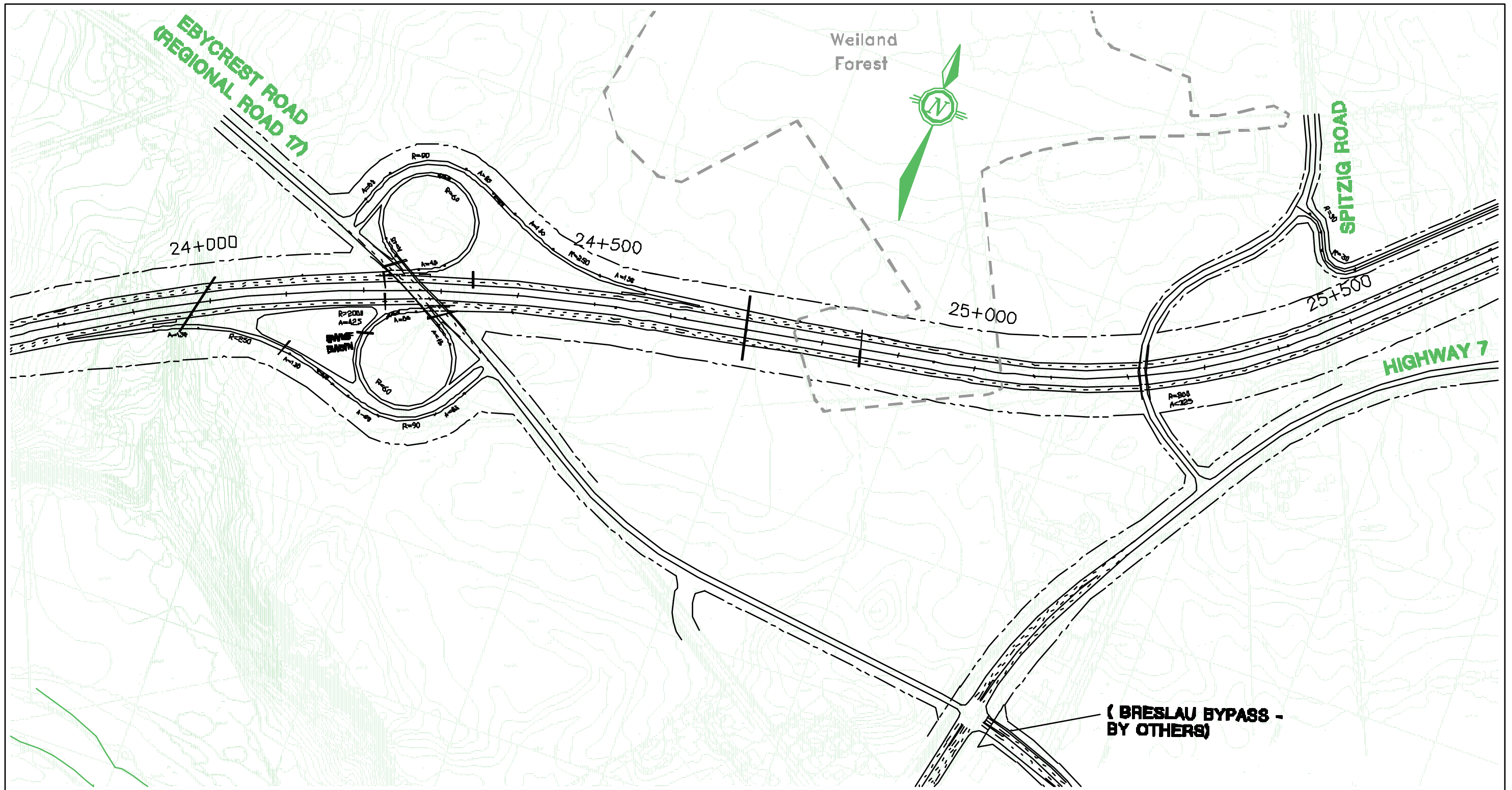
**Woolwich Road 66**



**PLATE  
7**

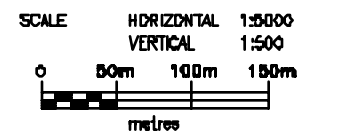
# HIGHWAY 7 PLANNING STUDY KITCHENER TO GUELPH RECOMMENDED ROUTE (2002)

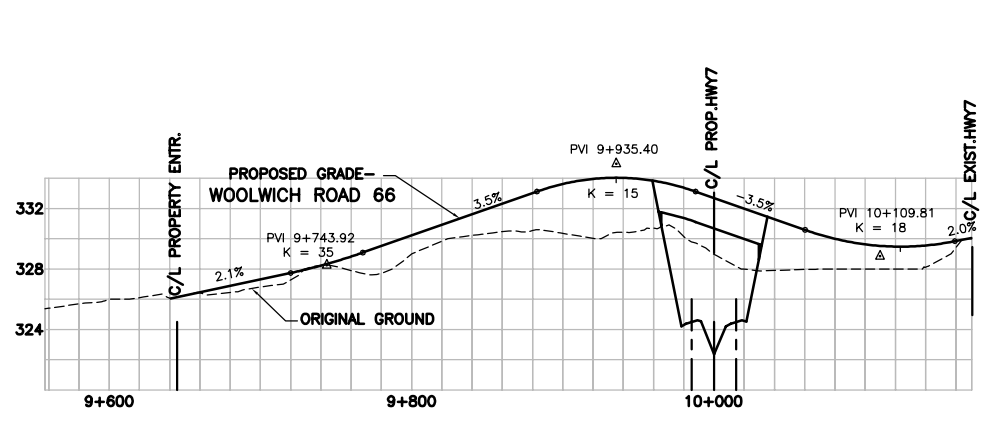




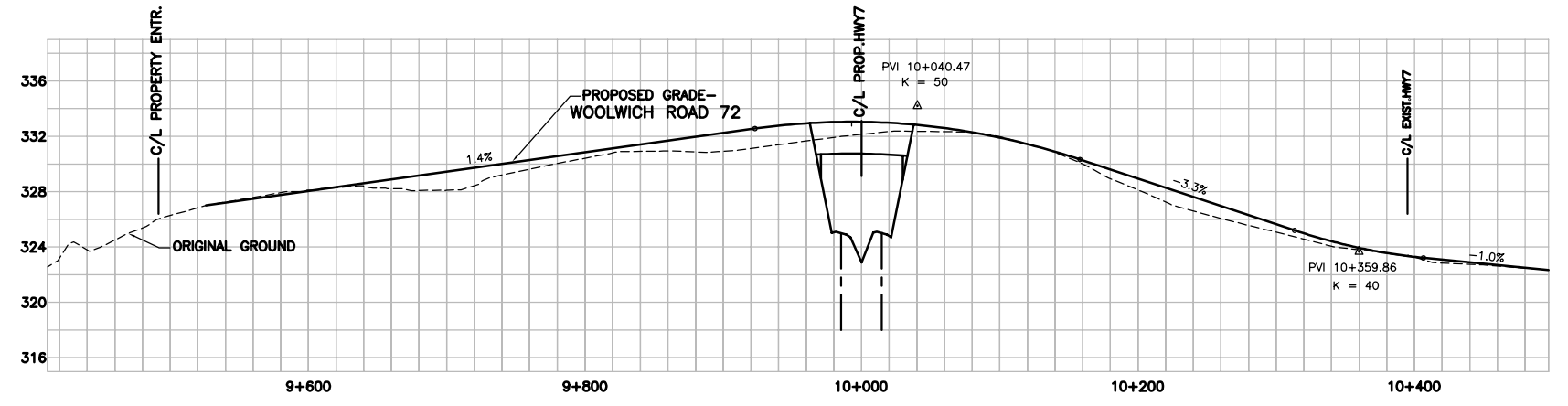
# HIGHWAY 7 PLANNING STUDY KITCHENER TO GUELPH RECOMMENDED ROUTE (2002)

**PLATE  
8**

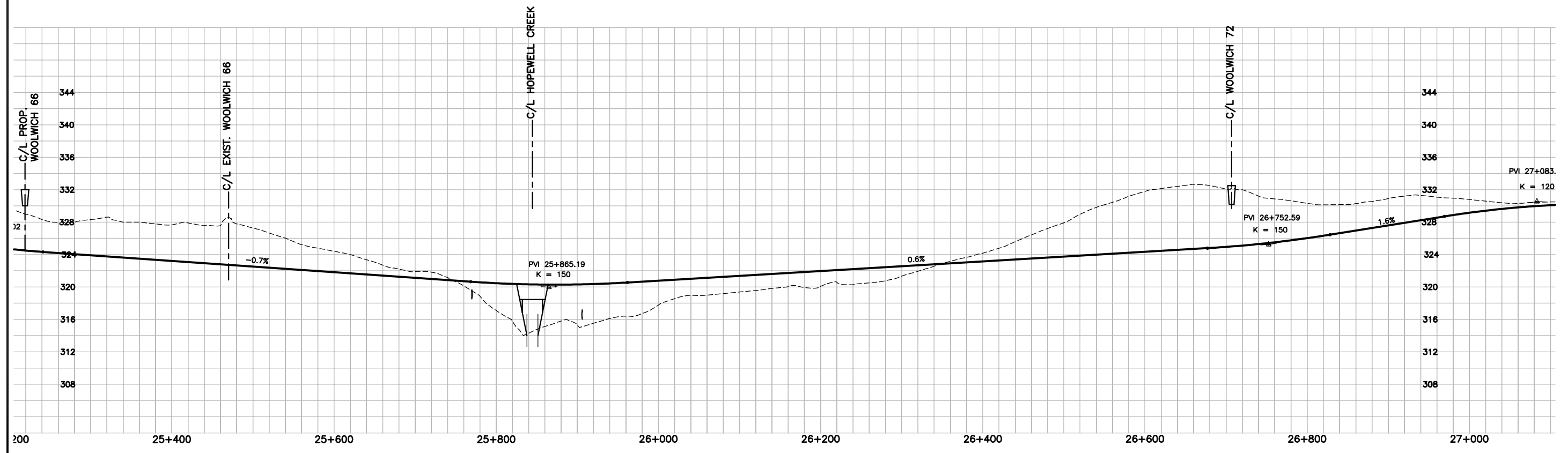




**Woolwich Road 66**

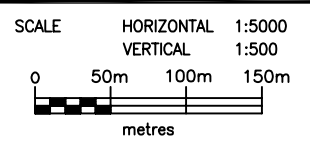


**Woolwich Road 72**

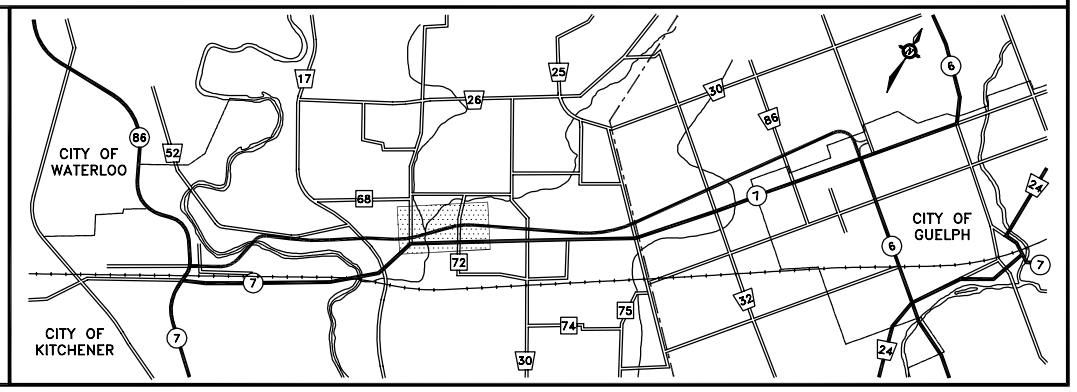


**PLATE**

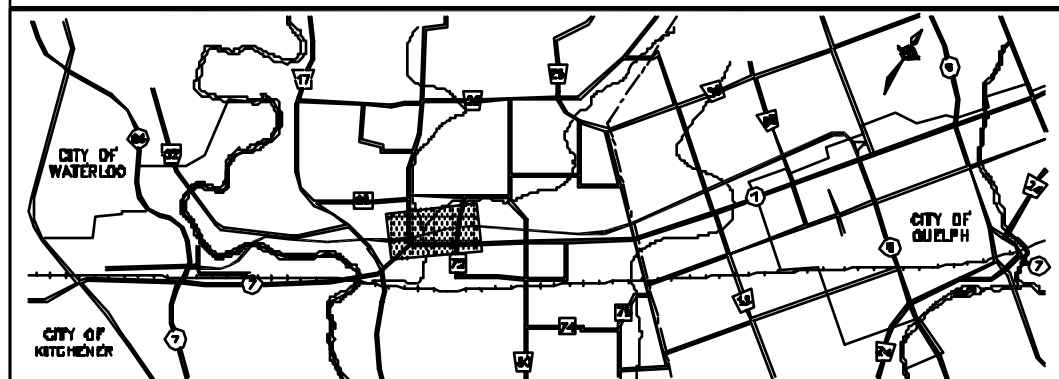
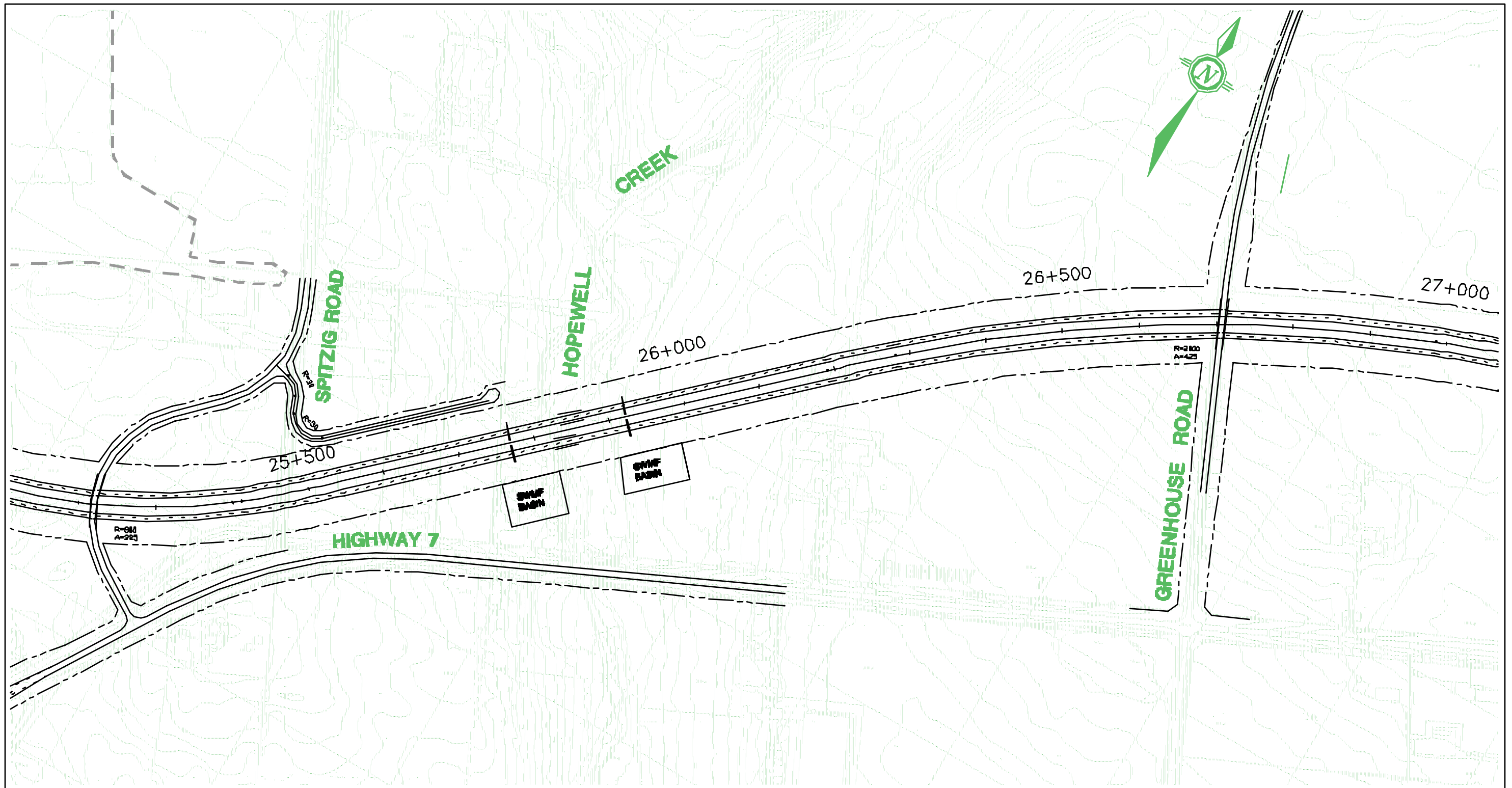
**9**



**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH  
RECOMMENDED ROUTE (2002)**





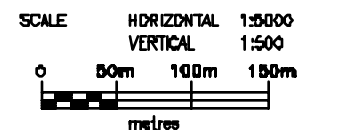


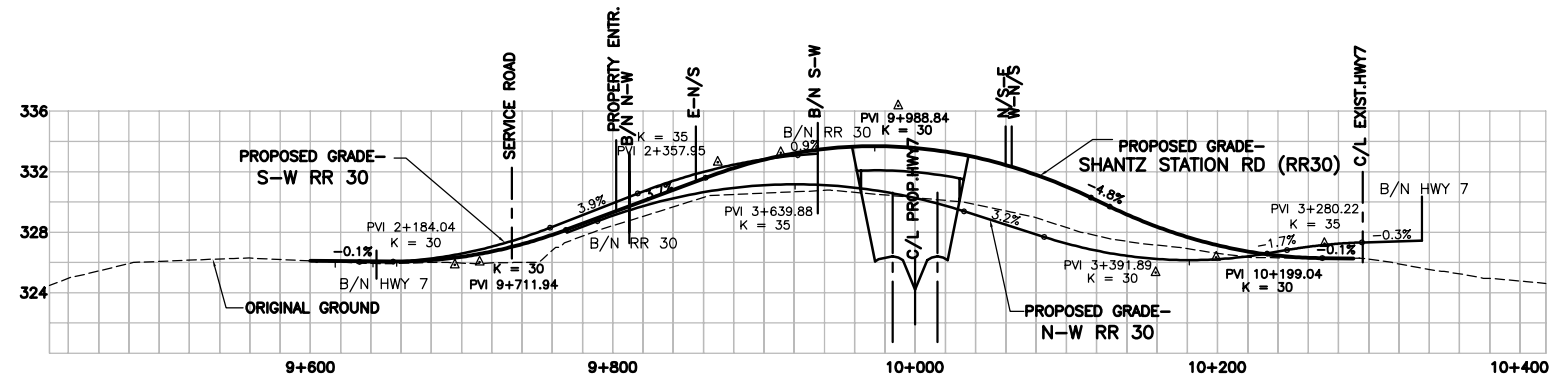
# HIGHWAY 7 PLANNING STUDY

## KITCHENER TO GUELPH

### RECOMMENDED ROUTE (2002)

**PLATE**  
**10**





Shantz Station Road ( RR 30 )

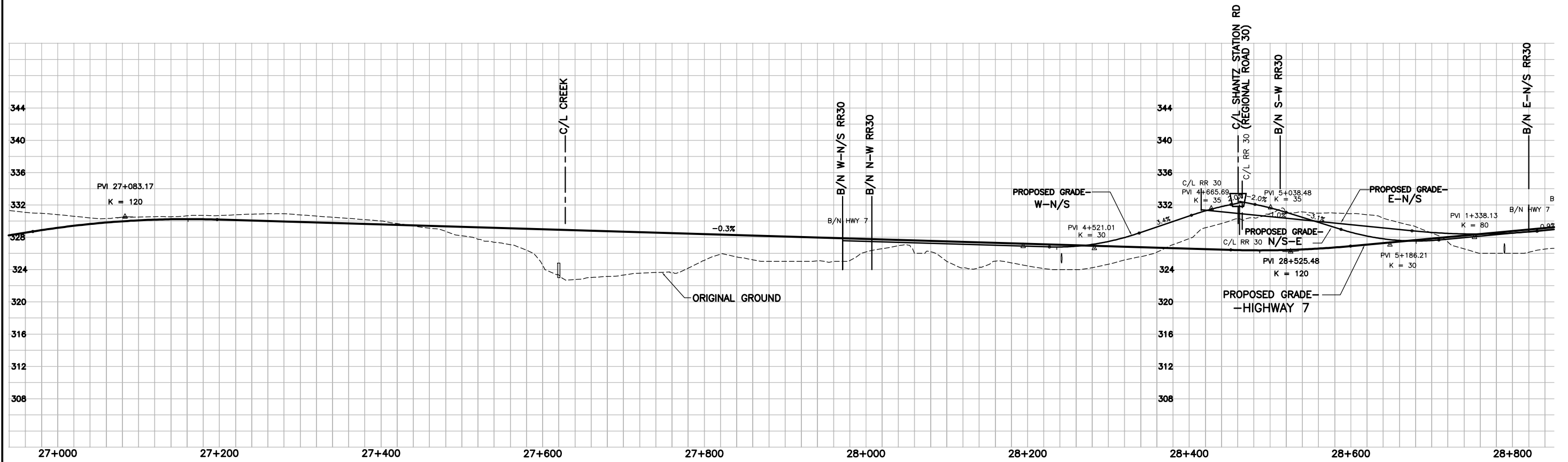
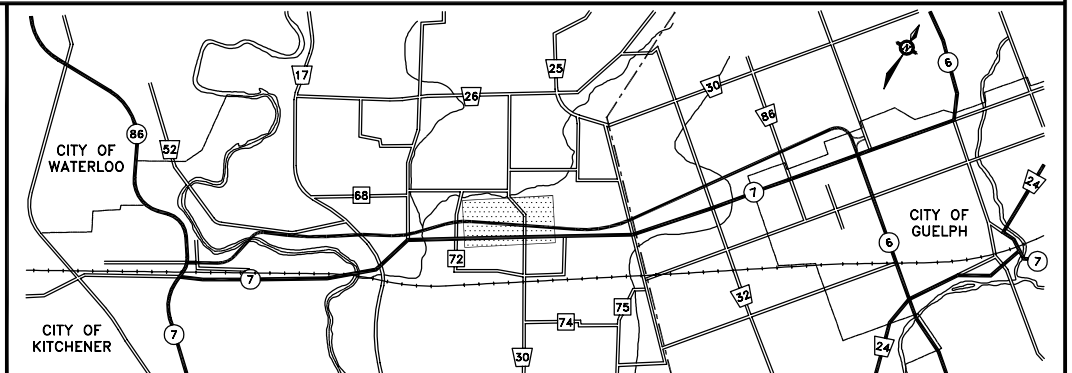
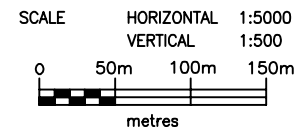
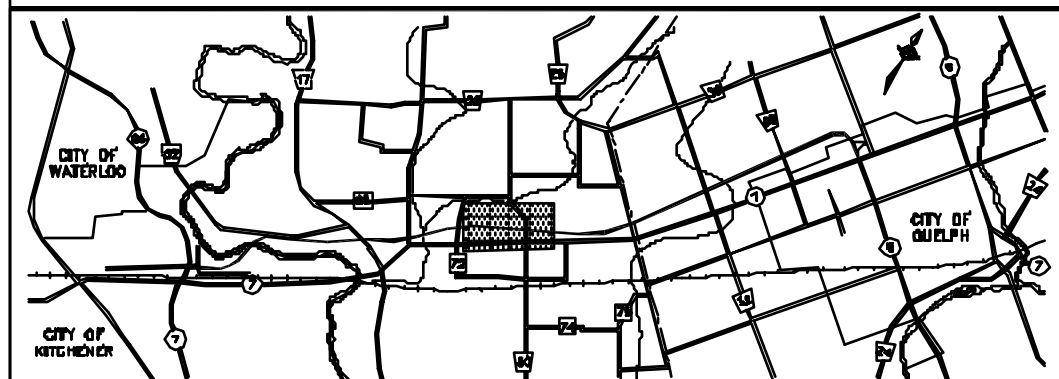
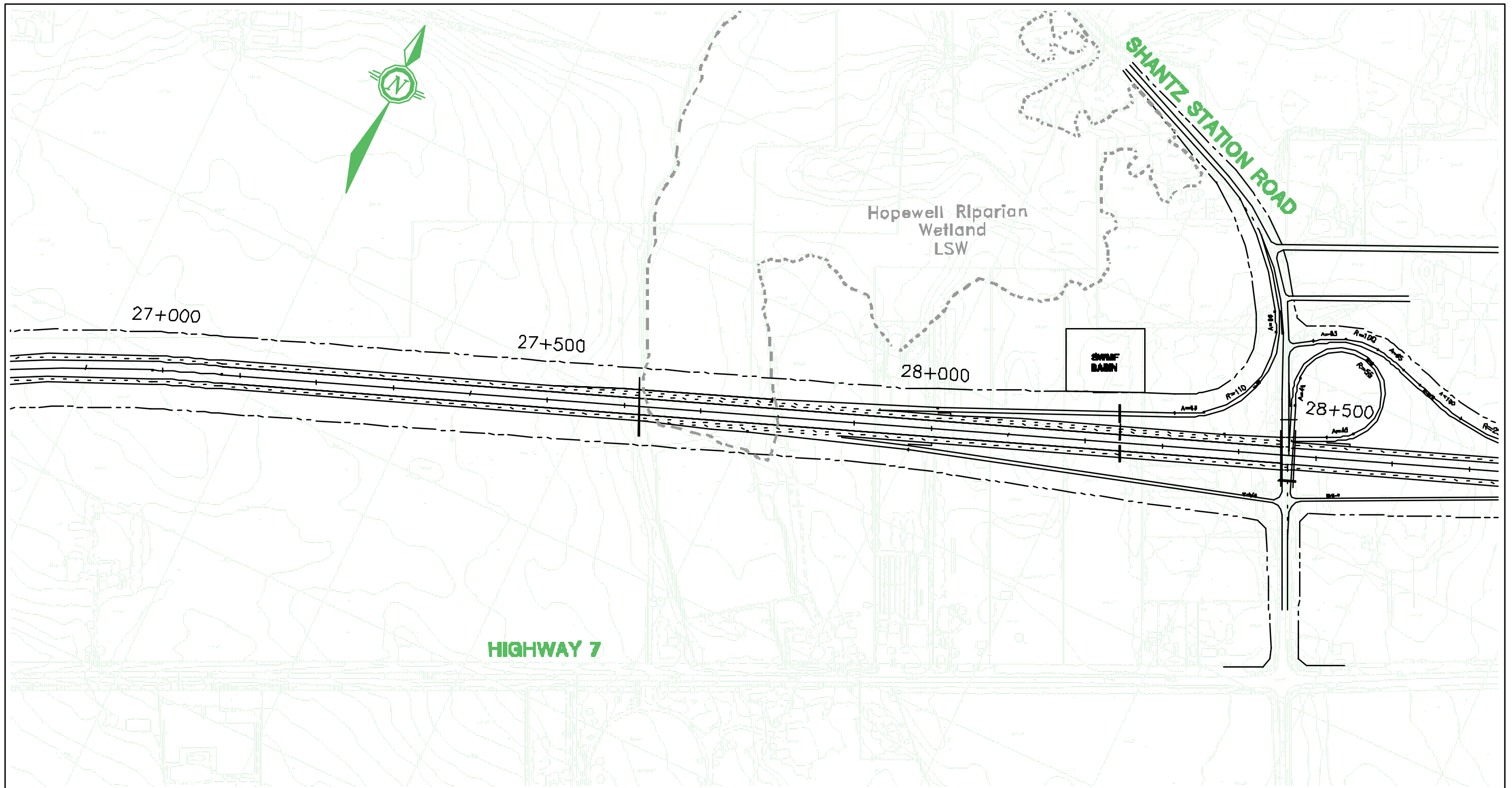


PLATE  
11

# HIGHWAY 7 PLANNING STUDY KITCHENER TO GUELPH RECOMMENDED ROUTE (2002)



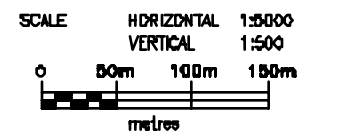


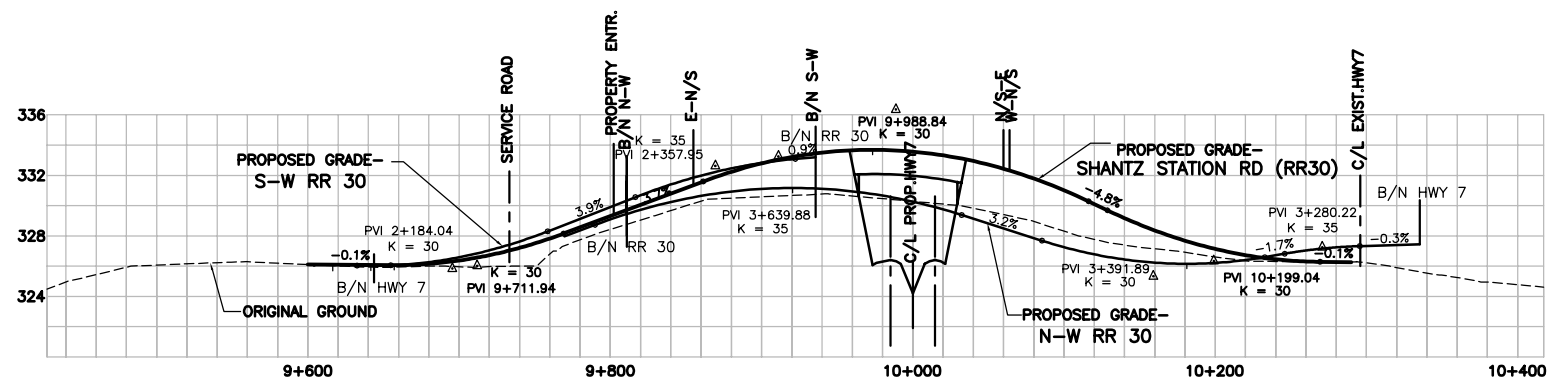
# HIGHWAY 7 PLANNING STUDY

## KITCHENER TO GUELPH

### RECOMMENDED ROUTE (2002)

PLATE  
12





Shantz Station Road ( RR 30 )

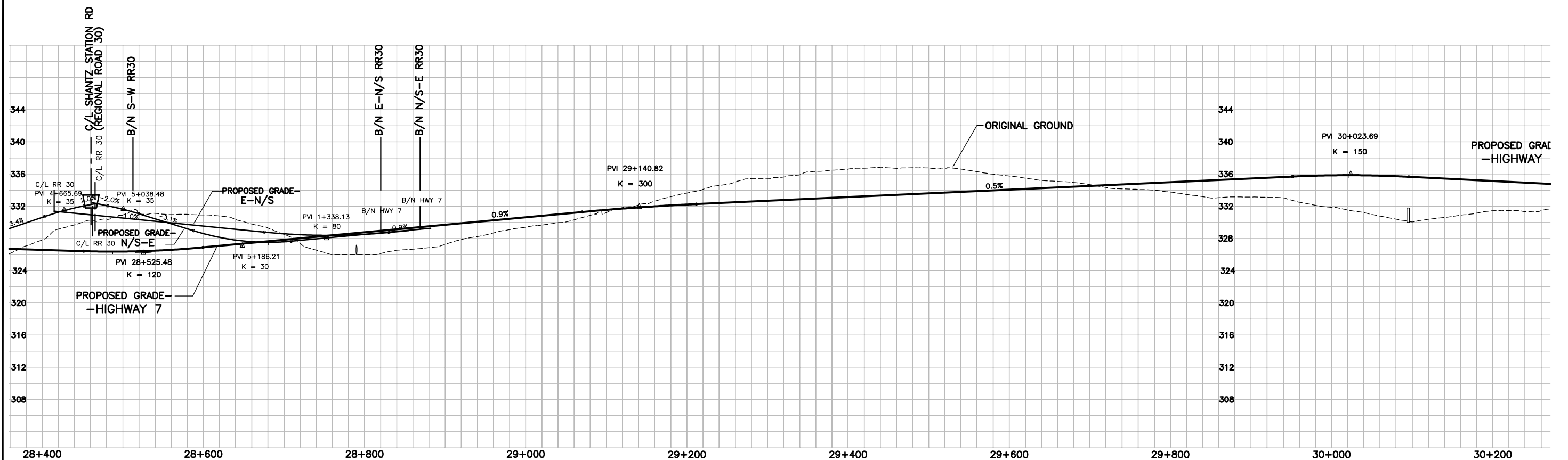
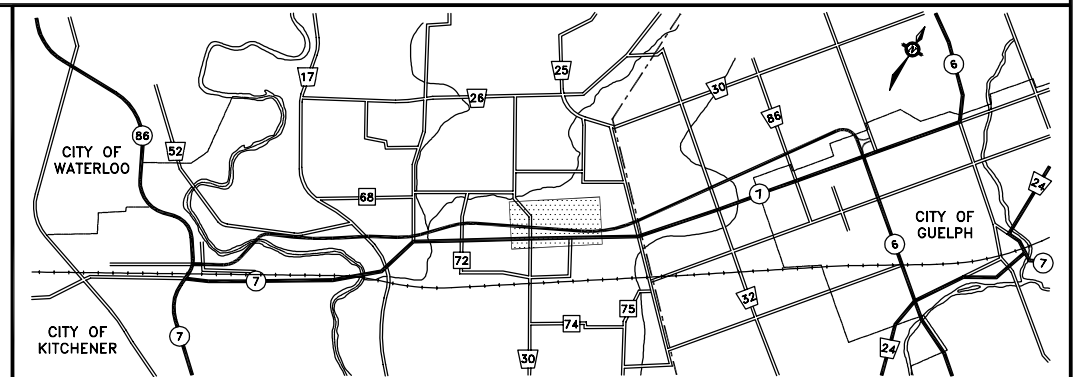
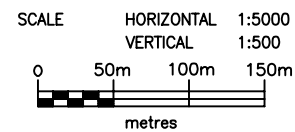
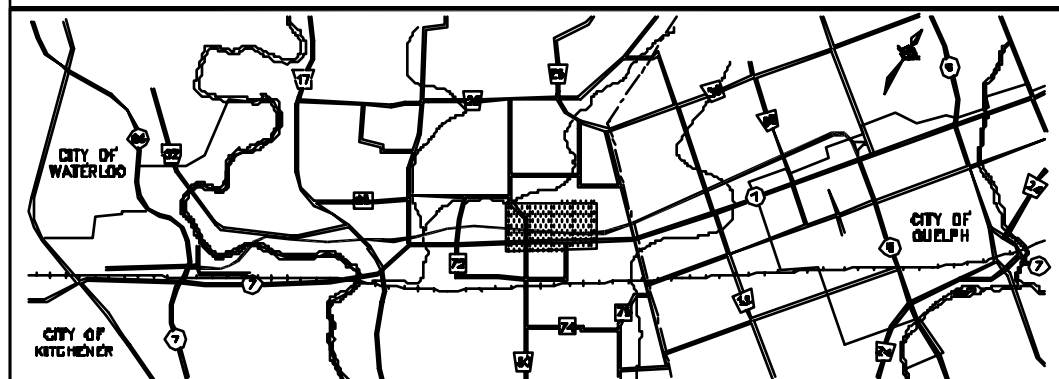
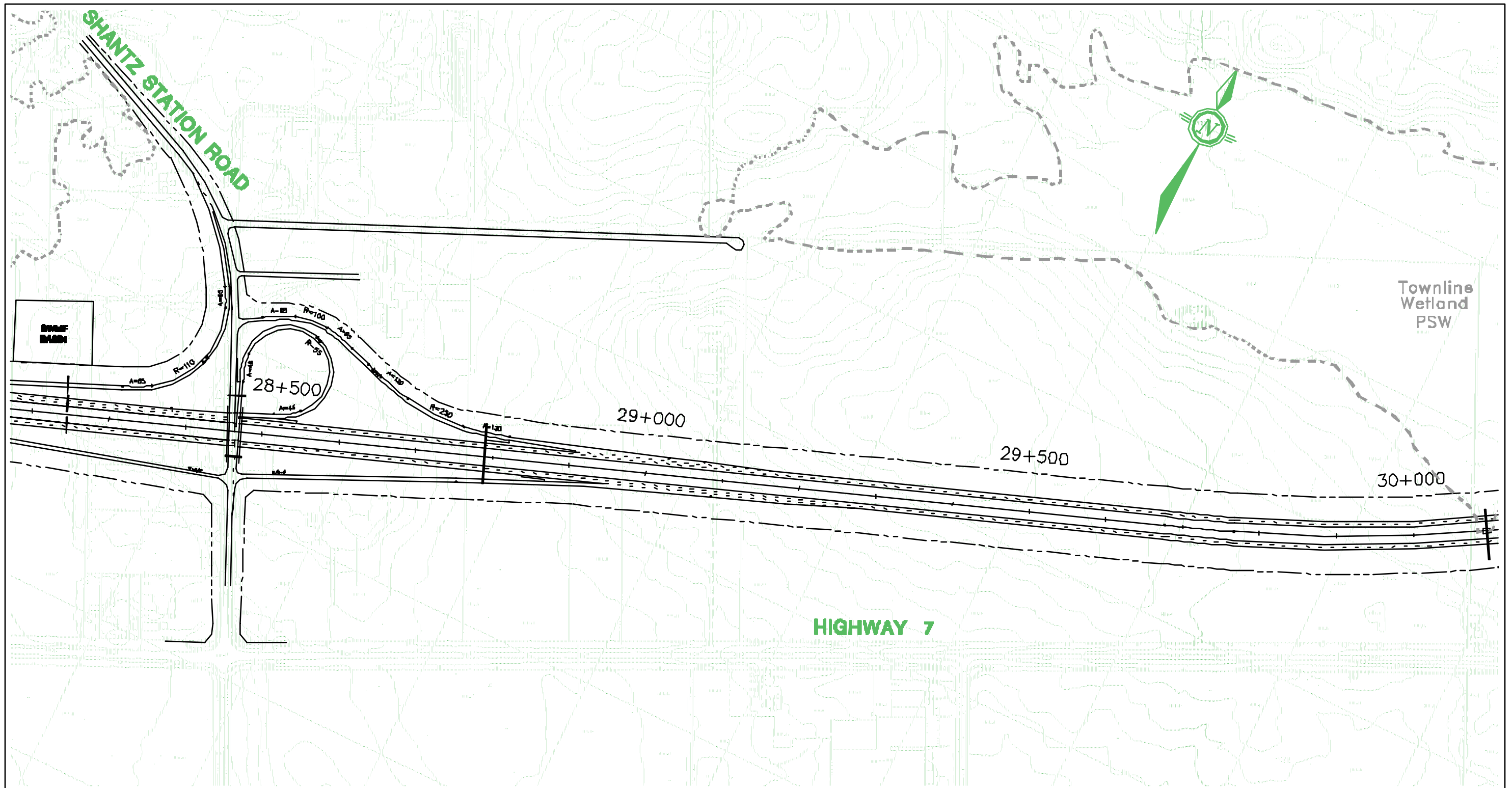


PLATE  
13

# HIGHWAY 7 PLANNING STUDY KITCHENER TO GUELPH RECOMMENDED ROUTE (2002)



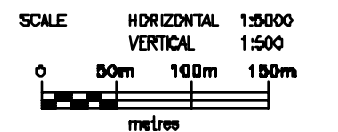


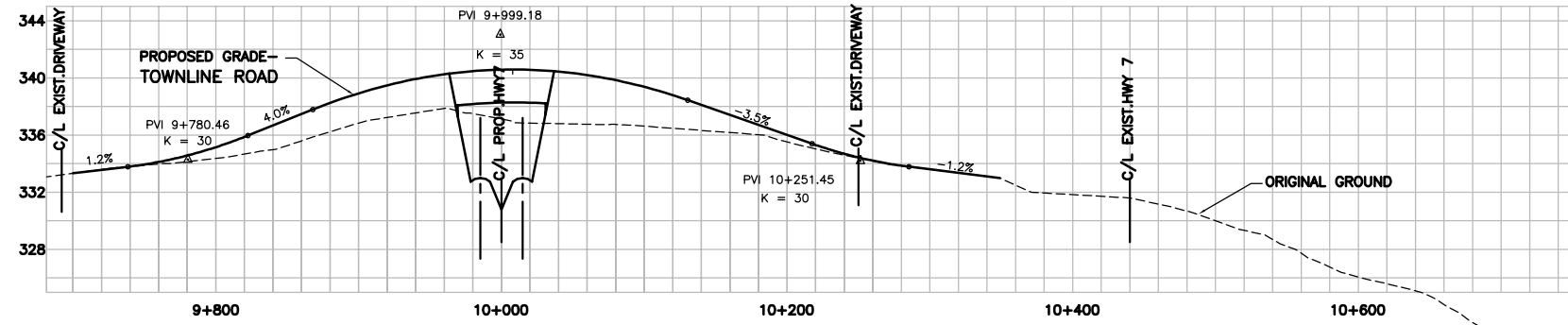
# HIGHWAY 7 PLANNING STUDY

## KITCHENER TO GUELPH

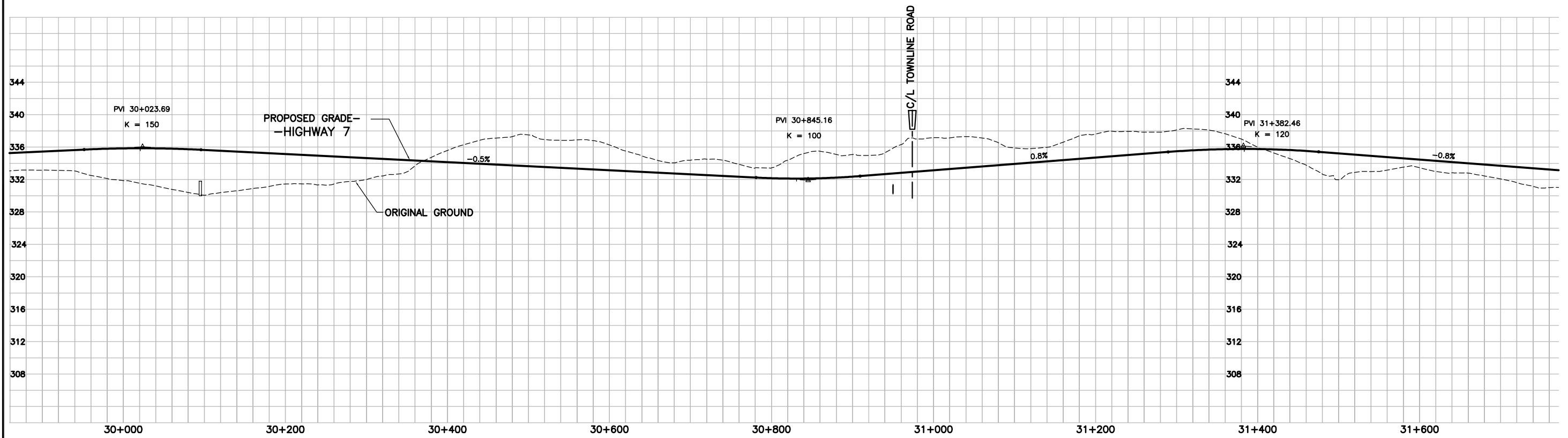
### RECOMMENDED ROUTE (2002)

PLATE  
**14**



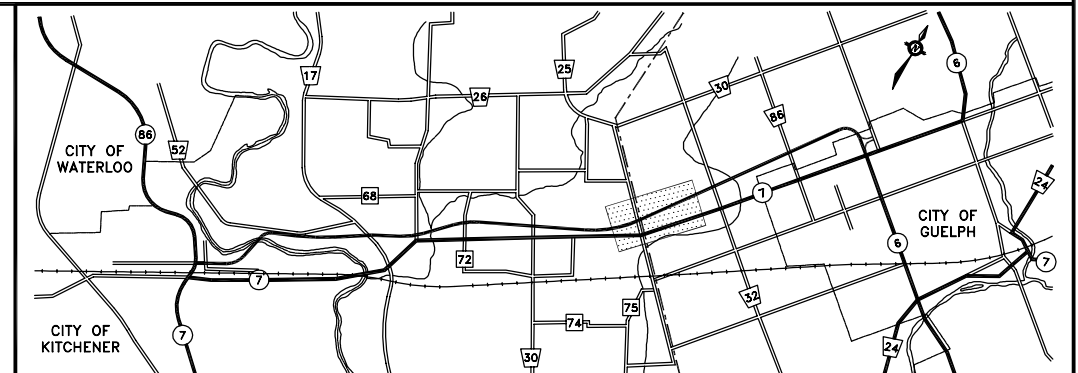
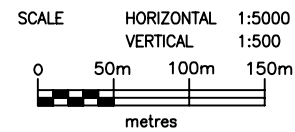


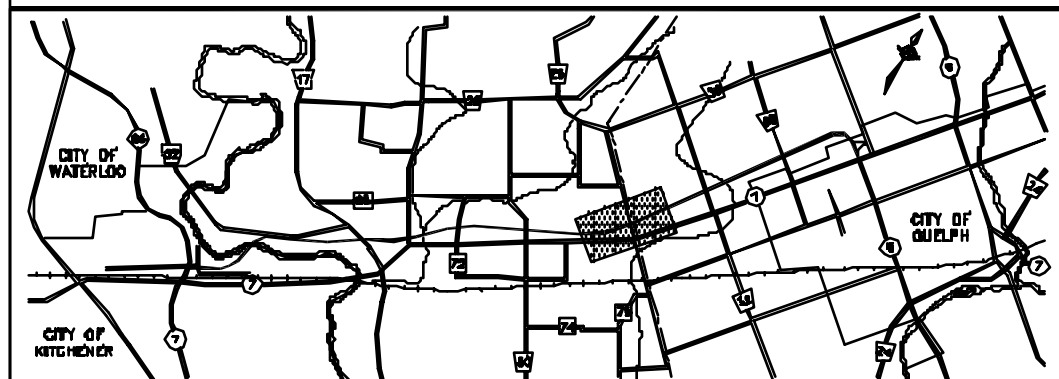
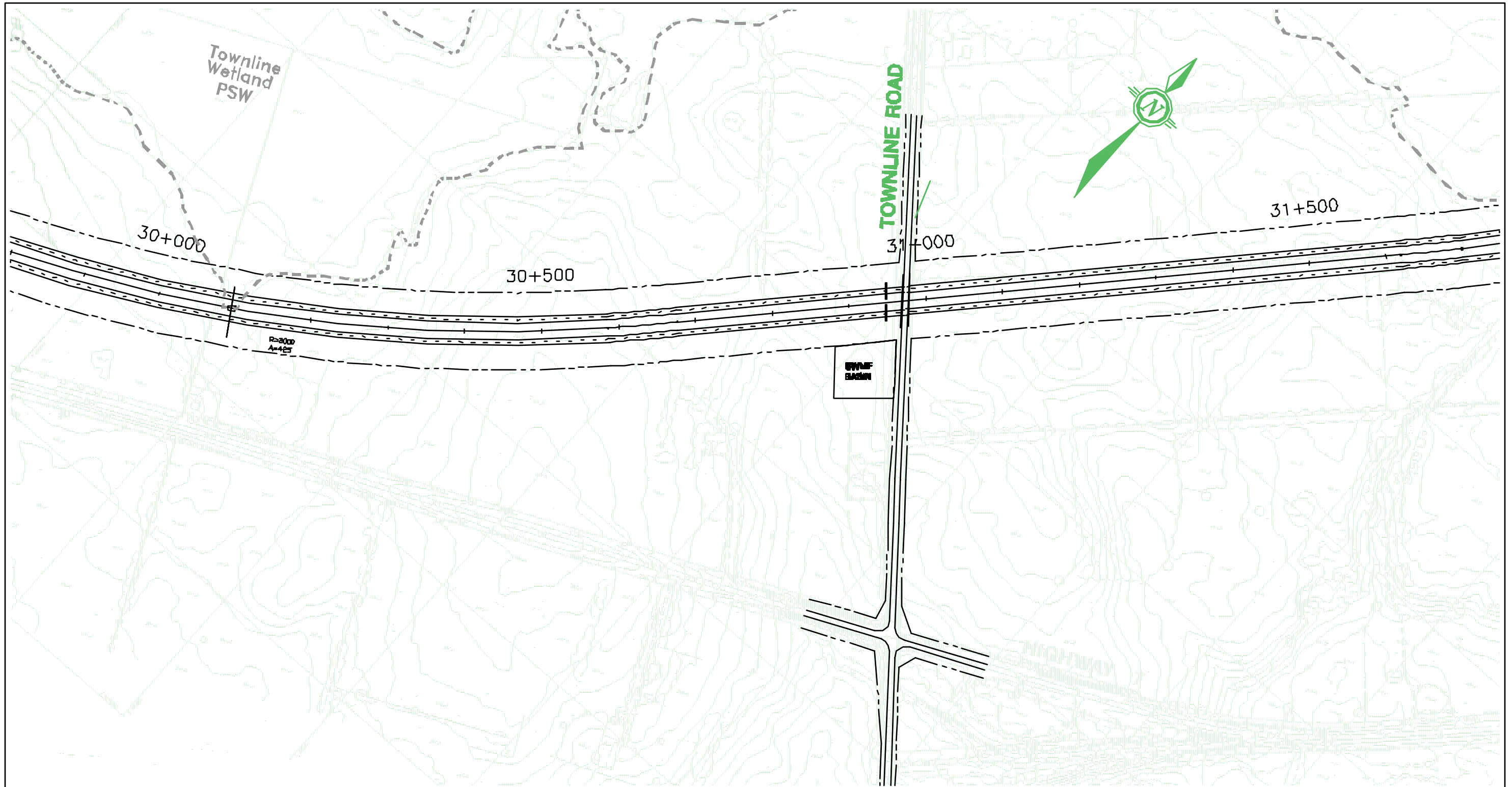
**Townline Road**



**PLATE  
15**

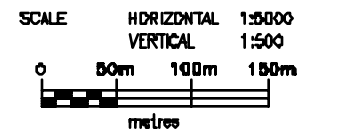
**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH  
RECOMMENDED ROUTE (2002)**



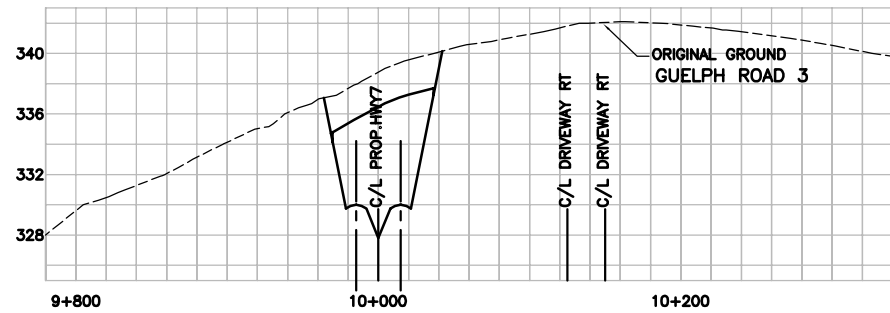


**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH  
RECOMMENDED ROUTE (2002)**

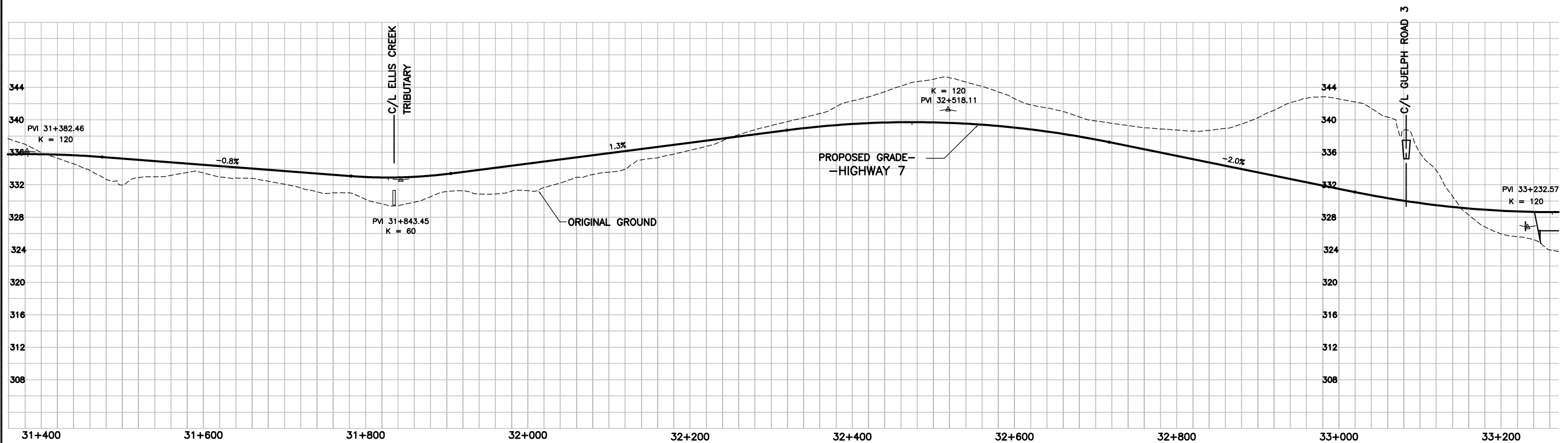
**PLATE  
16**





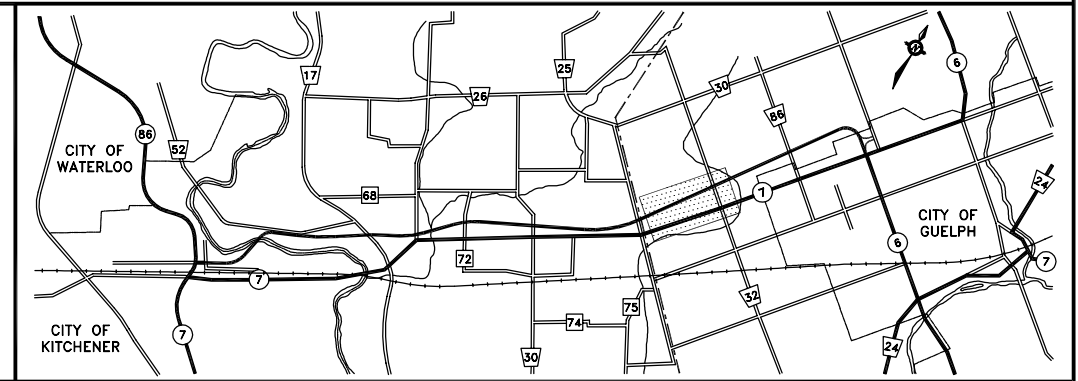
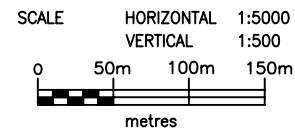


**Guelph Road 3**

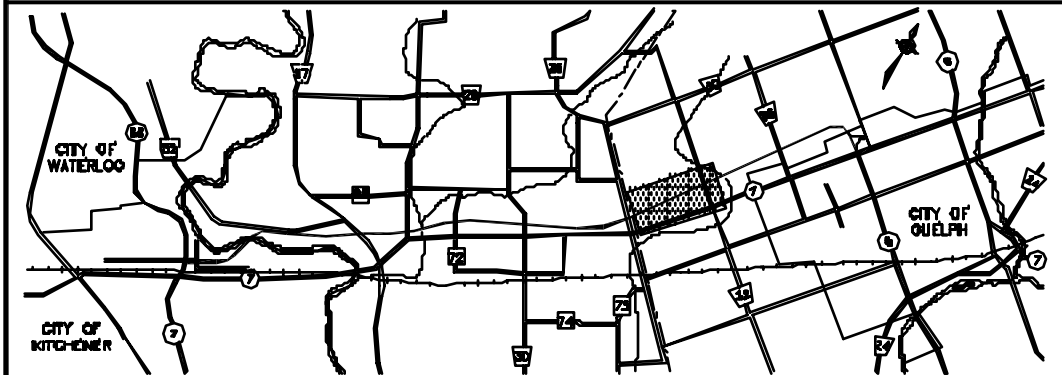
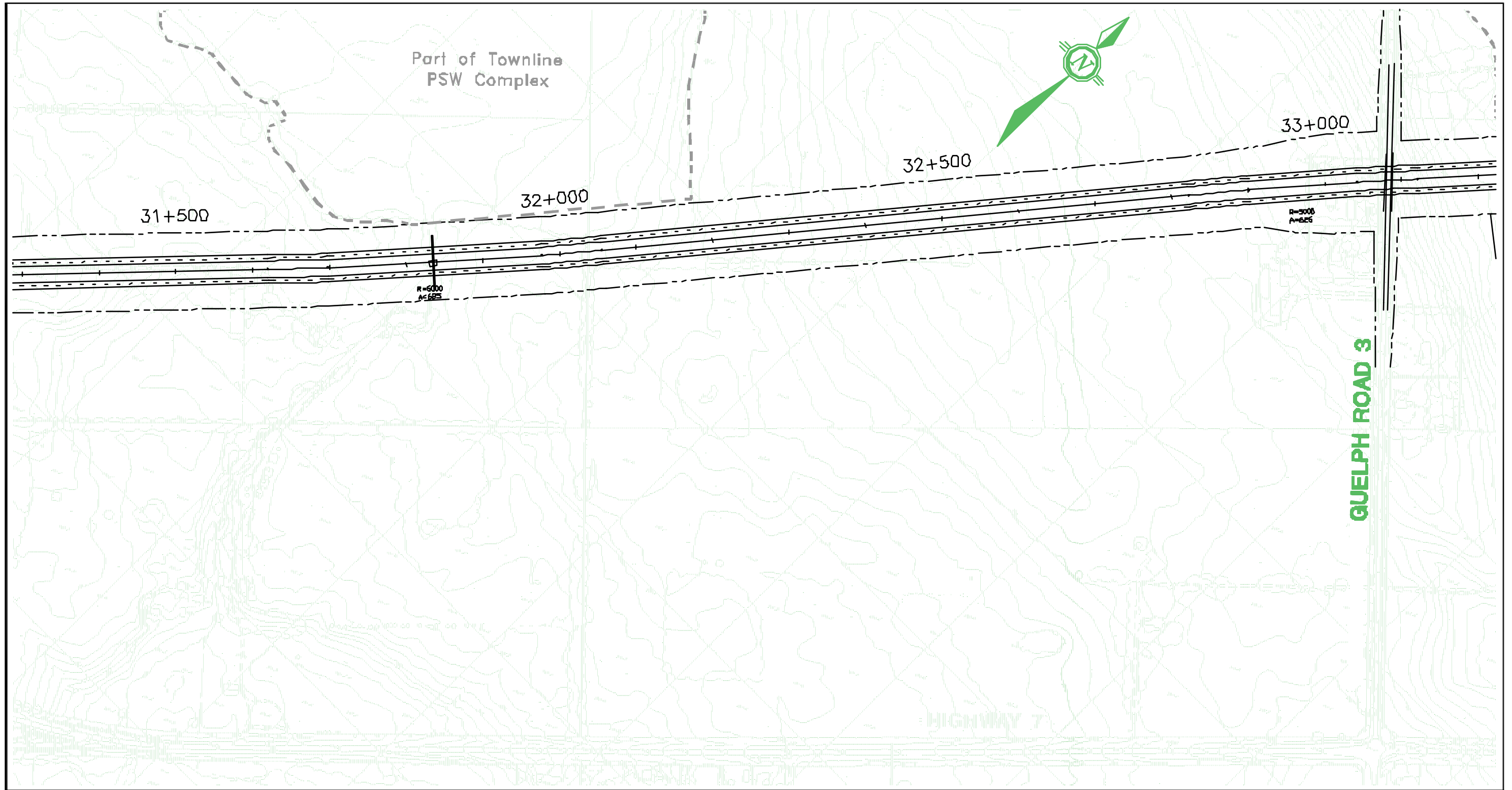


**PLATE  
17**

**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH  
RECOMMENDED ROUTE (2002)**

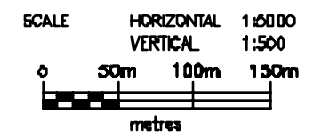


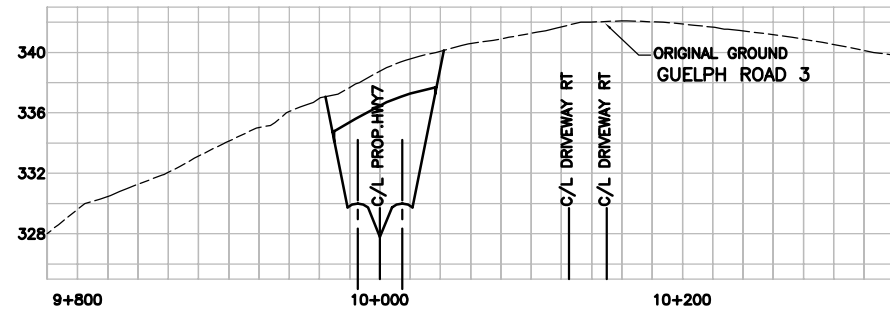




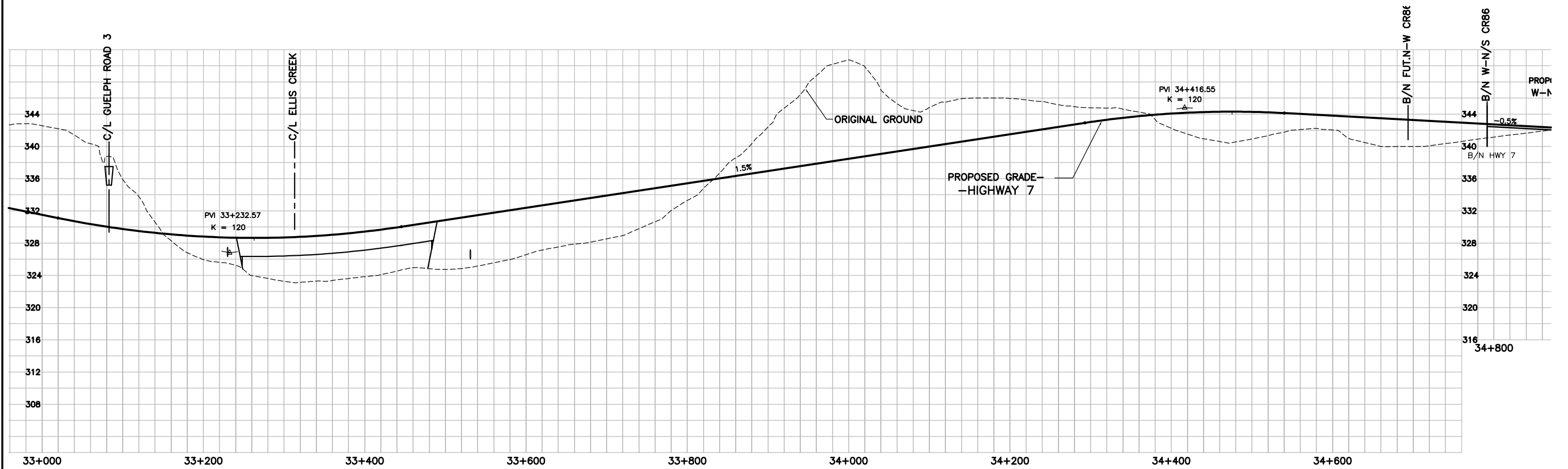
**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH  
RECOMMENDED ROUTE (2002)**

**PLATE  
18**



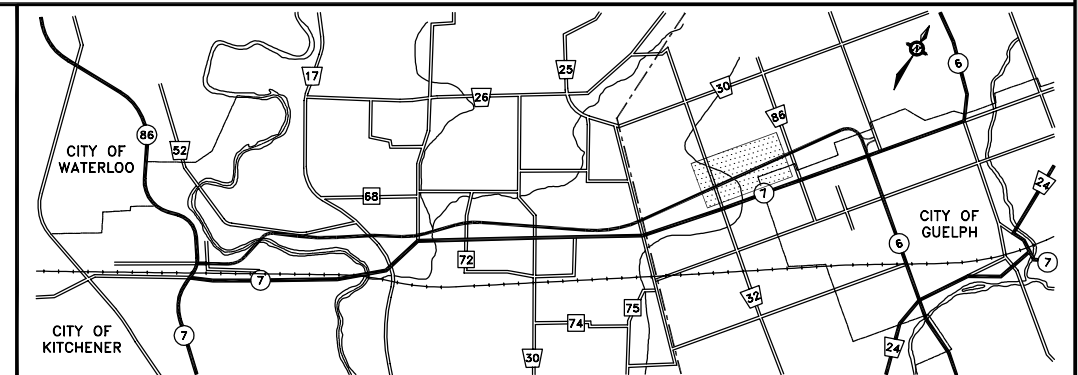
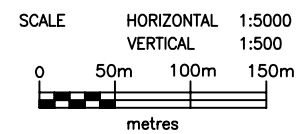


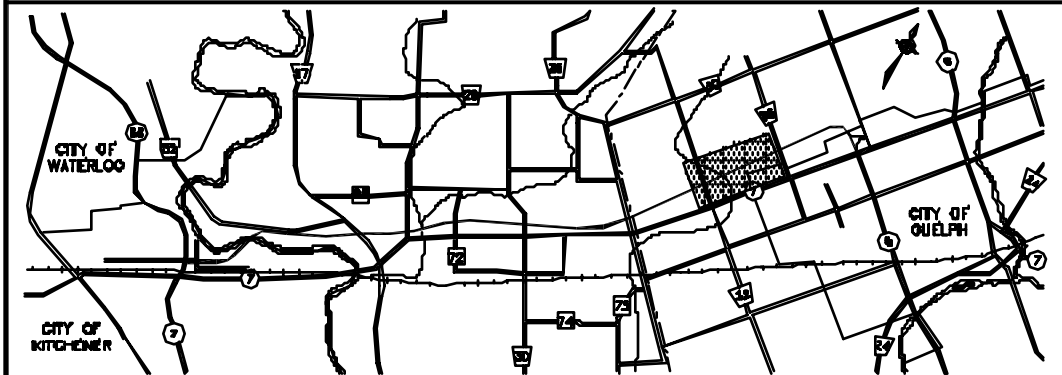
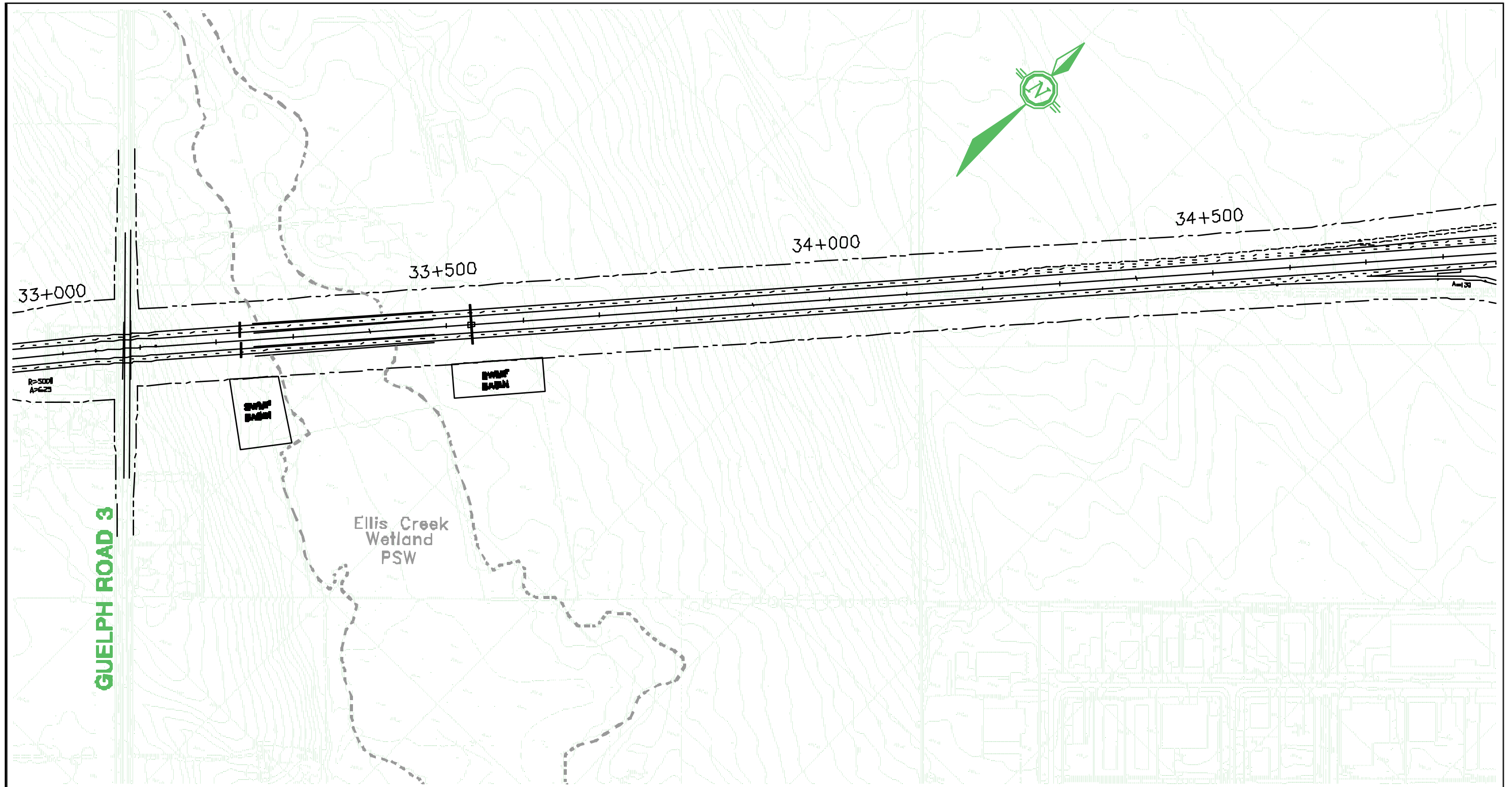
**Guelph Road 3**



**PLATE  
19**

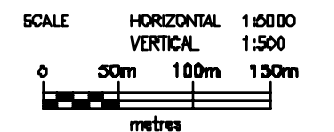
**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH  
RECOMMENDED ROUTE (2002)**

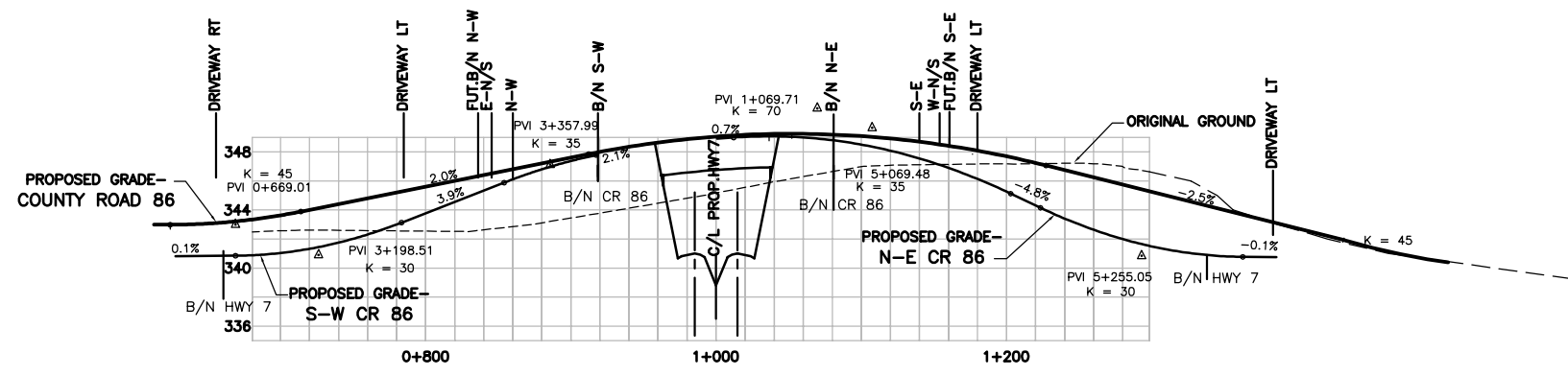




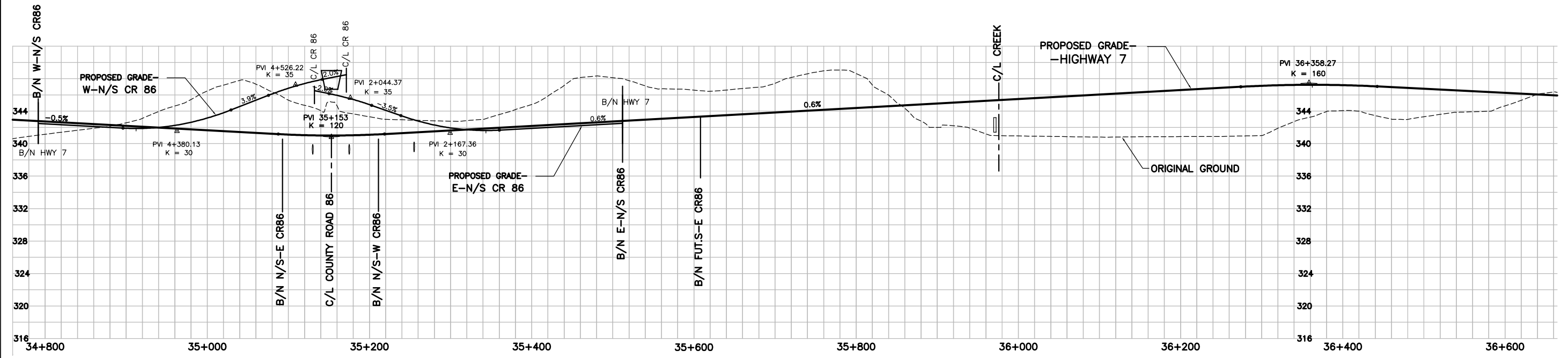
# HIGHWAY 7 PLANNING STUDY KITCHENER TO GUELPH RECOMMENDED ROUTE (2002)

**PLATE  
20**





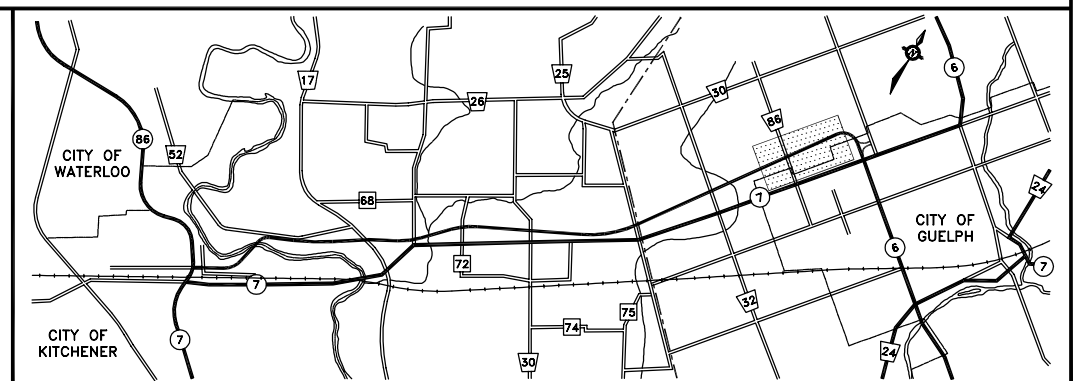
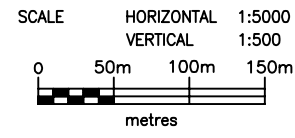
County Road 86

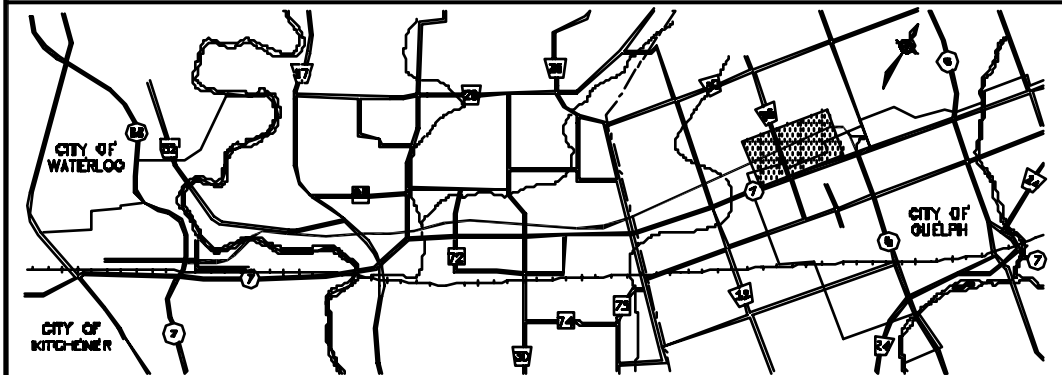
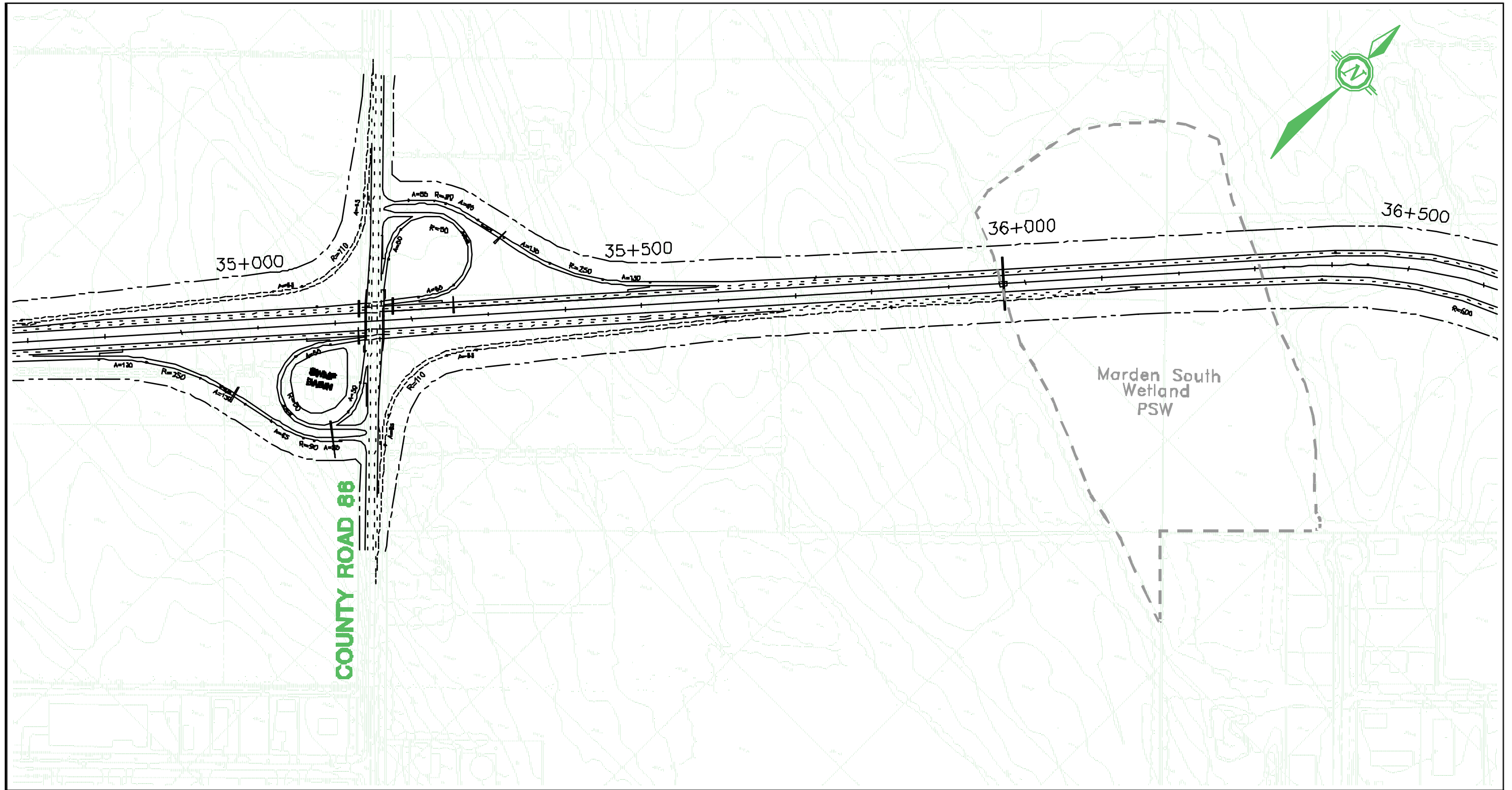


PLATE

21

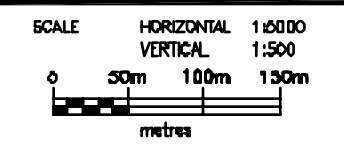
**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH  
RECOMMENDED ROUTE (2002)**





# HIGHWAY 7 PLANNING STUDY KITCHENER TO GUELPH RECOMMENDED ROUTE (2002)

PLATE  
**22**



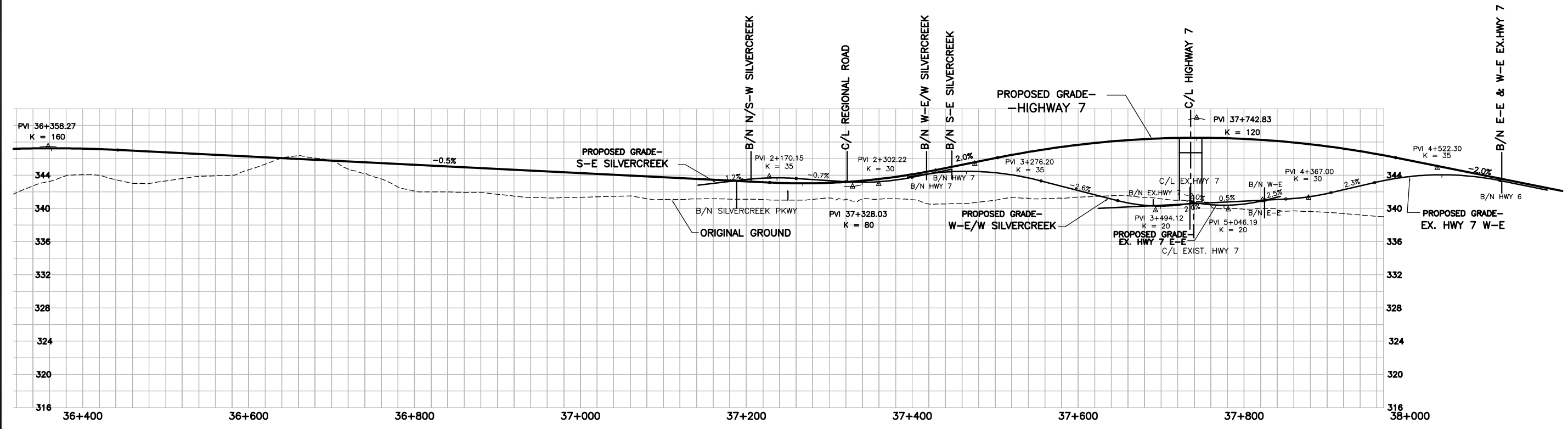
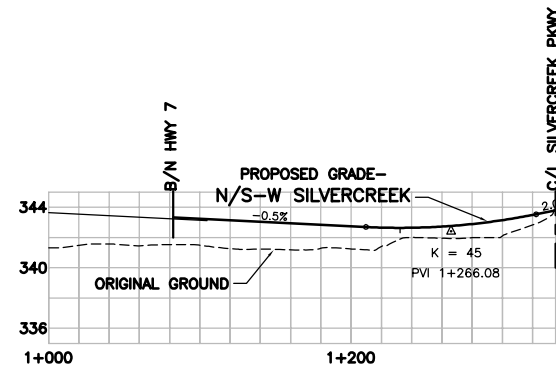
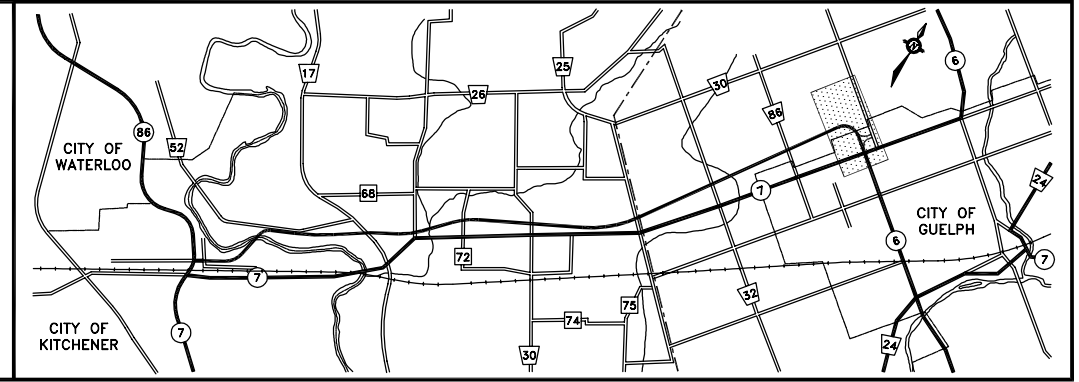
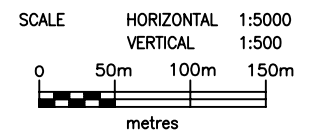
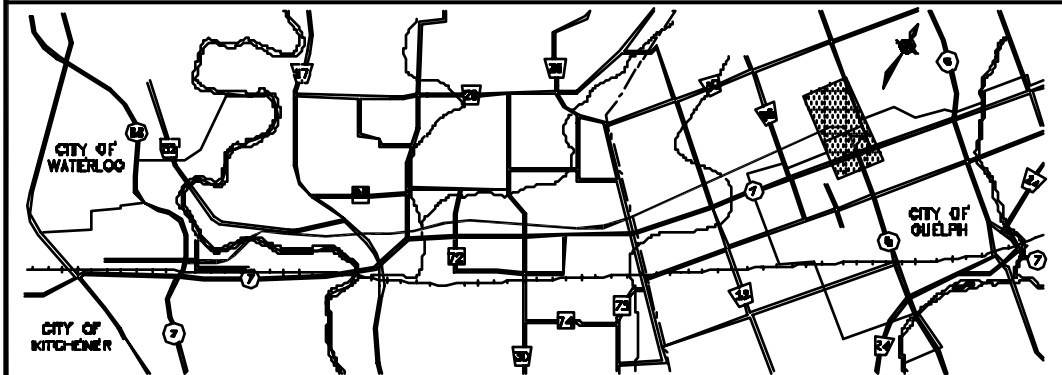
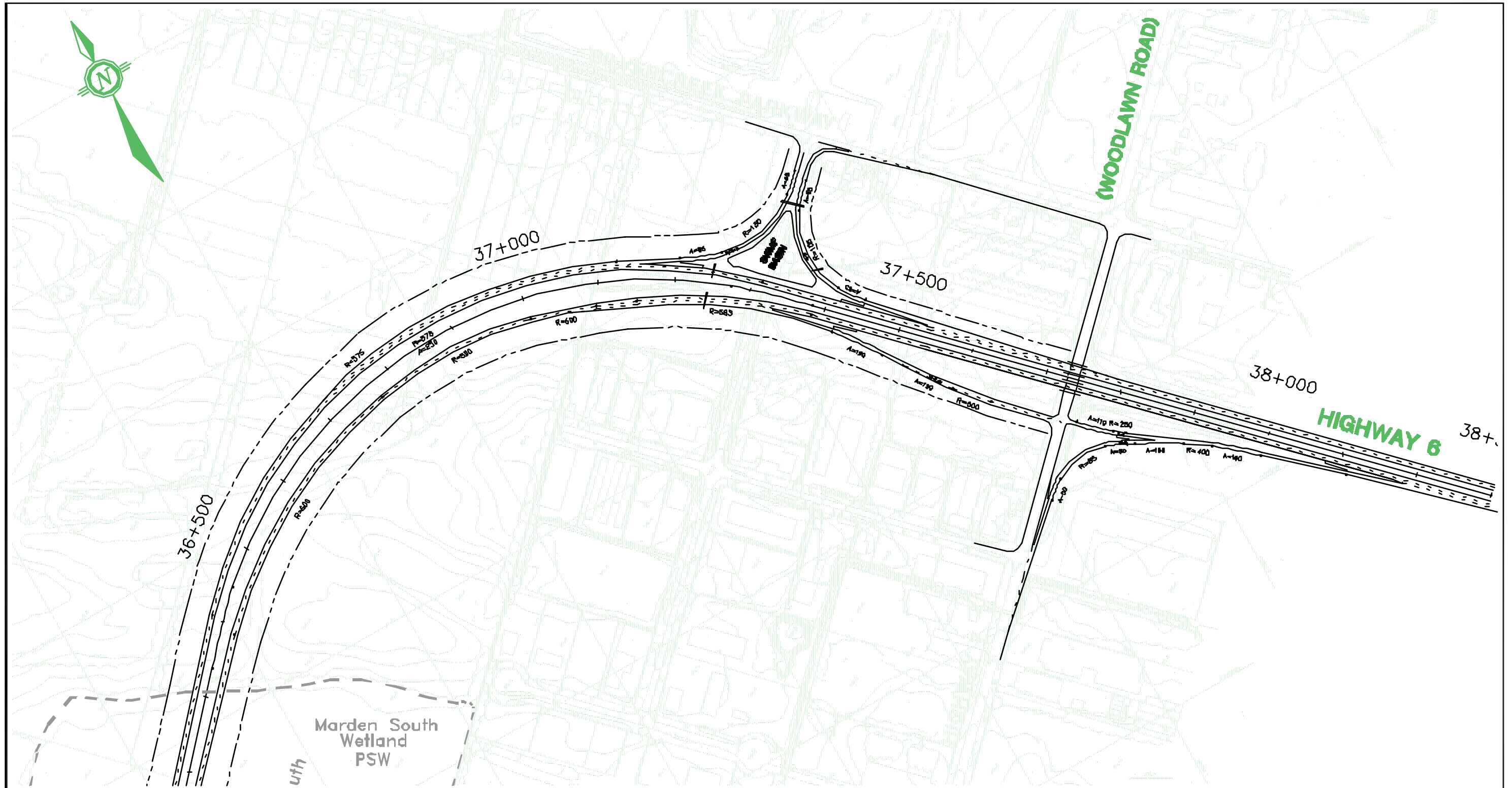


PLATE  
**23**

# HIGHWAY 7 PLANNING STUDY KITCHENER TO GUELPH RECOMMENDED ROUTE (2002)





**HIGHWAY 7 PLANNING STUDY  
KITCHENER TO GUELPH  
RECOMMENDED ROUTE (2002)**

**PLATE  
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