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Canada-United States-Ontario-Michigan
Border Transportation Partnership

# Detroit River International Crossing Environmental Assessment Study



## Preliminary Construction Cost Estimate Report for Practical Alternatives (Access Road and Inspection Plaza)

URS

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# Preface

The Detroit River International Crossing (DRIC) Environmental Assessment Study is being conducted by a partnership of the federal, state and provincial governments in Canada and the United States in accordance with the requirements of the Canadian Environmental Assessment Act (CEAA), the Ontario Environmental Assessment Act (OEAA), and the U.S. National Environmental Policy Act (NEPA). In 2006, the Canadian and U.S. Study Teams completed an assessment of illustrative crossing, plaza and access road alternatives. This assessment is documented in two reports: *Generation and Assessment of Illustrative Alternatives Report - Draft November 2006)* (Canadian side) and *Evaluation of Illustrative Alternatives Report (December 2006)* (U.S. side). The results of this assessment led to the identification of an Area of Continued Analysis (ACA) as shown in Exhibit 1.

Within the ACA, practical alternatives were developed for the crossings, plazas and access road alternatives. The evaluation of practical crossing, plaza and access road alternatives is based on the following seven factors:

- Changes to Air Quality
- Protection of Community and Neighbourhood Characteristics
- Consistency with Existing and Planned Land Use
- Protection of Cultural Resources
- Protection of the Natural Environment
- Improvements to Regional Mobility
- Cost and Constructability

This report pertains to the Cost and Constructability factor and is one of several reports that will be used in support of the evaluation of practical alternatives and the selection of the technically and environmentally preferred alternative. This report will form a part of the environmental assessment documentation for this study.

Additional documentation pertaining to the evaluation of practical alternatives is available for viewing/downloading at the study website (www.partnershipborderstudy.com).

# Table of Contents



## List of Exhibits



## List of Tables

# 1. Introduction

The Detroit River International Crossing Study Team presented preliminary construction cost estimates for the practical alternatives at Public Information Open House (PIOH) 4 held in December of 2006.

The practical alternatives originally presented at PIOH 3, were refined based on public and stakeholder consultation. The cost estimates presented at PIOH4 reflected these refinements to the practical alternatives.

This report documents preliminary construction cost estimates developed for the Access Road and Inspection Plaza practical alternatives in the Area of Continued Analysis (ACA) (refer to Exhibit 1). The construction cost estimates were based on a conceptual level of design, which is considered a reasonable basis for comparison of practical alternatives.

For costing purposes, the practical alternatives were divided into these segments:

- The Access Road alternatives from North Talbot Road to Malden Road;
- The Access Road alternatives from Malden Road to Inspection Plaza alternatives;
- The Inspection Plaza alternatives.

Quantities for major construction items were estimated from the conceptual plan, profile, and typical cross-section drawings. Unit costs were obtained from the Ontario Ministry of Transportation's unit cost database and other sources, as appropriate. The unit costs are in 2006 $CAD. The cost for minor items, contingencies and engineering were added as different percentages of the cost for major construction items. Costs for operation and maintenance, as well as property acquisition were considered separately.

As the Partnership expects the completion of construction by 2013, the preliminary construction costs were escalated to 2011 (which would be halfway during the construction). The cost increase was based on a projected annual growth rate of 3% to account for inflation to 2011, and the formula:

Year 2011 Construction Cost ($CAD)= Year 2006 Construction Cost ($CAD) X 1.03**5

Detailed calculations of preliminary construction cost estimates for the Access Road and Inspection Plaza practical alternatives are documented in Appendix A of this report.

The preliminary construction costs for the Crossing practical alternatives were developed jointly with the U.S. Study Team. Engineers from both Canadian and U.S. Teams undertook a Bridge Type Study that considered numerous options for cable stayed and/or suspension bridges at each crossing location. Refer to *the Bridge Type Study Report, Second Revision, July 2007* for preliminary construction cost estimates of the Crossing practical alternatives.

The objective of this report is to provide reasonable basis for a construction cost comparison of practical alternatives. This will provide useful input to the environmental assessment and evaluation.

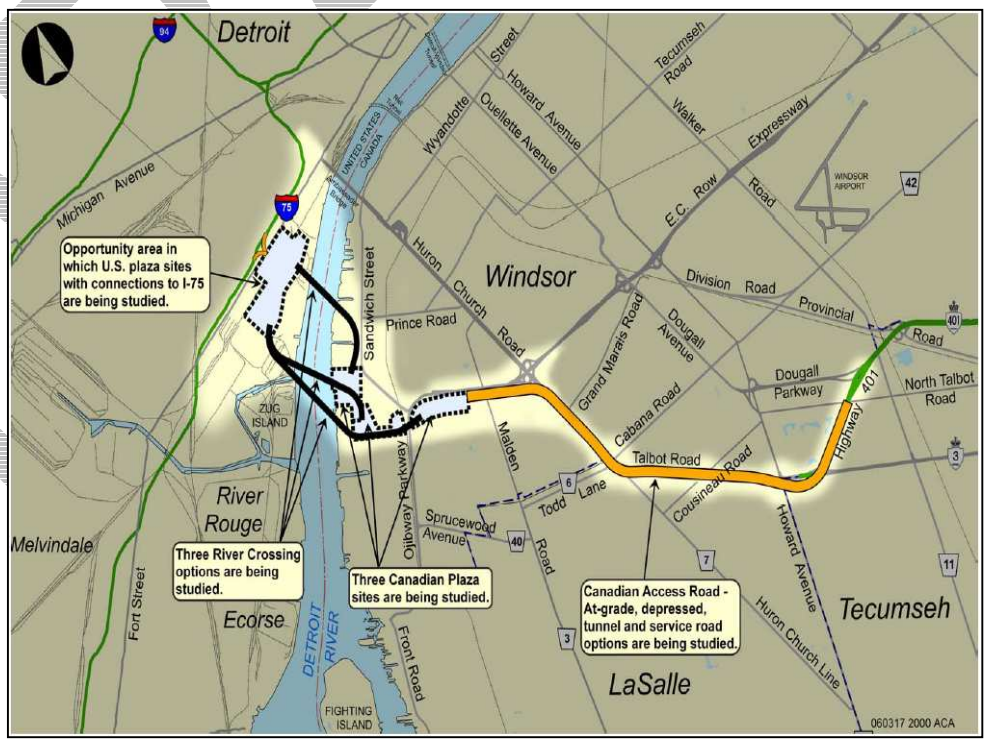
## Other Related Documents

The Study Team prepared a *draft Structural Planning Report for Practical Alternatives, July 2007*. The report included structural planning sheets showing structure type and associated preliminary cost estimate, for each structure proposed for the Access Road practical alternatives. These preliminary structural construction cost estimates were included in the overall cost estimates for the Access Road practical alternatives.

The Team prepared a *draft Stormwater Management Plan for Practical Alternatives, July, 2007.* The Plan included conceptual drainage designs developed for the Access Road practical alternatives with associated preliminary drainage cost estimates. The preliminary drainage cost estimates were included in the overall cost estimates for the Access Road practical alternatives.

The Team also completed a *draft Constructability Report for Access Road Practical Alternatives, May 2007.* This report discussed constructability of the practical alternatives including construction methods, construction staging and utility relocation.

**EXHIBIT 1: KEY PLAN OF THE AREA OF CONTINUED ANALYSIS**



## 1.1 Area of Continued Analysis

The Area of Continued Analysis (ACA) is an area within which the Access Road, Inspection Plaza and Crossing practical alternatives were developed. More in-depth technical and environmental investigations were undertaken to support the generation and assessment of practical alternatives. Exhibit 1 depicts the ACA.

The western portion of the ACA on the Canadian side includes a portion of the west Windsor industrial area at the south end of the Sandwich community. East of that industrial area, the ACA includes a continuous transportation corridor including E.C. Row Expressway, Huron Church Road, Highway 3 and Highway 401. On the U.S. side, the Area of Continued Analysis extends from Zug Island to the vicinity of Ambassador Bridge, and from the I-75 to the Detroit River.

## 1.2 Access Road Practical Alternatives

The five Access Road practical alternatives generally follow the existing Highway 3 and Huron Church Road corridor, and then run parallel and to the south of E.C. Row Expressway.

The Access Road will be a six-lane divided urban freeway with a 6.8m wide median. The median will include a Tall Wall concrete barrier and 3.0m wide shoulders. The outside shoulders are proposed to be 3.0m wide. Interchanges will be provided at Highway 3 and Huron Church Road (south of EC Row) for all alternatives. The Access Road practical alternatives will provide additional access at either St. Clair College or Todd Lane/Cabana Road. The Access Road alternatives will connect to the Inspection Plaza practical alternatives.

Two types of service roads are proposed for the Access Road practical alternatives. The first type includes a one-way service road on each side of the freeway whereas the second type includes a four-lane service road just on one side of the freeway.

Geometric design standards used for the Access Road practical alternatives are generally based on the MTO design standards and consultation with engineering specialists, agencies and stakeholders. The following is a summary of the five Access Road practical alternatives:

**Alternative 1A** includes an at-grade divided freeway along the Highway 3 / Huron Church Road corridor with below grade sections, and one-way service roads on each side of the freeway. Interchanges are proposed at Highway 3, St. Clair College and Huron Church Road.

**Alternative 1B** includes a below-grade divided freeway along the Highway 3 / Huron Church Road corridor, and one-way service roads on each side of the freeway. Interchanges are proposed at Highway 3, St. Clair College, and Huron Church Road.

**Alternative 2A** includes an at-grade divided freeway with below grade sections. This alternative is predominantly aligned west of the existing Highway 3 and Huron Church Road corridor. The existing section of Highway 3 and Huron Church Road will function as a service road to the freeway. Interchanges are proposed at Howard Avenue, Todd Lane/Cabana and Huron Church Road.

**Alternative 2B** includes a below grade freeway which is predominantly aligned west of the existing Highway 3 and Huron Church Road corridor. This section of Highway 3 and Huron Church Road would function as a service road to the freeway. Interchanges are proposed at Howard Avenue, Todd Lane/Cabana and Huron Church Road.

**Alternative 3** is a cut and cover tunnelled freeway with service roads (Highway 3 and Huron Church Road) constructed on top of the tunnel. Interchanges are proposed at Highway 3, St. Clair College and Huron Church Road.

Typical cross-sections for each alternative are presented in Appendix C.

Alternatives 1A and 2A include localized cross-sections which are below grade. The below grade cross-sections are primarily located at major crossing roads such as Howard Avenue, Cousineau Road / Sandwich Parkway, Cabana Road / Todd Lane and Spring Garden Road. In addition, Alternative 3 includes localized below grade cross-sections, which function as a transition between the at-grade and tunnel cross-sections.

An exhibit of the Access Road practical alternatives is found in Appendix B.

## 1.3 Inspection Plaza Practical Alternatives

There are four Inspection Plaza practical alternatives. Plaza A is located south of EC Row Expressway, east of Ojibway Parkway. Plazas B and B1 are located in the Brighton Beach Industrial Park between Broadway Street and McKee Street. Plaza C is adjacent to the Detroit River, west of Sandwich Street and south of Prospect Avenue. All plaza locations are approximately 30-40 hectares (80 acres) in size, and have been designed to accommodate the future expansion need to 2035 and beyond.

An exhibit of the Inspection Plaza practical alternatives is found in Appendix B.

## 1.4 Crossing Practical Alternatives

The Crossing practical alternatives were developed jointly with the U.S. Study Team. Engineers from both Canadian and U.S. Teams undertook a Bridge Type Study that considered numerous options for cable stayed and/or suspension bridges at each crossing location. The study considered optional locations for piers, anchor blocks and touchdown points, as well as elements that affect the width of the bridge (lane widths, shoulder areas, medians, sidewalks and protection of the cables).
There are three Crossing practical alternatives: Crossing A, Crossing B, and Crossing C.

In consultation with the Canadian and U.S. Coast Guards and representatives from the shipping industry, it has been determined that the placement of a pier in the Detroit River would have negative impacts on navigation and marine safety. Therefore, the recommended options clear span the river, and do not have piers in the water. Suspension and cable-stayed bridges are being considered for Crossing B and C. The clear span at Crossing A is over 1.2 km (0.7 miles), which is too long for a cable-stayed bridge. Therefore, only a suspension bridge is being considered for Crossing A. Refer *to the Bridge Type Study Report, Second Revision, July 2007*.

An exhibit of the Crossing practical alternatives is found in Appendix B.

# 2. Preliminary Construction Cost Estimates for Access Road Practical Alternatives

## 2.1 Highway Engineering

The Study Team developed preliminary construction costs for six-lane at grade, below grade and above grade divided urban freeway sections. Quantities were estimated from conceptual plans, profiles and typical cross sections for major items including concrete pavement, asphalt pavement on shoulders, open grade drainage layer, granular base, earthworks, Tall wall median barrier, noise walls, and light poles. Unit prices for major items were obtained from the MTO's unit cost database. This information is included under Supporting Data as part of Appendix A. The unit prices are in 2006 Canadian Dollars. Cost of minor items was added as a percentage of the cost of major items. Speed change lanes and inside shoulder widening for sight distances were not quantified for each alternative, but are covered by an overall contingency of 20%. The Study Team also developed separate unit costs for 6-lane freeway tunnel section, municipal service road and interchange ramps. Refer to Appendix A of this report for detailed calculations of these unit prices.

Preliminary construction costs for interchanges were based on the unit cost of interchange ramps, overall length of ramps, the number and cost of underpass and overpass structures at interchanges, and preliminary construction cost estimates for interchanges in the Windsor area provided by MTO. The preliminary construction cost for a new typical MTO interchange is estimated from $12M to $15M, and the cost of a reconstructed interchange is estimated from $8M to $12M. The cost of freeway-to-freeway style interchanges ($45M to $50M) was based on another MTO transportation project, the Highway 404 Extension. This estimate was used as a benchmark reference for similar types of interchanges on this project.

## 2.2 Structural Engineering

The Study Team prepared the *draft Structural Planning Report for Practical Alternatives* in July 2007. The report included structural planning sheets showing structure type and associated preliminary cost estimate, for each structure proposed for the Access Road practical alternatives. These preliminary structural construction cost estimates were included in the overall cost estimates for Access Road practical alternatives.

The preliminary structural cost estimate was based on a unit cost of $2000 / $m^2$ for a typical MTO structure with Canadian Precast Concrete Institute (CPCI) girders. This unit cost was obtained from the MTO's unit cost database. The cost is in 2006 $CAD. Unit costs for structures with greater complexities are shown below:

- $2000 / m$^2$: bridge with integral abutments
- $2100 / m$^2$: bridge with integral abutments and Cantilever Retaining Wall System (RSS)
- $2100 / m$^2$: bridge with semi-integral abutments
- $2200 / m$^2$: bridge with semi-integral abutments and RSS walls
- $2300 / m$^2$: post-tensioned bridge with semi-integral abutments
- $2500 / m$^2$: bridge with semi-integral abutments above Essex Terminal Railway (ETR) tracks

## Below-Grade Freeway Section

The Study Team developed preliminary construction costs for the structural portion (retaining walls) of 6-lane below-grade freeway section. Below-grade freeway sections are included in Alternatives 1A, 1B, 2A and 2B, and 3. It was assumed, after discussions with geotechnical engineering consultant, that retaining walls would be 1.05m diameter reinforced concrete caissons with concrete facing. The total depth of caissons was assumed to be approximately 24m.

Details of structural unit cost estimates for the 7m and 12m deep below-grade freeway sections are given in Appendix D. Structural unit costs were based on MTO's unit cost database for caissons adjusted to 1.05m diameter caissons and large quantities required for this project. The structural unit costs are in 2006 Canadian Dollars. Earth excavation, construction staging, utility relocations, engineering costs, contingencies, etc. were estimated as part of the Highway Engineering component.

A summary of structural unit costs for caisson walls is given in Table 1:

**TABLE 1: SUMMARY OF STRUCTURAL UNIT COSTS FOR CAISSON WALLS**

| | Below-Grade Freeway Section Depth | Unit length | Structural Unit Cost for Caisson Walls ($CAD / m) |
|---|---|---|---|
| 1 | 7m | m | $45,000 |
| 2 | 12m | m | $65,000 |
| 3 | Depth varies from 0 to 7m | m | $30,000 |
| 4 | Depth varies from 0 to 12m | m | $45,000 |
| 5 | Depth varies from 0 to 18m | m | $65,000 |
| 6 | Depth varies from 7m to 12m | m | $65,000 |
| 7 | Depth varies from 12m to 18m | m | $75,000 |

## Tunnel Freeway Section

Two basic types of tunnel construction have been considered, namely "bored" and "cut and cover". Cut and cover tunnels were selected over bored tunnels for the following reasons:

- A standard cross-section for a six-lane freeway would require a tunnel boring machine (TBM) with a diameter of over 18m. The largest TBM constructed to date in the world is just over 15m in diameter. Developing and using a TBM with a diameter of over 18m would entail considerable risk to the schedule and is not considered practical for this project.
- Soil conditions are not suitable for tunnel boring. A bored soft ground tunnel would result in a limited thickness of soil above the tunnel. This could cause unacceptable ground surface settlements that could impact structures (houses), utilities and roadways.

The preliminary construction cost estimate for the "cut and cover" six-lane freeway tunnel section was based on the conceptual plan, profile and typical cross section developed for the tunnel alternative (Alternative 3). The typical section was based on full transverse ventilation in tunnel with two ventilation buildings, one located near each portal. Ventilation requirements are discussed in the "Ventilation Technical Memorandum-Phase 2, Proposed Highway 401 Tunnel (Talbot Road – Huron Church Road Corridor)" by RWDI, August 4, 2006.

In that memo, three options for ventilating the tunnel by full-transverse means were proposed. These options were:

- Two ventilation buildings located between the portals and midpoint of the tunnel. Ideal location would be 1.5km from either portal end;
- Two ventilation buildings located at the portals of the tunnel; and
- One ventilation building located at the midpoint of the tunnel.

For initial costing purposes, the option with two ventilation buildings located near the portals was selected. Two ventilation buildings would have much smaller footprints than the option with one ventilation building. Also, the size of ventilation ducts in tunnel would be smaller with two buildings as compared to one ventilation building.

The vertical profile control (which is the top of driving lanes in tunnel) is typically 10.5m below the original ground. The tunnel section will be a twin concrete box section with an overall width of approximately 58m and a height of approximately 11m. This means the bottom of excavation would be approximately 14m below the original ground surface.

The Study Team considered three different types of support of excavation walls for the tunnel alternative:

- Caisson walls with tiebacks;
- Slurry walls with tiebacks;
- Diaphragm walls with tiebacks.

The tunnel is proposed to be constructed in two stages to maintain existing traffic along the Talbot Road / Huron Church Road corridor. No closure of this major international transportation route will be allowed during the construction.

Structural unit costs developed for the tunnel freeway assumed that the base slab and walls would be cast in place concrete. However, top (roof) slab could be made of pre-cast concrete beams because they are more economical than cast-in-place concrete beams. Structural tunnel unit costs are based on the MTO unit price database, where applicable. They are adjusted for large quantities of concrete required on this project. The Project Team also contacted a major Ontario contractor to seek input into unit price for concrete on large-scale construction projects. These unit costs were then compared to those prepared by the Study Team tunnel specialists. The structural tunnel unit costs are in 2006 Canadian Dollars. Earthworks, drainage, construction staging, tunnel ventilation, electrical and mechanical systems in tunnel, engineering costs, contingencies, etc. are estimated as a part of the Highway Engineering component. Refer to Table 2 for Summary of Structural Unit Costs for different tunnel sections:

### TABLE 2: SUMMARY OF STRUCTURAL UNIT COSTS FOR TUNNEL SECTION

| | Type of supports of excavation walls | Unit length of tunnel | Unit cost for approx. 58m wide tunnel (CAD$ / m) |
|---|---|---|---|
| 1 | Caisson walls with tiebacks | m | $185,300 |
| 2 | Slurry walls with tiebacks | m | $200,000 |
| 3 | Diaphragm walls with tiebacks | m | $214,400 |
| | Recommended unit cost for tunnel section | m | $215,000 |

Table 3 below shows the preliminary construction cost estimate developed for the tunnel section:

### TABLE 3: UNIT COST (PER KM) FOR TUNNEL IN 2006 CAD DOLLARS

| Item | Unit | Unit Price | Quantity | Total |
|---|---|---|---|---|
| Support of Excavation Walls | $m^2$ | $432 | 215000.0 | $92,840,909 |
| Temporary Surface Traffic Lanes | $m^2$ | $114 | 127300.0 | $14,465,909 |
| Excavation | $m^3$ | $11 | 3300000.0 | $37,500,000 |
| Haul and Disposal | $m^3$ | $25 | 4290000.0 | $107,250,000 |
| Temporary Bridge Decking | each | $1,704,545 | 5.0 | $8,522,727 |
| Concrete Tunnel | m | $215,000 | 5800.0 | $1,247,000,000 |
| Backfill | $m^3$ | $73 | 1100000.0 | $80,000,000 |
| Final Surface Traffic Lanes | $m^2$ | $114 | 174200.0 | $19,795,455 |
| Standpipe | L.M. | $455 | 12800.0 | $5,818,182 |
| Pump Station | each | $909,091 | 3.0 | $2,727,273 |
| Signs, Striping | L.S. | $3,409,091 | 1.0 | $3,409,091 |
| Sub-Total | | | | $1,619,329,545 |
| Misc. Fittings | % | 2.0% | | $32,386,591 |

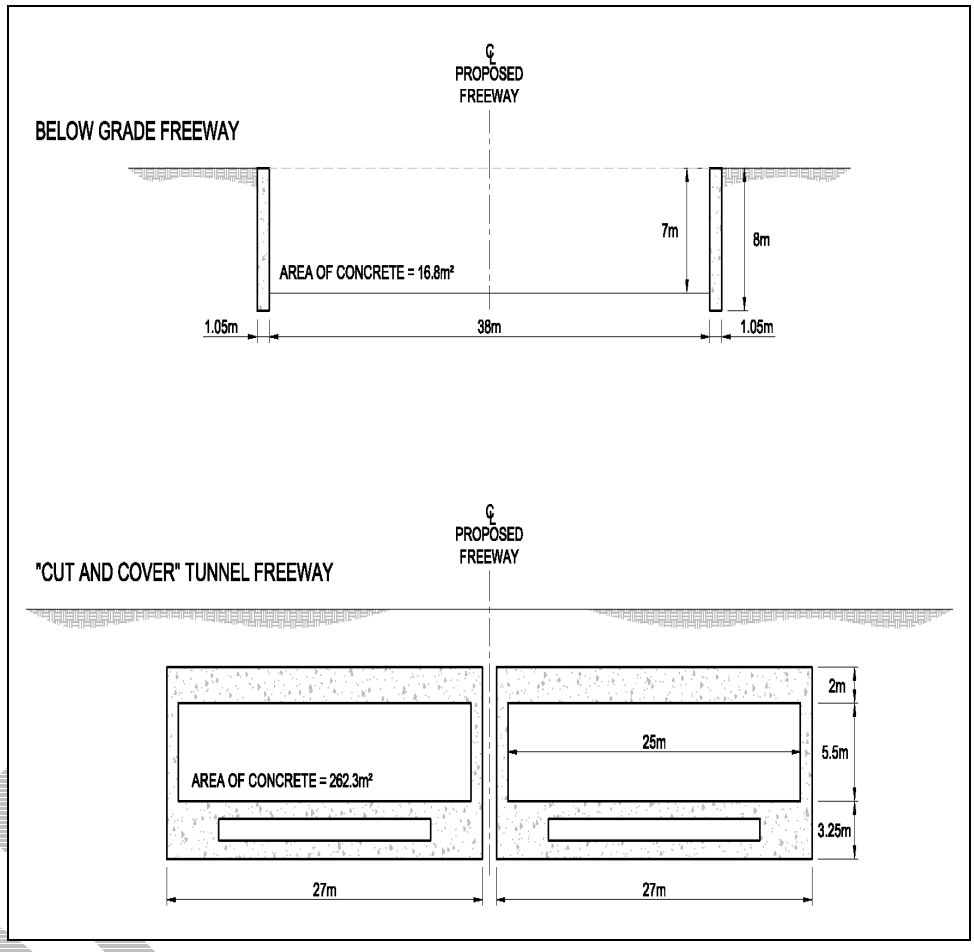
| Item | Unit | Unit Price | Quantity | Total |
|---|---|---|---|---|
| Communication, Control, CCTV | % | 4.0% | | $64,773,182 |
| Tunnel Lighting and Power | % | 3.0% | | $48,579,886 |
| | | | **GRAND TOTAL COST** | **$1,765,069,205** |
| | | | TOTAL LENGTH OF TUNNEL (km) | 5.8 |
| | | | **Unit Cost per km** | **$304,322,277** |

Concrete placed in tunnel boxes would be the single most expensive item affecting tunnel cost. As shown above, the preliminary cost estimate for the basic tunnel boxes was approximately $1.8 billion for the ±6km long tunnel section. The cost of concrete placed in tunnel boxes was estimated at approximately $1.3 billion, which is 72% of the total cost. Items that could affect the size of tunnel boxes, like ventilation ducts, speed change lanes or increasing widths of shoulders at horizontal curves, would have a large impact on tunnel cost. As well, the cost will be very sensitive to changes in the cost of concrete.

The size of ventilation ducts will depend on the length of tunnel and number of ventilation buildings placed along its alignment. For a short tunnel with a large number of ventilation buildings, the size of ventilation ducts would be relatively small as compared to a long tunnel with small number of ventilation buildings. Two ventilation buildings are proposed, one at each portal for the tunnel alternative, which resulted in quite large size of ventilation ducts. The preliminary unit cost of placing concrete in two tunnel boxes with large ventilation ducts was estimated at $215,000 per linear metre.

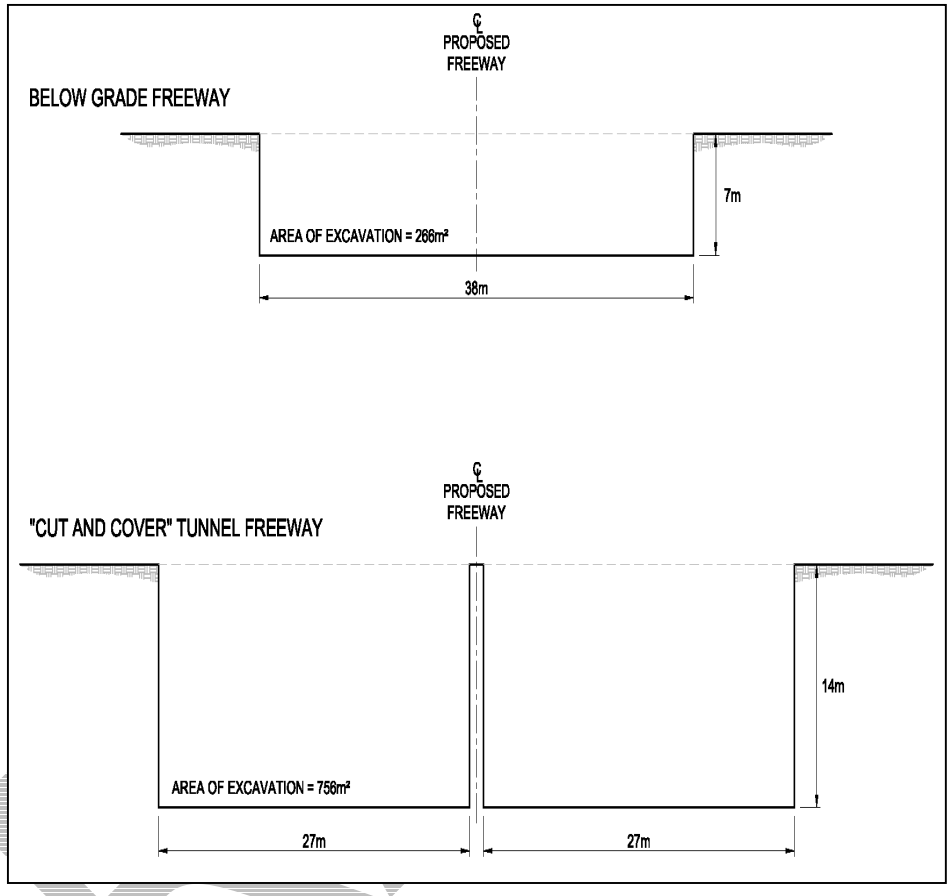
The cost of supplying and placing the reinforced concrete for tunnel boxes would be the single most expensive construction item for the tunnel option. Refer to Figure 1 below showing the difference in unit area of concrete required for below grade and tunnel freeway sections. The tunnel section will require approximately sixteen times more concrete than the below grade freeway section.

## FIGURE 1 – UNIT AREA FOR CONCRETE




The difference in cost between tunnel and below-grade freeway sections can be also explained by the depth and area of excavation. Figure 2 shows an average depth of excavation for the freeway sections, as well as the unit areas of excavation. The quantity of excavation for tunnel section will be approximately three times larger than that for the below grade freeway section.

**FIGURE 2 – DEPTH AND UNIT AREA FOR EXCAVATION**




As noted previously, cost estimates are based on a conceptual level of design. Localized widenings for speed change lanes and sight distances have not been specifically designed at this stage. However, the need for widenings such as these would add considerable cost to the tunnel option.

Length of speed change lanes constructed in a tunnel will depend on a number of interchanges constructed along its alignment. Fewer interchanges would result in less speed change lanes. For the Tunnel alternative, the length of speed change lanes constructed in the tunnel would be approximately two kilometres, which is 33% of the total length. Cost difference between placing concrete in tunnel boxes for the six-lane cross section with speed change lanes and the section without speed change lanes would be approximately $40 million. This has not been explicitly allowed for in the current estimate.

Tunnel costs would be also affected in instances where shoulders are required to be widened at horizontal curves to accommodate lateral clearances for stopping sight distance. For example, for a design speed of 120 km/h, a horizontal curve with R=1700m will accommodate lateral clearance for stopping sight distance of 245m. However, two horizontal curves on the DRIC tunnel alignment have radii less than 1700m. The

approximate length of these two horizontal curves is 1.3km. Two shoulders (inside and outside) need to be widened approximately 3m to accommodate lateral clearance. The cost difference between the section which accommodates and the one which does not accommodate lateral clearance would be approximately $26 million. Again, this has not been included at this time.

In summary, there are several design parameters which would cause the cost of the tunnel to increase or decrease. These will be further evaluated if the tunnel alternative is selected; however, the current level of estimating is considered sufficient for comparison and evaluation purposes.

## Construction Staging Cost

Construction staging for the Access Road practical alternatives 2A and 2B will be the most simple and the least time-consuming as compared to other alternatives. Traffic will stay on Highway 3 / Huron Church Road while the new Access Road is being built.

Construction staging for the Access Road practical alternatives 1A and 1B will be more complex and time consuming as compared to alternatives 2A and 2B. Service roads need to be built first. Then the existing traffic on Highway 3 / Huron Church Road needs to be shifted to service roads so that the new Access Road could be built.

Construction staging for the tunnel alternative will be the most complex and time consuming as compared to any other alternative. It will involve extensive network of temporary detours placed along and across the site in order to maintain the flow of traffic and allow access to properties along the corridor. Additionally, more construction stages will be required for the tunnel alternatives because of the need to build the tunnel section in two halves.

Refer to *the draft Constructability Report for Access Road Practical Alternatives, May 2007* for more in –depth discussions on construction staging, construction methods and utility relocations.

# 3. Preliminary Construction Cost Estimates for Inspection Plaza Practical Alternatives

The Study Team developed the preliminary construction cost estimates for Inspection Plaza. The cost did not include the land or relocation costs, the environmental clean-up cost, and it assumed that the inspection plaza would be constructed approximately at existing grade. For Plaza C, the cost of relocating Keith Transformer Station was not included. At the Practical Alternatives stage, the cost of each plaza alternative is considered the same. Refer to Table 4 below for the Preliminary Construction Cost Estimate of the Inspection Plaza:

**TABLE 4: PRELIMINARY CONSTRUCTION COST ESTIMATE FOR INSPECTION PLAZA**

| | Units | Unit Price | Estimate | Total | Comments |
|---|---|---|---|---|---|
| Primary Inspection Booths: | | | | | |
| Passenger (20 inbound, 3 outbound) | 23 | $48,000 | $1,104,000 | | |
| Bi-Level (19 inbound, 2 outbound) | 21 | $72,000 | $1,512,000 | | |
| Toll Booths (outbound) | 12 | $48,000 | $576,000 | | |
| Gatehouses | 3 | $48,000 | $144,000 | **$3,336,000** | |
| Buildings | M2 | | | | |
| Main | 3,080.4 | $2,000 | $6,160,821 | | |
| Commercial Office | 3,045.4 | $2,000 | $6,090,764 | | |
| Commercial Warehouse | 1,602.4 | $2,000 | $3,204,857 | | |
| Bus | 273.5 | $2,000 | $547,012 | | |
| Outbound | 28.0 | $2,000 | $55,900 | **$16,059,355** | |
| Agricultural | 1,000.0 | $2,000 | $2,000,000 | **$2,000,000** | |
| Toll House | | | $100,000 | **$100,000** | parking included |
| Operations/Maintenance | 3,000.0 | $2,000 | $6,000,000 | **$6,000,000** | |
| Broker | 1,602.4 | $2,000 | $100,000 | **$100,000** | |
| VACIS | | | $600,000 | **$600,000** | NFBC add $1.6M for equipment |
| Duty Free | | | $4,500,000 | **$4,500,000** | parking included |
| Curr. Exch. Public Washroom | | | $3,800,000 | **$3,800,000** | parking included |
| Salt Storage | | | $550,000 | **$550,000** | |
| Plaza | | | | | |
| Pavement Concrete | 130000.0 | $175 | $22,750,000 | **$22,750,000** | |
| Pavement Asphalt | 130000.0 | $50 | $6,500,000 | **$6,500,000** | |

| | Units | Unit Price | Estimate | Total | Comments |
|---|---|---|---|---|---|
| Canopy | | | | | |
| PILs | | | | | |
| Passenger | 15300.0 | $450 | $6,885,000 | | |
| Bi-Level | 0.0 | | | | |
| Passenger Secondary | | | | **$6,885,000** | |
| | | **Sub-Total** | **$73,180,355** | | |
| Grading | $1,200,000 | | | | |
| Clearing | $130,000 | | | | |
| Slope and erosion Control | $4,000,000 | | | | |
| Landscaping | $2,000,000 | 25% | $18,295,089 | **$18,295,089** | |
| Stormwater | $300,000 | | | | |
| Fencing/ sound walls | $1,000,000 | | | | |
| Signing | $1,000,000 | | | | |
| Lighting | $1,200,000 | | | | |
| Utilities | $350,000 | | | | |
| Total site prep | $11,180,000 | | | | |
| | | | **TOTAL** | **$91,475,444** | |
| **Contingency** | | | **Total time 1.60** | **$146,360,710** | |

Preliminary construction cost estimate for the Inspection Plaza was rounded to $150M (2006 $CAD) or $180M (2011 $CAD).

# 4. Lifecycle and Maintenance (L&M) Costs for Access Road Practical Alternatives

For the assessment purposes, the relative difference in the L&M costs between the Access Road alternatives will be discussed here.

The at-grade Access Road alternatives would have the lowest lifecycle and maintenance costs as compared to the other alternatives.

The below-grade Access Road alternatives will require higher lifecycle and maintenance costs as compared to at-grade alternatives. The premium L&M costs will include the lifecycle cost for retaining walls, the replacement cost for drainage pumps, electrical and mechanical costs for pump houses, cost of sediment removal from syphons, cost of snow removal in winter, etc.

The highest lifecycle and maintenance costs will be required for the tunnel option. The cost premium will include lifecycle cost for concrete in tunnel and retaining walls, cost of replacing ventilation fans, mechanical and electrical maintenance costs, cost of replacing drainage pumps, communication, CCTV, Control Centre, fire & frost protections, emergency maintenance costs and energy costs to run the mechanical systems (ventilation), ventilation buildings, control centre and illumination.

# 5. Overall Conclusions

## Access Road Practical Alternatives – Preliminary Construction Cost Estimates

Preliminary construction cost estimates (2011 $CAD) for the Access Road Practical Alternatives from North Talbot Road to Malden Road range from approximately $620M to $3800M. Specifically:

- Preliminary construction costs of at-grade alternatives are estimated in the order of $620M – $920M
- Preliminary construction costs of below-grade options are about $1000M - $1400M
- Preliminary construction costs of the tunnel alternative are estimated between $3600M and $3800M.

The increased costs for the tunnel alternative relate directly to increase in quantities for concrete needed to build tunnel boxes and support of excavation walls as well as the excavation, ventilation, electrical, drainage, communication and Emergency Management System costs.

A summary of preliminary construction cost estimates for the Access Road Practical Alternatives is given in Table 5 below. The costs are in the 2011 Canadian Dollars:

**TABLE 5: SUMMARY OF PRELIMINARY CONSTRUCTION COST ESTIMATES FOR ACCESS ROAD PRACTICAL ALTERNATIVES**

| **Practical Alternatives** | | **Preliminary Construction Costs $CAD 2011** |
|---|---|---|
| Access Road | Inspection Plaza | North Talbot Road to Malden Road |
| 1A | A | $920M |
| 1B | A | $1,360M |
| 2A | A | $790M |
| 2B | A | $1,200M |
| 3 | A | $3,780M |
| 1A | B & C | $750M |
| 1B | B & C | $1,190M |
| 2A | B & C | $620M |
| 2B | B & C | $1,030M |
| 3 | B & C | $3,610M |

## Inspection Plaza Practical Alternatives – Preliminary Construction Costs

The preliminary construction cost estimate for the plazas is $180M (2011 $CAD). The preliminary construction cost estimates for the access road alternatives from Malden Road to the inspection plaza alternatives including the costs of the plazas range from $180M - $280M (2011 $CAD) depending on which plaza alternative is chosen (not inclusive of costs associated with the potential relocation of the Keith Transformer Station under plaza C).

For comparison purposes, access roadways from Malden Road to the Inspection Plaza alternatives are considered as part of the cost of the plaza.

# APPENDIX A

## Preliminary Construction Cost Estimates for Access Road and Inspection Plaza Practical Alternatives

## Preliminary Practical Alternative Costs (2011) - Property Cost Not Included

| OPTION | | | | | NORTH TALBOT ROAD TO MALDEN ROAD ($CAD) | MALDEN ROAD TO PLAZA ($CAD) | PLAZA ($CAD) | CROSSING ($CAD) | TOTAL ($CAD) |
|---|---|---|---|---|---|---|---|---|---|
| PRACTICAL ALTERNATIVE | | PLAZA | | CROSSING | | | | | |
| 1A | + | A | + | A | $920,000,000 | $0 | $180,000,000 | TBD | TBD |
| 1B | + | A | + | A | $1,360,000,000 | $0 | $180,000,000 | TBD | TBD |
| 2A | + | A | + | A | $790,000,000 | $0 | $180,000,000 | TBD | TBD |
| 2B | + | A | + | A | $1,200,000,000 | $0 | $180,000,000 | TBD | TBD |
| 3 | + | A | + | A | $3,780,000,000 | $0 | $180,000,000 | TBD | TBD |
| 1A | + | A | + | B | $920,000,000 | $0 | $180,000,000 | TBD | TBD |
| 1B | + | A | + | B | $1,360,000,000 | $0 | $180,000,000 | TBD | TBD |
| 2A | + | A | + | B | $790,000,000 | $0 | $180,000,000 | TBD | TBD |
| 2B | + | A | + | B | $1,200,000,000 | $0 | $180,000,000 | TBD | TBD |
| 3 | + | A | + | B | $3,780,000,000 | $0 | $180,000,000 | TBD | TBD |
| 1A | + | B | + | B | $750,000,000 | $80,000,000 | $180,000,000 | TBD | TBD |
| 1B | + | B | + | B | $1,190,000,000 | $80,000,000 | $180,000,000 | TBD | TBD |
| 2A | + | B | + | B | $620,000,000 | $80,000,000 | $180,000,000 | TBD | TBD |
| 2B | + | B | + | B | $1,030,000,000 | $80,000,000 | $180,000,000 | TBD | TBD |
| 3 | + | B | + | B | $3,610,000,000 | $80,000,000 | $180,000,000 | TBD | TBD |
| 1A | + | A | + | C | $920,000,000 | $0 | $180,000,000 | TBD | TBD |
| 1B | + | A | + | C | $1,360,000,000 | $0 | $180,000,000 | TBD | TBD |
| 2A | + | A | + | C | $790,000,000 | $0 | $180,000,000 | TBD | TBD |
| 2B | + | A | + | C | $1,200,000,000 | $0 | $180,000,000 | TBD | TBD |
| 3 | + | A | + | C | $3,780,000,000 | $0 | $180,000,000 | TBD | TBD |
| 1A | + | B | + | C | $750,000,000 | $80,000,000 | $180,000,000 | TBD | TBD |
| 1B | + | B | + | C | $1,190,000,000 | $80,000,000 | $180,000,000 | TBD | TBD |
| 2A | + | B | + | C | $620,000,000 | $80,000,000 | $180,000,000 | TBD | TBD |
| 2B | + | B | + | C | $1,030,000,000 | $80,000,000 | $180,000,000 | TBD | TBD |
| 3 | + | B | + | C | $3,610,000,000 | $80,000,000 | $180,000,000 | TBD | TBD |
| 1A | + | C | + | C | $750,000,000 | $100,000,000 | $180,000,000 * | TBD | TBD |
| 1B | + | C | + | C | $1,190,000,000 | $100,000,000 | $180,000,000 * | TBD | TBD |
| 2A | + | C | + | C | $620,000,000 | $100,000,000 | $180,000,000 * | TBD | TBD |
| 2B | + | C | + | C | $1,030,000,000 | $100,000,000 | $180,000,000 * | TBD | TBD |
| 3 | + | C | + | C | $3,610,000,000 | $100,000,000 | $180,000,000 * | TBD | TBD |

**TBD - TO BE DETERMINED**

*** DOES NOT INCLUDE COST OF KEITH TRANSFORMER STATION RELOCATION (APPROXIMATELY $180 MILLION)**

## Preliminary Practical Alternative Costs (2006) - Property Cost Not Included

| OPTION | | | | | NORTH TALBOT ROAD TO MALDEN ROAD ($CAD) | MALDEN ROAD TO PLAZA ($CAD) | PLAZA ($CAD) | CROSSING ($CAD) | TOTAL ($CAD) |
|---|---|---|---|---|---|---|---|---|---|
| PRACTICAL ALTERNATIVE | | PLAZA | | CROSSING | | | | | |
| 1A | + | A | + | A | $790,000,000 | $0 | $150,000,000 | TBD | TBD |
| 1B | + | A | + | A | $1,170,000,000 | $0 | $150,000,000 | TBD | TBD |
| 2A | + | A | + | A | $680,000,000 | $0 | $150,000,000 | TBD | TBD |
| 2B | + | A | + | A | $1,040,000,000 | $0 | $150,000,000 | TBD | TBD |
| 3 | + | A | + | A | $3,260,000,000 | $0 | $150,000,000 | TBD | TBD |
| 1A | + | A | + | B | $790,000,000 | $0 | $150,000,000 | TBD | TBD |
| 1B | + | A | + | B | $1,170,000,000 | $0 | $150,000,000 | TBD | TBD |
| 2A | + | A | + | B | $680,000,000 | $0 | $150,000,000 | TBD | TBD |
| 2B | + | A | + | B | $1,040,000,000 | $0 | $150,000,000 | TBD | TBD |
| 3 | + | A | + | B | $3,260,000,000 | $0 | $150,000,000 | TBD | TBD |
| 1A | + | B | + | B | $650,000,000 | $70,000,000 | $150,000,000 | TBD | TBD |
| 1B | + | B | + | B | $1,020,000,000 | $70,000,000 | $150,000,000 | TBD | TBD |
| 2A | + | B | + | B | $540,000,000 | $70,000,000 | $150,000,000 | TBD | TBD |
| 2B | + | B | + | B | $900,000,000 | $70,000,000 | $150,000,000 | TBD | TBD |
| 3 | + | B | + | B | $3,120,000,000 | $70,000,000 | $150,000,000 | TBD | TBD |
| 1A | + | A | + | C | $790,000,000 | $0 | $150,000,000 | TBD | TBD |
| 1B | + | A | + | C | $1,170,000,000 | $0 | $150,000,000 | TBD | TBD |
| 2A | + | A | + | C | $680,000,000 | $0 | $150,000,000 | TBD | TBD |
| 2B | + | A | + | C | $1,040,000,000 | $0 | $150,000,000 | TBD | TBD |
| 3 | + | A | + | C | $3,260,000,000 | $0 | $150,000,000 | TBD | TBD |
| 1A | + | B | + | C | $650,000,000 | $70,000,000 | $150,000,000 | TBD | TBD |
| 1B | + | B | + | C | $1,020,000,000 | $70,000,000 | $150,000,000 | TBD | TBD |
| 2A | + | B | + | C | $540,000,000 | $70,000,000 | $150,000,000 | TBD | TBD |
| 2B | + | B | + | C | $900,000,000 | $70,000,000 | $150,000,000 | TBD | TBD |
| 3 | + | B | + | C | $3,120,000,000 | $70,000,000 | $150,000,000 | TBD | TBD |
| 1A | + | C | + | C | $650,000,000 | $80,000,000 | $150,000,000 * | TBD | TBD |
| 1B | + | C | + | C | $1,020,000,000 | $80,000,000 | $150,000,000 * | TBD | TBD |
| 2A | + | C | + | C | $540,000,000 | $80,000,000 | $150,000,000 * | TBD | TBD |
| 2B | + | C | + | C | $900,000,000 | $80,000,000 | $150,000,000 * | TBD | TBD |
| 3 | + | C | + | C | $3,120,000,000 | $80,000,000 | $150,000,000 * | TBD | TBD |

TBD - TO BE DETERMINED

* DOES NOT INCLUDE COST OF KEITH TRANSFORMER STATION RELOCATION (APPROXIMATELY $150 MILLION)

# Practical Alternative 1A

## Practical Alternative 1A - At-grade on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO PLAZA A

| Description | Unit | Quantity | Unit Price | $CAD Cost |
|---|---|---|---|---|
| Highway 401 - North Talbot Road to Howard Ave. | Km | 1.7 | $13,489,722 | $22,932,527 |
| Interchange at Highway 401 / Highway 3 / Howard Avenue | Each | 1.0 | $25,000,000 | $25,000,000 |
| 6-lane freeway at-grade section - Highways | Km | 2.7 | $13,489,722 | $36,287,352 |
| 6-lane freeway transition section - Highways | Km | 3.6 | $9,567,545 | $34,778,024 |
| 6-lane freeway transition section - Structural | L.S. | 1.0 | $85,050,000 | $85,050,000 |
| 6-lane freeway below grade section - Highways | Km | 1.8 | $9,567,545 | $17,374,661 |
| 6-lane freeway below grade section - Structural | L.S. | 1.0 | $81,720,000 | $81,720,000 |
| 6-lane freeway above grade section - Highways | Km | 0.6 | $9,583,569 | $5,366,798 |
| Excavation - transition section | m3 | 154851.0 | $10 | $1,548,510 |
| Excavation - below grade section | m3 | 84625.6 | $10 | $846,256 |
| Municipal road on both sides of the freeway | Km | 5.6 | $2,612,375 | $14,629,299 |
| Realign Huron Church Line | Km | 1.0 | $1,700,000 | $1,700,000 |
| Underpass structure at Howard Ave | Each | 1.0 | $3,522,000 | $3,522,000 |
| Underpass structure at Cousineau Road | Each | 1.0 | $3,461,000 | $3,461,000 |
| Pedestrian Plaza at Cousineau Road | Each | 1.0 | $8,778,000 | $8,778,000 |
| Underpass structure at St.Clair College Road | Each | 1.0 | $1,977,000 | $1,977,000 |
| Underpass structure at Todd Lane / Cabana Road | Each | 1.0 | $2,724,000 | $2,724,000 |
| Pedestrian Plaza at Todd Lane / Cabana Road | Each | 1.0 | $11,844,000 | $11,844,000 |
| Interchange at St. Clair College | Each | 1.0 | $18,000,000 | $18,000,000 |

## Practical Alternative 1A - At-grade on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO PLAZA A

| | | | | |
|---|---|---|---|---|
| Bridge at Turkey Creek | Each | 1.0 | $4,659,000 | $4,659,000 |
| Underpass structure at Grand Marais Road West | Each | 1.0 | $3,478,000 | $3,478,000 |
| Partial interchange at E.C. ROW Expressway | Each | 1.0 | $25,000,000 | $25,000,000 |
| 6-lane freeway transition section from Huron Church Road to Plaza A - Structure (36m wide) | Km | 0.8 | $80,000,000 | $60,800,000 |
| Overpass structure at Malden Road | Each | 1.0 | $2,860,000 | $2,860,000 |
| Interchange at Malden Road | L.S. | 1.0 | $50,000,000 | $50,000,000 |
| Stormwater Management Facility | L.S. | 1.0 | $5,025,000 | $5,025,000 |
| Drainage | L.S. | 1.0 | $15,069,600 | $15,069,600 |
| Pumping Stations | L.S. | 1.0 | $3,200,000 | $3,200,000 |
| Roadway Storm Sewer | L.S. | 1.0 | $16,064,080 | $16,064,080 |
| Signalized intersection | Each | 10.0 | $200,000 | $2,000,000 |
| Small Drain Culverts | L.S. | 6.0 | $300,000 | $1,800,000 |
| Construction staging | L.S. | 1.0 | $10,000,000 | $10,000,000 |
| Utility Relocations | L.S. | 1.0 | $30,000,000 | $30,000,000 |
| Subtotal | | | | $607,495,107 |
| Contingency | | 20.0% | | $121,499,021 |
| **Total Construction Cost $CAD** | | | | **$728,994,129** |
| Engineering (Planning, Design, Construction Administration) | | 10.0% | | $60,749,511 |
| **Total Cost $CAD (2006)** | | | | **$789,743,639** |

## Practical Alternative 1A - At-grade on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO PLAZA A

| | | | | |
|---|---|---|---|---|
| Cost Escalate $CAD (2011) | | 3.0%<br>1.16 | | $915,529,327 |
| **Rounded Cost $CAD (2011)** | | | | **$920,000,000** |

*** All cost based on 2006 HICO unit prices**

## Practical Alternative 1A - At-grade on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO MALDEN ROAD

| Description | Unit | Quantity | Unit Price | $CAD Cost |
|---|---|---|---|---|
| Highway 401 - North Talbot Road to Howard Ave. | Km | 1.7 | $13,489,722 | $22,932,527 |
| Interchange at Highway 401 / Highway 3 / Howard Avenue | Each | 1.0 | $25,000,000 | $25,000,000 |
| 6-lane freeway at-grade section - Highways | Km | 3.1 | $13,489,722 | $41,683,241 |
| 6-lane freeway transition section - Highways | Km | 2.8 | $9,567,545 | $27,123,989 |
| 6-lane freeway transition section - Structural | L.S. | 1.0 | $85,050,000 | $85,050,000 |
| 6-lane freeway below grade section - Highways | Km | 1.8 | $9,567,545 | $17,374,661 |
| 6-lane freeway below grade section - Structural | L.S. | 1.0 | $81,720,000 | $81,720,000 |
| 6-lane freeway above grade section - Highways | Km | 0.5 | $9,583,569 | $4,791,784 |
| Excavation - transition section | m3 | 120771.0 | $10 | $1,207,710 |
| Excavation - below grade section | m3 | 84625.6 | $10 | $846,256 |
| Municipal road on both sides of the freeway | Km | 5.6 | $2,612,375 | $14,629,299 |
| Realign Huron Church Line | Km | 1.0 | $1,700,000 | $1,700,000 |
| Underpass structure at Howard Ave | Each | 1.0 | $3,522,000 | $3,522,000 |
| Underpass structure at Cousineau Road | Each | 1.0 | $3,461,000 | $3,461,000 |
| Pedestrian Plaza at Cousineau Road | Each | 1.0 | $8,778,000 | $8,778,000 |
| Underpass structure at St.Clair College Road | Each | 1.0 | $1,977,000 | $1,977,000 |
| Underpass structure at Todd Lane / Cabana Road | Each | 1.0 | $2,724,000 | $2,724,000 |
| Pedestrian Plaza at Todd Lane / Cabana Road | Each | 1.0 | $11,844,000 | $11,844,000 |
| Interchange at St. Clair College | Each | 1.0 | $18,000,000 | $18,000,000 |

## Practical Alternative 1A - At-grade on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO MALDEN ROAD

| | | | | |
|---|---|---|---|---|
| Bridge at Turkey Creek | Each | 1.0 | $4,659,000 | $4,659,000 |
| Underpass structure at Grand Marais Road West | Each | 1.0 | $3,478,000 | $3,478,000 |
| Partial interchange at E.C. ROW Expressway | Each | 1.0 | $25,000,000 | $25,000,000 |
| Overpass structure at Malden Road | Each | 1.0 | $2,860,000 | $2,860,000 |
| Stormwater Management Facility | L.S. | 1.0 | $5,025,000 | $5,025,000 |
| Drainage | L.S. | 1.0 | $15,069,600 | $15,069,600 |
| Pumping Stations | L.S. | 1.0 | $3,200,000 | $3,200,000 |
| Roadway Storm Sewer | L.S. | 1.0 | $16,064,080 | $16,064,080 |
| Signalized intersection | Each | 10.0 | $200,000 | $2,000,000 |
| Small Drain Culverts | L.S. | 6.0 | $300,000 | $1,800,000 |
| Construction staging | L.S. | 1.0 | $10,000,000 | $10,000,000 |
| Utility Relocations | L.S. | 1.0 | $30,000,000 | $30,000,000 |
| Subtotal | | | | $493,521,146 |
| Contingency | | 20.0% | | $98,704,229 |
| **Total Construction Cost $CAD** | | | | **$592,225,376** |
| Engineering (Planning, Design, Construction Administration) | | 10.0% | | $49,352,115 |
| **Total Cost $CAD (2006)** | | | | **$641,577,490** |
| Cost Escalate $CAD (2011) | | 3.0% 1.16 | | $743,764,151 |
| **Rounded Cost $CAD (2011)** | | | | **$750,000,000** |

* **All cost based on 2006 HICO unit prices**

**URS Canada Inc.**

**Alignment Alternative "1A" Practical - At Grade Freeway Along Talbot / Huron Church Road with Service Roads on Both Sides (Sept. 2006)**

| Structure I.D. | Structure Name | Structure Type | Length ( M ) | Width ( M ) | Cost ( $ ) |
|---|---|---|---|---|---|
| 1A - 10 | Highway 3 WB Underpass | Three Spans Bridge | 42+26+29 | 12.55 | $2,556,000 |
| 1A - 11 | Highway 401 Ramp W-E Underpass | Single Span Bridge | 36 | 12.05 | $911,000 |
| 1A - 12 | Highway 401 Ramp E-N/S Overpass | Single Span Bridge | 39 | 12.05 | $987,000 |
| 1A - 13 | Ramp E-W at West of Howard Avenue | Boat Section | 400 | Length | $12,000,000 |
| 1A - 20 | Approach Ramp of Highway 401at East of Howard Avenue | Boat Section | 500 | Length | $15,000,000 |
| 1A - 21 | Below Grade Hwy 401 at Howard Avenue | Boat Section | 93 | Length | $4,185,000 |
| 1A - 22 | Howard Avenue Underpass | Two Spans Bridge | 26+32 | 27.6 | $3,522,000 |
| 1A - 23 | Approach Ramp of Highway 401at West of Howard Avenue | Boat Section | 300 | Length | $9,000,000 |
| 1A - 30 | Approach Ramp of Hwy 401 at East of Cousineau Road | Boat Section | 350 | Length | $10,500,000 |
| 1A - 31 | Below Grade Hwy 401at Cousineau Road | Boat Section | 658 | Length | $29,610,000 |
| 1A - 32 | Cousineau Road Underpass | Two Spans Bridge | 27+30 | 27.6 | $3,461,000 |
| 1A - 33 | Pedestrain Plaza at Cousineau Road | Two Spans Bridge | 27+30 | 70 | $8,778,000 |
| 1A - 34 | St.Clair College Road Underpass | Two Spans Bridge | 26+26 | 18.1 | $1,977,000 |
| 1A - 35 | Approach Ramp of Hwy 401 at West of St.Clair Collge Road | Boat Section | 250 | Length | $7,500,000 |
| 1A - 36 | Below Grade Hwy 401 at East of Cousineau Road | Boat Section | 300 | Length | $13,500,000 |
| 1A - 37 | Ramps E-W & W-E to Hwy 401 at West of Cousineau Road | Boat Section | 480 | Length | $14,400,000 |
| 1A - 40 | Approach Ramp of Hwy 401 at East of Cabana Road | Boat Section | 410 | Length | $12,300,000 |
| 1A - 41 | Below Grade Hwy 401 at Cabana Road | Boat Section | 128 | Length | $5,760,000 |
| 1A - 42 | Cabana Road Underpass | Two Spans Bridge | 21+26 | 27.6 | $2,724,000 |
| 1A - 43 | Pedestrian Plaza at Cabana Road West | Two Spans Bridge | 21+21 | 120 | $11,844,000 |
| 1A - 44 | Approach Ramp of Hwy 401 at West of Cabana Road | Boat Section | 375 | Length | $11,250,000 |
| 1A - 50 | Turkey Creek Bridge | Single Span Bridge | 26 | 89.6 | $4,659,000 |
| 1A - 60 | Approach Ramp of Hwy 401 at Grand Marais Road West side | Boat Section | 350 | Length | $10,500,000 |
| 1A - 61 | Below Grade Hwy 401 at South of Huron Church Road | Boat Section | 637 | Length | $28,665,000 |
| 1A - 62 | Huron Church Road Ramp N-S Underpass | Two Spans Bridge | 36+33 | 12.05 | $1,829,000 |
| 1A - 63 | Grand Marais Road West Underpass | Two Spans Bridge | 30+30 | 27.6 | $3,478,000 |
| 1A - 64 | Approach Ramp of Hwy 401 at just East of EC ROW Expressway | Boat Section | 300 | Length | $9,000,000 |
| 1A - 65 | Ramps N-S & S-N to Hwy 401 at East of Huron Church Line | Boat Section | 420 | Length | $12,600,000 |
| 1A - 66 | Below Grade Ramps S-N,N-S to Hwy 401 at East of Huron Church Line | Boat Section | 150 | Length | $6,750,000 |
| 1A - 90 | Malden Road Overpass | Single Span Bridge | 35 | 40.85 | $2,860,000 |
| 1A - 91 | Ramp W-E Underpass | Two Spans Bridge | 45+45 | 9.3 | $1,758,000 |
| 1A - 92 | Matchette Road Overpass | Single Span Bridge | 40 | 40.85 | $3,268,000 |
| 1A - 93 | Ojibway / ETR Overpass | Three Spans Bridge | 34+34+45 | 37.85 | $10,693,000 |
| 1A - 94 | Ramp E-W at Ojibway Parkway Overpass | Single Span Bridge | 44 | 12.05 | $1,060,000 |

**URS Canada Inc.**

**Alignment Alternative "1A" Practical - At Grade Freeway Along Talbot / Huron Church Road with Service Roads on Both Sides (Sept. 2006)**

| Structure I.D. | Structure Name | Structure Type | Length ( M ) | Width ( M ) | Cost ( $ ) |
|---|---|---|---|---|---|
| 1A - 95 | Ramp E-W at ETR Overpass | Single Span Bridge | 30 | 12.05 | $904,000 |
| 1A - 110 | Cahill Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 1A - 120 | Secondary Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 1A - 130 | Lennon Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 1A - 140 | Marentette Mangin Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 1A - 150 | Basin Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 1A - 160 | Titcombe Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| | | **TOTAL COST** | | | **$281,589,000** |

**Note: Above Costs include only Structural Costs. These costs do not include Roadwork, Earthwork, Road & Traffic Diversions, Roadway Protection etc; which are included in the Highway Costs**

Detroit River International Crossing
**STORMWATER MANAGEMENT STUDY**
Highway 3 / Huron Church Road Corridor
**ALTERNATIVE 1A - At Grade**
**CONSTRUCTION COST ESTIMATE**

PRELIMINARY
COST TO BE CONFIRMED

| Item | Description | Quantity | Unit | Unit Cost | Total |
|---|---|---|---|---|---|
| I | Stormwater Management Facility | 43,817 | cu.m. | $ 114.68 | $ 5,025,000.00 |
| | Inlet/ Outlet Control Structure | 10 | L.S. | 125,000.00 | 1,250,000.00 |
| | Landscaping | 10 | L.S. | 200,000.00 | 2,000,000.00 |
| | Earthworks | 177,500 | cu.m. | 10.00 | 1,775,000.00 |
| III | Oil Grit Separator | - | unit | | |
| IV | Drainage | 1,830 | l.m. | $ 8,234.75 | $ 15,069,600.00 |
| | Wolfe/Cahill Drainage 4.5 x 1.5 | 1,200 | l.m. | 6,000.00 | 7,200,000.00 |
| | Wolfe/Cahill Drain Catch Basins | 60 | unt | 700.00 | 42,000.00 |
| | Cahill Drain Crossing 4.5 x 1.5 | 200 | l.m. | 6,000.00 | 1,200,000.00 |
| | Cahill West Tributary Re-Alignment/Replacement (1200mmØ) | 155 | l.m. | 575.00 | 89,125.00 |
| | Lenon Drain, Replacement 3.0 x 1.50 | 140 | l.m. | 3,500.00 | 490,000.00 |
| | Marentette Mangin Drain (1200mmØ) | 15 | l.m. | 575.00 | 8,625.00 |
| | Basin Drain, Replacement 2.1 x 1.50 | 60 | l.m. | 3,000.00 | 180,000.00 |
| | Titcombe Drain (1200mmØ) | 50 | | 575.00 | 28,750.00 |
| | Installation & Demolition (60% of direct cost) 9,238,500 | | L.S. | | 5,543,100.00 |
| | Earthworks | 24,000 | cu.m. | 12.00 | 288,000.00 |
| V | Pumping Station | 4 | unit | $ 800,000.00 | $ 3,200,000.00 |
| | Pump No. of Pumping Sta = 4 | 4 | unit | 600,000.00 | 2,400,000.00 |
| | Pump House | 4 | unit | 200,000.00 | 800,000.00 |
| VI | Roadway Storm Sewer (Conveying 5-Year Storm) | 10,890 | l.m. | $ 1,475.12 | $ 16,064,080.00 |
| | Highway 401 | | | | |
| | Storm Sewer (average sze = 750 mm) | 10,890 | l.m. | 400.00 | 4,356,000.00 |
| | Manholes (average size = 1500 mm) | 121 | unit | 4,450.00 | 538,450.00 |
| | Catch Basins (standard depth) | 363 | unit | 700.00 | 254,100.00 |
| | Catch Basin Leads | 12,705 | l.m. | 50.00 | 635,250.00 |
| | Miscellaneous (MH/CB Covers, etc) | 121 | unit | 3,000.00 | 363,000.00 |
| | Earthworks | 11,000 | cu.m. | 12.00 | 132,000.00 |
| | Installation (60% of direct cost) 5,783,800.00 | | | | 3,688,080.00 |
| | Service Road | | | | - |
| | Storm Sewer (average size = 600 mm) | 12,605 | l.m. | 150.00 | 1,890,750.00 |
| | Manholes (average size = 1200 mm) | 150 | unit | 2,000.00 | 300,000.00 |
| | Catch Basins | 450 | unit | 700.00 | 315,000.00 |
| | Catch Basin Leads | 15,750 | l.m. | 50.00 | 787,500.00 |
| | Miscellaneous (MH/CB Covers, etc) | 150 | unit | 3,000.00 | 450,000.00 |
| | Earthworks | 9,000 | cu.m. | 12.00 | 108,000.00 |
| | Installation (60% of direct cost) 3,293,250.00 | | | | 2,245,950.00 |
| Estimated Direct and Indirect Cost | | | | | $ 39,358,680.00 |
| Add 20% Contingency | | | | | $ 7,871,736.00 |
| **Total Estimated Construction Cost** | | | | | **$ 47,230,416.00** |



90% = $ 43,000,000.00

# Practical Alternative 1B

## Practical Alternative 1B - Below grade on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO PLAZA A

| Description | Unit | Quantity | Unit Price | $CAD Cost |
|---|---|---|---|---|
| Highway 401 - North Talbot Road to Howard Ave. | Km | 1.7 | $13,489,722 | $22,932,527 |
| Interchange at Highway 401 / Highway 3 / Howard Avenue | Each | 1.0 | $25,000,000 | $25,000,000 |
| 6-lane freeway transition section - Highways | Km | 1.7 | $9,567,545 | $15,977,799 |
| 6-lane freeway transition section - Structural | L.S. | 1.0 | $42,550,000 | $42,550,000 |
| 6-lane freeway below grade section - Highways | Km | 5.4 | $9,567,545 | $51,664,740 |
| 6-lane freeway below grade section - Structural | L.S. | 1.0 | $275,000,000 | $275,000,000 |
| 6-lane freeway above grade section - Highways | Km | 0.6 | $9,583,569 | $5,366,798 |
| Excavation - transition section | m3 | 71142.0 | $10 | $711,420 |
| Excavation - below grade section | m3 | 251640.0 | $10 | $2,516,400 |
| Municipal road on both sides of the freeway | Km | 5.6 | $2,612,375 | $14,629,299 |
| Realign Huron Church Line | Km | 1.0 | $1,700,000 | $1,700,000 |
| Underpass structure at Howard Ave | Each | 1.0 | $3,036,000 | $3,036,000 |
| Underpass structure at Montgomery Drive | Each | 1.0 | $1,596,000 | $1,596,000 |
| Underpass structure at Cousineau Road | Each | 1.0 | $3,279,000 | $3,279,000 |
| Pedestrian plaza at Cousineau Road | Each | 1.0 | $8,526,000 | $8,526,000 |
| Underpass structure at St.Clair College Road | Each | 1.0 | $1,977,000 | $1,977,000 |
| Interchange at St. Clair College | Each | 1.0 | $38,000,000 | $38,000,000 |
| Underpass structure at Huron Church Line | Each | 1.0 | $2,512,000 | $2,512,000 |
| Underpass structure at Todd Lane / | Each | 1.0 | $2,434,000 | $2,434,000 |

## Practical Alternative 1B - Below grade on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO PLAZA A

| | | | | |
|---|---|---|---|---|
| Cabana Road | | | | |
| Pedestrian plaza at Cabana Road West | Each | 1.0 | $10,584,000 | $10,584,000 |
| Underpass structure at Pulford Street | Each | 1.0 | $1,977,000 | $1,977,000 |
| Underpass structure at Lambton Road | Each | 1.0 | $3,130,000 | $3,130,000 |
| Underpass structure at Labelle Street/ Bethlehem | Each | 1.0 | $2,071,000 | $2,071,000 |
| Pulford Street Interchange | Each | 1.0 | $48,000,000 | $48,000,000 |
| Turkey Creek Tunnel | Each | 1.0 | $26,500,000 | $26,500,000 |
| Turkey Creek Bridge | Each | 1.0 | $8,007,000 | $8,007,000 |
| Partial interchange at E.C. ROW Expressway | Each | 1.0 | $50,000,000 | $50,000,000 |
| 6-lane freeway transition section from Huron Church Road to Plaza A - Structure (36m wide) | Km | 0.8 | $80,000,000 | $60,800,000 |
| Overpass structure at Malden Road | Each | 1.0 | $2,860,000 | $2,860,000 |
| Interchange at Malden Road | L.S. | 1.0 | $50,000,000 | $50,000,000 |
| Stormwater Management Facility | L.S. | 1.0 | $3,850,000 | $3,850,000 |
| Drainage | L.S. | 1.0 | $44,327,800 | $44,327,800 |
| Pumping Stations | L.S. | 1.0 | $4,000,000 | $4,000,000 |
| Roadway Storm Sewer | L.S. | 1.0 | $17,426,408 | $17,426,408 |
| Signalized intersection | Each | 13.0 | $200,000 | $2,600,000 |
| Small drain culverts | L.S. | 6.0 | $300,000 | $1,800,000 |

## Practical Alternative 1B - Below grade on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO PLAZA A

| | | | | |
|---|---|---|---|---|
| Construction staging | L.S. | 1.0 | $10,000,000 | $10,000,000 |
| Utility Relocations | L.S. | 1.0 | $30,000,000 | $30,000,000 |
| Subtotal | | | | $897,342,192 |
| Contingency | | 20.0% | | $179,468,438 |
| **Total Construction Cost $CAD** | | | | **$1,076,810,630** |
| Engineering (Planning, Design, Construction Administration) | | 10.0% | | $89,734,219 |
| **Total Cost $CAD (2006)** | | | | **$1,166,544,849** |
| Cost Escalate $CAD (2011) | | 3.0% 1.16 | | $1,352,345,200 |
| **Rounded Cost $CAD (2011)** | | | | **$1,360,000,000** |

* **All cost based on 2006 HICO unit prices**

## Practical Alternative 1B - Below grade on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO MALDEN ROAD

| Description | Unit | Quantity | Unit Price | $CAD Cost |
|---|---|---|---|---|
| Highway 401 - North Talbot Road to Howard Ave. | Km | 1.7 | $13,489,722 | $22,932,527 |
| Interchange at Highway 401 / Highway 3 / Howard Avenue | Each | 1.0 | $25,000,000 | $25,000,000 |
| 6-lane freeway at-grade section - Highways | Km | 0.4 | $13,489,722 | $5,395,889 |
| 6-lane freeway transition section - Highways | Km | 0.9 | $9,567,545 | $8,323,764 |
| 6-lane freeway transition section - Structural | L.S. | 1.0 | $42,550,000 | $42,550,000 |
| 6-lane freeway below grade section - Highways | Km | 5.4 | $9,567,545 | $51,664,740 |
| 6-lane freeway below grade section - Structural | L.S. | 1.0 | $275,000,000 | $275,000,000 |
| 6-lane freeway above grade section - Highways | Km | 0.5 | $9,583,569 | $4,791,784 |
| Excavation - transition section | m3 | 37062.0 | $10 | $370,620 |
| Excavation - below grade section | m3 | 251640.0 | $10 | $2,516,400 |
| Municipal road on both sides of the freeway | Km | 5.6 | $2,612,375 | $14,629,299 |
| Realign Huron Church Line | Km | 1.0 | $1,700,000 | $1,700,000 |
| Underpass structure at Howard Ave | Each | 1.0 | $3,036,000 | $3,036,000 |
| Underpass structure at Montgomery Drive | Each | 1.0 | $1,596,000 | $1,596,000 |
| Underpass structure at Cousineau Road | Each | 1.0 | $3,279,000 | $3,279,000 |
| Pedestrian plaza at Cousineau Road | Each | 1.0 | $8,526,000 | $8,526,000 |
| Underpass structure at St.Clair College Road | Each | 1.0 | $1,977,000 | $1,977,000 |
| Interchange at St. Clair College | Each | 1.0 | $38,000,000 | $38,000,000 |
| Underpass structure at Huron Church Line | Each | 1.0 | $2,512,000 | $2,512,000 |

## Practical Alternative 1B - Below grade on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO MALDEN ROAD

| | | | | |
|---|---|---|---|---|
| Underpass structure at Todd Lane / Cabana Road | Each | 1.0 | $2,434,000 | $2,434,000 |
| Pedestrian plaza at Cabana Road West | Each | 1.0 | $10,584,000 | $10,584,000 |
| Underpass structure at Pulford Street | Each | 1.0 | $1,977,000 | $1,977,000 |
| Underpass structure at Lambton Road | Each | 1.0 | $3,130,000 | $3,130,000 |
| Underpass structure at Labelle Street/ Bethlehem | Each | 1.0 | $2,071,000 | $2,071,000 |
| Pulford Street Interchange | Each | 1.0 | $48,000,000 | $48,000,000 |
| Turkey Creek Tunnel | Each | 1.0 | $26,500,000 | $26,500,000 |
| Turkey Creek Bridge | Each | 1.0 | $8,007,000 | $8,007,000 |
| Partial interchange at E.C. ROW Expressway | Each | 1.0 | $50,000,000 | $50,000,000 |
| Overpass structure at Malden Road | Each | 1.0 | $2,860,000 | $2,860,000 |
| Stormwater Management Facility | L.S. | 1.0 | $3,850,000 | $3,850,000 |
| Drainage | L.S. | 1.0 | $44,327,800 | $44,327,800 |
| Pumping Stations | L.S. | 1.0 | $4,000,000 | $4,000,000 |
| Roadway Storm Sewer | L.S. | 1.0 | $17,426,408 | $17,426,408 |
| Signalized intersection | Each | 13.0 | $200,000 | $2,600,000 |
| Small drain culverts | L.S. | 6.0 | $300,000 | $1,800,000 |
| Construction staging | L.S. | 1.0 | $10,000,000 | $10,000,000 |

## Practical Alternative 1B - Below grade on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO MALDEN ROAD

| | | | | |
|---|---|---|---|---|
| Utility Relocations | L.S. | 1.0 | $30,000,000 | $30,000,000 |
| Subtotal | | | | $783,368,231 |
| Contingency | | 20.0% | | $156,673,646 |
| **Total Construction Cost $CAD** | | | | **$940,041,877** |
| Engineering (Planning, Design, Construction Administration) | | 10.0% | | $78,336,823 |
| **Total Cost $CAD (2006)** | | | | **$1,018,378,700** |
| Cost Escalate $CAD (2011) | | 3.0% 1.16 | | $1,180,580,025 |
| **Rounded Cost $CAD (2011)** | | | | **$1,190,000,000** |

* **All cost based on 2006 HICO unit prices**

**URS Canada Inc.**

**Alignment Alternative "1B" Practical - Below Grade Freeway Along Talbot / Huron Church Road with Service Roads on Both Sides (Sept. 2006)**

| Structure I.D. | Structure Name | Structure Type | Length ( M ) | Width ( M ) | Cost ( $ ) |
|---|---|---|---|---|---|
| 1B - 10 | Highway 3 WB Underpass | Three Spans Bridge | 42+26+23 | 12.55 | $2,398,000 |
| 1B - 11 | Highway 401 Ramp W-E Underpass | Single Span Bridge | 36 | 12.05 | $911,000 |
| 1B - 12 | Highway 401 Ramp E-N/S Overpass | Single Span Bridge | 39 | 12.05 | $987,000 |
| 1B - 13 | Ramp E-W at East of Howard Avenue | Boat Section | 540 | Length | $16,200,000 |
| 1B - 14 | Approach Ramp of Highway 401 at East of Howard Avenue | Boat Section | 400 | Length | $12,000,000 |
| 1B - 20 | Highway with Ramp E-W at East of Howard Avenue | Boat Section | 100 | Length | $3,000,000 |
| 1B - 22 | Howard Avenue Underpass | Two Spans Bridge | 23+27 | 27.6 | $3,036,000 |
| 1B - 23 | Montgomery Drive Underpass | Two Spans Bridge | 21+21 | 18.1 | $1,596,000 |
| 1B - 32 | Cousineau Road/Sandwich Parkway Underpass | Two Spans Bridge | 27+27 | 27.6 | $3,279,000 |
| 1B - 33 | Pedestrian Plaza at Cousineau Road | Two Spans Bridge | 29+29 | 70 | $8,526,000 |
| 1B - 34 | St.Clair College Road Underpass | Two Spans Bridge | 26+26 | 18.1 | $1,977,000 |
| 1B - 35 | Huron Church Line Underpass | Two Spans Bridge | 21+21 | 26 | $2,512,000 |
| 1B - 36 | Ramps E-W & W-E on East of St.Clair College Road | Boat Section | 560 | Length | $16,800,000 |
| 1B - 37 | Ramps E-W & W-E on West of St.Clair College Road | Boat Section | 600 | Length | $18,000,000 |
| 1B - 42 | Cabana Road West / Todd Lane Underpass | Two Spans Bridge | 21+21 | 27.6 | $2,434,000 |
| 1B - 43 | Pedestrian Plaza at Cabana Road West | Two Spans Bridge | 21+21 | 120 | $10,584,000 |
| 1B - 44 | Pulford Street Underpass | Two Spans Bridge | 26+26 | 18.1 | $1,977,000 |
| 1B - 51 | Grand Marais West / Lampton Underpass | Two Spans Bridge | 27+27 | 27.6 | $3,130,000 |
| 1B - 55 | Turkey Creek Bridge for Service Roads (incl.staged const.,temp.bridge etc) | Single Span Bridge | 28 | 40.85 | $8,007,000 |
| 1B - 60 | Ramps S-N & N-S on East of Pulford Street | Boat Section | 670 | Length | $43,550,000 |
| 1B - 61 | Ramps S-N & N-S on East of Grand Marais Road | Boat Section | 620 | Length | $40,300,000 |
| 1B - 62 | Huron Church Road Ramp N-S Underpass | Two Spans Bridge | 33+34 | 12.05 | $1,776,000 |
| 1B - 63 | Labelle Street/Bethlehem Avenue Underpass | Two Spans Bridge | 26+26 | 18.1 | $2,071,000 |
| 1B - 64 | Approach Ramp of Highway 401 near EC ROW Expressway | Boat Section | 470 | Length | $30,550,000 |
| 1B - 90 | Malden Road Overpass | Single Span Bridge | 35 | 40.85 | $2,860,000 |
| 1B - 91 | Ramp W-E Underpass | Two Spans Bridge | 45+45 | 9.3 | $1,758,000 |
| 1B - 92 | Matchette Road Overpass | Single Span Bridge | 40 | 40.85 | $3,268,000 |
| 1B - 93 | Ojibway / ETR Overpass | Three Spans Bridge | 34+34+45 | 37.85 | $10,693,000 |
| 1B - 94 | Ramp E-W at Ojibway Parkway Overpass | Single Span Bridge | 44 | 12.05 | $1,060,000 |
| 1B - 95 | Ramp E-W at ETR Overpass | Single Span Bridge | 30 | 12.05 | $904,000 |
| 1B - 201 | Below Grade Highway 401 at East of Howard Avenue | Boat Section | 100 | Length | $4,500,000 |
| 1B - 202 | Below Grade Hwy 401 bet.Howard Avenue & Montgomery Drive | Boat Section | 800 | Length | $36,000,000 |
| 1B - 203 | Below Grade Hwy 401 at West of Montgomery Drive | Boat Section | 600 | Length | $27,000,000 |

**URS Canada Inc.**

**Alignment Alternative "1B" Practical - Below Grade Freeway Along Talbot / Huron Church Road with Service Roads on Both Sides (Sept. 2006)**

| Structure I.D. | Structure Name | Structure Type | Length ( M ) | Width ( M ) | Cost ( $ ) |
|---|---|---|---|---|---|
| 1B - 204 | Below Grade Highway 401 with S.C.L.at East of Cousineau Rd./Sandwich Parkway | Boat Section | 150 | Length | $6,750,000 |
| 1B - 211 | Below Grade Highway 401 bet.Cousineau & St.Clair College Road | Boat Section | 475 | Length | $21,375,000 |
| 1B - 212 | Below Grade Highway 401 at West of St.Clair College Road | Boat Section | 425 | Length | $19,125,000 |
| 1B - 213 | Below Grade Highway 401 with S.C.L.at West of St.Clair College Road | Boat Section | 250 | Length | $11,250,000 |
| 1B - 214 | Below Grade Highway 401 at East of Huron Church Line | Boat Section | 425 | Length | $19,125,000 |
| 1B - 215 | Below Grade Highway 401 bet.Huron Church Line & Cabana Rd. West/Todd Lane | Boat Section | 400 | Length | $18,000,000 |
| 1B - 221 | Below Grade Highway 401 at West of Todd Lane | Boat Section | 400 | Length | $26,000,000 |
| 1B - 222 | Below Grade Highway 401 with S.C.L.at East of Pulford Street | Boat Section | 200 | Length | $13,000,000 |
| 1B - 223 | Below Grade Highway 401 bet.Pulford Street & Grand Marais Rd.West | Boat Section | 325 | Length | $21,125,000 |
| 1B - 224 | Below Grade Highway 401 with S.C.L.at East of Grand Marais Rd.West/Lambton Road | Boat Section | 125 | Length | $8,125,000 |
| 1B - 225 | Highway 401 in Tunnel under Turkey Creek | Cut & Cover Tunnel | 100 | Length | $26,500,000 |
| 1B - 231 | Below Grade Hwy 401 with S.C.L.at West of Grand Marais Rd.West/Lambton Road | Boat Section | 125 | Length | $8,125,000 |
| 1B - 232 | Below Grade Highway 401 bet.Grand Marais Road & Labelle Street | Boat Section | 400 | Length | $26,000,000 |
| 1B - 233 | Below Grade Highway 401 at West of Labelle Street / Bethlehen | Boat Section | 100 | Length | $6,500,000 |
| 1B - 110 | Cahill Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 1B - 120 | Secondary Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 1B - 130 | Lennon Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 1B - 140 | Marentette Mangin Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 1B - 150 | Basin Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 1B - 160 | Titcombe Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| | | **TOTAL COST** | | | **$556,444,000** |

**Note: Above Costs include only Structural Costs. These costs do not include Roadwork, Earthwork, Road & Traffic Diversions, Roadway Protection etc; which are included in the Highway Costs.**

Detroit River International Crossing
**STORMWATER MANAGEMENT STUDY**
Highway 3 / Huron Church Road Corridor
**ALTERNATIVE 1B - Below Grade**
**CONSTRUCTION COST ESTIMATE**

PRELIMINARY
COST TO BE CONFIRMED

| Item | Description | Quantity | Unit | Unit Cost | Total |
|---|---|---|---|---|---|
| I | Stormwater Management Facility | 40,738 | cu.m. | $ 94.51 | $ 3,850,000.00 |
| | Inlet/ Outlet Control Structure | 7 | L.S. | 125,000.00 | 875,000.00 |
| | Landscaping | 7 | L.S. | 200,000.00 | 1,400,000.00 |
| | Earthworks | 157,500 | cu.m. | 10.00 | 1,575,000.00 |
| III | Oil Grit Separator | - | unit | | |
| IV | Drainage | 2275 | l.m. | $ 19,484.75 | $ 44,327,800.00 |
| | Cahill/Wolfe Drainage 4.5 x 1.5 | 1300 | l.m. | 6,000.00 | 7,800,000.00 |
| | Cahill/Wolfe Drainage Catch Basins | 65 | unt | 1,150.00 | 74,750.00 |
| | Cahill Drain Crossing, Siphon 4.5 x 1.5 | 100 | l.m. | 22,500.00 | 2,250,000.00 |
| | Cahill West Tributary Re-Alignment/Replacement (1200mmØ) | 330 | l.m. | 575.00 | 189,750.00 |
| | Lennon Drain Replacement, Siphon 3.0 x 1.50 | 120 | l.m. | 15,000.00 | 1,800,000.00 |
| | Turkey Creek Replacement, Siphor 25.0 x 2.0 | 110 | l.m. | 125,000.00 | 13,750,000.00 |
| | Turkey Creek Siphon Inlet Headwall, Grate | 1 | unit | 500,000.00 | 500,000.00 |
| | Turkey Creek Siphon Outlet Headwall, Grate | 1 | unit | 300,000.00 | 300,000.00 |
| | Marentette Mangin Drain (1200mmØ) | 15 | l.m. | 575.00 | 8,625.00 |
| | Basin Drain, Replacement 2.1 x 1.50 | 60 | l.m. | 3,000.00 | 180,000.00 |
| | Titcombe Drain (1200mmØ) | 50 | l.m. | 575.00 | 28,750.00 |
| | Installation and Demolition (60% of direct cost) 27,442,375 | | L.S. | | 16,465,425.00 |
| | Earthworks | 35,000 | cu.m. | 12.00 | 420,000.00 |
| V | Pumping Station | 5 | unit | $ 800,000.00 | $ 4,000,000.00 |
| | Pump No. of Pumping Sta.= 5 | 5 | unit | 600,000.00 | 3,000,000.00 |
| | Pump House | 5 | unit | 200,000.00 | 1,000,000.00 |
| VI | Roadway Storm Sewer (Conveying 100-Year Storm) | 10,890 | l.m. | $ 1,600.22 | $ 17,426,408.00 |
| | Highawy 401 | | | | |
| | Storm Sewer (average sze = 1050 mm) | 10,890 | l.m. | 460.00 | 5,009,400.00 |
| | Manholes (average size = 1800 mm) | 121 | unit | 5,180.00 | 626,780.00 |
| | Catch Basins (twin inlet, standard depth) | 363 | unit | 1,150.00 | 417,450.00 |
| | Catch Basin Leads | 12,705 | l.m. | 50.00 | 635,250.00 |
| | Miscellaneous (MH/CB Covers, etc) | 121 | unit | 3,000.00 | 363,000.00 |
| | Earthworks | 22,000 | cu.m. | 12.00 | 264,000.00 |
| | Installation (60% of direct cost) 6,688,880 | | | | 4,013,328.00 |
| | Service Road | | | | |
| | Storm Sewer (average size = 600 mm) | 12,605 | l.m. | 150.00 | 1,890,750.00 |
| | Manholes (average size = 1200 mm) | 150 | unit | 2,000.00 | 300,000.00 |
| | Catch Basins | 450 | unit | 700.00 | 315,000.00 |
| | Catch Basin Leads | 15,750 | l.m. | 50.00 | 787,500.00 |
| | Miscellaneous (MH/CB Covers, etc) | 150 | unit | 3,000.00 | 450,000.00 |
| | Earthworks | 9,000 | cu.m. | 12.00 | 108,000.00 |
| | Installation (60% of direct cost) 3,293,250.00 | | | | 2,245,950.00 |
| Estimated Direct and Indirect Cost | | | | | $ 69,604,208.00 |
| Add 20% Contingency | | | | | $ 13,920,841.60 |
| **Total Estimated Construction Cost** | | | | | **$ 83,525,049.60** |



90% = $ 76,000,000.00

# Practical Alternative 2A

## Practical Alternative 2A - At-grade besides Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO PLAZA A

| Description | Unit | Quantity | Unit Price | $CAD Cost |
|---|---|---|---|---|
| Highway 401 - North Talbot Road to Howard Ave. | Km | 1.7 | $13,489,722 | $22,932,527 |
| Interchange at Highway 401 / Highway 3 / Howard Avenue | Each | 1.0 | $25,000,000 | $25,000,000 |
| 6-lane freeway at-grade section - Highways | Km | 2.6 | $13,489,722 | $34,938,380 |
| 6-lane freeway transition section - Highways | Km | 3.6 | $9,567,545 | $34,376,187 |
| 6-lane freeway transition section - Structural | L.S. | 1.0 | $83,790,000 | $83,790,000 |
| 6-lane freeway below grade section - Highways | Km | 1.6 | $9,567,545 | $14,829,694 |
| 6-lane freeway below grade section - Structural | L.S. | 1.0 | $69,750,000 | $69,750,000 |
| 6-lane freeway above grade section - Highways | Km | 0.6 | $9,583,569 | $5,366,798 |
| Excavation - transition section | m3 | 153061.8 | $10 | $1,530,618 |
| Excavation - below grade section | m3 | 72230.0 | $10 | $722,300 |
| Underpass structure at Howard Ave | Each | 1.0 | $3,643,000 | $3,643,000 |
| Underpass structure at Sandwich Parkway | Each | 1.0 | $2,318,000 | $2,318,000 |
| Underpass structure at Huron Church Line | Each | 1.0 | $2,981,000 | $2,981,000 |
| Underpass structure at Cabana Road West | Each | 1.0 | $3,097,000 | $3,097,000 |
| Underpass structure at Grand Marais West | Each | 1.0 | $3,478,000 | $3,478,000 |
| Underpass structure at Spring Garden Road | Each | 1.0 | $1,113,000 | $1,113,000 |
| Interchange at Todd Lane / Cabana Road | Each | 1.0 | $25,000,000 | $25,000,000 |
| Municipal road on west side from Lambton Road to Todd Lane | Km | 1.3 | $1,700,000 | $2,210,000 |

## Practical Alternative 2A - At-grade besides Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO PLAZA A

| | | | | |
|---|---|---|---|---|
| Bridge at Turkey Creek | Each | 1.0 | $3,120,000 | $3,120,000 |
| Partial interchange at E.C. ROW Expressway | Each | 1.0 | $22,000,000 | $22,000,000 |
| 6-lane freeway transition section from Huron Church Road to Plaza A - Structure (36m wide) | Km | 0.8 | $80,000,000 | $60,800,000 |
| Overpass structure at Malden Road | Each | 1.0 | $2,860,000 | $2,860,000 |
| Interchange at Malden Road | L.S. | 1.0 | $50,000,000 | $50,000,000 |
| Stormwater Management Facility | L.S. | 1.0 | $4,075,000 | $4,075,000 |
| Drainage | L.S. | 1.0 | $1,856,600 | $1,856,600 |
| Pumping Stations | L.S. | 1.0 | $3,200,000 | $3,200,000 |
| Roadway Storm Sewer | L.S. | 1.0 | $9,966,880 | $9,966,880 |
| Modify the existing interchange at Huron Church / E.C. ROW Expressway | Each | 1.0 | $2,000,000 | $2,000,000 |
| Signalized intersection | Each | 15.0 | $200,000 | $3,000,000 |
| Small drain culverts | L.S. | 6.0 | $300,000 | $1,800,000 |
| Construction staging | L.S. | 1.0 | $5,000,000 | $5,000,000 |
| Utility Relocations | L.S. | 1.0 | $15,000,000 | $15,000,000 |
| Subtotal | | | | $521,754,985 |
| Contingency | | 20.0% | | $104,350,997 |
| **Total Construction Cost $CAD** | | | | **$626,105,982** |
| Engineering (Planning, Design, Construction Administration) | | 10.0% | | $52,175,498 |
| **Total Cost $CAD (2006)** | | | | **$678,281,480** |

## Practical Alternative 2A - At-grade besides Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO PLAZA A

| | | | | |
|---|---|---|---|---|
| Cost Escalate $CAD (2011) | | 3.0%<br>1.16 | | $786,314,135 |
| **Rounded Cost $CAD (2011)** | | | | **$790,000,000** |

*** All cost based on 2006 HICO unit prices**

## Practical Alternative 2A - At-grade besides Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO MALDEN ROAD

| Description | Unit | Quantity | Unit Price | $CAD Cost |
|---|---|---|---|---|
| Highway 401 - North Talbot Road to Howard Ave. | Km | 1.7 | $13,489,722 | $22,932,527 |
| Interchange at Highway 401 / Highway 3 / Howard Avenue | Each | 1.0 | $25,000,000 | $25,000,000 |
| 6-lane freeway at-grade section - Highways | Km | 3.0 | $13,489,722 | $40,334,269 |
| 6-lane freeway transition section - Highways | Km | 2.8 | $9,567,545 | $26,722,152 |
| 6-lane freeway transition section - Structural | L.S. | 1.0 | $83,790,000 | $83,790,000 |
| 6-lane freeway below grade section - Highways | Km | 1.6 | $9,567,545 | $14,829,694 |
| 6-lane freeway below grade section - Structural | L.S. | 1.0 | $69,750,000 | $69,750,000 |
| 6-lane freeway above grade section - Highways | Km | 0.5 | $9,583,569 | $4,791,784 |
| Excavation - transition section | m3 | 118981.8 | $10 | $1,189,818 |
| Excavation - below grade section | m3 | 72230.0 | $10 | $722,300 |
| Underpass structure at Howard Ave | Each | 1.0 | $3,643,000 | $3,643,000 |
| Underpass structure at Sandwich Parkway | Each | 1.0 | $2,318,000 | $2,318,000 |
| Underpass structure at Huron Church Line | Each | 1.0 | $2,981,000 | $2,981,000 |
| Underpass structure at Cabana Road West | Each | 1.0 | $3,097,000 | $3,097,000 |
| Underpass structure at Grand Marais West | Each | 1.0 | $3,478,000 | $3,478,000 |
| Underpass structure at Spring Garden Road | Each | 1.0 | $1,113,000 | $1,113,000 |
| Interchange at Todd Lane / Cabana Road | Each | 1.0 | $25,000,000 | $25,000,000 |
| Signalized intersection | Each | 15.0 | $200,000 | $3,000,000 |
| Municipal road on west side from Lambton Road | Km | 1.3 | $1,700,000 | $2,210,000 |

## Practical Alternative 2A - At-grade besides Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO MALDEN ROAD

| | | | | |
|---|---|---|---|---|
| to Todd Lane | | | | |
| Bridge at Turkey Creek | Each | 1.0 | $3,120,000 | $3,120,000 |
| Partial interchange at E.C. ROW Expressway | Each | 1.0 | $22,000,000 | $22,000,000 |
| Overpass structure at Malden Road | Each | 1.0 | $2,860,000 | $2,860,000 |
| Stormwater Management Facility | L.S. | 1.0 | $4,075,000 | $4,075,000 |
| Drainage | L.S. | 1.0 | $1,856,600 | $1,856,600 |
| Pumping Stations | L.S. | 1.0 | $3,200,000 | $3,200,000 |
| Roadway Storm Sewer | L.S. | 1.0 | $9,966,880 | $9,966,880 |
| Modify the existing interchange at Huron Church / E.C. ROW Expressway | Each | 1.0 | $2,000,000 | $2,000,000 |
| Small drain culverts | L.S. | 6.0 | $300,000 | $1,800,000 |
| Construction staging | L.S. | 1.0 | $5,000,000 | $5,000,000 |
| Utility Relocations | L.S. | 1.0 | $15,000,000 | $15,000,000 |
| Subtotal | | | | $407,781,024 |
| Contingency | | 20.0% | | $81,556,205 |
| **Total Construction Cost $CAD** | | | | **$489,337,229** |
| Engineering (Planning, Design, Construction Administration) | | 10.0% | | $40,778,102 |
| **Total Cost $CAD (2006)** | | | | **$530,115,331** |
| Cost Escalate $CAD (2011) | | 3.0% 1.16 | | $614,548,960 |
| **Rounded Cost $CAD (2011)** | | | | **$620,000,000** |

* **All cost based on 2006 HICO unit prices**

**URS Canada Inc.**

**Alignment Alternative "2A" Practical - At Grade Freeway Parallel to Talbot / Huron Church Road (Sept. 2006)**

| Structure I.D. | Structure Name | Structure Type | Length ( M ) | Width ( M ) | Cost ( $ ) |
|---|---|---|---|---|---|
| 2A - 10 | Highway 3 WB Underpass | Three Spans Bridge | 42+26+23 | 12.55 | $2,398,000 |
| 2A - 11 | Highway 401 Ramp W-E Underpass | Single Span Bridge | 36 | 12.05 | $911,000 |
| 2A - 12 | Highway 401 Ramp E-N/S Overpass | Single Span Bridge | 39 | 12.05 | $987,000 |
| 2A - 13 | Ramp E-W at West of Howard Avenue | Boat Section | 510 | Length | $15,300,000 |
| 2A - 20 | Approach Ramp of Highway 401 at East of Howard Avenue | Boat Section | 500 | Length | $15,000,000 |
| 2A - 21 | Below Grade Hwy 401 at East of Howard Avenue | Boat Section | 90 | Length | $4,050,000 |
| 2A - 22 | Howard Avenue Underpass | Two Spans Bridge | 30+30 | 27.6 | $3,643,000 |
| 2A - 23 | Below Grade Hwy 401 at West of Howard Avenue | Boat Section | 70 | Length | $3,150,000 |
| 2A - 24 | Approach Ramp of Highway 401 at West of Howard Avenue | Boat Section | 300 | Length | $9,000,000 |
| 2A - 30 | Approach Ramp of Highway 401 at East of Cousineau Road | Boat Section | 350 | Length | $10,500,000 |
| 2A - 31 | Below Grade Hwy 401 at East of Cousineau Road | Boat Section | 65 | Length | $2,925,000 |
| 2A - 32 | Sandwich Parkway Underpass | Two Spans Bridge | 20+20 | 27.6 | $2,318,000 |
| 2A - 34 | Below Grade Hwy 401 at West of Cousineau Road | Boat Section | 65 | Length | $2,925,000 |
| 2A - 35 | Approach Ramp of Highway 401 at West of Cousineau Road | Boat Section | 270 | Length | $8,100,000 |
| 2A - 40 | Approach Ramp of Highway 401 at East of Cousineau Road | Boat Section | 450 | Length | $13,500,000 |
| 2A - 41 | Below Grade Hwy 401 at West of Cabana Road West | Boat Section | 50 | Length | $2,250,000 |
| 2A - 42 | Cabana Road West Underpass | Two Spans Bridge | 26+25 | 27.6 | $3,097,000 |
| 2A - 43 | Below Grade Hwy 401 at East of Cabana Road West | Boat Section | 350 | Length | $15,750,000 |
| 2A - 44 | Below Grade Hwy 401 at West of Huron Church Line | Boat Section | 75 | Length | $3,375,000 |
| 2A - 45 | Below Grade Wider Hwy 401 at East of Huron Church Line | Boat Section | 100 | Length | $4,500,000 |
| 2A - 46 | Approach Ramp of Highway 401 at West of Cabana Road West | Boat Section | 375 | Length | $11,250,000 |
| 2A - 47 | Ramp N-E/W at East of Cabana Road West | Boat Section | 340 | Length | $10,200,000 |
| 2A - 48 | Ramp E/W-S at East of Cabana Road West | Boat Section | 340 | Length | $10,200,000 |
| 2A - 49 | Huron Church Line Underpass | Two Spans Bridge | 27+27 | 24 | $2,981,000 |
| 2A - 50 | Turkey Creek Bridge | Single Span Bridge | 26 | 60 | $3,120,000 |
| 2A - 51 | Grand Marais Road West Underpass | Two Spans Bridge | 30+30 | 27.6 | $3,478,000 |
| 2A - 60 | Approach Ramp of Highway 401 at Grand Marais Road West side | Boat Section | 273 | Length | $8,190,000 |
| 2A - 61 | Below Grade Hwy 401 at just West of Grand Marais Road West | Boat Section | 125 | Length | $5,625,000 |
| 2A - 62 | Huron Church Ramp N-S Underpass | Two Spans Bridge | 32+38 | 12.05 | $1,856,000 |
| 2A - 63 | Spring Garden Road Underpass | Two Spans Bridge | 22+22 | 12.05 | $1,113,000 |
| 2A - 64 | Below Grade Hwy 401 with S.C.L.Ramp at South of Huron Church Road | Boat Section | 100 | Length | $4,500,000 |
| 2A - 65 | Below Grade Hwy 401 at South of Huron Church Road | Boat Section | 125 | Length | $5,625,000 |

**URS Canada Inc.**

**Alignment Alternative "2A" Practical - At Grade Freeway Parallel to Talbot / Huron Church Road (Sept. 2006)**

| Structure I.D. | Structure Name | Structure Type | Length ( M ) | Width ( M ) | Cost ( $ ) |
|---|---|---|---|---|---|
| 2A - 66 | Below Grade Hwy 401 with Ramp S-N at South of Huron Church Road | Boat Section | 100 | Length | $4,500,000 |
| 2A - 67 | Below Grade Hwy 401 at just South of Ramp N-S | Boat Section | 125 | Length | $5,625,000 |
| 2A - 68 | Below Grade Hwy 401 at North of Ramp N-S | Boat Section | 110 | Length | $4,950,000 |
| 2A - 69 | Approach Ramp S-N to Hwy 401 at South of Huron Church Road | Boat Section | 250 | Length | $7,500,000 |
| 2A - 70 | Approach Ramp N-S to Hwy 401 at South of Huron Church Road | Boat Section | 250 | Length | $7,500,000 |
| 2A - 71 | Approach Ramp of Highway 401 at near EC ROW Expressway | Boat Section | 275 | Length | $8,250,000 |
| 2A - 90 | Malden Road Overpass | Single Span Bridge | 35 | 40.85 | $2,860,000 |
| 2A - 91 | Ramp W-E Underpass | Two Spans Bridge | 45+45 | 9.3 | $1,758,000 |
| 2A - 92 | Matchette Road Overpass | Single Span Bridge | 40 | 40.85 | $3,268,000 |
| 2A - 93 | Ojibway / ETR Overpass | Three Spans Bridge | 34+34+45 | 37.85 | $10,693,000 |
| 2A - 94 | Ramp E-W at Ojibway Parkway Overpass | Single Span Bridge | 44 | 12.05 | $1,060,000 |
| 2A - 95 | Ramp E-W at ETR Overpass | Single Span Bridge | 30 | 12.05 | $904,000 |
| 2A - 110 | Cahill Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 2A - 120 | Secondary Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 2A - 130 | Lennon Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 2A - 140 | Marentette Mangin Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 2A - 150 | Basin Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 2A - 160 | Titcombe Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| | | **TOTAL COST** | | | **$252,485,000** |

**Note: Above Costs include only Structural Costs. These costs do not include Roadwork, Earthwork, Road & Traffic Diversions, Roadway Protection etc; which are included in the Highway Costs.**

Detroit River International Crossing
**STORMWATER MANAGEMENT STUDY**
Highway 3 / Huron Church Road Corridor
**ALTERNATIVE 2A - At Grade**
**CONSTRUCTION COST ESTIMATE**

PRELIMINARY
COST TO BE CONFIRMED

| Item | Description | Quantity | Unit | Unit Cost | Total |
|---|---|---|---|---|---|
| I | Stormwater Management Facility | 37,100 | cu.m. | $ 109.84 | $ 4,075,000.00 |
| | Inlet/ Outlet Control Structure | 8 | L.S. | 125,000.00 | 1,000,000.00 |
| | Landscaping | 8 | L.S. | 200,000.00 | 1,600,000.00 |
| | Earthworks | 147,500 | cu.m. | 10.00 | 1,475,000.00 |
| III | Oil Grit Separator | - | unit | | |
| IV | Drainage | 565 | l.m. | $ 3,286.02 | $ 1,856,600.00 |
| | Cahill Drain Crossing Extension 4.5 x 1.5 | 80 | l.m. | 6,000.00 | 480,000.00 |
| | Cahill West Tributary Re-Alignment/Replacement (1200mmØ) | 340 | l.m. | 575.00 | 195,500.00 |
| | Lenon Drain, Extension 3.0 x 1.50 | 70 | l.m. | 3,500.00 | 245,000.00 |
| | Marentette Mangin Drain (1200mmØ) | 15 | l.m. | 575.00 | 8,625.00 |
| | Basin Drain, Replacement 2.1 x 1.50 | 60 | l.m. | 3,000.00 | 180,000.00 |
| | Titcombe Drain (1200mmØ) | 50 | | 575.00 | 28,750.00 |
| | Installation and Demolition (60% of direct cost) 1,137,875 | | L.S. | | 682,725.00 |
| | Earthworks | 3,000 | cu.m. | 12.00 | 36,000.00 |
| V | Pumping Station | 4 | unit | $ 800,000.00 | $ 3,200,000.00 |
| | Pump No. of Pumping Sta = 4 | 4 | unit | 600,000.00 | 2,400,000.00 |
| | Pump House | 4 | unit | 200,000.00 | 800,000.00 |
| VI | Roadway Storm Sewer (Conveying 5-Year Storm) | 10,890 | l.m. | $ 915.23 | $ 9,966,880.00 |
| | Highway 401 | | | | |
| | Storm Sewer (average sze = 750 mm) | 10,890 | l.m. | 400.00 | 4,356,000.00 |
| | Manholes (average size = 1500 mm) | 121 | unit | 4,450.00 | 538,450.00 |
| | Catch Basins (standard depth) | 363 | unit | 700.00 | 254,100.00 |
| | Catch Basin Leads | 12,705 | l.m. | 50.00 | 635,250.00 |
| | Miscellaneous (MH/CB Covers, etc) | 121 | unit | 3,000.00 | 363,000.00 |
| | Earthworks | 11,000 | cu.m. | 12.00 | 132,000.00 |
| | Installation (60% of direct cost) 5,783,800.00 | | | | 3,688,080.00 |
| | | | | | - |
| Add 20% Contingency | | | | | $ 3,819,696.00 |
| **Total Estimated Construction Cost** | | | | | **$ 22,918,176.00** |

O:\DRIC\13_Hwy_Planning\00_CAD\Cost estimate\August 2007\[DRIC Prelim Cost Estimates - No Property - to Malden.xls]DR-Alt 3

90% = $ 21,000,000.00

# Practical Alternative 2B

## Practical Alternative 2B - Below grade besides Talbot Road / Huron Church Road - NORTH TALBOT ROAD TO PLAZA A

| Description | Unit | Quantity | Unit Price | $CAD Cost |
|---|---|---|---|---|
| Highway 401 - North Talbot Road to Howard Ave. | Km | 1.7 | $13,489,722 | $22,932,527 |
| Interchange at Highway 401 / Highway 3 / Howard Avenue | Each | 1.0 | $40,000,000 | $40,000,000 |
| 6-lane freeway transition section - Highways | Km | 1.6 | $9,567,545 | $15,528,125 |
| 6-lane freeway transition section - Structural | L.S. | 1.0 | $31,690,000 | $31,690,000 |
| 6-lane freeway below grade section - Highways | Km | 5.8 | $9,567,545 | $55,491,758 |
| 6-lane freeway below grade section - Structural | L.S. | 1.0 | $290,500,000 | $290,500,000 |
| 6-lane freeway above grade section - Highways | Km | 0.6 | $9,583,569 | $5,366,798 |
| Excavation - transition section | m3 | 69139.8 | $10 | $691,398 |
| Excavation - below grade section | m3 | 270280.0 | $10 | $2,702,800 |
| Underpass structure at Howard Ave | Each | 1.0 | $3,218,000 | $3,218,000 |
| Underpass structure at Montgomery Road | Each | 1.0 | $1,596,000 | $1,596,000 |
| Underpass structure at Cousineau Road | Each | 1.0 | $2,318,000 | $2,318,000 |
| Underpass structure at Huron Church Line | Each | 1.0 | $3,229,000 | $3,229,000 |
| Underpass structure at Cabana Road West | Each | 1.0 | $3,036,000 | $3,036,000 |
| Interchange at Todd Lane / Cabana Road | Each | 1.0 | $40,000,000 | $40,000,000 |
| Tunnel under Turkey Creek | Each | 1.0 | $26,500,000 | $26,500,000 |
| Turkey Creek Bridge | Each | 1.0 | $8,007,000 | $8,007,000 |
| Underpass structure at Lambton Road | Each | 1.0 | $3,643,000 | $3,643,000 |
| Underpass structure at Spring Garden Road | Each | 1.0 | $1,672,000 | $1,672,000 |

## Practical Alternative 2B - Below grade besides Talbot Road / Huron Church Road - NORTH TALBOT ROAD TO PLAZA A

| | | | | |
|---|---|---|---|---|
| Partial interchange at E.C. ROW Expressway | Each | 1.0 | $40,000,000 | $40,000,000 |
| 6-lane freeway transition section from Huron Church Road to Plaza A - Structure (36m wide) | Km | 0.8 | $80,000,000 | $60,800,000 |
| Overpass structure at Malden Road | Each | 1.0 | $2,860,000 | $2,860,000 |
| Interchange at Malden Road | L.S. | 1.0 | $50,000,000 | $50,000,000 |
| Modify the existing interchange at Huron Church / E.C. ROW Expressway | Each | 1.0 | $2,000,000 | $2,000,000 |
| Stormwater Management Facility | L.S. | 1.0 | $3,737,500 | $3,737,500 |
| Drainage | L.S. | 1.0 | $36,782,600 | $36,782,600 |
| Pumping Stations | L.S. | 1.0 | $4,000,000 | $4,000,000 |
| Roadway Storm Sewer | L.S. | 1.0 | $11,329,208 | $11,329,208 |
| Signalized intersection | Each | 15.0 | $200,000 | $3,000,000 |
| Small drain culverts | L.S. | 6.0 | $300,000 | $1,800,000 |
| Construction staging | L.S. | 1.0 | $5,000,000 | $5,000,000 |
| Utility Relocations | L.S. | 1.0 | $15,000,000 | $15,000,000 |
| Subtotal | | | | $794,431,715 |
| Contingency | | 20.0% | | $158,886,343 |
| **Total Construction Cost $CAD** | | | | **$953,318,057** |
| Engineering (Planning, Design, Construction Administration) | | 10.0% | | $79,443,171 |
| **Total Cost $CAD (2006)** | | | | **$1,032,761,229** |

## Practical Alternative 2B - Below grade besides Talbot Road / Huron Church Road - NORTH TALBOT ROAD TO PLAZA A

| | | | | |
|---|---|---|---|---|
| Cost Escalate $CAD (2011) | | 3.0%<br>1.16 | | $1,197,253,318 |
| **Rounded Cost $CAD (2011)** | | | | **$1,200,000,000** |

*** All cost based on 2006 HICO unit prices**

## Practical Alternative 2B - Below grade besides Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO MALDEN ROAD

| Description | Unit | Quantity | Unit Price | $CAD Cost |
|---|---|---|---|---|
| Highway 401 - North Talbot Road to Howard Ave. | Km | 1.7 | $13,489,722 | $22,932,527 |
| Interchange at Highway 401 / Highway 3 / Howard Avenue | Each | 1.0 | $40,000,000 | $40,000,000 |
| 6-lane freeway at-grade section - Highways | Km | 0.4 | $13,489,722 | $5,395,889 |
| 6-lane freeway transition section - Highways | Km | 0.8 | $9,567,545 | $7,874,089 |
| 6-lane freeway transition section - Structural | L.S. | 1.0 | $31,690,000 | $31,690,000 |
| 6-lane freeway below grade section - Highways | Km | 5.8 | $9,567,545 | $55,491,758 |
| 6-lane freeway below grade section - Structural | L.S. | 1.0 | $290,500,000 | $290,500,000 |
| 6-lane freeway above grade section - Highways | Km | 0.5 | $9,583,569 | $4,791,784 |
| Excavation - transition section | m3 | 35059.8 | $10 | $350,598 |
| Excavation - below grade section | m3 | 270280.0 | $10 | $2,702,800 |
| Underpass structure at Howard Ave | Each | 1.0 | $3,218,000 | $3,218,000 |
| Underpass structure at Montgomery Road | Each | 1.0 | $1,596,000 | $1,596,000 |
| Underpass structure at Cousineau Road | Each | 1.0 | $2,318,000 | $2,318,000 |
| Underpass structure at Huron Church Line | Each | 1.0 | $3,229,000 | $3,229,000 |
| Underpass structure at Cabana Road West | Each | 1.0 | $3,036,000 | $3,036,000 |
| Interchange at Todd Lane / Cabana Road | Each | 1.0 | $40,000,000 | $40,000,000 |
| Tunnel under Turkey Creek | Each | 1.0 | $26,500,000 | $26,500,000 |
| Turkey Creek Bridge | Each | 1.0 | $8,007,000 | $8,007,000 |
| Underpass structure at Lambton Road | Each | 1.0 | $3,643,000 | $3,643,000 |

## Practical Alternative 2B - Below grade besides Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO MALDEN ROAD

| | | | | |
|---|---|---|---|---|
| Underpass structure at Spring Garden Road | Each | 1.0 | $1,672,000 | $1,672,000 |
| Partial interchange at E.C. ROW Expressway | Each | 1.0 | $40,000,000 | $40,000,000 |
| Modify the existing interchange at Huron Church / E.C. ROW Expressway | Each | 1.0 | $2,000,000 | $2,000,000 |
| Overpass structure at Malden Road | Each | 1.0 | $2,860,000 | $2,860,000 |
| Stormwater Management Facility | L.S. | 1.0 | $3,737,500 | $3,737,500 |
| Drainage | L.S. | 1.0 | $36,782,600 | $36,782,600 |
| Pumping Stations | L.S. | 1.0 | $4,000,000 | $4,000,000 |
| Roadway Storm Sewer | L.S. | 1.0 | $11,329,208 | $11,329,208 |
| Small drain culverts | L.S. | 6.0 | $300,000 | $1,800,000 |
| Signalized intersection | Each | 15.0 | $200,000 | $3,000,000 |
| Construction staging | L.S. | 1.0 | $5,000,000 | $5,000,000 |
| Utility Relocations | L.S. | 1.0 | $15,000,000 | $15,000,000 |
| Subtotal | | | | $680,457,754 |
| Contingency | | 20.0% | | $136,091,551 |
| **Total Construction Cost $CAD** | | | | **$816,549,304** |
| Engineering (Planning, Design, Construction Administration) | | 10.0% | | $68,045,775 |
| **Total Cost $CAD (2006)** | | | | **$884,595,080** |
| Cost Escalate $CAD (2011) | | 3.0% 1.16 | | $1,025,488,142 |
| **Rounded Cost $CAD (2011)** | | | | **$1,030,000,000** |

* **All cost based on 2006 HICO unit prices**

**URS Canada Inc.**

**Alignment Alternative "2B" Practical - Below Grade Freeway Parallel to Talbot / Huron Church Road (Sept. 2006)**

| Structure I.D. | Structure Name | Structure Type | Length ( M ) | Width ( M ) | Cost ( $ ) |
|---|---|---|---|---|---|
| 2B - 10 | Highway 3 WB Underpass | Three Spans Bridge | 42+26+23 | 12.55 | $2,398,000 |
| 2B - 11 | Ramp W-E Underpass | Single Span Bridge | 36 | 12.05 | $911,000 |
| 2B - 12 | Highway 401Ramp E-N/S Overpass | Single Span Bridge | 39 | 12.05 | $987,000 |
| 2B - 13 | Approach Ramp E-W of Hwy 401 at East of Howard Avenue | Boat Section | 550 | Length | $16,500,000 |
| 2B - 14 | Approach Ramp of Highway 401 at East of Howard Avenue | Boat Section | 500 | Length | $15,000,000 |
| 2B - 20 | Approach Ramp of Highway 401 at Howard Avenue | Boat Section | 123 | Length | $3,690,000 |
| 2B - 22 | Howard Avenue Underpass | Two Spans Bridge | 23+30 | 27.6 | $3,218,000 |
| 2B - 23 | Montgomery Road Underpass | Two Spans Bridge | 21+21 | 18.1 | $1,596,000 |
| 2B - 24 | Ramp W-N/S on West of Howard Avenue | Boat Section | 400 | Length | $12,000,000 |
| 2B - 32 | Cousineau Road / Sandwich Parkway Underpass | Two Spans Bridge | 20+20 | 27.6 | $2,318,000 |
| 2B - 33 | Huron Church Line Underpass | Two Spans Bridge | 27+27 | 26 | $3,229,000 |
| 2B - 34 | Ramps E/W-S and S-E/W | Boat Section | 800 | Length | $24,000,000 |
| 2B - 42 | Cabana Road West Underpass | Two Spans Bridge | 25+25 | 27.6 | $3,036,000 |
| 2B - 43 | Ramps N-E/W and E/W-N | Boat Section | 400 | Length | $12,000,000 |
| 2B - 51 | Grand Marais Road West / Lambton Underpass | Two Spans Bridge | 30+30 | 27.6 | $3,643,000 |
| 2B - 52 | Highway 401 Ramps N-S & S-N | Deeper Boat Section | 500 | Length | $32,500,000 |
| 2B - 55 | Turkey Creek Bridge (incl.staged const.,temp.bridge etc) | Single Span Bridge | 28 | 40.85 | $8,007,000 |
| 2B - 62 | Huron Church Line Ramp N-S Underpass | Two Spans Bridge | 30+40 | 12.05 | $1,856,000 |
| 2B - 63 | Spring Garden Underpass | Two Spans Bridge | 22+22 | 18.1 | $1,672,000 |
| 2B - 64 | Approach Ramp of Highway 401 near Spring Garden Road | Deepr Boat Section | 200 | Length | $13,000,000 |
| 2B - 90 | Malden Road Overpass | Single Span Bridge | 35 | 40.85 | $2,860,000 |
| 2B - 91 | Ramp W-E Underpass | Two Spans Bridge | 45+45 | 9.3 | $1,758,000 |
| 2B - 92 | Matchette Road Overpass | Single Span Bridge | 40 | 40.85 | $3,268,000 |
| 2B - 93 | Ojibway / ETR Overpass | Three Spans Bridge | 34+34+45 | 37.85 | $10,693,000 |
| 2B - 94 | Ramp E-W at Ojibway Parkway Overpass | Single Span Bridge | 44 | 12.05 | $1,060,000 |
| 2B - 95 | Ramp E-W at ETR Overpass | Single Span Bridge | 30 | 12.05 | $904,000 |
| 2B - 201 | Below Grade Hwy 401 bet.Howard Avenue & Montgomery Dr. | Boat Section | 200 | Length | $9,000,000 |
| 2B - 202 | Below Grade Hwy 401 with S.C.L.bet.Howard Avenue & Montgomery Dr. | Boat Section | 250 | Length | $11,250,000 |
| 2B - 203 | Below Grade Hwy 401 at East of Montgomery Drive | Boat Section | 325 | Length | $14,625,000 |
| 2B - 204 | Below Grade Hwy 401 bet.Montgomery Dr.& Cousineau Road | Boat Section | 800 | Length | $36,000,000 |
| 2B - 211 | Below Grade Hwy 401 bet.Cousineau Road & Huron Church Line | Boat Section | 1500 | Length | $67,500,000 |
| 2B - 212 | Below Grade Hwy 401 with Ramps at East of Huron Church Line | Boat Section | 150 | Length | $6,750,000 |
| 2B - 213 | Below Grade Hwy 401 with Ramps at West of Huron Church Line | Boat Section | 50 | Length | $2,250,000 |
| 2B - 214 | Below Grade Hwy 401 bet.Huron Church Line & Cabana Road West/Todd Lane | Boat Section | 400 | Length | $18,000,000 |
| 2B - 221 | Below Grade Hwy 401 at West of Cabana Road West / Todd Lane | Deepr Boat Section | 100 | Length | $6,500,000 |

**URS Canada Inc.**

**Alignment Alternative "2B" Practical - Below Grade Freeway Parallel to Talbot / Huron Church Road (Sept. 2006)**

| Structure I.D. | Structure Name | Structure Type | Length ( M ) | Width ( M ) | Cost ( $ ) |
|---|---|---|---|---|---|
| 2B - 222 | Below Grade Hwy 401 with Ramps bet.Cabana Rd.West & Pulford St. | Boat Section | 300 | Length | $19,500,000 |
| 2B - 223 | Below Grade Hwy 401 at East of Grand Marais Road West | Boat Section | 800 | Length | $52,000,000 |
| 2B - 224 | Highway 401 in Tunnel under Turkey Creek | Cut & Cover Tunnel | 100 | Length | $26,500,000 |
| 2B - 231 | Below Grade Hwy 401 at West of Grand Marais Road West | Boat Section | 150 | Length | $9,750,000 |
| 2B - 232 | Below Grade Hwy 401 with Ramp N-S at West of Grand Marais Road West | Boat Section | 150 | Length | $9,750,000 |
| 2B - 233 | Below Grade Hwy 401 at West of Grand Marais Road West | Boat Section | 150 | Length | $9,750,000 |
| 2B - 234 | Below Grade Hwy 401 with Ramp S-N at West of Grand Marais Rd.West | Boat Section | 100 | Length | $6,500,000 |
| 2B - 235 | Below Grade Hwy 401 at South of Huron Church Road | Boat Section | 175 | Length | $11,375,000 |
| 2B - 236 | Approach Ramp of Hwy 401 at South of Huron Church Road | Boat Section | 200 | Length | $9,000,000 |
| 2B - 110 | Cahill Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 2B - 120 | Secondary Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 2B - 130 | Lennon Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 2B - 140 | Marentette Mangin Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 2B - 150 | Basin Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| 2B - 160 | Titcombe Drain Culvert | Culvert | 1 | Nos. | $300,000 |
| | | **TOTAL COST** | | | **$509,904,000** |

**Note: Above Costs include only Structural Costs. These costs do not include Roadwork, Earthwork, Road & Traffic Diversions, Roadway Protection etc; which are included in the Highway Costs.**

Detroit River International Crossing
**STORMWATER MANAGEMENT STUDY**
Highway 3 / Huron Church Road Corridor
**ALTERNATIVE 2B - Below Grade**
**CONSTRUCTION COST ESTIMATE**

PRELIMINARY
COST TO BE CONFIRMED

| Item | Description | Quantity | Unit | Unit Cost | Total |
|---|---|---|---|---|---|
| I | Stormwater Management Facility | 39,300 | cu.m. | $ 95.10 | $ 3,737,500.00 |
| | Inlet/ Outlet Control Structure | 7 | L.S. | 125,000.00 | 875,000.00 |
| | Landscaping | 7 | L.S. | 200,000.00 | 1,400,000.00 |
| | Earthworks | 146,250 | cu.m. | 10.00 | 1,462,500.00 |
| III | Oil Grit Separator | - | unit | | |
| IV | Drainage | 597 | l.m. | $ 61,612.40 | $ 36,782,600.00 |
| | Cahill Drain Crossing, Siphon 4.5 x 1.5 | 140 | l.m. | 22,500.00 | 3,150,000.00 |
| | Cahill West Tributary Replacement (1200mmØ) | 90 | l.m. | 575.00 | 51,750.00 |
| | Lennon Drain Replacement, Siphon 3.0 x 1.50 | 160 | l.m. | 15,000.00 | 2,400,000.00 |
| | Turkey Creek Replacement, Siphon 25.0 x 2.0 | 130 | l.m. | 125,000.00 | 16,250,000.00 |
| | Turkey Creek Siphon Inlet Headwall, Grate | 1 | unit | 500,000.00 | 500,000.00 |
| | Turkey Creek Siphon Outlet Headwall, Grate | 1 | unit | 300,000.00 | 300,000.00 |
| | Marentette Mangin Drain (1200mmØ) | 15 | l.m. | 575.00 | 8,625.00 |
| | Basin Drain, Replacement 2.1 x 1.50 | 60 | l.m. | 3,000.00 | 180,000.00 |
| | Titcombe Drain (1200mmØ) | 50 | l.m. | 575.00 | 28,750.00 |
| | Installation and Demolition (60% of direct cost) 22,869,125 | | L.S. | | 13,721,475.00 |
| | Earthworks | 16,000 | cu.m. | 12.00 | 192,000.00 |
| V | Pumping Station | 4 | unit | $ 1,000,000.00 | $ 4,000,000.00 |
| | Pump No. of Pumping Sta.= 5 | 5 | unit | 600,000.00 | 3,000,000.00 |
| | Pump House | 5 | unit | 200,000.00 | 1,000,000.00 |
| VI | Roadway Storm Sewer (Conveying 100-Year Storm) | 10,890 | l.m. | $ 1,040.33 | $ 11,329,208.00 |
| | Highawy 401 | | | | |
| | Storm Sewer (average sze = 1050 mm) | 10,890 | l.m. | 460.00 | 5,009,400.00 |
| | Manholes (average size = 1800 mm) | 121 | unit | 5,180.00 | 626,780.00 |
| | Catch Basins (twin inlet, standard depth) | 363 | unit | 1,150.00 | 417,450.00 |
| | Catch Basin Leads | 12,705 | l.m. | 50.00 | 635,250.00 |
| | Miscellaneous (MH/CB Covers, etc) | 121 | unit | 3,000.00 | 363,000.00 |
| | Earthworks | 22,000 | cu.m. | 12.00 | 264,000.00 |
| | Installation (60% of direct cost) 6,688,880 | | | | 4,013,328.00 |
| Estimated Direct and Indirect Cost | | | | | $ 55,849,308.00 |
| Add 20% Contingency | | | | | $ 11,169,861.60 |
| **Total Estimated Construction Cost** | | | | | **$ 67,019,169.60** |



90% = $ 61,000,000.00

# Practical Alternative 3

## Practical Alternative 3 - Cut and Cover Tunnel on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO PLAZA A

| Description | Unit | Quantity | Unit Price | $CAD Cost |
|---|---|---|---|---|
| Highway 401 - North Talbot Road to Howard Ave. | Km | 1.7 | $13,489,722 | $22,932,527 |
| Interchange at Highway 401 / Highway 3 / Howard Avenue | Each | 1.0 | $30,000,000 | $30,000,000 |
| 6-lane freeway transition section - Highways | Km | 2.0 | $9,567,545 | $18,656,712 |
| 6-lane freeway transition section - Structural | L.S. | 1.0 | $51,750,000 | $51,750,000 |
| 6-lane freeway above grade section - Highways | Km | 0.6 | $9,583,569 | $5,366,798 |
| 6-lane freeway tunnel section - Howard Ave. to E.C. ROW Expressway | Km | 5.8 | $304,322,277 | $1,757,461,148 |
| Ventilation Buildings | Each | 2.0 | $75,000,000 | $150,000,000 |
| Control Centre | L.S. | 1.0 | $4,545,455 | $4,545,455 |
| Tunnel below Turkey Creek | Each | 1.0 | $95,400,000 | $95,400,000 |
| Turkey Creek Bridge | Each | 1.0 | $8,007,000 | $8,007,000 |
| Construction staging | L.S. | 1.0 | $30,000,000 | $30,000,000 |
| Interchange at St. Clair College | Each | 1.0 | $95,000,000 | $95,000,000 |
| Interchange at Lambton Road | Each | 1.0 | $75,000,000 | $75,000,000 |
| Municipal road from Howard Ave to E.C. ROW Expressway | Km | 5.6 | $2,468,557 | $13,823,917 |
| 6-lane freeway transition section from Huron Church Road to Plaza A - Structure (36m wide) | Km | 0.8 | $80,000,000 | $60,800,000 |
| Overpass structure at Malden Road | Each | 1.0 | $2,860,000 | $2,860,000 |

## Practical Alternative 3 - Cut and Cover Tunnel on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO PLAZA A

| | | | | |
|---|---|---|---|---|
| Interchange at Malden Road | L.S. | 1.0 | $50,000,000 | $50,000,000 |
| Stormwater Management Facility | L.S. | 1.0 | $1,387,500 | $1,387,500 |
| Oil Grit Separator | L.S. | 1.0 | $160,000 | $160,000 |
| Drainage | L.S. | 1.0 | $336,400 | $336,400 |
| Pumping Station | L.S. | 1.0 | $4,000,000 | $4,000,000 |
| Roadway Storm Sewer | L.S. | 1.0 | $2,787,040 | $2,787,040 |
| Signalized intersection | Each | 10.0 | $200,000 | $2,000,000 |
| Utility Relocations | L.S. | 1.0 | $25,000,000 | $25,000,000 |
| Subtotal | | | | $2,507,274,497 |
| Contingency | | 20.0% | | $501,454,899 |
| **Total Construction Cost $CAD** | | | | **$3,008,729,396** |
| Engineering<br>(Planning, Design, Construction Administration) | | 10.0% | | $250,727,450 |
| **Total Cost $CAD (2006)** | | | | **$3,259,456,846** |
| Cost Escalate $CAD (2011) | | 3.0%<br>1.16 | | $3,778,603,818 |
| **Rounded Cost $CAD (2011)** | | | | **$3,780,000,000** |

* **All cost based on 2006 HICO unit prices**

## Practical Alternative 3 - Cut and Cover Tunnel on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO MALDEN ROAD

| Description | Unit | Quantity | Unit Price | $CAD Cost |
|---|---|---|---|---|
| Highway 401 - North Talbot Road to Howard Ave. | Km | 1.7 | $13,489,722 | $22,932,527 |
| Interchange at Highway 401 / Highway 3 / Howard Avenue | Each | 1.0 | $30,000,000 | $30,000,000 |
| 6-lane freeway at-grade section - Highways | Km | 0.4 | $13,489,722 | $5,395,889 |
| 6-lane freeway transition section - Highways | Km | 1.2 | $9,567,545 | $11,002,676 |
| 6-lane freeway transition section - Structural | L.S. | 1.0 | $51,750,000 | $51,750,000 |
| 6-lane freeway above grade section - Highways | Km | 0.5 | $9,583,569 | $4,791,784 |
| 6-lane freeway tunnel section - Howard Ave. to E.C. ROW Expressway | Km | 5.8 | $304,322,277 | $1,757,461,148 |
| Ventilation Buildings | Each | 2.0 | $75,000,000 | $150,000,000 |
| Control Centre | L.S. | 1.0 | $4,545,455 | $4,545,455 |
| Tunnel below Turkey Creek | Each | 1.0 | $95,400,000 | $95,400,000 |
| Turkey Creek Bridge | Each | 1.0 | $8,007,000 | $8,007,000 |
| Construction staging | L.S. | 1.0 | $30,000,000 | $30,000,000 |
| Interchange at St. Clair College | Each | 1.0 | $95,000,000 | $95,000,000 |
| Interchange at Lambton Road | Each | 1.0 | $75,000,000 | $75,000,000 |
| Municipal road from Howard Ave to E.C. ROW Expressway | Km | 5.6 | $2,468,557 | $13,823,917 |
| Overpass structure at Malden Road | Each | 1.0 | $2,860,000 | $2,860,000 |
| Stormwater Management Facility | L.S. | 1.0 | $1,387,500 | $1,387,500 |

## Practical Alternative 3 - Cut and Cover Tunnel on Talbot Road / Huron Church Road
## NORTH TALBOT ROAD TO MALDEN ROAD

| | | | | |
|---|---|---|---|---|
| Oil Grit Separator | L.S. | 1.0 | $160,000 | $160,000 |
| Drainage | L.S. | 1.0 | $336,400 | $336,400 |
| Pumping Station | L.S. | 1.0 | $4,000,000 | $4,000,000 |
| Roadway Storm Sewer | L.S. | 1.0 | $2,787,040 | $2,787,040 |
| Signalized intersection | Each | 10.0 | $200,000 | $2,000,000 |
| Utility Relocations | L.S. | 1.0 | $25,000,000 | $25,000,000 |
| Subtotal | | | | $2,393,641,336 |
| Contingency | | 20.0% | | $478,728,267 |
| **Total Construction Cost $CAD** | | | | **$2,872,369,603** |
| Engineering (Planning, Design, Construction Administration) | | 10.0% | | $239,364,134 |
| **Total Cost $CAD (2006)** | | | | **$3,111,733,737** |
| Cost Escalate $CAD (2011) | | 3.0% 1.16 | | $3,607,352,247 |
| **Rounded Cost $CAD (2011)** | | | | **$3,610,000,000** |

* **All cost based on 2006 HICO unit prices**

**URS Canada Inc.**

**Alignment Alternative "3" Practical - Wider Tunnel Option (incorporating RWDI Comments), Highway 401 Along Talbot / Huron Church Road with Service Roads on Both Sides (Sept. 2006)**

| Structure I.D. | Structure Name | Structure Type | Length ( M ) | Width ( M ) | Cost ( $ ) |
|---|---|---|---|---|---|
| 3 - 10 | Highway 3 WB Underpass | Three Spans Bridge | 42+26+23 | 12.55 | $2,398,000 |
| 3 - 11 | Ramp W-E Underpass | Single Span Bridge | 36 | 12.05 | $911,000 |
| 3 - 12 | Highway 401 Ramp E-N/S Overpass | Single Span Bridge | 39 | 12.05 | $987,000 |
| 3 - 13 | Ramp E-W at East of Howard Avenue | Deeper Boat Section | 425 | Length | $19,125,000 |
| 3 - 20 | Approach Ramp of Highway 401 at East of Howard Avenue | Deeper Boat Section | 750 | Length | $33,750,000 |
| 3 - 25 | Ramp E-W Tunnel (Narrow) | Cut and Cover Tunnel | 75 | Length | $6,750,000 |
| 3 - 30 | Ramps E-W and W-E | Deeper Boat Section | 500 | Length | $22,500,000 |
| 3 - 35 | Ramp E-W and W-E Tunnels (Narrow) | Cut and Cover Tunnels | 225 | Length | $16,875,000 |
| 3 - 40 | Approach Ramps E-W and W-E | Deeper Boat Section | 500 | Length | $22,500,000 |
| 3 - 45 | Ramp E-W and W-E Tunnels (Narrow) | Cut and Cover Tunnels | 275 | Length | $20,625,000 |
| 3 - 55 | Turkey Creek Bridge for Service Roads (incl.staged const.,temp.bridge etc) | Single Span Bridge | 28 | 40.85 | $8,007,000 |
| 3 - 60 | Approach Ramps S-N & N-S | Deeper Boat Section | 425 | Length | $27,625,000 |
| 3 - 65 | Ramp S-N & N-S Tunnels (Narrow) | Deeper Cut and Cover Tu | 350 | Length | $47,250,000 |
| 3 - 70 | Approach Ramp of Highway 401 near EC ROW Parkway | Deeper Boat Section | 400 | Length | $18,000,000 |
| 3 - 90 | Malden Road Overpass | Single Span Bridge | 35 | 40.85 | $2,860,000 |
| 3 - 91 | Ramp W-E Underpass | Two Spans Bridge | 45+45 | 9.3 | $1,758,000 |
| 3 - 92 | Matchette Road Overpass | Single Span Bridge | 40 | 40.85 | $3,268,000 |
| 3 - 93 | Ojibway / ETR Overpass | Three Spans Bridge | 34+34+45 | 37.85 | $10,693,000 |
| 3 - 94 | Ramp E-W at Ojibway Parkway Overpass | Single Span Bridge | 44 | 12.05 | $1,060,000 |
| 3 - 95 | Ramp E-W at ETR Overpass | Single Span Bridge | 30 | 12.05 | $904,000 |
| 3 - 301 | Highway 401 Tunnel from East to West of Howard Avenue | Cut and Cover Tunnel | 175 | Length | $43,050,000 |
| 3 - 302 | Highway 401 Tunnel between Howard Avenue & Cousineau Road | Cut and Cover Tunnel | 1175 | Length | $252,625,000 |
| 3 - 303 | Highway 401 Tunnel at East of Cousineau Road | Cut and Cover Tunnel | 175 | Length | $43,050,000 |
| 3 - 311 | Highway 401 Tunnel at West of Cousineau Road | Cut and Cover Tunnel | 1450 | Length | $311,750,000 |
| 3 - 312 | Highway 401 Tunnel at West of Huron Church Line | Cut and Cover Tunnel | 200 | Length | $49,200,000 |
| 3 - 313 | Highway 401 Tunnel at East of Cabana Road West/Todd Lane | Cut and Cover Tunnel | 500 | Length | $107,500,000 |
| 3 - 321 | Highway 401 Tunnel at West of Cabana Road West/Todd Lane | Cut and Cover Tunnel | 950 | Length | $204,250,000 |
| 3 - 322 | Highway 401 Tunnel below Turkey Creek | Deeper Tunnel | 300 | Length | $95,400,000 |
| 3 - 323 | Highway 401 Tunnel at East of Grand Marais Road West | Cut and Cover Tunnel | 150 | Length | $36,900,000 |
| 3 - 331 | Highway 401 Tunnel at West of Grand Marais Road West | Cut and Cover Tunnel | 1000 | Length | $215,000,000 |
| | | **TOTAL COST** | | | **$1,628,071,000** |
| | | **Tunnel Cost** | | | **$1,358,725,000** |

**Note: Above Costs include only Structural Costs. These costs do not include Roadwork, Earthwork, Road & Traffic Diversions, Roadway Protection etc; which are included in the Highway Costs.**

Detroit River International Crossing
**STORMWATER MANAGEMENT STUDY**
Highway 3 / Huron Church Road Corridor
**ALTERNATIVE 3 - Tunnel**
**CONSTRUCTION COST ESTIMATE**

PRELIMINARY
COST TO BE CONFIRMED

| Item | Description | | Quantity | Unit | Unit Cost | Total |
|---|---|---|---|---|---|---|
| I | Stormwater Management Facility | | 18,500 | cu.m. | $ 75.00 | $ 1,387,500.00 |
| | Inlet/ Outlet Control Structure | | 2 | L.S. | 125,000.00 | 250,000.00 |
| | Landscaping | | 2 | L.S. | 200,000.00 | 400,000.00 |
| | Earthworks | | 73,750 | cu.m. | 10.00 | 737,500.00 |
| III | Oil Grit Separator | | 2 | unit | $ 80,000.00 | $ 160,000.00 |
| IV | Drainage | | 58 | l.m. | $ 5,800.00 | $ 336,400.00 |
| | Basin Drain, Replacement | 2.1 x 1.50 | 58 | l.m. | 3,000.00 | 174,000.00 |
| | Titcombe Drain | (1200mmØ) | 50 | l.m. | 575.00 | 28,750.00 |
| | Installation and Demolition (60% of direct cost) | 202,750 | | L.S. | | 121,650.00 |
| | Earthworks | | 1,000 | cu.m. | 12.00 | 12,000.00 |
| V | Pumping Station | | 5 | unit | $ 800,000.00 | $ 4,000,000.00 |
| | Pump No. of Pumping Sta.= | 5 | 5 | unit | 600,000.00 | 3,000,000.00 |
| | Pump House | | 5 | unit | 200,000.00 | 1,000,000.00 |
| VI | Roadway Storm Sewer | | 10,890 | l.m. | $ 255.93 | $ 2,787,040.00 |
| | Highawy 401 | | | | | |
| | Storm Sewer (average sze = 450 mm) | | 10,890 | l.m. | 90.00 | 980,100.00 |
| | Manholes (average size = 1200 mm) | | 121 | unit | 3,000.00 | 363,000.00 |
| | Catch Basins (standard depth) | | 242 | unit | 700.00 | 169,400.00 |
| | Catch Basin Leads | | 8,470 | l.m. | 50.00 | 423,500.00 |
| | Miscellaneous (MH/CB Covers, etc) | | 121 | unit | 1,500.00 | 181,500.00 |
| | Earthworks | | 8,000 | cu.m. | 12.00 | 96,000.00 |
| | Installation (60% of direct cost) | 955,900 | | | | 573,540.00 |
| Estimated Direct and Indirect Cost | | | | | | $ 8,670,940.00 |
| Add 20% Contingency | | | | | | $ 1,734,188.00 |
| **Total Estimated Construction Cost** | | | | | | **$ 10,405,128.00** |



90% = $ 10,000,000.00

Malden Road to Plaza B

## From Malden Road to Plaza B
## PRELIMINARY COST ESTIMATE

| Description | Unit | Quantity | Unit Price | $CAD Cost |
|---|---|---|---|---|
| 6-lane freeway above-grade section from Huron Church Road to Plaza B | Km | 2.3 | $9,583,569 | $22,042,208 |
| Underpass structure at W-E Ramp | Each | 1.0 | $1,758,000 | $1,758,000 |
| Overpass structure at Matchette Road | Each | 1.0 | $3,268,000 | $3,268,000 |
| Directional ramps to / from E.C. ROW Expy | Km | 2.0 | $1,816,283 | $3,632,566 |
| Signalized intersection | Each | 2.0 | $200,000 | $400,000 |
| Structure on directional ramps | Each | 2.0 | $1,000,000 | $2,000,000 |
| Interchange at Ojibway Parkway | L.S. | 1.0 | $15,000,000 | $15,000,000 |
| Utility Relocations | L.S. | 1.0 | $8,000,000 | $8,000,000 |
| Subtotal | | | | $48,100,774 |
| Contingency | | 20.0% | | $9,620,155 |
| **Total Construction Cost $CAD** | | | | **$57,720,929** |
| Engineering (Planning, Design, Construction Administration) | | 10.0% | | $4,810,077 |
| **Total Cost $CAD (2006)** | | | | **$62,531,007** |
| Cost Escalate $CAD (2011) | | 3.0% | | $71,910,658 |
| **Rounded Cost $CAD (2011)** | | | | **$80,000,000** |

# Malden Road to Plaza C

## From Malden Road to Plaza C
## PRELIMINARY COST ESTIMATE

| Description | Unit | Quantity | Unit Price | $CAD Cost |
|---|---|---|---|---|
| 6-lane freeway at-grade section from Huron Church Road to Plaza B | Km | 0.7 | $13,489,722 | $9,982,394 |
| 6-lane freeway above-grade section from Huron Church Road to Plaza B | Km | 2.3 | $9,583,569 | $22,042,208 |
| Underpass structure at W-E Ramp | Each | 1.0 | $1,758,000 | $1,758,000 |
| Overpass structure at Matchette Road | Each | 1.0 | $3,268,000 | $3,268,000 |
| Directional ramps to / from E.C. ROW Expressway | Km | 2.0 | $1,816,283 | $3,632,566 |
| Signalized intersection | Each | 3.0 | $200,000 | $600,000 |
| Structure on directional ramps | Each | 2.0 | 1,000,000 | $2,000,000 |
| Interchange at Ojibway Parkway | L.S. | 1.0 | $15,000,000 | $15,000,000 |
| Utility Relocations | L.S. | 1.0 | $12,000,000 | $12,000,000 |
| Subtotal | | | | $60,300,774 |
| Contingency | | 20.0% | | $12,060,155 |
| **Total Construction Cost $CAD** | | | | **$72,360,929** |
| Engineering (Planning, Design, Construction Administration) | | 10.0% | | $6,030,077 |
| **Total Cost $CAD (2006)** | | | | **$78,391,007** |
| Cost Escalate $CAD (2011) | | 3.0% | | $90,149,658 |
| **Rounded Cost $CAD (2011)** | | | | **$100,000,000** |

# Plaza Costs

**PLAZA**
**PRELIMINARY COST ESTIMATE**

| Description | Unit | Quantity | Unit Price | $CAD Cost |
|---|---|---|---|---|
| **Plaza A** | | | | |
| Construction | LS | 1.0 | 150,000,000 | 150,000,000 |
| **Total Cost $CAD (2006)** | | | | **$150,000,000** |
| Cost Escalate $CAD (2011) | | 3.0% | | $172,500,000 |
| **Rounded Cost $CAD (2011)** | | | | **$180,000,000** |

| | | | | |
|---|---|---|---|---|
| **Plaza B** | | | | |
| Construction | LS | 1.0 | $150,000,000 | $150,000,000 |
| **Total Cost $CAD (2006)** | | | | **$150,000,000** |
| Cost Escalate $CAD (2011) | | 3.0% | | $172,500,000 |
| **Rounded Cost $CAD (2011)** | | | | **$180,000,000** |

| | | | | |
|---|---|---|---|---|
| **Plaza C** | | | | |
| Construction | LS | 1.0 | $150,000,000 | $150,000,000 |
| **Total Cost $CAD (2006)** | | | | **$150,000,000** |
| Cost Escalate $CAD (2011) | | 3.0% | | $172,500,000 |
| **Rounded Cost $CAD (2011)** | | | | **$180,000,000** |

# Supporting Data

| CUT AND COVER TUNNEL - UNIT COST | | | | | |
|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Quantity** | **Total** | **Comments** |
| Support of Excavation Walls | $m^2$ | $432 | 215000.0 | $92,840,909 | |
| Temporary Surface Traffic Lanes | $m^2$ | $114 | 127300.0 | $14,465,909 | |
| Excavation | $m^3$ | $11 | 3300000.0 | $37,500,000 | |
| Haul and Disposal | $m^3$ | $25 | 4290000.0 | $107,250,000 | |
| Temporary Bridge Decking | each | $1,704,545 | 5.0 | $8,522,727 | |
| Concrete Tunnel | m | $215,000 | 5800.0 | $1,247,000,000 | |
| Backfill | $m^3$ | $73 | 1100000.0 | $80,000,000 | |
| Final Surface Traffic Lanes | $m^2$ | $114 | 174200.0 | $19,795,455 | |
| Standpipe | L.M. | $455 | 12800.0 | $5,818,182 | |
| Pump Station | each | $909,091 | 3.0 | $2,727,273 | |
| Signs, Striping | L.S. | $3,409,091 | 1.0 | $3,409,091 | |
| **Sub-Total** | | | | $1,619,329,545 | |
| Misc. Fittings | % | | 2.0% | $32,386,591 | |
| Communication, Control, CCTV | % | | 4.0% | $64,773,182 | |
| Tunnel Lighting and Power | % | | 3.0% | $48,579,886 | |
| **GRAND TOTAL** | | | | $1,765,069,205 | |
| | | | TOTAL LENGTH | 5.8 | |
| **Grand Total (per km)** | km | | | **$304,322,277** | |

| 401 MAINLINE FOR AT GRADE SECTION - UNIT COST (KM) | | | | | |
|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Quantity** | **Total** | **Comments** |
| Jointed Plain Conc. Pavement (260mm depth) | $m^2$ | $175 | 23000 | $4,025,000 | 11.5m WIDE x 2 |
| Asphalt (Superpave 12.5) | t | $75 | 990 | $185,625 | multiplier of 2.5 |
| Open Grade Drainage Layer | t | $25 | 3330 | $199,800 | multiplier of 2.4 |
| Granular A | t | $16 | 14374 | $551,962 | multiplier of 2.4 |
| Tall Wall | m | $200 | 1000 | $200,000 | |
| Chanageable Signs | each | $80,000 | 1 | $80,000 | Assume 1 per km |
| Subdrain | m | $25 | 6000 | $150,000 | 6 runs |
| Noise Barrier System (inc. Jersey barrier) | m | $2,000 | 2000 | $4,000,000 | 2 runs |
| Light Stands | each | $60,000 | 10 | $600,000 | along CL every 100m |
| **Sub-Total** | | | | $9,992,387 | |
| **Minor Items** | | 35% | | $3,497,335 | |
| **Grand Total (per km)** | **km** | | | **$13,489,722** | |

**WITH NOISE WALL**

| 401 MAINLINE FOR AT GRADE SECTION - UNIT COST (KM) | | | | | |
|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Quantity** | **Total** | **Comments** |
| Jointed Plain Conc. Pavement (260mm depth) | $m^2$ | $175 | 23000 | $4,025,000 | 11.5m WIDE x 2 |
| Asphalt (Superpave 12.5) | t | $75 | 990 | $185,625 | multiplier of 2.5 |
| Open Grade Drainage Layer | t | $25 | 3330 | $199,800 | multiplier of 2.4 |
| Granular A | t | $16 | 14374 | $551,962 | multiplier of 2.4 |
| Tall Wall | m | $200 | 1000 | $200,000 | |
| Chanageable Signs | each | $80,000 | 1 | $80,000 | Assume 1 per km |
| Subdrain | m | $25 | 6000 | $150,000 | 6 runs |
| Light Stands | each | $60,000 | 10 | $600,000 | along CL every 100m |
| **Sub-Total** | | | | $5,992,387 | |
| **Minor Items** | | 35% | | $2,097,335 | |
| | | | | | |
| **Grand Total (per km)** | km | | | **$8,089,722** | |

**WITHOUT NOISE WALL**

| 401 MAINLINE FOR ABOVE GRADE SECTION - UNIT COST (KM) | | | | | |
|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Quantity** | **Total** | **Comments** |
| Jointed Plain Conc. Pavement (260mm depth) | $m^2$ | $175 | 23000 | $4,025,000 | 11.5m WIDE x 2 |
| Asphalt (Superpave 12.5) | t | $75 | 990 | $185,625 | multiplier of 2.5 |
| Open Grade Drainage Layer | t | $25 | 3330 | $199,800 | multiplier of 2.4 |
| Granular A | t | $16 | 15792 | $606,413 | multiplier of 2.4 |
| Earth Borrow | $m^3$ | $7 | 164586 | $1,152,102 | Average of 4m fill |
| Tall Wall | m | $200 | 1000 | $200,000 | |
| Chanageable Signs | each | $80,000 | 1 | $80,000 | Assume 1 per km |
| Subdrain | m | $25 | 2000 | $50,000 | 2 runs |
| Light Stands | each | $60,000 | 10 | $600,000 | along CL every 100m |
| **Sub-Total** | | | | $7,098,940 | |
| **Minor Items** | | 35% | | $2,484,629 | |
| **Grand Total (per km)** | km | | | **$9,583,568.73** | |

| 401 MAINLINE FOR BELOW GRADE SECTION - UNIT COST (KM) | | | | | |
|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Quantity** | **Total** | **Comments** |
| Jointed Plain Conc. Pavement (260mm depth) | $m^2$ | $175 | 23000 | $4,025,000 | 11.5m WIDE x 2 |
| Asphalt (Superpave 12.5) | t | $75 | 1092 | $204,750 | multiplier of 2.5 |
| Open Grade Drainage Layer | t | $25 | 3330 | $199,800 | multiplier of 2.4 |
| Granular A | t | $16 | 15300 | $587,520 | multiplier of 2.4 |
| Jersey Barrier | m | $120 | 2000 | $240,000 | |
| Jersey Barrier c/w Chain Link Fence | m | $425 | 2000 | $850,000 | Top of retain wall |
| Tall Wall | m | $200 | 1000 | $200,000 | |
| Chanageable Signs | each | $80,000 | 1 | $80,000 | Assume 1 per km |
| Subdrain | m | $25 | 4000 | $100,000 | 4 runs |
| Light Stands | each | $60,000 | 10 | $600,000 | along CL every 100m |
| **Sub-Total** | | | | $7,087,070 | |
| **Minor Items** | | 35% | | $2,480,475 | |
| | | | | | |
| **Grand Total (per km)** | km | | | **$9,567,545** | |

| MUNICIPAL ROADS FOR TUNNEL SECTION - UNIT COST (KM) FOR BOTH SIDES | | | | | |
|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Quantity** | **Total** | **Comments** |
| Hot Mix HL-1 (45mm Depth) | t | $75 | 988 | $185,250 | multiplier of 2.5 |
| Asphalt (55mm HDBC, 50mm HL-8) | t | $60 | 2304 | $345,600 | multiplier of 2.5 |
| Granular A | t | $16 | 3486 | $133,862 | multiplier of 2.4 |
| Granular B | t | $14 | 14066 | $393,848 | multiplier of 2.0 |
| Curb and Gutter | m | $50 | 4000 | $200,000 | 4 runs |
| Concrete Sidewalk | $m^2$ | $50 | 3000 | $150,000 | 1.5m wide x 2 runs |
| Subdrain | m | $25 | 4000 | $100,000 | 4 runs |
| Light Stands | each | $8,000 | 40 | $320,000 | every 50m x 2 rows = 40 |
| **Sub-Total** | | | | $1,828,560 | |
| **Minor Items** | | 35% | | $639,996 | |
| | | | | | |
| **Grand Total (per km) for both sides** | | | | **$2,468,557** | |

| MUNICIPAL ROADS FOR AT GRADE SECTION - UNIT COST (KM) FOR BOTH SIDES | | | | | |
|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Quantity** | **Total** | **Comments** |
| Hot Mix HL-1 (45mm Depth) | t | $75 | 1124 | $210,750 | multiplier of 2.5 |
| Asphalt (55mm HDBC, 50mm HL-8) | t | $60 | 2620 | $393,000 | multiplier of 2.5 |
| Granular A | t | $16 | 3936 | $151,142 | multiplier of 2.4 |
| Granular B | t | $14 | 14650 | $410,200 | multiplier of 2.0 |
| Curb and Gutter | m | $50 | 4000 | $200,000 | 4 runs |
| Concrete Sidewalk | $m^2$ | $50 | 3000 | $150,000 | 1.5m wide x 2 runs |
| Subdrain | m | $25 | 4000 | $100,000 | 4 runs |
| Light Stands | each | $8,000 | 40 | $320,000 | every 50m x 2 rows = 40 |
| **Sub-Total** | | | | $1,935,092 | |
| **Minor Items** | | 35% | | $677,282 | |
| | | | | | |
| **Grand Total (per km) for both sides** | | | | **$2,612,375** | |

| INTERCHANGE RAMPS FOR ABOVE GRADE SECTION - UNIT COST (2-LANE RAMPS) | | | | | |
|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Quantity** | **Total** | **Comments** |
| Hot Mix HL-1 (45mm Depth) | t | $75 | 495 | $92,813 | multiplier of 2.5 |
| Asphalt (55mm HDBC, 50mm HL-8) | t | $60 | 1156 | $173,400 | multiplier of 2.5 |
| Granular A | t | $16 | 2246 | $86,246 | multiplier of 2.4 |
| Granular B | t | $14 | 7962 | $222,936 | multiplier of 2.0 |
| Earth Borrow | $m^3$ | $7 | 110000 | $770,000 | |
| **Sub-Total** | | | | $1,345,395 | |
| **Minor Items** | | 35% | | $470,888 | |
| | | | | | |
| **Grand Total (per km)** | | | | **$1,816,283** | |

| INTERCHANGE RAMPS FOR AT GRADE SECTION - UNIT COST (2-LANE RAMPS) | | | | | |
|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Quantity** | **Total** | **Comments** |
| Hot Mix HL-1 (45mm Depth) | t | $75 | 495 | $92,813 | multiplier of 2.5 |
| Asphalt (55mm HDBC, 50mm HL-8) | t | $60 | 1156 | $173,400 | multiplier of 2.5 |
| Granular A | t | $16 | 2246 | $86,246 | multiplier of 2.4 |
| Granular B | t | $14 | 7962 | $222,936 | multiplier of 2.0 |
| **Sub-Total** | | | | $575,395 | |
| **Minor Items** | | 35% | | $201,388 | |
| | | | | | |
| **Grand Total (per km)** | | | | **$776,783** | |

Canada | U.S. Department of Transportation Federal Highway Administration | Ontario | MDOT Michigan Department of Transportation

Canada-United States-Ontario-Michigan Border Transportation Partnership

# Detroit River International Crossing
# Environmental Assessment Study

## Preliminary Construction Cost Estimate Report for Practical Alternatives (Access Road and Inspection Plaza)

## Appendices B, C and D

URS

August 2007

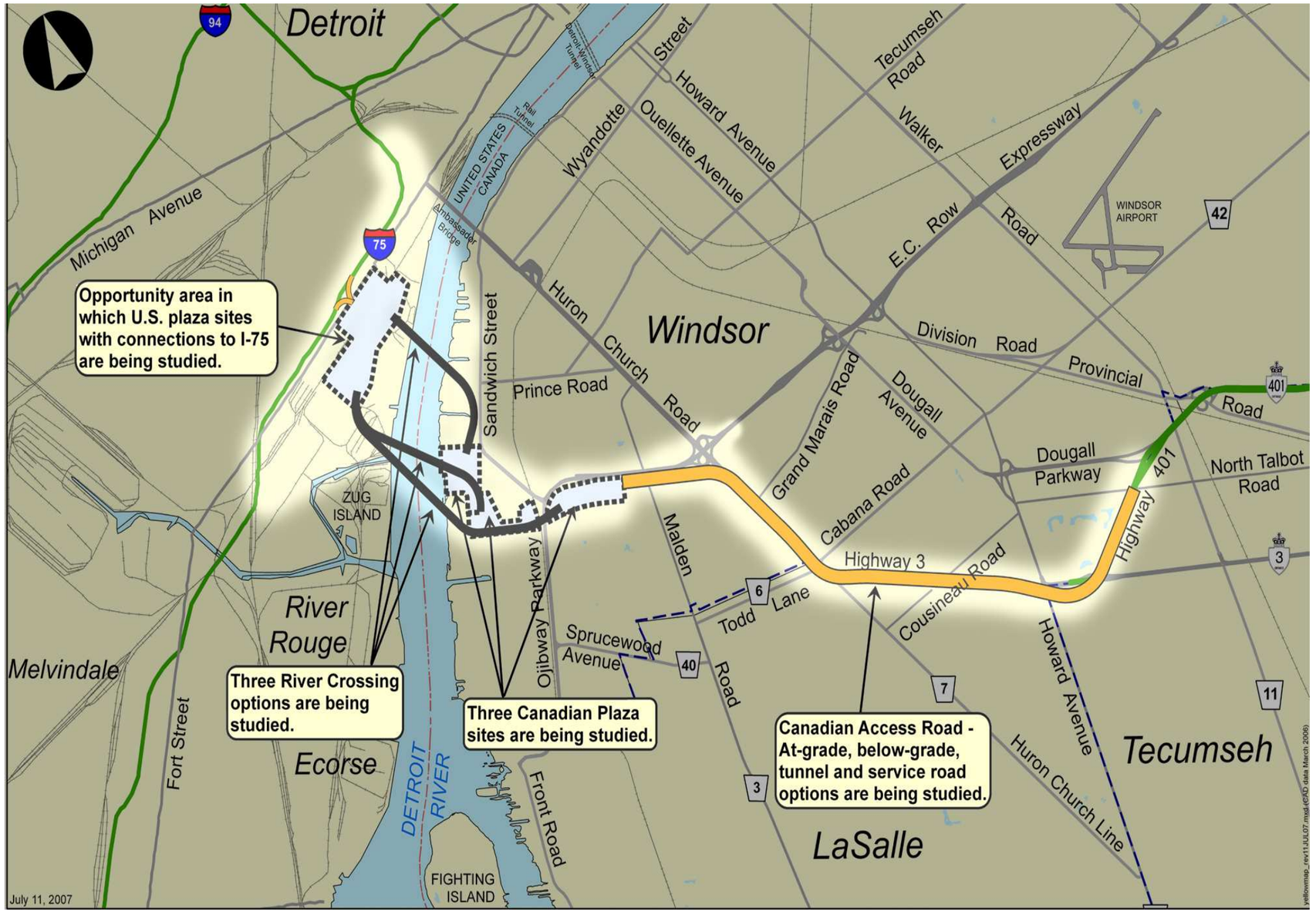
# APPENDIX B

## Conceptual Design Drawings for Access Road and Inspection Plaza Practical Alternatives

# Crossing, Plaza & Access Road Practical Alternatives

## Practical Alternative Drawings – November 2006

Refinements have been incorporated into the Practical Access Road Alternatives since Public Information Open House #3 held in March 2006. The refinements are based on comments received from members of the public as well as from stakeholders, such as the Municipalities. Key objectives of the refinements include reducing overall impacts and providing additional access to and from the freeway and across the freeway.



URS

# Memorandum

| | |
|---|---|
| Date: | August 16, 2006 (Revised November 9, 2006) |
| To: | File |
| From: | Tim Sorochinsky |
| c.c. | Murray Thompson, Len Kozachuk, George Katic, Colin Wong, Roger Ward, Kevin DeVos |
| Reference: | Detroit River International Crossing (DRIC) Environmental Assessment Study |
| Subject: | Summary of Refinements to Access Road Alternatives |

This memo provides a summary of refinements, which were incorporated into the Practical Access Route Alternatives since PIOH3. The refinements are based on comments received from members of the public and stakeholders (such as the Municipalities). Key objectives of the refinements include reducing impacts and providing additional access to and from the Freeway, and across the Freeway.

**Alt 1A – One-Way Service Roads on Either Side of 6-Lane Freeway, At-grade (Option 1)**

- Connection added between Lamont Ave and 7th Street;
- Connection added between Lambton Road and Grand Marais Road over Freeway and Service Roads, including access from Lambton Road to southbound Service Road, and from Grand Marais Road to northbound Service Road;
- Freeway profile lowered between Labelle Street to north of Turkey Creek;
- Both Huron Church Road ramp profiles modified with Freeway profile change;
- 150m wide 'land bridge' added at Todd Lane / Cabana Road West; Freeway profile modified accordingly;
- 150m 'land bridge' added at Cousineau Road; Freeway profile modified accordingly.

**Alt 1A – One-Way Service Roads on Either Side of 6-Lane Freeway, At-Grade (Option 2)**

- Same modifications as described in Alternative 1A Option 1 discussion.
- Slip on/off ramps (4) added between Freeway and Service Roads at St. Clair College.

**Alt 1B - One-Way Service Roads on Either Side of 6-Lane Freeway, Below-Grade (Option 1)**

- Start of transition from depressed Freeway to at-grade Freeway begins south of Spring Garden Road;
- At-grade connection added between Bethlehem Avenue and Labelle Street over depressed Freeway;
- Short Freeway tunnel section added under Grand Marais Drain/Turkey Creek;
- Pulford Street extended over depressed Freeway to southbound Service Road;
- Slip on/off ramps (2) from Freeway to Service Roads added between Pulford Street and Todd Lane/Cabana Road;
- 150 m 'land bridge' added at Todd Lane/Cabana Road West;
- Huron Church Line realigned and extended over depressed Freeway to northbound Service Road (replaces Service Road connection to Todd Lane);
- 150 m 'land bridge' added at Cousineau Road;
- Montgomery Drive extended over depressed Freeway to northbound Service Road.

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**Alt 1B – One-Way Service Roads on Either Side of 6-Lane Freeway, Below-Grade (Option 2)**

- Same modifications as described in Alternative 1B Option 1 discussion.
- Slip on/off ramps (4) added between Freeway and Service Roads at St. Clair College.

**Alt 2A – Six Lane Freeway at-grade, Along Side Huron Church/Highway 3 (Options 1 and 2)**

- Spring Garden Road extended over depressed Freeway to Huron Church Road;
- Connection added between Lambton Road and Grand Marais Road over Freeway and Huron Church Road, including access from Grand Marais Road to Huron Church Road;
- Freeway profile lowered between Bethlehem Avenue to north of Turkey Creek;
- Both Huron Church Road ramp profiles modified with Freeway profile change;
- North limit of West Service Road changed from Lambton Road to Gratiot Street (formerly, West Service Road was provided from Lambton Road to Todd Lane).

**Alt 2B - Six Lane Freeway Below-Grade, Along Side Huron Church/Highway 3 (Options 1 and 2)**

- Spring Garden Road extended over depressed Freeway to Huron Church Road;
- Short Freeway tunnel section added under Grand Marais Drain/Turkey Creek;
- Montgomery Road extended over depressed Freeway to Highway 3.

**Alt 3 – Cut & Cover Tunnel Below Rebuilt Huron Church/Highway 3 Corridor**

- No change.

**ALL ACCESS ROAD ALTERNATIVES**

The following note was added to all alternatives:

"Maintain Pathway along Grand Marais Drain/Turkey Creek"

**Description of Options:**

Option 1: Maintain Right-of-Way limit on west side of Highway 3 from St. Clair College to north of Howard Avenue.

Option 2: Maintain Right-of-Way limit on east side of Highway 3 from St. Clair College to north of Howard Avenue.

**KEY ROADWAY MODIFICATIONS AT PLAZAS**

Plaza A Alternative: Matchette Road realigned along the west end of Plaza A.

All Plaza Alternatives: Add ramp from Malden Road to Freeway westbound (to new international bridge) and add ramp from Freeway eastbound (from bridge) to Malden Road.

# LEGEND

- REQUIRED RIGHT-OF-WAY
- HIGHWAY 401 AT GRADE
- HIGHWAY 401 ABOVE GRADE
- HIGHWAY 401 BELOW GRADE
- HIGHWAY 401 TUNNEL
- HIGHWAY 401 GRADE TRANSITION
- MUNICIPAL ROAD
- MUNICIPAL ROAD
- PROPOSED STRUCTURE
- PROPOSED LAND BRIDGE
- CROSSING ALTERNATIVE A
- CROSSING ALTERNATIVE B
- CROSSING ALTERNATIVE C
- CROSSING ALTERNATIVE C1
- CROSSING ALTERNATIVE C2
- POTENTIAL PLAZA BOUNDARY
- (A) PLAZA IDENTIFIER
- U.S. BOUND TRAFFIC
- CANADA BOUND TRAFFIC

- AQUATIC HABITAT
- MUNICIPAL BOUNDARIES
- APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS
- ANALYSIS ENVELOPE
- ANSI AREA
- ENVIRONMENTALLY SENSITIVE AREA
- WETLANDS AREA

- SCHOOL
- PLACE OF WORSHIP
- PARK OR RECREATIONAL AREA
- TRAIL
- MUSEUM
- NATIONAL HERITAGE SITE
- AIR MONITORING STATION
- ENVIRONMENTALLY SENSITIVE AREA
- ANSI
- SENIORS RESIDENCE/ EXTENDED CARE FACILITY
- MOE WELL
- BRINE WELL
- INDUSTRY RESOURCE SITE
- CLOSED LANDFILL

# Plaza Alternative A

CONCEPTUAL

# PLAZA A - CROSSING C

SCALE 1:15 000

NOVEMBER 2006

CONCEPTUAL

250m 0m 250m 500m


# PLAZA A - CROSSING B

SCALE 1:15 000

NOVEMBER 2006

CONCEPTUAL

DETROIT

U.S.A.

CANADA

DETROIT RIVER

WINDSOR

ESSEX TERMINAL RAILWAY

MATCHETTE ROAD

E.C.ROWE EXPRESSWAY

OJIBWAY PARKWAY

JUNCTION ST

DRAGOON ST

LIVERNOIS AVE

WATERMAN ST

GREEN ST

JEFFERSON AVE

ZUG ISLAND

SHIPPING CHANNEL

CROSSING ALTERNATIVE A

DETROIT-WINDSOR TRUCK FERRY ROUTE

250m 0m 250m 500m


# PLAZA A - CROSSING A

SCALE 1:15 000

NOVEMBER 2006

CROSSING ALTERNATIVE C

DETROIT RIVER U.S.A.

CANADA

LAFARGE WINDSOR AGGREGATE DOCK

CBM ST MARYS WINDSOR PLANT

APPROXIMATE LIMIT OF AREA OF CONTI

RUSSELL ST

STERLING MARINE FUELS

PRINCE RD

BLESSED SACRAMENT CHURCH

ANDLAUER TRANSPORT

FORMER HURON STEEL

SANDWICH ST

PERFECTION AUTOMOTIVE PRODUCTS

STANDARD INDUCTION & CASTINGS

K SCRAP RESOURCES

VAN DEHOGEN GROUP

HYDRO ONE TRANSMISSION LINE

ESSEX AGGREGATES

CENTRAL TRANSPORT

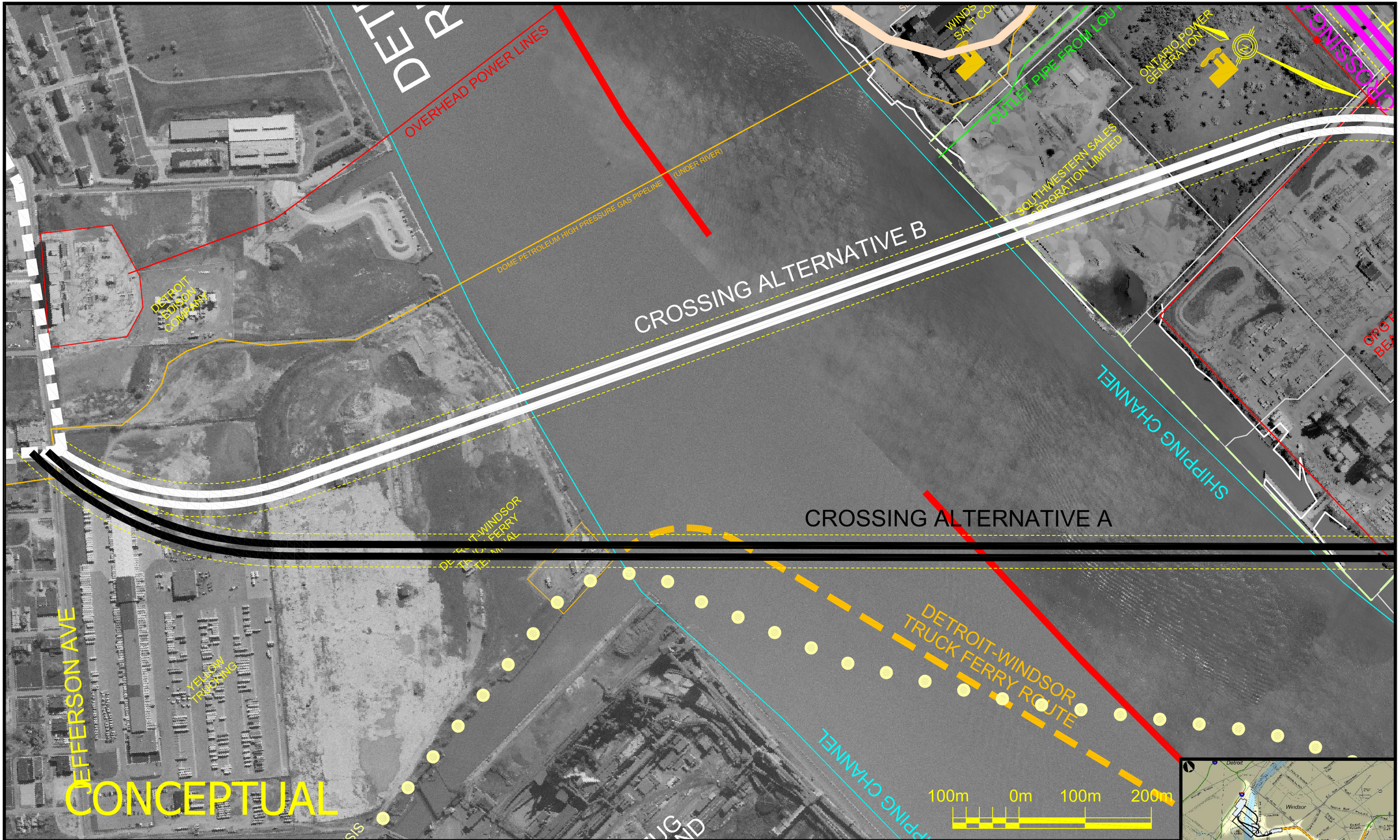
EXTENT OF SURFACE SETTLEMENT FROM SINKHOLE

HISTORIC FORT WAYNE

CONCEPTUAL

100m 0m 100m 200m


| PLAZA A - CROSSING C | SCALE 1:5000 | NOVEMBER 2006 |
|---|---|---|




PLAZA A - CROSSINGS A & B

SCALE 1:5000

NOVEMBER 2006

DETROIT RIVER

U.S.A.

CANADA

STERLING MARINE FUELS

K SCRAP RESOURCES

K SCRAP RESOURCES

VAN DEHOGEN GROUP

HYDRO ONE TRANSMISSION LINE

ESSEX AGGREGATES

CENTRAL TRANSPORT

EXTENT OF SURFACE SETTLEMENT FROM SINKHOLE (1954)

WINDSOR SALT COMPANY

OVERHEAD POWER LINES

DOME PETROLEUM HIGH PRESSURE GAS PIPELINE (UNDER RIVER)

CROSSING ALTERNATIVE B

CONCEPTUAL

TRUCK DRIVER TRAINING CENTRE

MAJOR F.A. TILSTON V.C. ARMOURY AND POLICE TRAINING CENTRE

AIR-O SYSTEMS LTD. (SANDBLASTING)

AGENCY FUELS LTD.

OUTLET PIPE FROM LOU ROMANO WATER RECLAMATION PLANT

ONTARIO POWER GENERATION

SOUTHWESTERN SALES CORPORATION LIMITED

BP CANADA HIGH PRESSURE

ESSEX TERMINAL

LOU ROMANO WATER RECLAMATION PLANT

ANALYSIS FROM SLOPE

OJIBWAY PARKWAY

CROSSING ALTERNATIVE C

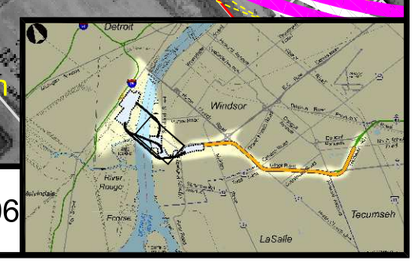
VOYAGEUR TRANSPORTATION SERVICES PRISM BERLIN

WINDSOR POWER PLANT

SANDWICH ST

OPG BRIGHTON BEACH POWER STATION

100m 0m 100m 200m




| PLAZA A - CROSSINGS B & C | SCALE 1:5000 | NOVEMBER 2006 |
|---|---|---|

SHIPPING CHANNEL

CROSSING A

SANDWICH ST

CROSSING ALTERNATIVE C

OJIBWAY PARKWAY

X TERMINAL RAILWAY

BP CANADA

BP CANADA HIGH PRIZ

APPROXIMATE LIMIT OF AREA OF CONTINUED ANA

OPG BRIGHTON BEACH POWER STATION

WINDSOR POWER PLANT

NEMAK PLANT

BRIGHTON BEACH INDUSTRIAL AREA

ERIE WILDLIFE RESCUE

HOWARD'S BACKHOE TRUCKING & BOBCAT SERVICE

OJIBWAY PARKWAY

BROADWAY STREET

ENVIRONMENTAL POLICY AREA

OJIBWAY BLACK OAK WOODS

BLACK OAK PRAIRIE HERITAGE PARK (LIFE ANSI)

BROADWAY PARK

100m 0m 100m 200m

CONCEPTUAL


# PLAZA A - CROSSINGS A, B & C

SCALE 1:5000

NOVEMBER 2006


| PLAZA A | SCALE 1:5000 | NOVEMBER 2006 |
|---|---|---|

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

WINDSOR

MALDEN PARK (FORMERLY WEST WINDSOR LANDFILL)

CANADIAN CUSTOMS SECONDARY COMPLEX (FOR CANADA BOUND TRUCKS USING THE AMBASSADOR BRIDGE)

LINC ONTARIO LTD. DIVISION OF UNIVERSAL AM-CAN LTD.

LAIDLAW

M.M.T.H. PETROLEUM EQUIPMENT INC.

PSC INDUSTRIAL SERVICES CANADA INC.

TRAVELODGE

ABORIGINAL PARK

E.C.ROW EXPRESSWAY

CENTURY FIRE EQUIPMENT

GARRY JOHN LTD. AUTO DEALER

A

OUTBOUND INSPECTION LANES 3 BYPASS LANES

STAFF/VISITOR PARKING 220

14 BAYS

COMMERCIAL SECONDARY

VACIS

VACIS QUEING

SALT STORAGE

CFIA

MAINTENANCE & PARKING STORAGE

206 TOTAL PARKING INCLUDES 4 OVERSIZE

250 m TOUCH DOWN

CHAPPUS ST

POTENTIAL LOCAL ACCESS TO MALDEN ROAD

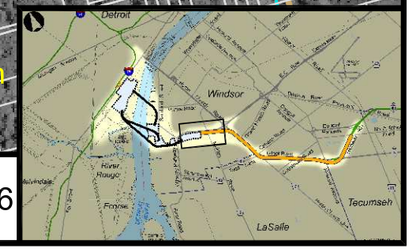
KEW AUTO SERVICE

A.P.P.D. PARTICIPATION INDUSTRIES/CENTRAL ADMINISTRATION

ANALYSIS ENVELOPE

CONCEPTUAL

100m 0m 100m 200m




# PLAZA A

SCALE 1:5000

NOVEMBER 2006

# Plaza Alternatives B & B1

CONCEPTUAL

# PLAZA B - CROSSING C

SCALE 1:15 000

NOVEMBER 2006

DETROIT

WINDSOR

U.S.A.

CANADA

DETROIT RIVER

ESSEX TERMINAL RAILWAY

DETROIT ST

JUNCTION ST

DRAKE ST

LIVERNOIS ST

WATERMAN ST

GREEN ST

JEFFERSON AVE

OVERHEAD POWER LINES

CROSSING ALTERNATIVE B

SHIPPING CHANNEL

DETROIT-WINDSOR TRUCK FERRY ROUTE

B1

250m 0m 250m 500m

CONCEPTUAL


# PLAZA B1 - CROSSING B

SCALE 1:15 000

NOVEMBER 2006

CROSSING ALTERNATIVE C

U.S.A.

CANADA

LAFARGE WINDSOR AGGREGATE DOCK

CBM ST MARYS WINDSOR PLANT

STERLING MARINE FUELS

K SCRAP RESOURCES

VAN DEHOGEN GROUP

HYDRO ONE TRANSMISSION LINE

ESSEX AGGREGATES

HISTORIC FORT WAYNE

CONCEPTUAL

WATKINSON ST

PETER ST

QUEEN ST

WATKINS ST

APPROXIMATE LIMIT OF AREA OF CONTINUED ANI

RUSSEL ST

BLESSED SACRAMENT CHURCH

ANDLAUER TRANSPORT

FORMER HURON STEEL

PERFECTION AUTOMOTIVE PRODUCTS

STANDARD INDUCTION & CASTINGS

SANDWICH ST

HILL ST

CHAPPELL AVE

JOHN R

CHRYSLER

TRUCK PER

100m 0m 100m 200m

Detroit
Windsor
River Rouge
Ecorse
Tecumseh
LaSalle

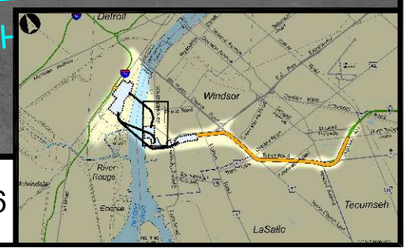
| PLAZA B - CROSSING C | SCALE 1:5000 | NOVEMBER 2006 |
|---|---|---|

B

BLESSED SACRAMENT CHURCH
ANDLAUER TRANSPORT
QUEEN ST
WATKINS ST
FORMER HURON STEEL
PERFECTION AUTOMOTIVE PRODUCTS
STANDARD INDUCTION & CASTINGS
JUBRICKS ENTERPRISES
JOHN B
MAJOR F.J. TILSON LTD ARMOURY & POLICE LAND TRAINING CENTRE
AIR & SYSTEMS LTD (SANDBLASTING)
AGENCY FUELS LTD
BP CANADA
LOU ROMANO WATER RECLAMATION PLANT
ANALYSIS
KARTER CARRIERS INC./ VOYAGEUR TRANSPORTATION SERVICE PRISM BERLIE
WINDSOR POWER PLANT
NEMAK PLANT
SANDWICH ST
APPROXIMATE LIMIT
RUSSELL ST
HILL ST
CHAPPELLE AVE
TRUCK CONFIGURATION
SEAL & SEALANT
RELEASE BY PASS
STERLING MARINE FUELS
K SCRAP RESOURCES
VAN DEHOGEN GROUP
HYDRO ONE TRANSMISSION LINE
ESSEX AGGREGATES
CENTRAL TRANSPORT
EXTENT OF SURFACE SETTLEMENT FROM SINKHOLE (1954)
WINDSOR SALT COMPANY
PROSPECT AVE
OUTLET PIPE FROM LOU ROMANO WATER RECLAMATION PLANT
ONTARIO POWER GENERATION
EGELD AVE
MCKEE RD (PRIVATE)
SOUTHWESTERN SALES CORPORATION LIMITED
ORC BRIGHTON BEACH POWER STATION
SHIPPING CHANNEL
TOLL HOUSE
DUTY FREE
LANE BUILDING
10 U.S.
10 CANADA
BOUNDARIES

CONCEPTUAL

100m 0m 100m 200m




# PLAZA B - CROSSING C

SCALE 1:5000

NOVEMBER 2006

SHIPPING CHANNEL

EUCLID AVE

MCKEE RD (PRIVATE)

OPG BRIGHTON BEACH POWER STATION

CARRIERS INC./ VOYAGEUR TRANSPORTATION SERVICE/ PRISM BERLIE

WINDSOR POWER PLANT

B

LOPL

FERMINAL RAILWAY

BP CANADA

APPROXIMATE LIMIT OF AREA OF CO

BP CANADA HIGH

DUTY FREE 1858 m2

NEMAK PLANT

CN #6008

OJIBWAY PKWY

TO U.S.

FROM CANADA

12 TOLLS

MAIN BUILDING

PAGE

AUDREY AVE

WRIGHT ST

BRIGHTON BEACH INDUSTRIAL AREA

LINSELL AVE

SCOTTEN AVE

ERIE WILDLIFE RESCUE

ENVIRONMENTAL POLICY AREA

OJIBWAY BLACK OAK WOODS

BLACK OAK PRAIRIE HERITAGE PARK (LIFE ANSI)

BROADWAY PARK

BROADWAY ST

OJIBWAY

CONCEPTUAL

100m 0m 100m 200m


| PLAZA B | SCALE 1:5000 | NOVEMBER 2006 |
|---|---|---|

DETF
RIV

OVERHEAD POWER LINES

ESSEX AGGREGATES

CENTRAL TRANSPORT

EXTENT OF SURFACE SETTLEMENT FROM SINKHOLE (1954)

WINDSOR SALT COMPANY

DETROIT EDISON COMPANY

DOME PETROLEUM HIGH PRESSURE GAS PIPELINE (UNDER RIVER)

PROSPECT AVE

OUTLET PIPE FROM LOU ROMANO

ONTARIO PO
GENERATIO

CROSSING ALTERNATIVE B

SOUTHWESTERN SALES
CORPORATION LIMITED

JEFFERSON AVE

YELLOW TRUCKING

DETROIT-WINDSOR
TRUCK FERRY
TERMINAL

DETROIT
TRUCK FERRY

SOLVAY
PROCESS

IED ANALYSIS

EUCLID AVE

MOKEE RD

SHIPPING CHANNEL

CONCEPTUAL

100m 0m 100m 200m


# PLAZA B1 - CROSSING B

SCALE 1:5000

NOVEMBER 2006

SHIPPING CHANNEL

MCKEE RD (PRIVATE)

EUCLID

OPG BRIGHTON BEACH POWER STATION

WINDSOR POWER PLANT

VOYAGEUR TRANSPORTATION SERVICES PRISM BERLIE

RMINAL RAILWAY

BP CANADA

BP CANADA HI

APPROXIMATE LIMIT OF AREA OF CONTIN

NEMAK PLANT

CN BOOTH

OJIBWAY PKWY

ERIE WILDLIFE RESCUE

B1

WATER ST

WRIGHT ST

AUDREY

BROADWAY ST

ENVIRONMENTAL POLICY AREA

OJIBWAY BLACK OAK WOODS

BLACK OAK PRAIRIE HERITAGE PARK (LIFE ANSI)

BROADWAY PARK

CONCEPTUAL

100m 0m 100m 200m

APPROXIMATE LIMI


# PLAZA B1

SCALE 1:5000

NOVEMBER 2006

BP CANADA

BP CANADA HIGH PRES

RD

E LIMIT OF AREA OF CONTINUED ANALYSIS

MALDEN PARK
(FORMERLY WEST
WINDSOR LANDFILL)

CANADIAN
CUSTOMS
SECONDARY
COMPLEX
(FOR CANADA BOUND
TRUCKS USING THE
AMBASSADOR BRIDGE)

CONTINENTAL AVE

LINC ONTARIO LTD.
DIVISION OF
UNIVERSAL AM-CAN
LTD.

E.C.ROW EXPR

CHAPPUS ST

ERIE
WILDLIFE
RESCUE

HOWARD'S
BACKHOE
TRUCKING &
BOBCAT
SERVICE

BEECH ST

A&P
AUTO
SERVICE

BP CANADA HIGH PRESSURE GAS
POWER TRANSMISSION LINE

ANALYSIS ENVELOPE

ARMANDA ST

ARMANDA ST

WENTWORTH ST

MALDEN RD

CHAPPUS
ST

K&W
AUTO
SERVICE

SPRING
GARDEN

OJIBWAY PARK
AND NATURE CENTRE
(PRAIRIE RESTORATION)

OJIBWAY PKWY

100m 0m 100m 200m

CONCEPTUAL

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS


# PLAZA B & B1

SCALE 1:5000

NOVEMBER 2006

# Plaza Alternative C


| PLAZA C - CROSSING C | SCALE 1:15 000 | NOVEMBER 2006 |
|---|---|---|

CROSSING ALTERNATIVE C

U.S.A.

DETROIT RIVER

CANADA

LAFARGE WINDSOR AGGREGATE DOCK

CBM ST MARYS WINDSOR PLANT

STERLING MARINE FUELS

RUSSELL ST

APPROXIMATE LIMIT OF AREA

WATKINS ST

BLESSED SACRAMENT CHURCH

DUFF ST

AND LAUER TRANSHORT

FORMER HURON STEEL

PERFECTION AUTOMOTIVE PRODUCTS

STANDARD INDUCTION & CASTINGS

WILL ST

ST HOMOMER

SANDWICH

OLLMER & SONS

K SCRAP RESOURCES

STERLING MARINE FUELS

VAN DEHOGEN GROUP

K-SCRAP RESOURCES

HYDRO ONE TRANSMISSION LINE

ESSEX AGGREGATES

CENTRAL TRANSPORT

EXTENT OF SURFACE SETTLEMENT FROM SINKHOLE (1994)

HISTORIC FORT WAYNE

ND POWER LINES

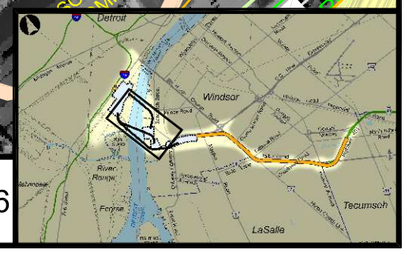
100m 0m 100m 200m

CONCEPTUAL

PLAZA C - CROSSING C

SCALE 1:5000

NOVEMBER 2006



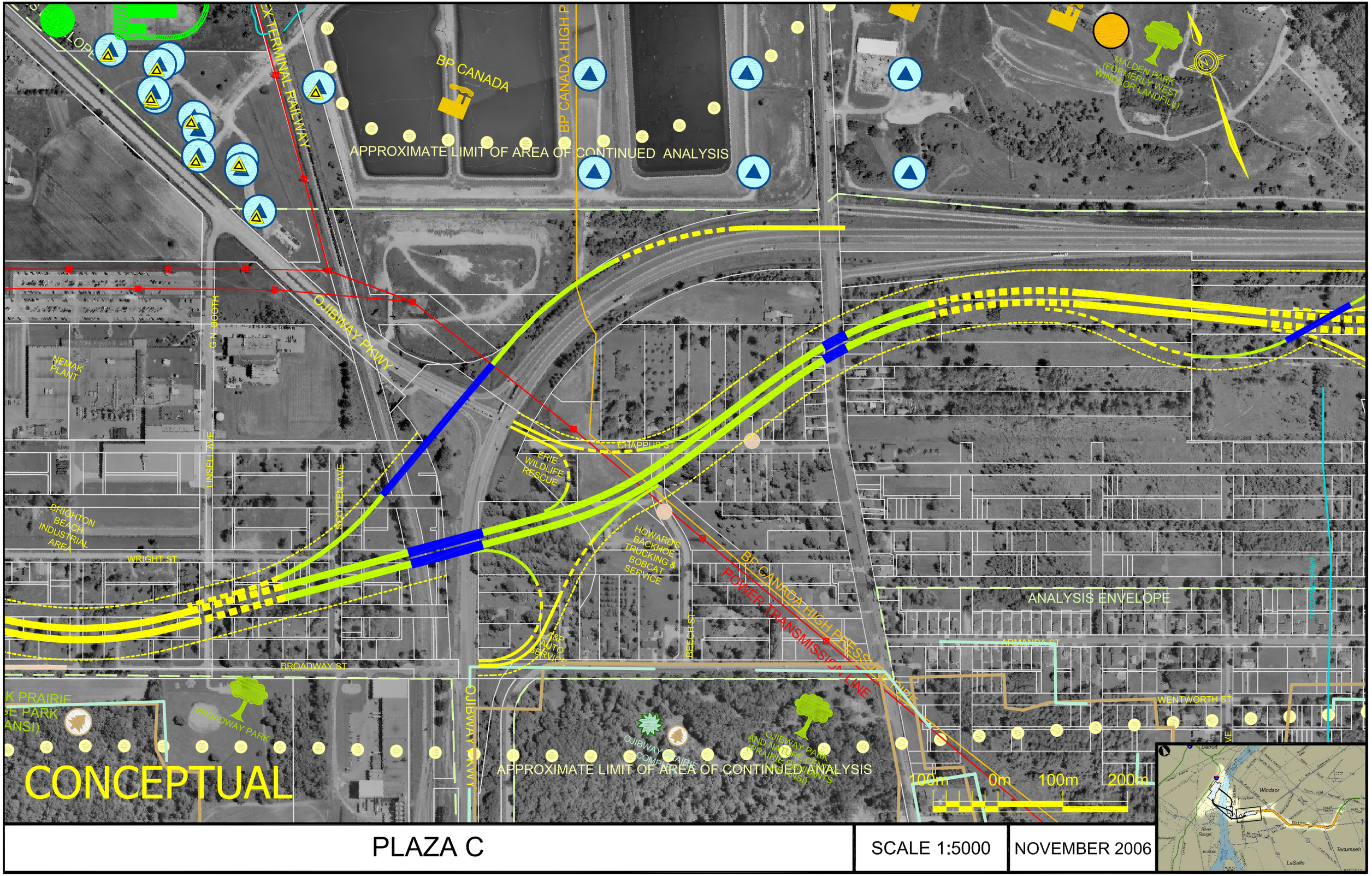
CONCEPTUAL

PLAZA C

SCALE 1:5000

NOVEMBER 2006

100m 0m 100m 200m




| PLAZA C | SCALE 1:5000 | NOVEMBER 2006 |
|---|---|---|

BP CANADA HIGH PI

OF CONTINUED ANALYSIS

MALDEN PARK
(FORMERLY WEST
WINDSOR LANDFILL)

CANADIAN
CUSTOMS
SECONDARY
COMPLEX
(FOR CANADA BOUND
TRUCKS USING THE
AMBASSADOR BRIDGE)

CONTINENTAL AVE

AMBASSADOR DRIVE

HUDSON AVE

LINC ONTARIO LTD.
DIVISION OF
UNIVERSAL AM-CAN
LTD.

LAIDLAW

CONEY AVE

E.C.ROW EXPRESSWAY

SPRING
GARDEN

SPRING GARDEN R

PA
INDUS
ADN

CHAPPUS ST

MALDEN RD

KRW
AUTO
SERVICE

HOWARD'S
BACKHOE
TRUCKING &
BOBCAT
SERVICE

BEECH ST

BP CANADA HIGH PRESSURE GAS
POWER TRANSMISSION LINE

ANALYSIS ENVELOPE

ARMANDA ST

WENTWORTH ST

TURNER AVE

MARENTETTE DR

OJIBWAY PARK
AND NATURE
PRAIRIE

OJIBWAY
COMP

MATE LIMIT OF AREA OF CONTINUED ANALYSIS

CONCEPTUAL

100m 0m 100m 200m


# PLAZA C

SCALE 1:5000

NOVEMBER 2006

# Access Road Alternative 1A

# ACCESS ROAD ALTERNATIVE 1A

SCALE 1:5000

NOVEMBER 2006

CONCEPTUAL

HURON CHURCH ROAD

TRAVELODGE

AMBASSADOR DRIVE

M.W.H. PETROLEUM EQUIPMENT INC.

PSC INDUSTRIAL SERVICES CANADA INC.

HUDSON AVE

CONTINENTAL AVE

LAIDLAW

CONEY AVE

CNC ONTARIO LTD. DIVISION OF UNIVERSAL AM-CAN LTD.

E.C.ROW EXPRESSWAY

TO PLAZA B OR C

ALIGNMENT OF PROPOSED HIGHWAY 401 TO PLAZA A SEE PLAZA A DISPLAY BOARD

TO PLAZA A

SPRING GARDEN

SPRING GARDEN RD

A.P.P.D. PARTICIPATION INDUSTRIES/CENTRAL ADMINISTRATION

CHAPPUS ST

MALDEN RD

K&W AUTO SERVICE

ASHBURN

WINDSOR

BETHLEHEM AVE

7TH ST

LAMONT AVE

ANDREW AVE

LAYLA CT

FLEMING CT

PAUL MARTIN CT

PRESTON CT

NORTHWAY AVE

BUTTERY ST

ST CLAIR AVE

YOUNGSTOWN STRIP

BELLEWOOD PUBLIC SCHOOL

BELLEWOOD PARK

LABELLE ST

BELLEWOOD ESTATES

CALIFORNIA AVE

ST CLAIR AVE

EGLINTON ST

NORTHWAY AVE

THE CHILDREN'S HOUSE MONTESSORI SCHOOL

MANGIN CR

ST. CECILE ACADEMY OF MUSIC

GRAND MARAIS ROAD WEST

GRAND MARAIS DRAIN

APPROXIMATE

MAINTAIN PATHWAY ALONG GRAND MARAIS DRAIN / TURKEY CREEK

CURRENTO CT

PETRO CANADA

FORMER SERVICE STATION DEMOLISHED TO GRADE

PETRO CANADA

LAMBTON ROAD

HURON ESTATES

SANSOTTA CT

AQUA TURF SPRINKLER SYSTEMS

TURKEY CREEK

VIA VITTA ST

NORA ST

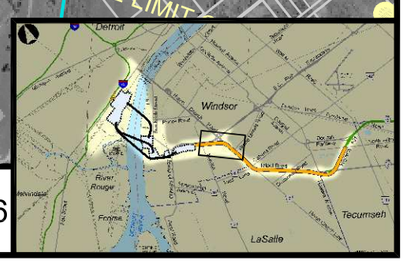
FAZIO DR

EMILIA RD

GRATIOT ST

APPROXIMATE LIMIT

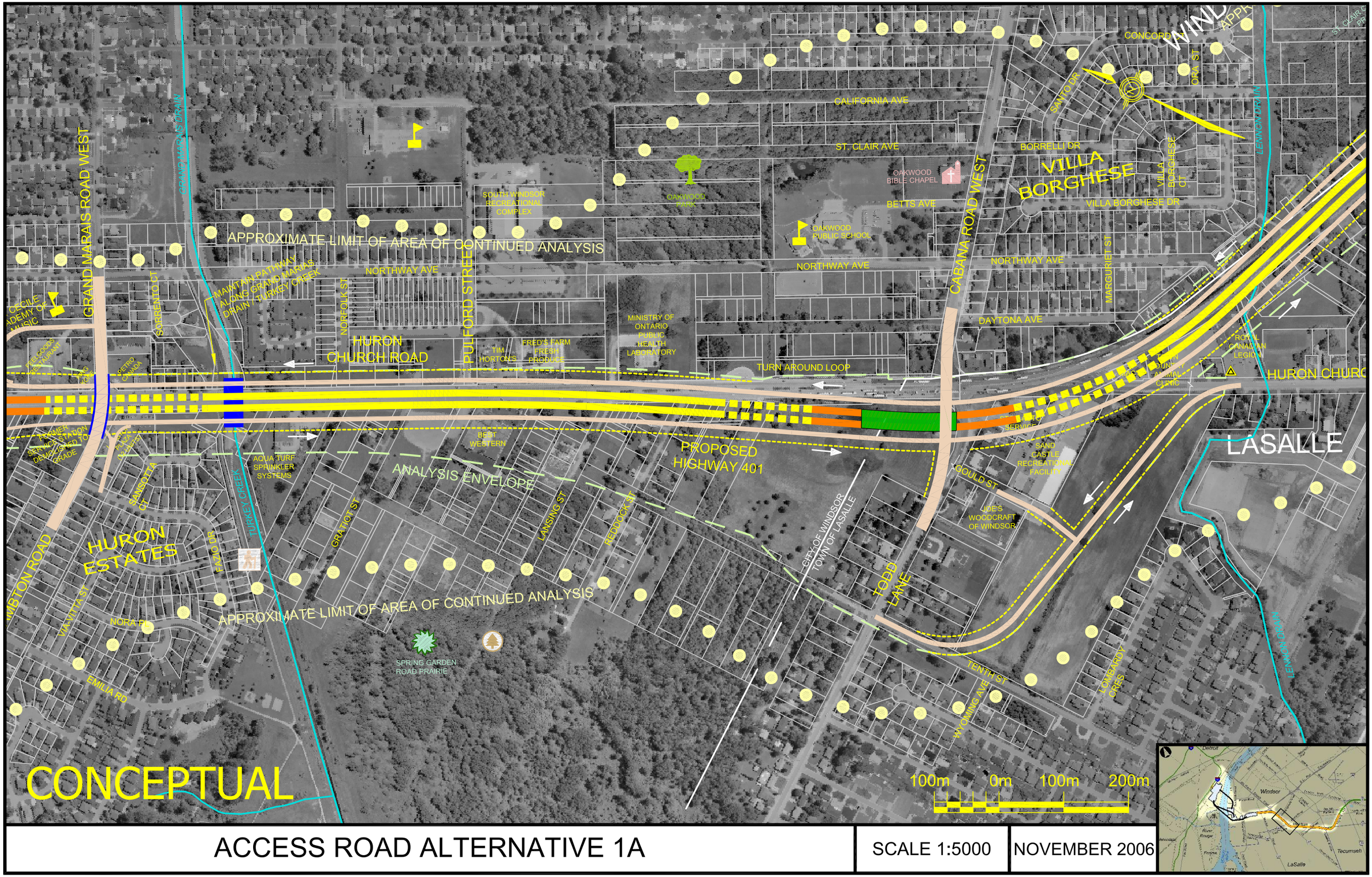
100m 0m 100m 200m




# PLAZA A - ACCESS ROAD ALTERNATIVE 1A

SCALE 1:5000

NOVEMBER 2006




# ACCESS ROAD ALTERNATIVE 1A

SCALE 1:5000

NOVEMBER 2006

WINDSOR

LASALLE

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

ANALYSIS ENVELOPE

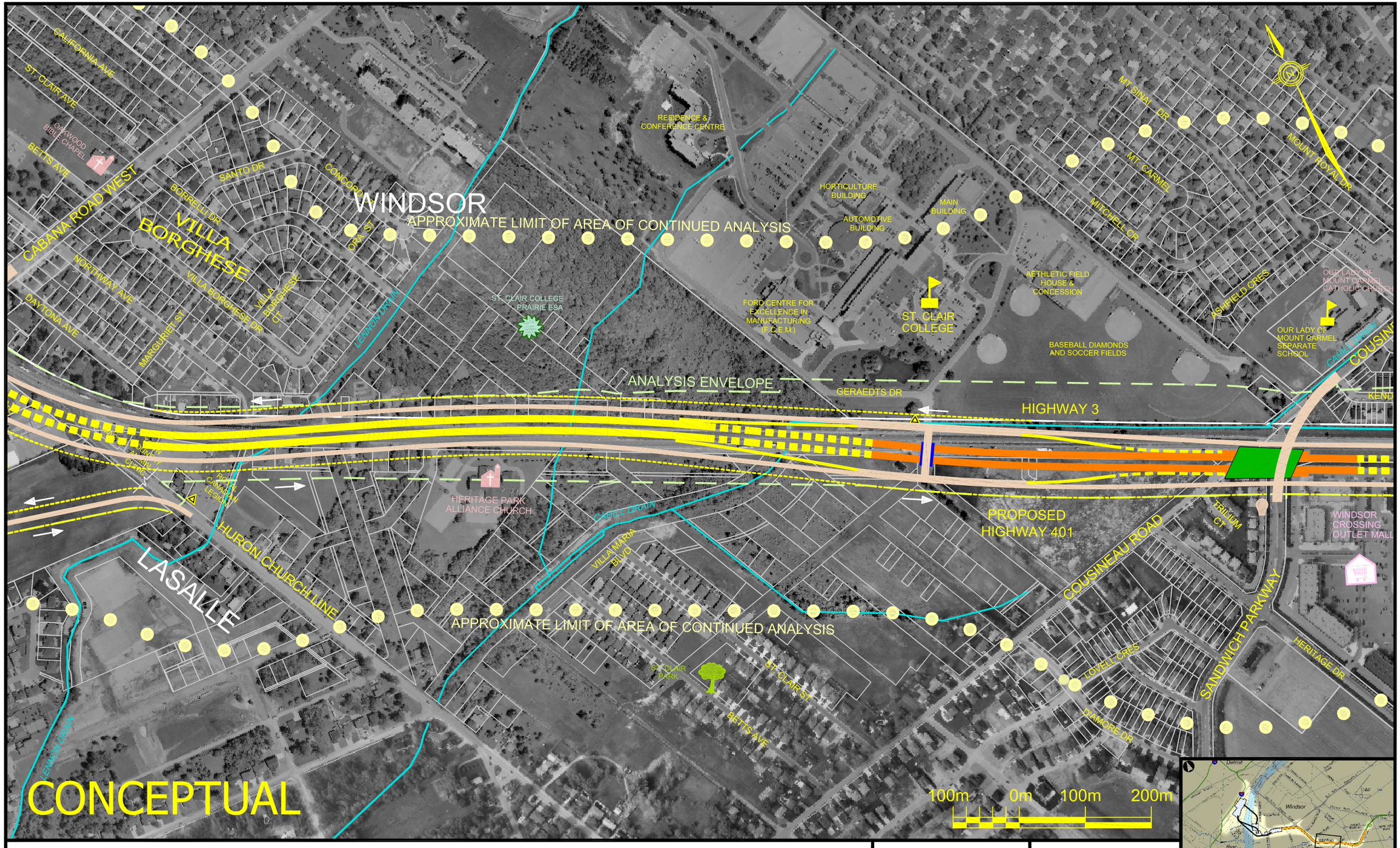
CONCEPTUAL

CALIFORNIA AVE
ST. CLAIR AVE
OAKWOOD BIBLE CHAPEL
BETTS AVE
CABANA ROAD WEST
VILLA BORGHESE
BORRELLI DR
SANTO DR
CONCORD DR
NORTHWAY AVE
DAYTONA AVE
MARGURIET ST
VILLA BORGHESE DR
VILLA BORGHESE CT
LENNOX DRAIN
RESIDENCE & CONFERENCE CENTRE
ST. CLAIR COLLEGE PRAIRIE ESA
FORD CENTRE FOR EXCELLENCE IN MANUFACTURING (F.C.E.M.)
HORTICULTURE BUILDING
AUTOMOTIVE BUILDING
MAIN BUILDING
ST. CLAIR COLLEGE
AETHLETIC FIELD HOUSE & CONCESSION
BASEBALL DIAMONDS AND SOCCER FIELDS
MT SINAI DR
MT. CARMEL
MITCHELL CR
MOUNT ROYAL DR
ASHFIELD CRES
OUR LADY OF MOUNT CARMEL CATHOLIC CHURCH
OUR LADY OF MOUNT CARMEL SEPARATE SCHOOL
CAHILL DRAIN
COUSINEAU
HIGHWAY 3
REALIGNED CAHILL DRAIN
GERAEDTS DR
KENNEDY
ROYAL CANADIAN LEGION
HERITAGE PARK ALLIANCE CHURCH
CAHILL DRAIN
PROPOSED HIGHWAY 401
VILLA MARIA BLVD
HURON CHURCH LINE
ST. CLAIR PARK
ST. CLAIR ST
BETTS AVE
LENNOX DRAIN
TRILLIUM CT
WINDSOR CROSSING OUTLET MALL
COUSINEAU ROAD
LOVELL CRES
DAMORE DR
SANDWICH PARKWAY
HERITAGE DR
100m 0m 100m 200m


# ACCESS ROAD ALTERNATIVE 1A - OPTION 1

SCALE 1:5000

NOVEMBER 2006




# ACCESS ROAD ALTERNATIVE 1A - OPTION 2

SCALE 1:5000

NOVEMBER 2006

WINDSOR

CHANDLER ARMS

CASGRAIN DR

MOUNT ROYAL DR

VETERANS MEMORIAL PARK

ACADÉMIE STE CÉCILE PRIVATE SCHOOL

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

ASHFIELD CRES

OUR LADY OF MOUNT CARMEL CATHOLIC CHURCH

OUR LADY OF MOUNT CARMEL SEPARATE SCHOOL

CAVILL DRAIN

COUSINEAU ROAD

VILLA PARADISO CRES

MATTHEW ROBZIK PARK

BROTHERS CT

ROSEMARY DR

WESTCLIFF CT

SHADETREE CRES

CRES

SHADE TREE CT

HOWARD AVENUE

JESSICA WAY

HAVENS DR

ALPENROSE AVE

ALPENROSE CT

KOMINUK PARK

HIGHWAY 3

REALIGNED WOLFE DRAIN

RENDELL ON CT

ALIBIS SPORTS BAR

AUTOBON CARWASH

CITY OF WINDSOR DRAIN

CITY OF WINDS

PROPOSED HIGHWAY 401 ANALYSIS ENVELOPE

XTR GAS CONVENIENCE AND RESTAURANT

SLEEP FACTORY

TRILLIUM CT

WINDSOR CROSSING OUTLET MALL

HOMESTEAD LANE

FOXWOOD CT

HEATHWOOD CT

ASHBERRY PL

CARRIAGE LANE

MONTGOMERY DR

STORAGE FACILITY

SURREY DR

GROSVENOR DR

CHELSEA DR

TOWN OF LASALLE

TOWN OF TECUMSEH

MERO AVE

SANDWICH PARKWAY

HERITAGE DR

RUSHWOOD CRES

HARVEST BEND

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

LASALLE

CROYDON RD

EASTBOURNE AVE

6TH CON. RD

J. JENNER PARK

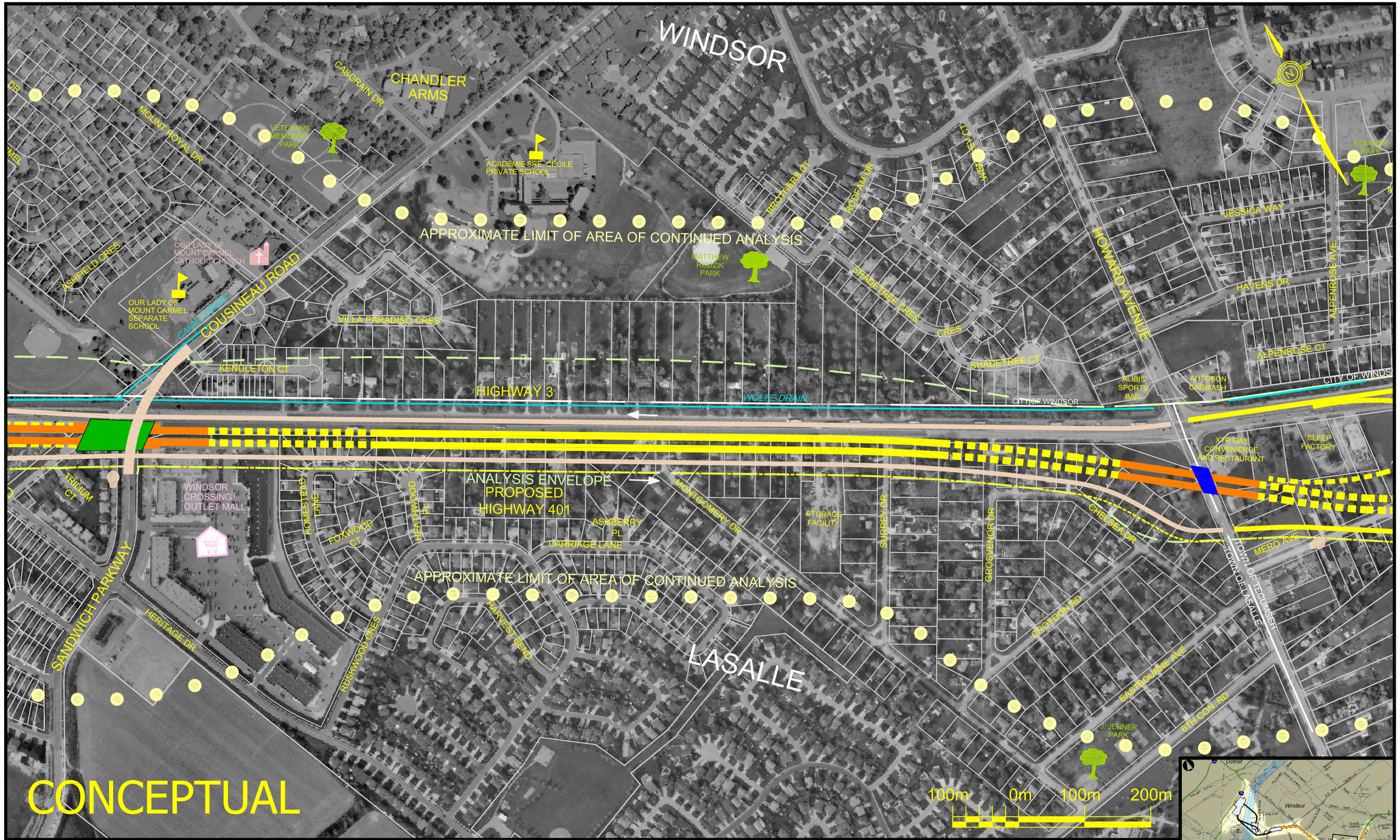
CONCEPTUAL

100m 0m 100m 200m


# ACCESS ROAD ALTERNATIVE 1A - OPTION 1

SCALE 1:5000

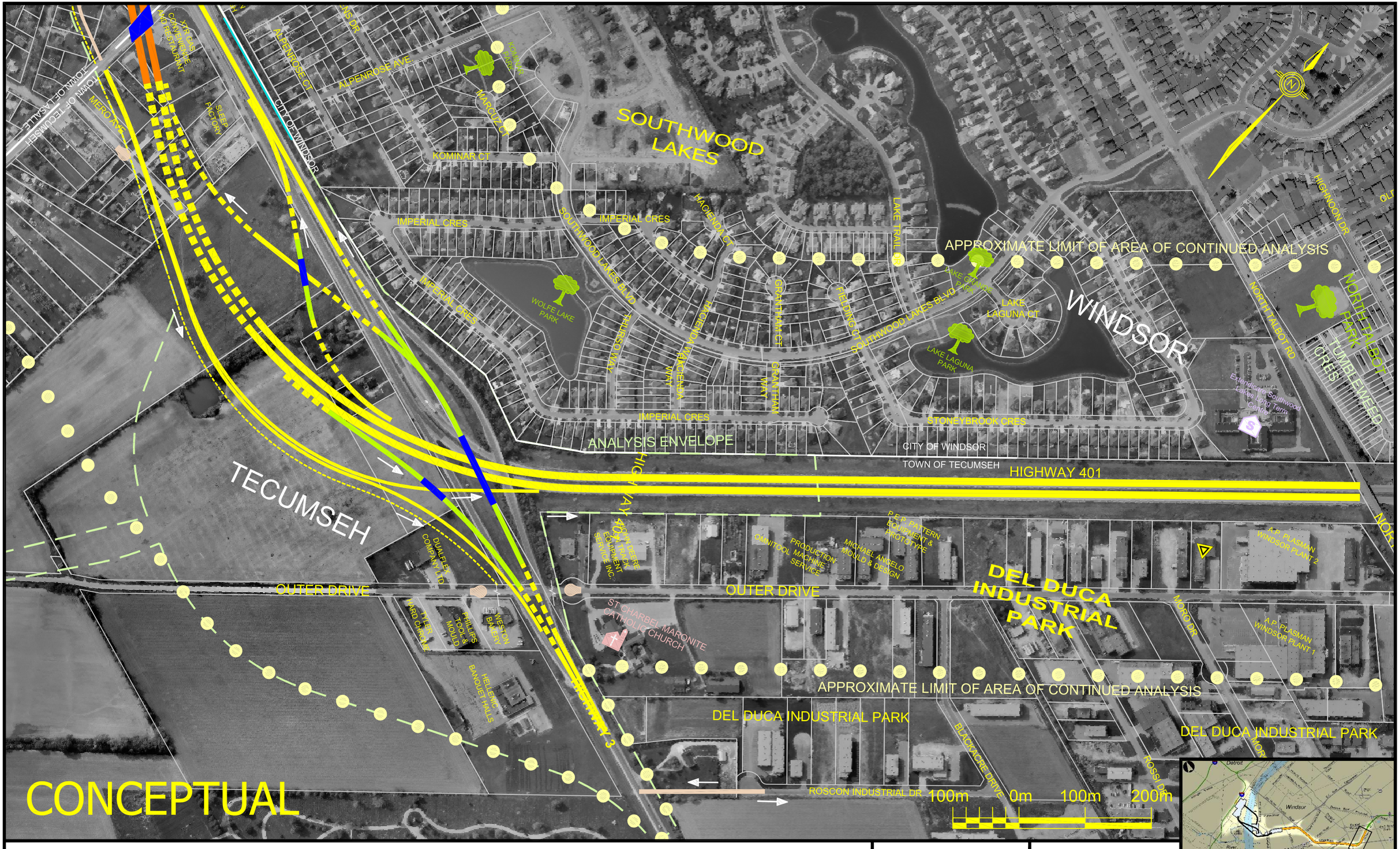
NOVEMBER 2006




# ACCESS ROAD ALTERNATIVE 1A - OPTION 2

SCALE 1:5000

NOVEMBER 2006




# ACCESS ROAD ALTERNATIVE 1A

SCALE 1:5000

NOVEMBER 2006

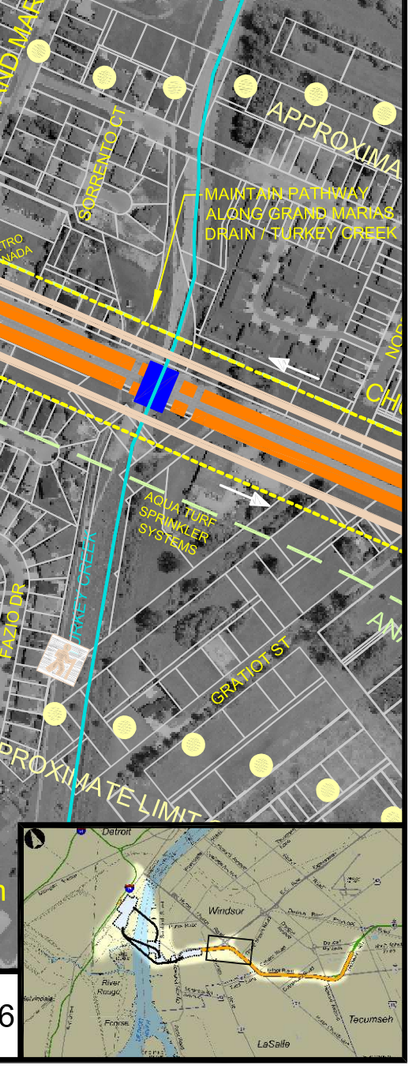
# Access Road Alternative 1B

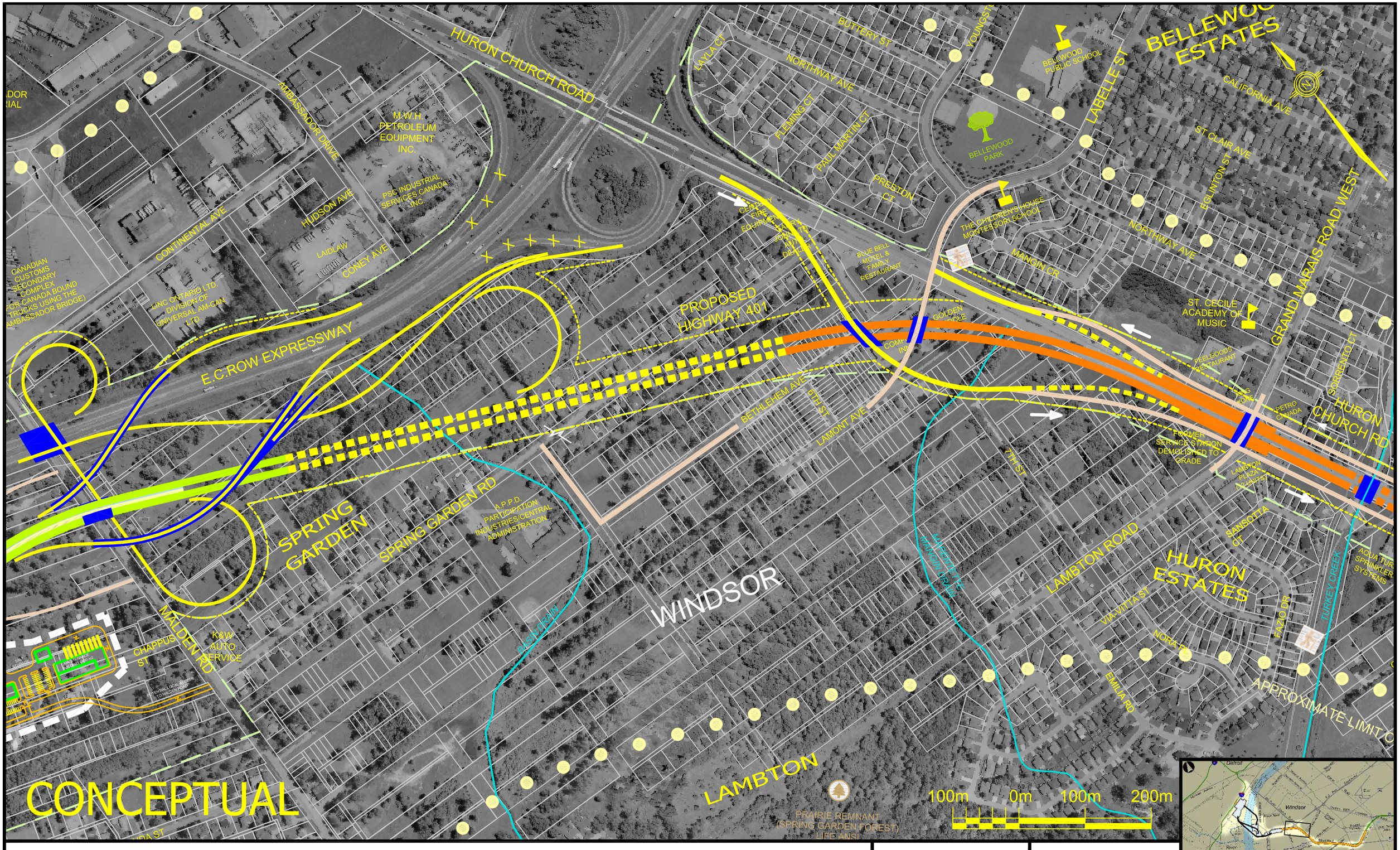
# ACCESS ROAD ALTERNATIVE 1B

SCALE 1:5000

NOVEMBER 2006

CONCEPTUAL






# PLAZA A - ACCESS ROAD ALTERNATIVE 1B

SCALE 1:5000

NOVEMBER 2006

# ACCESS ROAD ALTERNATIVE 1B

SCALE 1:5000

NOVEMBER 2006

CONCEPTUAL

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

ANALYSIS ENVELOPE

PROPOSED HIGHWAY 401

HURON CHURCH ROAD

NORTHWAY AVE

CALIFORNIA AVE

ST. CLAIR AVE

BETTS AVE

DAYTONA AVE

CONCORD ST

BORRELLI DR

VILLA BORGHESE DR

VILLA BORGHESE

VILLA BORGHESE CT

SANTO DR

ORA ST

LENNON DRIVE

MARGURET ST

GRAND MARAIS ROAD WEST

GRAND MARAIS DRAIN

CABANA ROAD WEST

SOUTH WINDSOR RECREATIONAL COMPLEX

OAKWOOD PARK

OAKWOOD BIBLE CHAPEL

OAKWOOD PUBLIC SCHOOL

MAINTAIN PATHWAY ALONG GRAND MARAIS DRAIN / TURKEY CREEK

CECILE ACADEMY OF MUSIC

SORRENTO CT

NORFOLK ST

PULFORD STREET

MINISTRY OF ONTARIO PUBLIC HEALTH LABORATORY

TIM HORTONS

FRED'S FARM FRESH PRODUCE

TURN AROUND LOOP

ROYAL CANADIAN LEGION

HURON CHURCH

FORMER SERVICE STATION TO BE DEMOLISHED TO GRADE

LIMIT OF AREA

SANSOTTA CT

AQUA TURF SPRINKLER SYSTEMS

BEST WESTERN

GRATIOT ST

LANSING ST

REDDOCK ST

SERVICE

SAND CASTLE RECREATIONAL FACILITY

GOULD ST

JOE'S WOODCRAFT OF WINDSOR

CITY OF WINDSOR TOWN OF LASALLE

TODD LANE

TENTH ST

WYOMING AVE

LOMBARDY CRES

LASALLE

LEWIS DRIVE

HURON ESTATES

FAZIO DR

VALVITTA ST

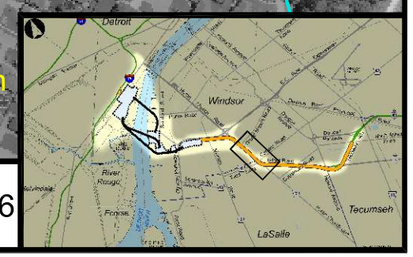
NORA TE

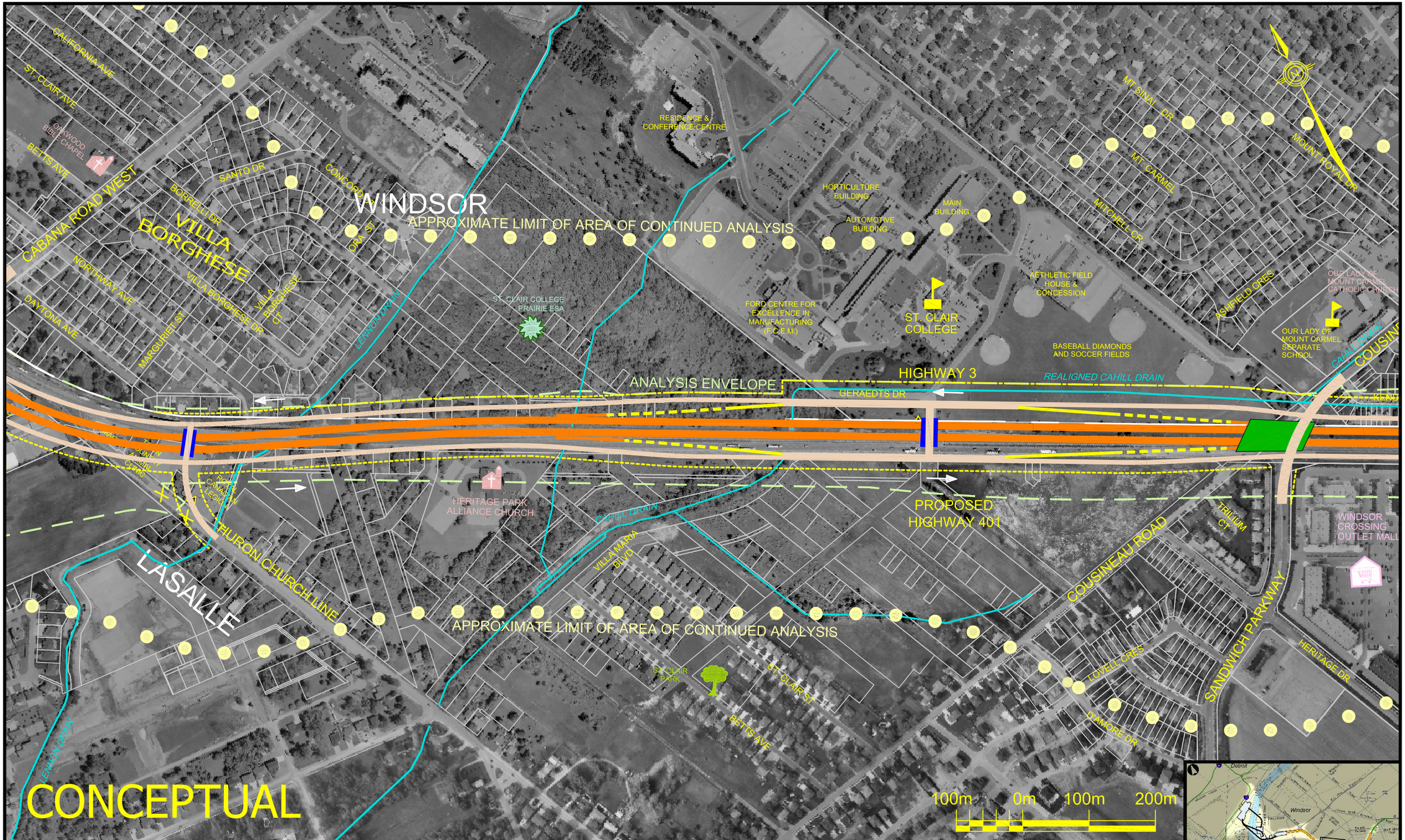
EMILIA RD

WIMBTON ROAD

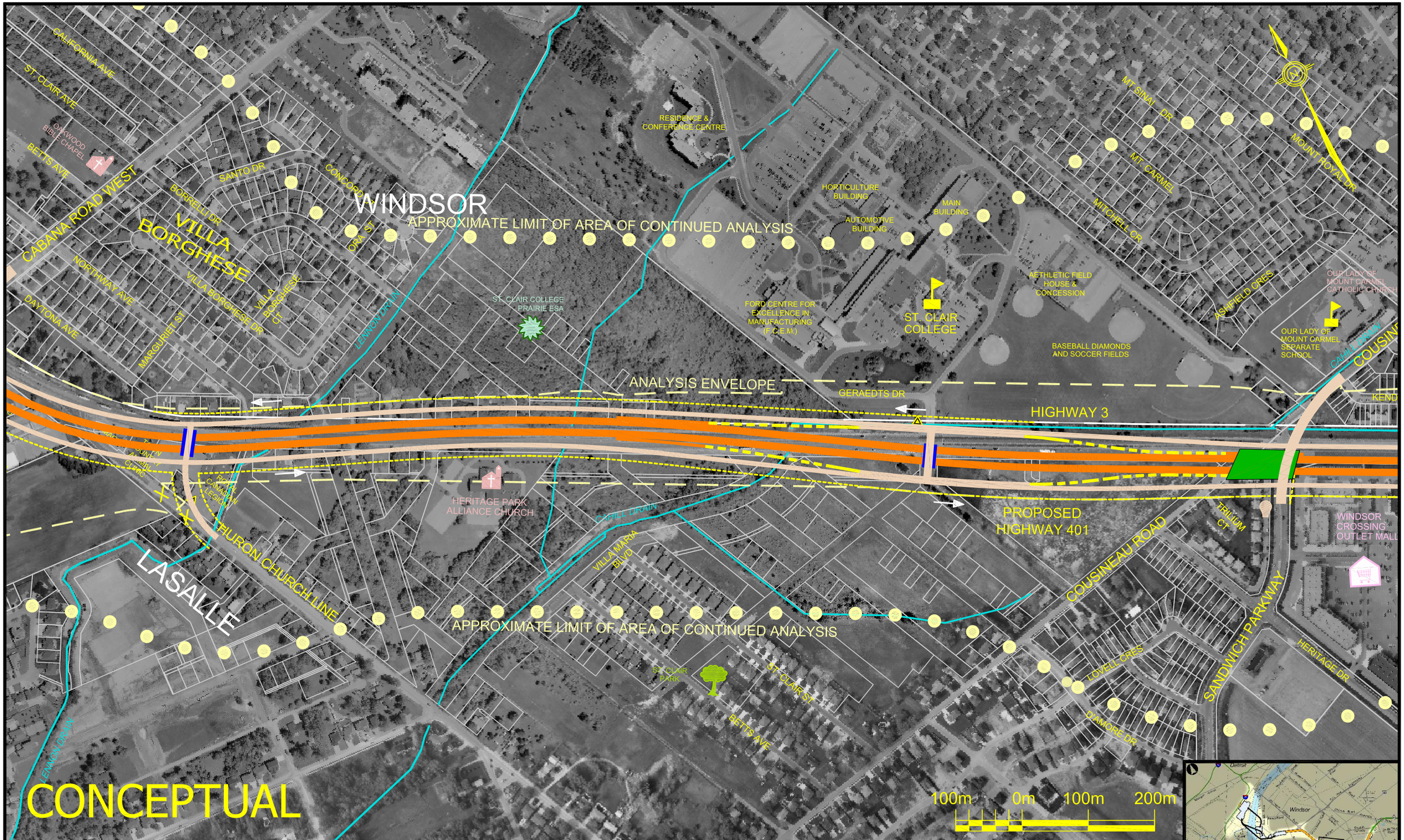
SPRING GARDEN ROAD PRAIRIE

100m 0m 100m 200m





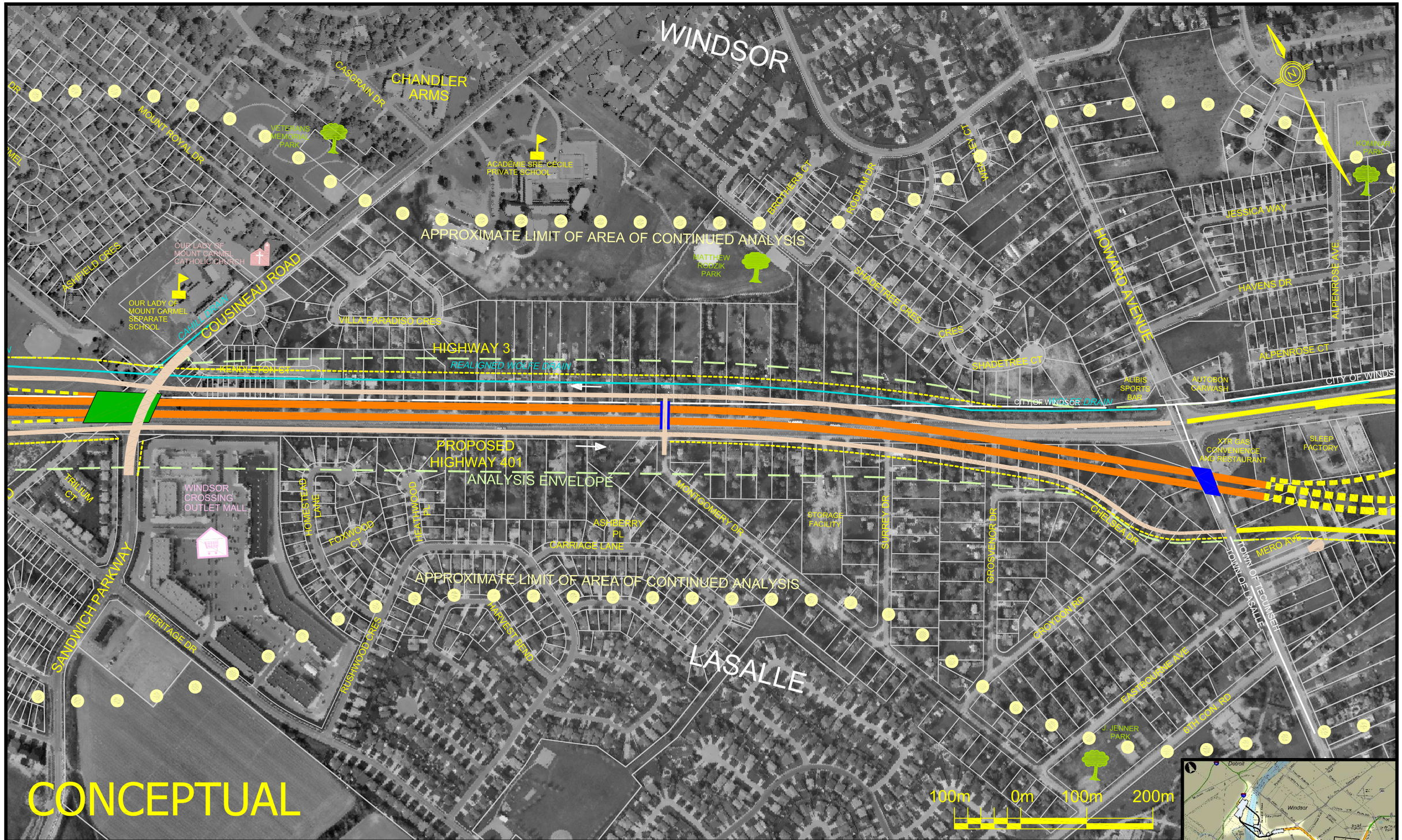

| ACCESS ROAD ALTERNATIVE 1B - OPTION 1 | SCALE 1:5000 | NOVEMBER 2006 |
|---|---|---|




ACCESS ROAD ALTERNATIVE 1B - OPTION 2

SCALE 1:5000

NOVEMBER 2006




CONCEPTUAL

| ACCESS ROAD ALTERNATIVE 1B - OPTION 1 | SCALE 1:5000 | NOVEMBER 2006 |
|---|---|---|

WINDSOR
CHANDLER ARMS
CASGRAIN DR
MOUNT ROYAL DR
VETERANS MEMORIAL PARK
ACADÉMIE STE. CÉCILE PRIVATE SCHOOL
APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS
BROTHERS CT
ROSEMARY DR
NEWLEY CT
HOWARD AVENUE
KENSINGTON PARK
JESSICA WAY
HAVENS DR
ALPENROSE AVE
ALPENROSE CT
ASHFIELD CRES
OUR LADY OF MOUNT CARMEL CATHOLIC CHURCH
MATTHEW RODZIK PARK
SHADETREE CRES
CRES
SHADETREE CT
OUR LADY OF MOUNT CARMEL SEPARATE SCHOOL
CAHILL DRAIN
COUSINEAU ROAD
VILLA PARADISO CRES
KENDLETON CT
HIGHWAY 3
WOLFE DRAIN
CITY OF WINDSOR
ALIBIS SPORTS BAR
AUTOBON CARWASH
CITY OF WINDS
XTR GAS CONVENIENCE AND RESTAURANT
SLEEP FACTORY
TRILLIUM CT
WINDSOR CROSSING OUTLET MALL
HOMESTEAD LANE
FOXWOOD CT
HEATHWOOD PL
ANALYSIS ENVELOPE
ASHBERRY PL
CARRIAGE LANE
MONTGOMERY DR
PROPOSED HIGHWAY 401
STORAGE FACILITY
SURREY DR
GROSVENOR DR
CHELSEA DR
MERO AVE
TOWN OF LASALLE
TOWN OF TECUMSEH
SANDWICH PARKWAY
HERITAGE DR
RUSHWOOD CRES
HARVEST BEND
LASALLE
CROYDON RD
EASTBOURNE AVE
6TH CON. RD
J. JENNER PARK
CONCEPTUAL
100m 0m 100m 200m
Detroit
Windsor
River Rouge
Lodno
LaSalle
Tecumseh

# ACCESS ROAD ALTERNATIVE 1B - OPTION 2

SCALE 1:5000

NOVEMBER 2006

SOUTHWOOD LAKES

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

ANALYSIS ENVELOPE

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

DEL DUCA INDUSTRIAL PARK

WINDSOR

TECUMSEH

CITY OF WINDSOR

TOWN OF TECUMSEH

HIGHWAY 401

CONCEPTUAL

ACCESS ROAD ALTERNATIVE 1B

SCALE 1:5000

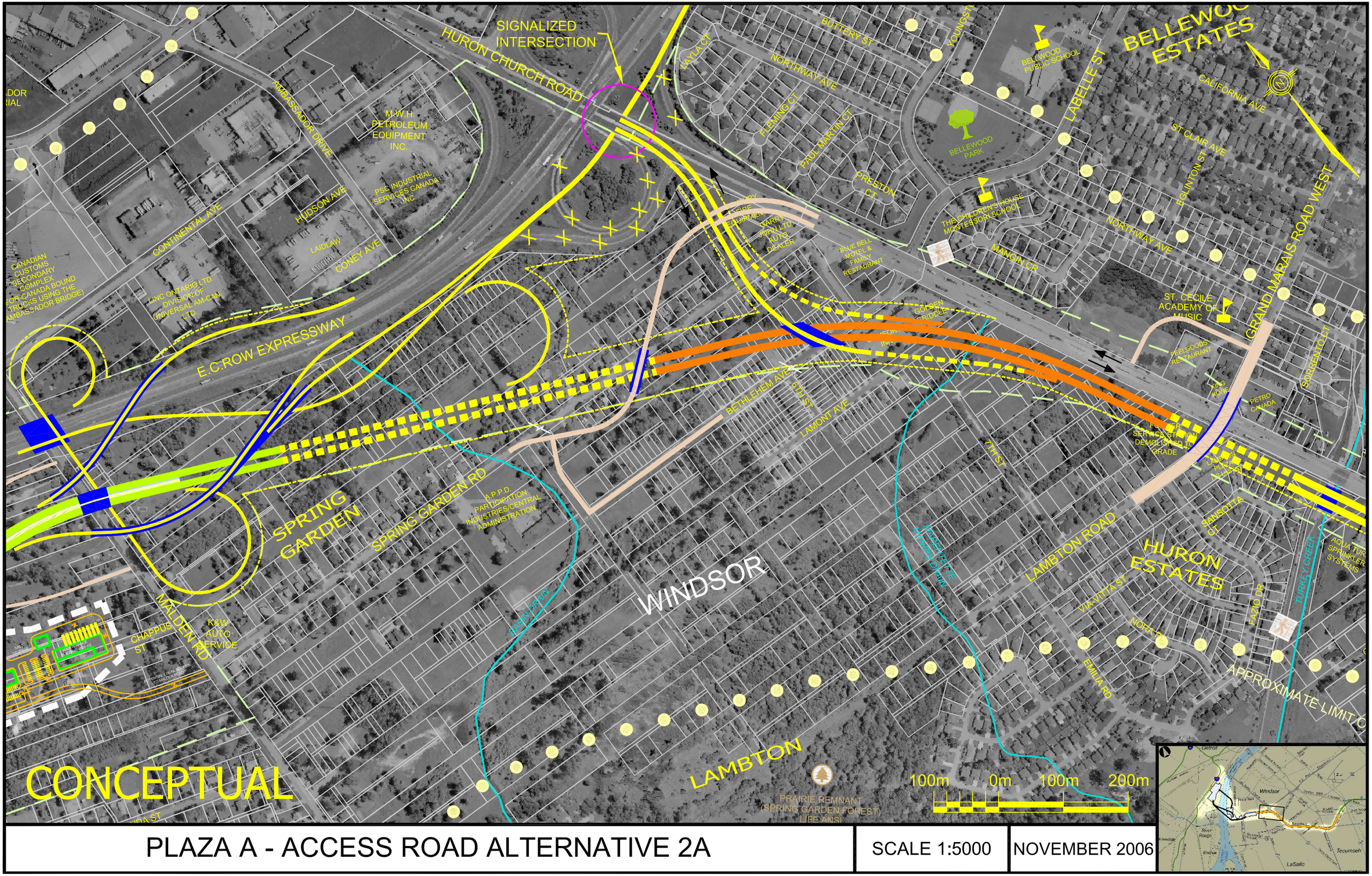
NOVEMBER 2006

# Access Road Alternative 2A


# ACCESS ROAD ALTERNATIVE 2A

SCALE 1:5000

NOVEMBER 2006



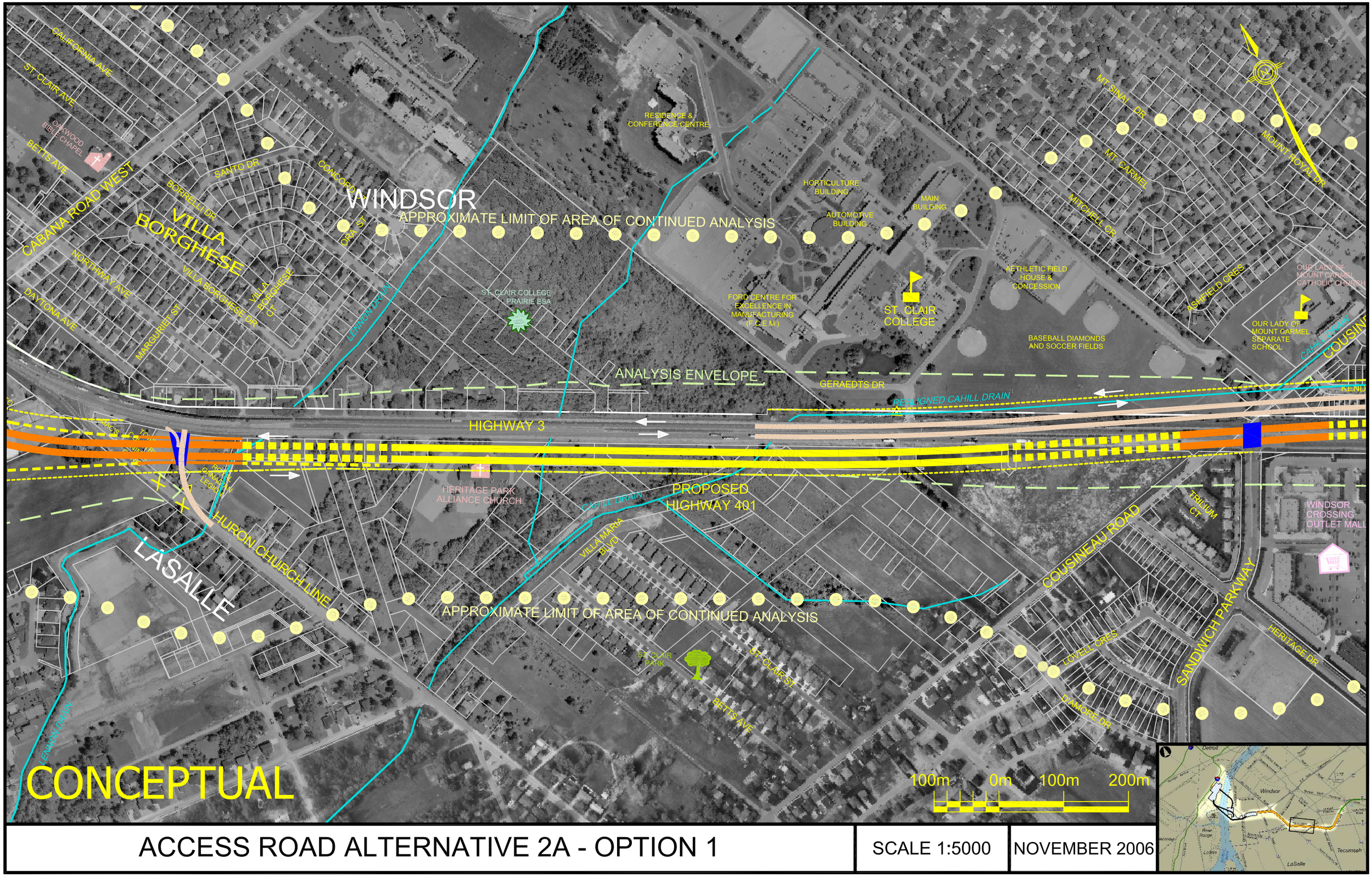

| PLAZA A - ACCESS ROAD ALTERNATIVE 2A | SCALE 1:5000 | NOVEMBER 2006 |
|---|---|---|

CONCEPTUAL

# ACCESS ROAD ALTERNATIVE 2A

SCALE 1:5000

NOVEMBER 2006




| ACCESS ROAD ALTERNATIVE 2A - OPTION 1 | SCALE 1:5000 | NOVEMBER 2006 |
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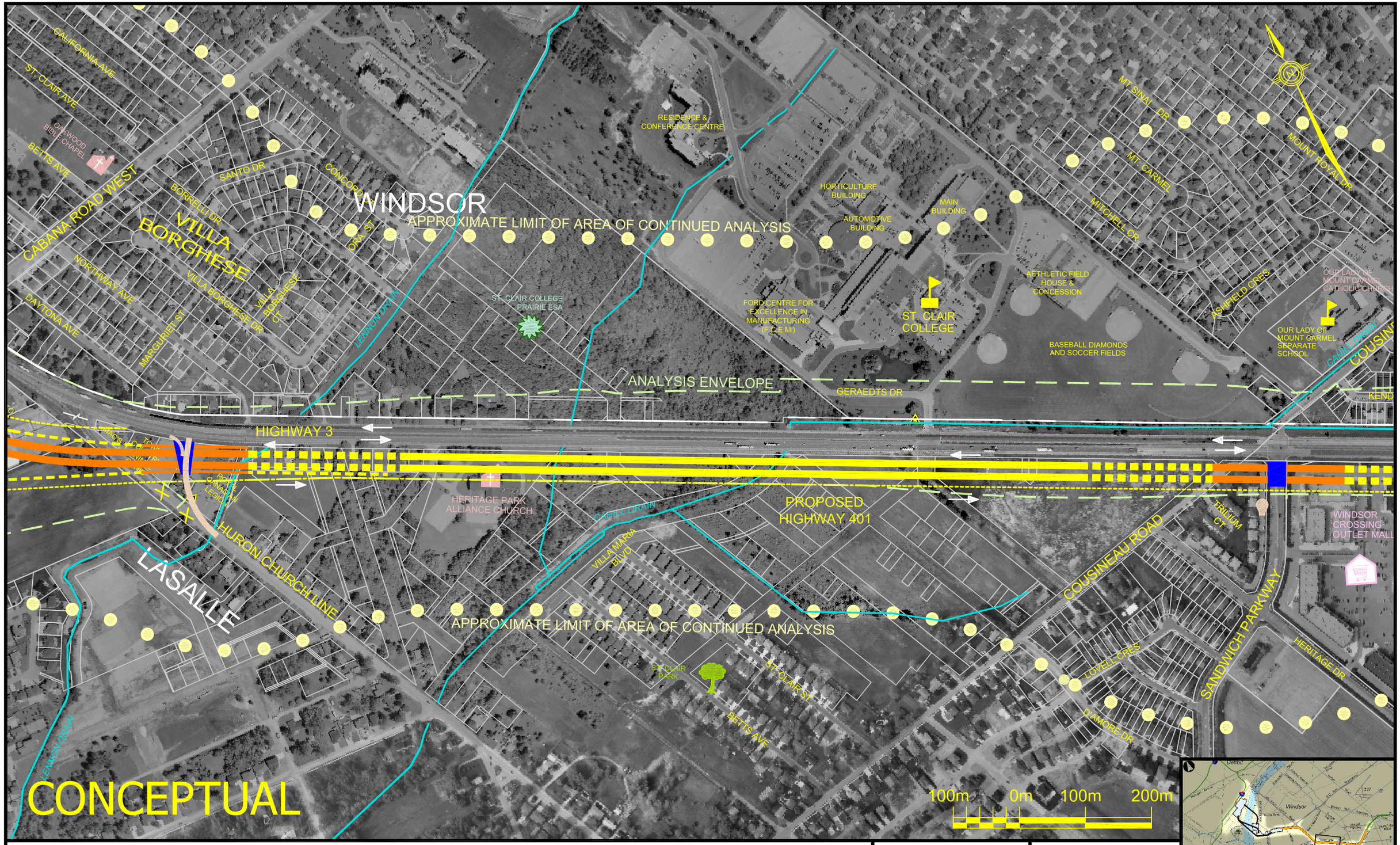



| ACCESS ROAD ALTERNATIVE 2A - OPTION 2 | SCALE 1:5000 | NOVEMBER 2006 |
|---|---|---|

WINDSOR

LASALLE

CHANDLER ARMS

CASGRAIN DR

MOUNT ROYAL DR

VETERANS MEMORIAL PARK

ACADÉMIE STE. CÉCILE PRIVATE SCHOOL

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

BROTHERS CT

HOFFAM DR

LOTUS TERR

HOWARD AVENUE

KENNEDY PARK

JESSICA WAY

HAVENS DR

ALPENROSE AVE

ALPENROSE CT

ALIBIS SPORTS BAR

AUTOBON CARWASH

CITY OF WINDS

HWY 3 SOUTHBOUND CLOSED

XTR GAS CONVENIENCE AND RESTAURANT

SLEEP FACTORY

MERO AVE

TOWN OF TECUMSEH

TOWN OF LASALLE

CHELSEA DR

GROSVENOR DR

CROYDON RD

EASTBOURNE AVE

6TH CON RD

J. JENNER PARK

SHADETREE CRES

SHADETREE CT

CRES

MATTHEW ROSZIK PARK

OUR LADY OF MOUNT CARMEL CATHOLIC CHURCH

OUR LADY OF MOUNT CARMEL SEPARATE SCHOOL

COUSINEAU ROAD

VILLA PARADISO CRES

CAHILL DRAIN

KENDLETON CT

HIGHWAY 3 REALIGNMENT

REALIGNED WOLFE DRAIN

CITY OF WINDSOR DRAIN

PROPOSED HIGHWAY 401

ANALYSIS ENVELOPE

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

WINDSOR CROSSING OUTLET MALL

TRILLIUM CT

HOMESTEAD LANE

FOXWOOD CT

HEATHWOOD CRT

ASHBERRY PL

CARRIAGE LANE

MONTGOMERY DR

STORAGE FACILITY

SURREY DR

SANDWICH PARKWAY

HERITAGE DR

RUSHWOOD CRES

HARVEST BEND

CONCEPTUAL

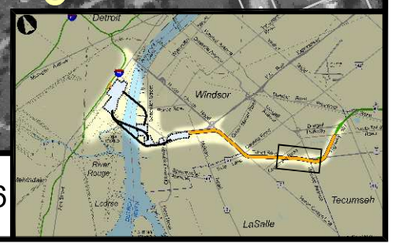
100m 0m 100m 200m


# ACCESS ROAD ALTERNATIVE 2A - OPTION 1

SCALE 1:5000

NOVEMBER 2006

WINDSOR
CHANDLER ARMS
CASGRAIN DR
MOUNT ROYAL DR
VETERANS MEMORIAL PARK
ACADÉMIE STE. CÉCILE PRIVATE SCHOOL
APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS
BROTHERS CT
RODFAM DR
MEL CT
MATTHEW ROBZIK PARK
SHADETREE CRES
HOWARD AVENUE
JESSICA WAY
HAVENS DR
ALPENROSE AVE
ALPENROSE CT
CRES
SHADETREE CT
ASHFIELD CRES
OUR LADY OF MOUNT CARMEL CATHOLIC CHURCH
OUR LADY OF MOUNT CARMEL SEPARATE SCHOOL
CAHILL DRAIN
COUSINEAU ROAD
VILLA PARADISO CRES
KENDLETON CT
WOLFE DRAIN
CITY OF WINDSOR
ALIBIS SPORTS BAR
AUTOBON CARWASH
CITY OF WINDS
HIGHWAY 3
HWY 3 SOUTHBOUND CLOSED
XTR GAS CONVENIENCE AND RESTAURANT
SLEEP FACTORY
TRILLIUM CT
WINDSOR CROSSING OUTLET MALL
HOMESTEAD LANE
FOXWOOD CT
HEATHWOOD CT
ANALYSIS ENVELOPE PROPOSED HIGHWAY 401
ASHBERRY PL
CARRIAGE LANE
MONTGOMERY DR
STORAGE FACILITY
SURREY DR
GROSVENOR DR
CHELSEA DR
TOWN OF LASALLE
TOWN OF TECUMSEH
MERO AVE
SANDWICH PARKWAY
HERITAGE DR
RUSHWOOD CRES
HARVEST BEND
APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS
LASALLE
CROYDON RD
EASTBOURNE AVE
6TH CON. RD
J. JENNER PARK
100m 0m 100m 200m
CONCEPTUAL




# ACCESS ROAD ALTERNATIVE 2A - OPTION 2

SCALE 1:5000

NOVEMBER 2006

SOUTHWOOD LAKES

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

WINDSOR

ANALYSIS ENVELOPE

CITY OF WINDSOR

TOWN OF TECUMSEH

HIGHWAY 401

TECUMSEH

OUTER DRIVE

DEL DUCA INDUSTRIAL PARK

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

DEL DUCA INDUSTRIAL PARK

CONCEPTUAL

ROSCON INDUSTRIAL DR

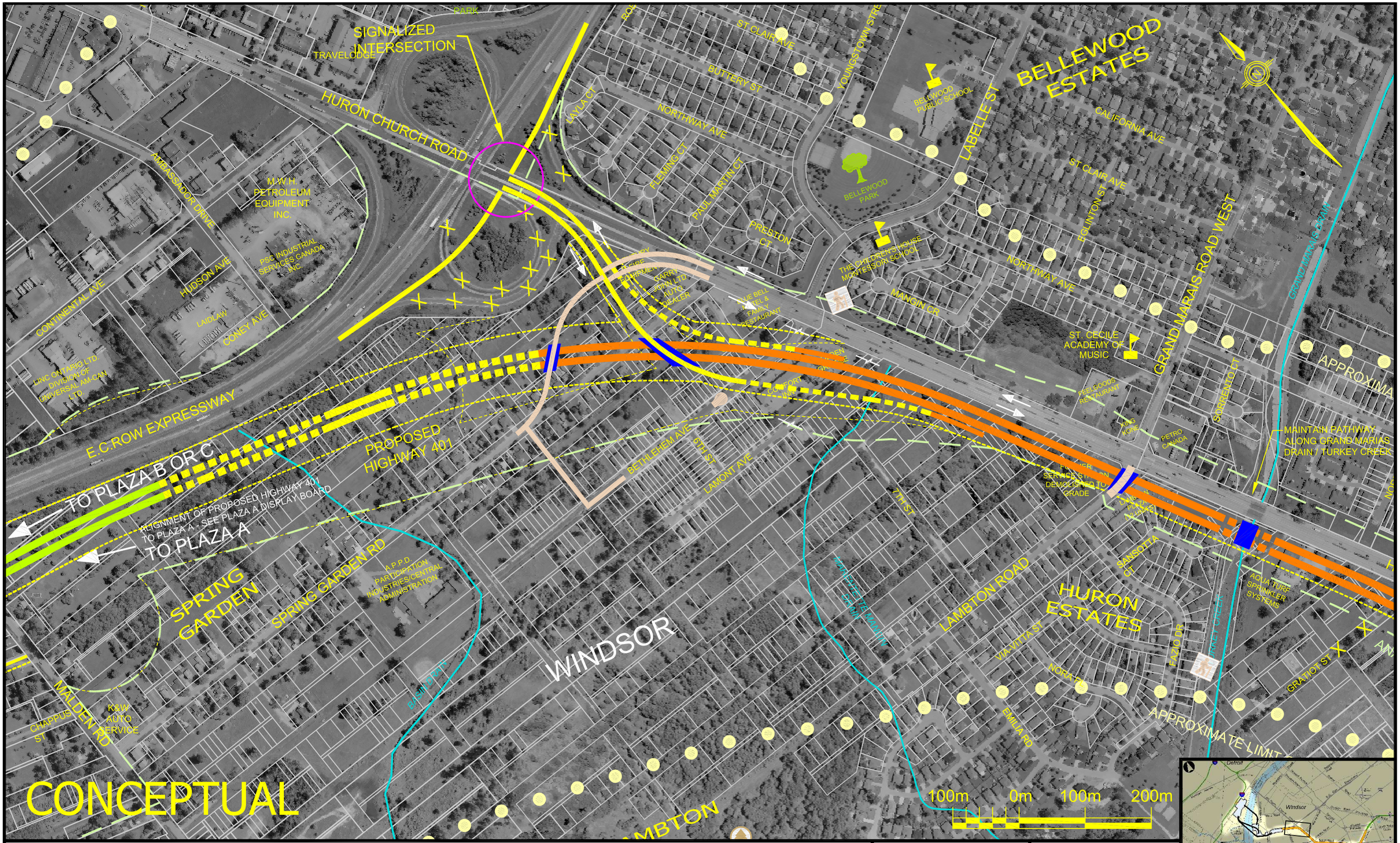
100m 0m 100m 200m

# ACCESS ROAD ALTERNATIVE 2A

SCALE 1:5000

NOVEMBER 2006

# Access Road Alternative 2B




ACCESS ROAD ALTERNATIVE 2B

SCALE 1:5000

NOVEMBER 2006

SIGNALIZED INTERSECTION
HURON CHURCH ROAD
AMBASSADOR DRIVE
M.W.H. PETROLEUM EQUIPMENT INC.
PSC INDUSTRIAL SERVICES CANADA INC.
HUDSON AVE
CONTINENTAL AVE
LAIDLAW
CONEY AVE
CANADIAN CUSTOMS SECONDARY COMPLEX (FOR CANADA BOUND TRUCKS USING THE AMBASSADOR BRIDGE)
INC ONTARIO LTD. A DIVISION OF UNIVERSAL AM-CAN LTD.
E.C.ROW EXPRESSWAY
SPRING GARDEN
SPRING GARDEN RD
A.P.P.D. PARTICIPATION INDUSTRIES/CENTRAL ADMINISTRATION
CHAPPUS ST
MALDEN RD
K&W AUTO SERVICE
CENTRAL DEM. ROUTE TO MALDEN ROAD
CONCEPTUAL
WINDSOR
LAMBTON
PRAIRIE REMNANT (SPRING GARDEN FOREST) LIFE: ANSI
BETHLEHEM AVE
LAMONT AVE
7TH ST
8TH ST
BUTTERY ST
YOUNG ST
LAYLA CT
NORTHWAY AVE
FLEMING CT
PAUL MARTIN CT
PREEDON CT
BELLEWOOD PUBLIC SCHOOL
BELLEWOOD PARK
LABELLE ST
BELLEWOOD ESTATES
CALIFORNIA AVE
ST CLAIR AVE
EGLINTON ST
THE CHILDREN'S HOUSE MONTESSORI SCHOOL
MANOR CR
GRAND MARAIS ROAD WEST
ST. CECILE ACADEMY OF MUSIC
SORRENTO CT
PETRO CANADA
LAMBTON ROAD
HURON ESTATES
SANSOTTA CT
TURKEY CREEK
AQUATURF SPRINKLER SYSTEMS
VIKVITTA ST
NORA ST
FALCO DR
EMILIA RD
APPROXIMATE LIMIT
100m 0m 100m 200m


# PLAZA A - ACCESS ROAD ALTERNATIVE 2B

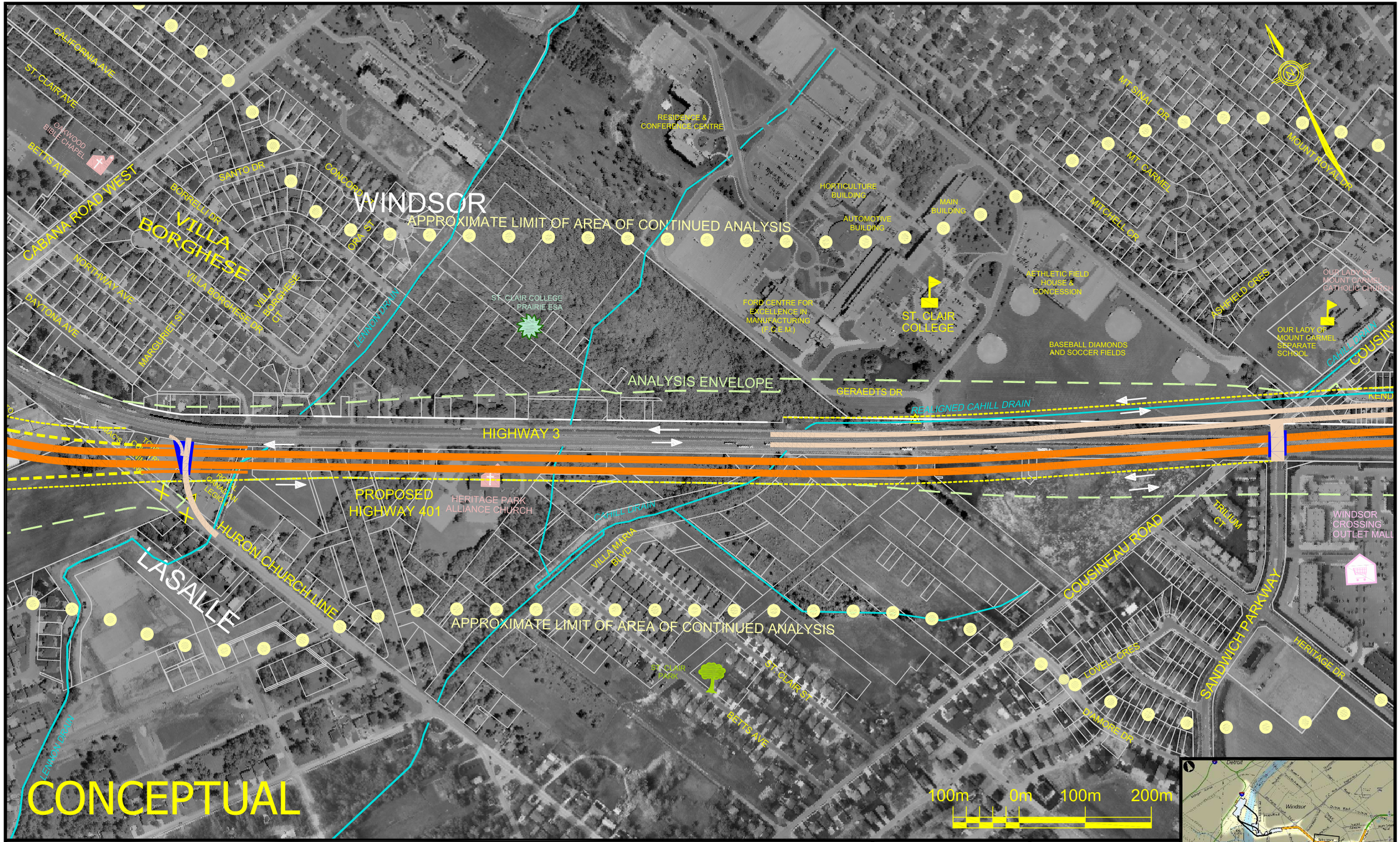
SCALE 1:5000

NOVEMBER 2006

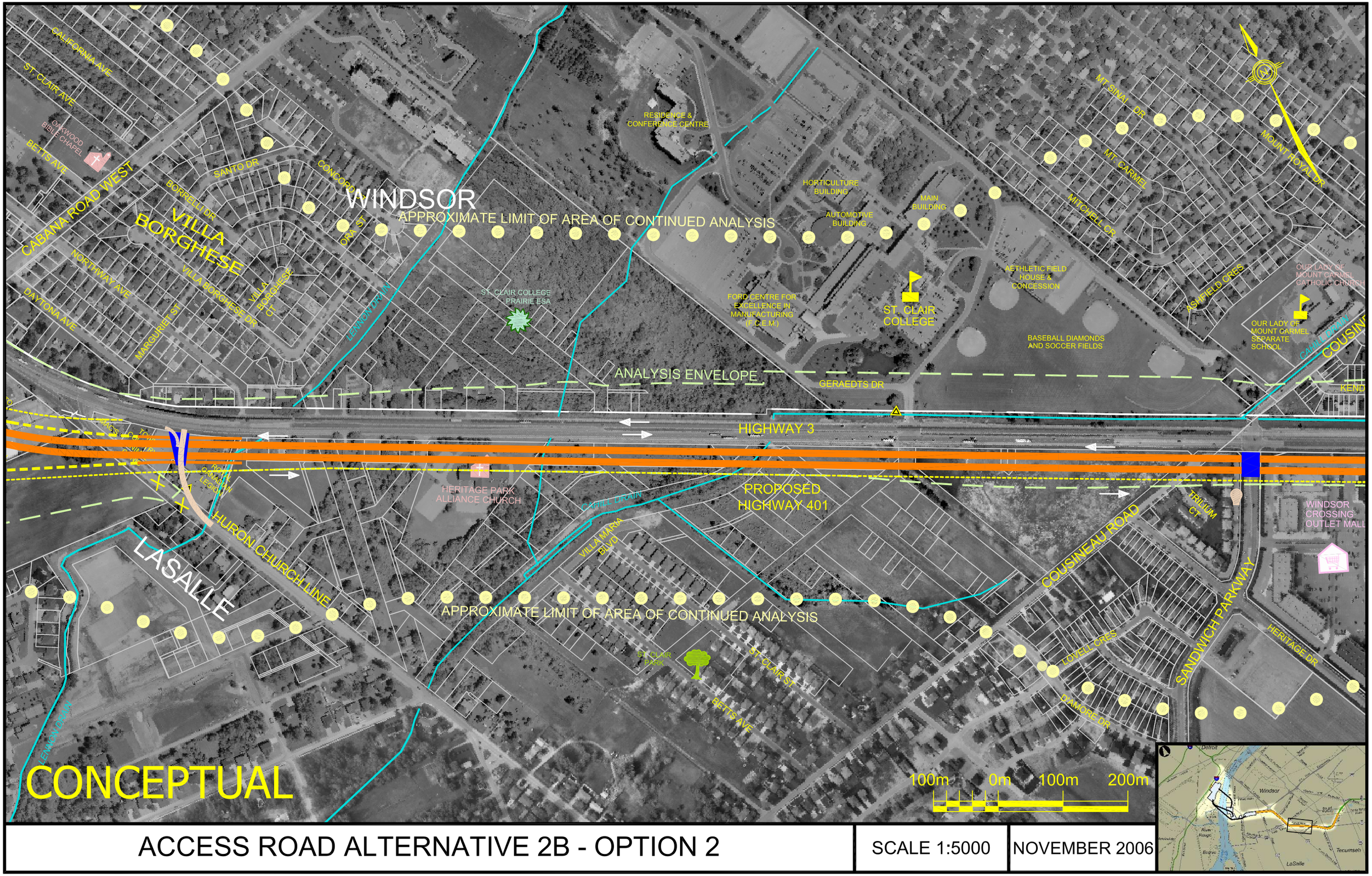

# ACCESS ROAD ALTERNATIVE 2B

SCALE 1:5000

NOVEMBER 2006




| ACCESS ROAD ALTERNATIVE 2B - OPTION 1 | SCALE 1:5000 | NOVEMBER 2006 |
|---|---|---|




ACCESS ROAD ALTERNATIVE 2B - OPTION 2

SCALE 1:5000

NOVEMBER 2006

WINDSOR
CHANDLER ARMS
CASGRAIN DR
MOUNT ROYAL DR
VETERANS MEMORIAL PARK
ACADEMIE STE CECILE PRIVATE SCHOOL
APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS
BROTHERS CT
ROOFAIM DR
MATTHEW ROOZIK PARK
SHADETREE CRES
CRES
SHADETREE CT
HOWARD AVENUE
JESSICA WAY
HAVENS DR
ALPENROSE AVE
ALPENROSE CT
ROMANIA PARK
ASHFIELD CRES
OUR LADY OF MOUNT CARMEL CATHOLIC CHURCH
OUR LADY OF MOUNT GARMEL SEPARATE SCHOOL
CADILLAC DRAIN
COUSINEAU ROAD
VILLA PARADISO CRES
HIGHWAY 3 REALIGNMENT
REALIGNED WOLFE DRAIN
RENDLETON CT
CITY OF WINDSOR DRAIN
ALIBIS SPORTS BAR
AUTODON CARWASH
CITY OF WINDS
HWY 3 SOUTHBOUND CLOSED
XTR GAS CONVENIENCE AND RESTAURANT
SLEEP FACTORY
PROPOSED HIGHWAY 401 ANALYSIS ENVELOPE
TRILLIUM CT
WINDSOR CROSSING OUTLET MALL
HOMESTEAD LANE
FOXWOOD CT
HEATHWOOD CT
ASHBERRY PL
CARRIAGE LANE
MONTGOMERY DR
STORAGE FACILITY
SURREY DR
GROSVENOR DR
CHELSEA DR
MERO AVE
TOWN OF TECUMSEH
TOWN OF LASALLE
SANDWICH PARKWAY
HERITAGE DR
RUSHWOOD CRES
HARVEST BEND
APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS
LASALLE
CROTON RD
EASTBOURNE AVE
6TH CON RD
J. JENNER PARK
CONCEPTUAL
100m 0m 100m 200m
Detroit
Windsor
River Rouge
Ecorse
Tecumseh
LaSalle

# ACCESS ROAD ALTERNATIVE 2B - OPTION 1

SCALE 1:5000

NOVEMBER 2006

WINDSOR
CHANDLER ARMS
CASGRAIN DR
MOUNT ROYAL DR
VETERANS MEMORIAL PARK
ACADÉMIE STE CÉCILE PRIVATE SCHOOL
APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS
BROTHERS CT
HOOFAM DR
WESTLOT
KONVALT PARK
JESSICA WAY
HOWARD AVENUE
HAVENS DR
ALPENROSE AVE
ALPENROSE CT
ASHFIELD CRES
OUR LADY OF MOUNT CARMEL CATHOLIC CHURCH
MATTHEW ROCZIK PARK
SHADETREE CRES
CRES
SHADETREE CT
OUR LADY OF MOUNT CARMEL SEPARATE SCHOOL
CAHILL DRAIN
COUSINEAU ROAD
VILLA PARADISO CRES
KENDLETON CT
WOLFE DRAIN
CITY OF WINDS
CITY OF WINDSOR
ALIBIS SPORTS BAR
AUTOBON CARWASH
HIGHWAY 3
HWY 3 SOUTHBOUND CLOSED
XTR GAS CONVENIENCE AND RESTAURANT
SLEEP FACTORY
ANALYSIS ENVELOPE
PROPOSED HIGHWAY 401
MONTGOMERY DR
STORAGE FACILITY
SURREY DR
GROSVENOR DR
CHELSEA DR
TRILLIUM CT
WINDSOR CROSSING OUTLET MALL
HOMESTEAD LANE
FOXWOOD CT
HEATHWOOD PL
ASHBERRY PL
CARRIAGE LANE
MERO AVE
TOWN OF TECUMSEH
TOWN OF LASALLE
SANDWICH PARKWAY
HERITAGE DR
ROSHWOOD CRES
HARVEST BEND
APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS
LASALLE
CROYDON RD
EASTBOURNE AVE
6TH CON. RD
J. JENNER PARK
CONCEPTUAL
100m 0m 100m 200m
Detroit
Windsor
River Rouge
Ecorse
Tecumseh
LaSalle

# ACCESS ROAD ALTERNATIVE 2B - OPTION 2

SCALE 1:5000

NOVEMBER 2006

SOUTHWOOD LAKES

WINDSOR

TECUMSEH

CITY OF WINDSOR

TOWN OF TECUMSEH

HIGHWAY 401

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

ANALYSIS ENVELOPE

DEL DUCA INDUSTRIAL PARK

ALPENROSE AVE

ALPENROSE CT

MARCUTT CT

KOMINAR CT

IMPERIAL CRES

SOUTHWOOD LAKES BLVD

HACIENDA CT

GRANTHAM CT

FIELDING CT

LAKE TRAIL GB

LAKE LAGUNA CT

LAKE LAGUNA PARK

LAKE OLIVIA PARK

WOLFE LAKE PARK

THURSO WAY

HACIENDA WAY

GRANTHAM WAY

STONEYBROOK CRES

HIGHNOON DR

NORTH TALBOT RD

NORTH TALBOT PARK

TUMBLEWEED CRES

MONO DR

OUTER DRIVE

ROSCON INDUSTRIAL DR

BLACKACRE DRIVE

ROSS DR

HIGHWAY 3

MERO AVE

SLEEP FACTORY

TOWN OF LASALLE

Extendicare Southwood Lakes Long Term Centre

ST CHARBEL-MARONITE CATHOLIC CHURCH

DUALFLEX COMPANY LTD.

TYLER HARD CHROME

PHILLIPS TOOL & MOULD

WESTON BAKERY

HELLENIC BANQUET HALLS

LIGHTHEERE ON TRUCK EQUIPMENT SERVICE INC.

OMNITOOL MACHINE PRODUCTION SERVICE

MICHAEL ANGELO MOULD & DESIGN

P.E.D. PATTERN EQUIPMENT & PROTOTYPE

A.P. PLASMAN WINDSOR PLANT 2

A.P. PLASMAN WINDSOR PLANT 1

100m 0m 100m 200m

CONCEPTUAL

# ACCESS ROAD ALTERNATIVE 2B

SCALE 1:5000

NOVEMBER 2006

# Access Road Alternative 3

# ACCESS ROAD ALTERNATIVE 3

SCALE 1:5000

NOVEMBER 2006

CONCEPTUAL

HURON CHURCH ROAD

TRAVELODGE

PARK

AMBASSADOR DRIVE

M.W.H. PETROLEUM EQUIPMENT INC.

PSC INDUSTRIAL SERVICES CANADA INC.

HUDSON AVE

CONTINENTAL AVE

LAIDLAW

CONEY AVE

CINC ONTARIO LTD. DIVISION OF UNIVERSAL AM-CAN LTD.

E.C.ROW EXPRESSWAY

TO PLAZA B OR C

ALIGNMENT OF PROPOSED HIGHWAY 401 TO PLAZA A - SEE PLAZA A DISPLAY BOARD

TO PLAZA A

SPRING GARDEN

SPRING GARDEN RD

A.P.P.D. PARTICIPATION INDUSTRIES/CENTRAL ADMINISTRATION

MALDEN RD

CHAPPUS ST

K&W AUTO SERVICE

WINDSOR

ROY

ST CLAIR AVE

YOUNGSTOWN STRA

BUTTERY ST

LAYLA CT

NORTHWAY AVE

FLEMING CT

PAUL MARTIN CT

PRESTON CT

BELLEWOOD PUBLIC SCHOOL

BELLEWOOD PARK

LABELLE ST

BELLEWOOD ESTATES

CALIFORNIA AVE

ST CLAIR AVE

HIGHLINTON ST

NORTHWAY AVE

THE CHILDREN'S HOUSE MONTESSORI SCHOOL

MANGIN CR

GRAND MARAIS ROAD WEST

ST. CECILE ACADEMY OF MUSIC

SORRENTO CT

APPROXIMA

MAINTAIN PATHWAY ALONG GRAND MARAIS DRAIN / TURKEY CREEK

CENTURY FIRE EQUIPMENT

GOLDEN GRIDDLE

COMFORT INN

BETHLEHEM AVE

LAMONT AVE

7TH ST

FORMER SERVICE STATION DEMOLISHED TO GRADE

PETRO CANADA

LAMBTON ROAD

HURON ESTATES

VIA VITTA ST

NORA ST

EMILIA RD

FAZIO DR

SANSOTTA CT

TURKEY CREEK

AQUATURF SPRINKLER SYSTEMS

GRATIOT ST

APPROXIMATE LIMIT

PROPOSED HIGHWAY

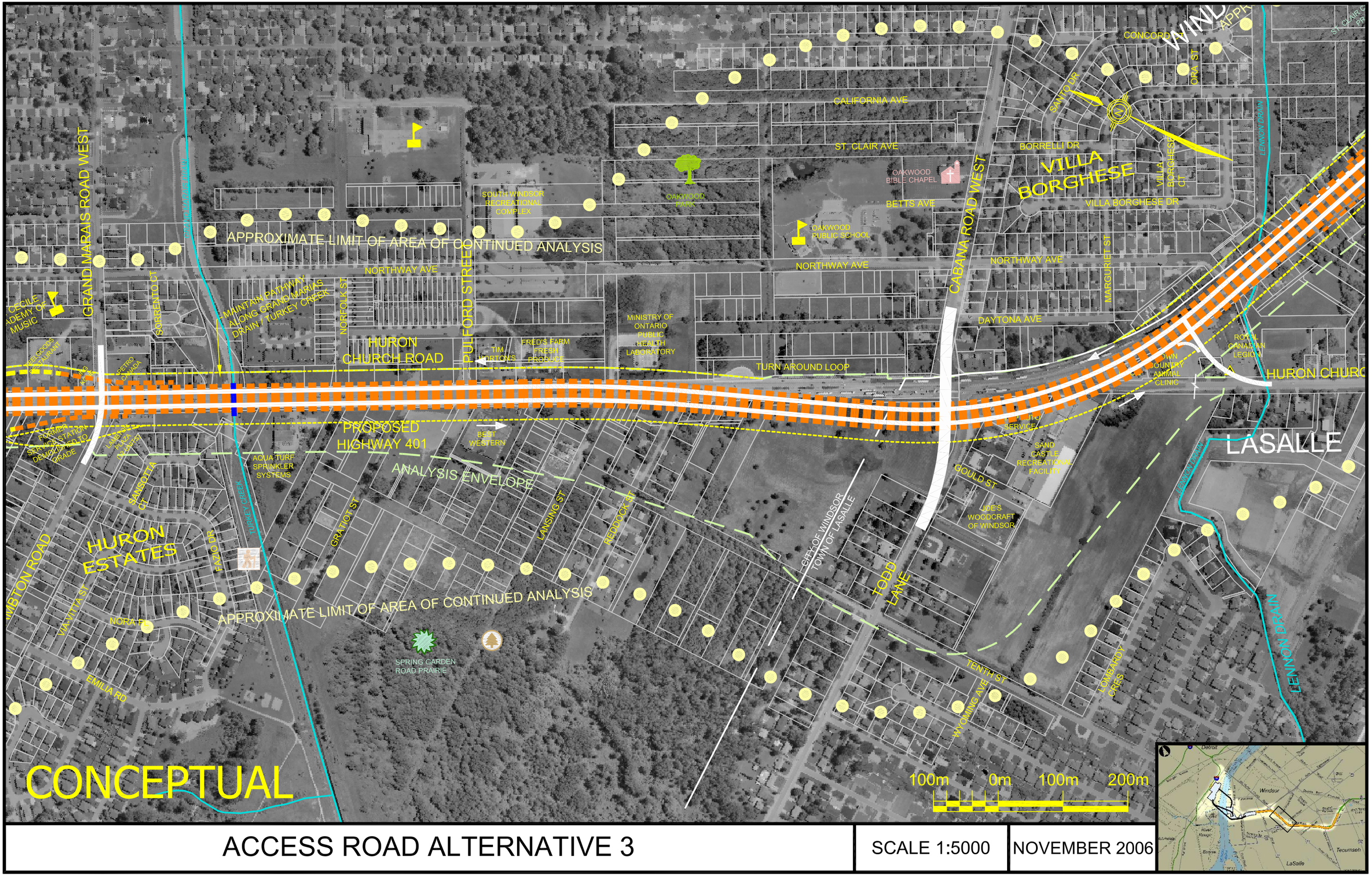
100m 0m 100m 200m

HURON CHURCH ROAD
BUTTERY ST
YOUNG ST
LAYLA CT
NORTHWAY AVE
FLEMING CT
PAUL MARTIN CT
PRESTON CT
BELLEWOOD PUBLIC SCHOOL
BELLEWOOD PARK
LABELLE ST
BELLEWOOD ESTATES
CALIFORNIA AVE
ST CLAIR AVE
EGLINTON ST
THE CHILDREN'S HOUSE MONTESSORI SCHOOL
NORTHWAY AVE
MANGIN CR
GRAND MARAIS ROAD WEST
ST. CECILE ACADEMY OF MUSIC
SORRENTO CT
HURON CHURCH ROAD
AMBASSADOR DRIVE
M.W.H. PETROLEUM EQUIPMENT INC.
PSC INDUSTRIAL SERVICES CANADA INC.
HUDSON AVE
CONTINENTAL AVE
LAIDLAW
CONEY AVE
CANADIAN CUSTOMS SECONDARY COMPLEX (FOR CANADA BOUND TRUCKS USING THE AMBASSADOR BRIDGE)
INC. ONTARIO LTD. DIVISION OF UNIVERSAL AM-CAN LTD.
CENTURY FIRE EQUIPMENT
SKARRY (ONTARIO) LTD. AUTO DEALER
E.C.ROW EXPRESSWAY
PROPOSED HIGHWAY 401
BETHLEHEM AVE
LAIMONT AVE
7TH ST
FARMER SERVICE STATION DEMOLISHED TO GRADE
PETRO CANADA
LAMBTON PLAZA ALTERED
SPRING GARDEN
SPRING GARDEN RD
A.P.P.D. PARTICIPATION INDUSTRIES/CENTRAL ADMINISTRATION
MALDEN RD
CHAPPUS ST
KEW AUTO SERVICE
WINDSOR
LAMBTON
PRAIRIE REMNANT (SPRING GARDEN FOREST) LIFE ANSI
MCDERMOTT DRAIN
LAMBTON ROAD
SANSOTTA CT
HURON ESTATES
VIA VITTA ST
NOVA CT
EMILIA RD
LAZIO DR
TURKEY CREEK
AQUATURF SPRINKLER SYSTEMS
APPROXIMATE LIMIT OF
100m 0m 100m 200m
CONCEPTUAL


# PLAZA A - ACCESS ROAD ALTERNATIVE 3

SCALE 1:5000

NOVEMBER 2006




# ACCESS ROAD ALTERNATIVE 3

SCALE 1:5000

NOVEMBER 2006

WINDSOR

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

LASALLE

APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS

ANALYSIS ENVELOPE

CONCEPTUAL

CALIFORNIA AVE
ST. CLAIR AVE
OAKWOOD BIBLE CHAPEL
BETTS AVE
CABANA ROAD WEST
SANTO DR
BORRELLI DR
VILLA BORGHESE
CONCORD ST
ORA ST
NORTHWAY AVE
VILLA BORGHESE DR
VILLA BORGHESE CT
DAYTONA AVE
MARGUERITE ST
LENNON DRAIN
RESIDENCE & CONFERENCE CENTRE
ST. CLAIR COLLEGE PRAIRIE ESA
HORTICULTURE BUILDING
AUTOMOTIVE BUILDING
MAIN BUILDING
FORD CENTRE FOR EXCELLENCE IN MANUFACTURING (F.C.E.M.)
ST. CLAIR COLLEGE
ATHLETIC FIELD HOUSE & CONCESSION
BASEBALL DIAMONDS AND SOCCER FIELDS
MT. SINAI DR
MT. CARMEL
MITCHELL CR
MOUNT ROYAL DR
ASHFIELD CRES
OUR LADY OF MOUNT CARMEL CATHOLIC CHURCH
OUR LADY OF MOUNT CARMEL SEPARATE SCHOOL
COUSINEAU
KEND
GERAEDTS DR
HIGHWAY 3
CAHILL DRAIN
CAHILL DRAIN
TOWN & COUNTRY FAMILY CLINIC
ROYAL CANADIAN LEGION
HERITAGE PARK ALLIANCE CHURCH
PROPOSED HIGHWAY 401
LENNON DRAIN
HURON CHURCH LINE
VILLA MARIA BLVD
ST. CLAIR PARK
ST. CLAIR ST
BETTS AVE
COUSINEAU ROAD
TRILLIUM CT
WINDSOR CROSSING OUTLET MALL
LOVELL CRES
SANDWICH PARKWAY
HERITAGE DR
D'AMORE DR
LENNON DRAIN
100m 0m 100m 200m


# ACCESS ROAD ALTERNATIVE 3

SCALE 1:5000

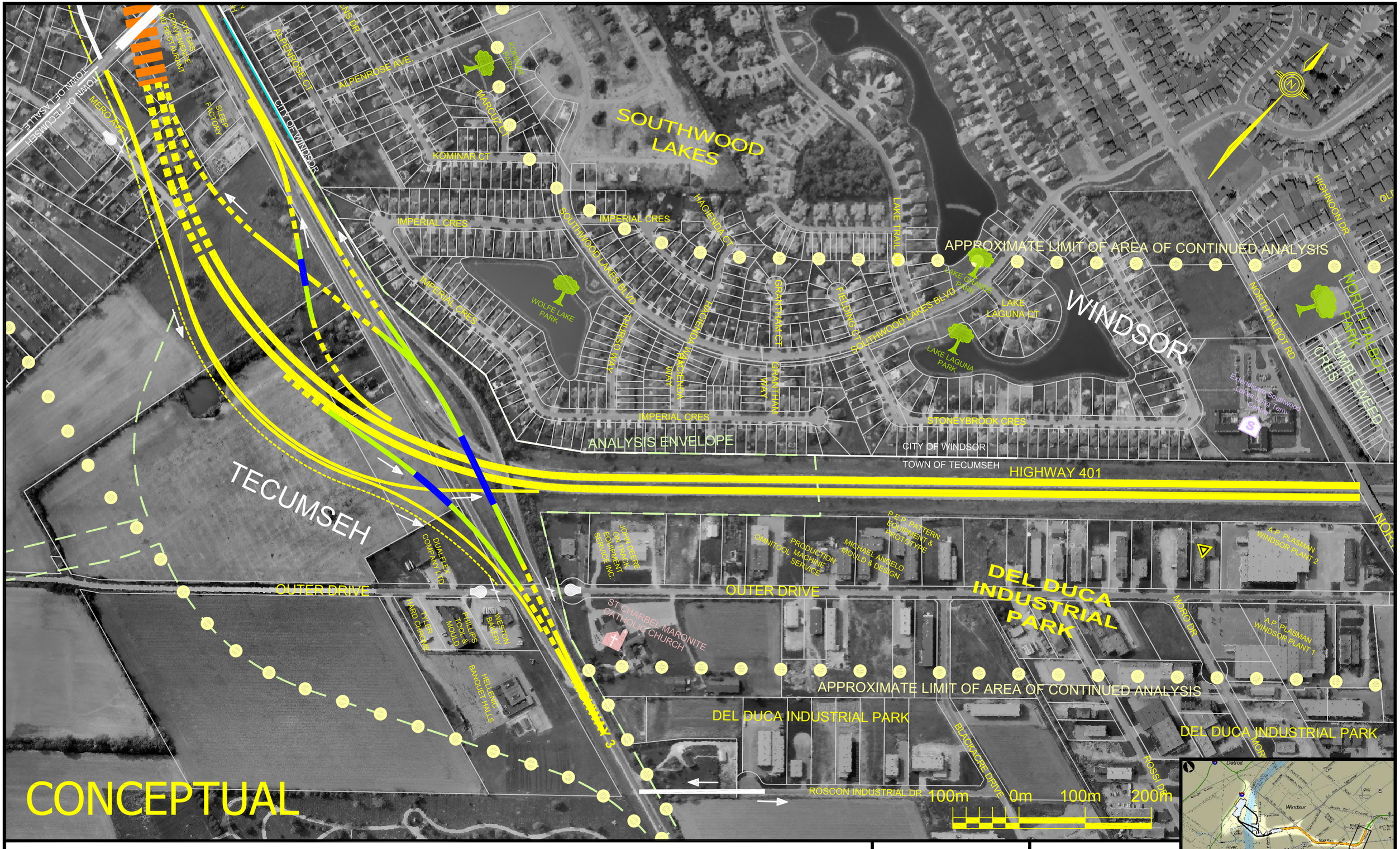
NOVEMBER 2006

WINDSOR
CHANDLER ARMS
CASGRAIN DR
MOUNT ROYAL DR
VETERANS MEMORIAL PARK
ACADÉMIE SRE. CÉCILE PRIVATE SCHOOL
APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS
MATTHEW RODZIK PARK
BROTHERS CT
HOFFAM DR
NAKESH CT
HOWARD AVENUE
JESSICA WAY
HAVENS DR
ALPENROSE AVE
ALPENROSE CT
SHADETREE CRES
SHADETREE CT
OUR LADY OF MOUNT CARMEL CATHOLIC CHURCH
OUR LADY OF MOUNT CARMEL SEPARATE SCHOOL
COUSINEAU ROAD
VILLA PARADISO CRES
KENDLETON CT
HIGHWAY 3
WOLFE DRAIN
CITY OF WINDSOR
CITY OF WINDS
ALIBIS SPORTS BAR
AUTODION CARWASH
XTR GAS CONVENIENCE AND RESTAURANT
SLEEP FACTORY
ANALYSIS ENVELOPE
PROPOSED HIGHWAY 401
STORAGE FACILITY
MONTGOMERY DR
ASHBERRY PL
CARRIAGE LANE
SURREY DR
GROSVENOR DR
CHELSEA DR
TRILLIUM CT
WINDSOR CROSSING OUTLET MALL
HOMESTEAD LANE
FOXWOOD CT
HEATHWOOD TR
SANDWICH PARKWAY
HERITAGE DR
RUSHWOOD CRES
MARVEST BEND
APPROXIMATE LIMIT OF AREA OF CONTINUED ANALYSIS
LASALLE
CROYDON RD
EASTBOURNE AVE
6TH CON. RD
TOWN OF LASALLE
TOWN OF TECUMSEH
MERO AVE
J. JENNER PARK
CONCEPTUAL
100m 0m 100m 200m
Detroit
Windsor
River Rouge
Ecorse
Tecumseh
LaSalle

# ACCESS ROAD ALTERNATIVE 3

SCALE 1:5000

NOVEMBER 2006

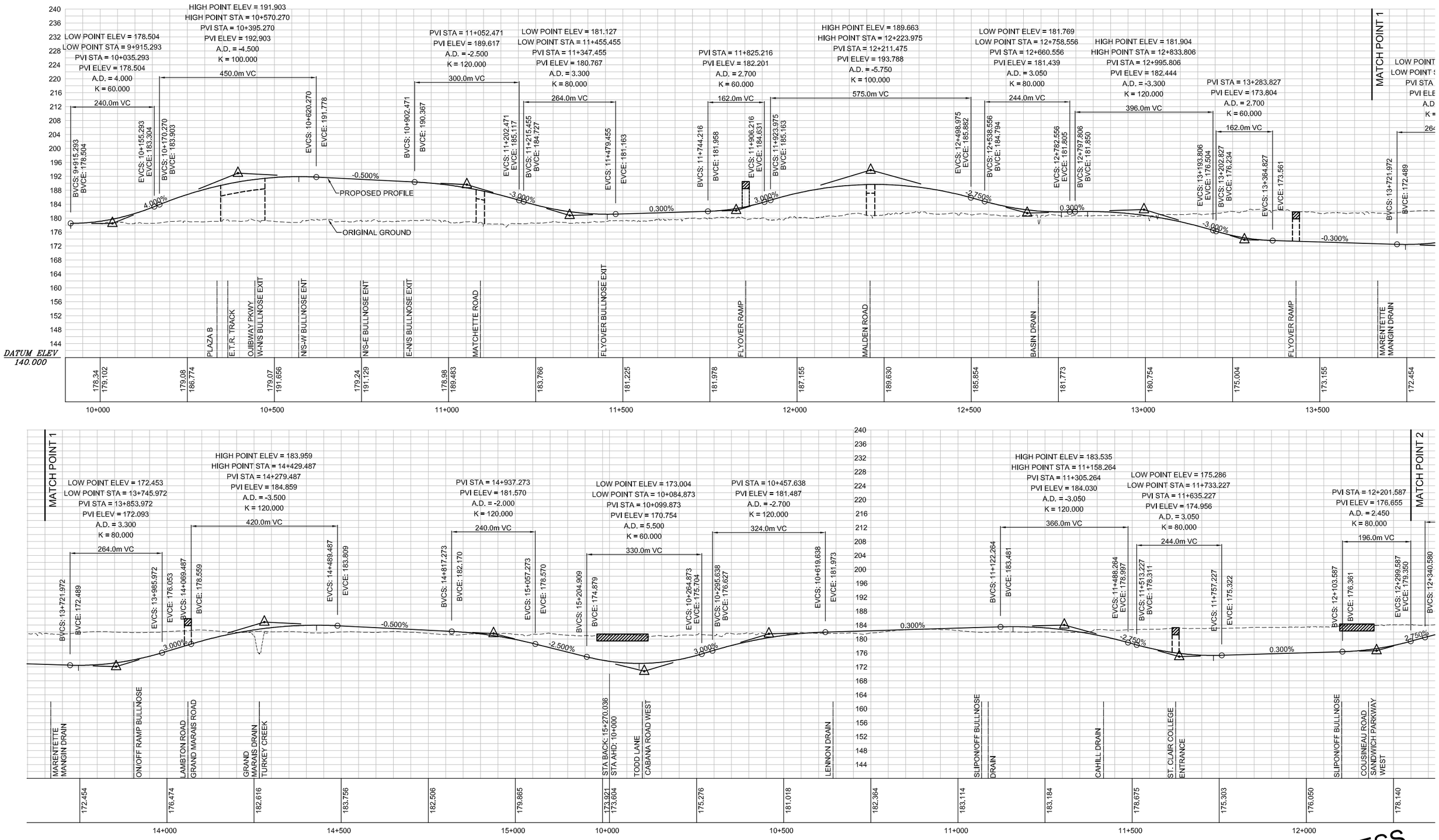



# CONCEPTUAL

## ACCESS ROAD ALTERNATIVE 3

SCALE 1:5000

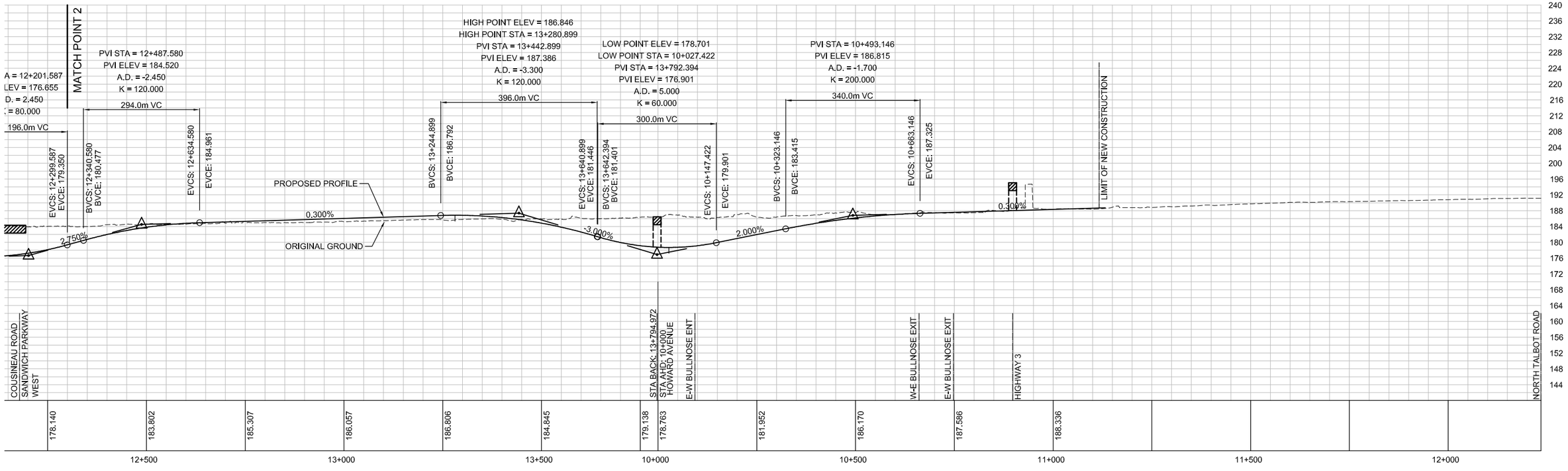
NOVEMBER 2006




# PROFILE OF HIGHWAY 401 ACCESS ROAD ALTERNATIVE 1A TO PLAZA B - AT GRADE

SCALE 1:10000/1000

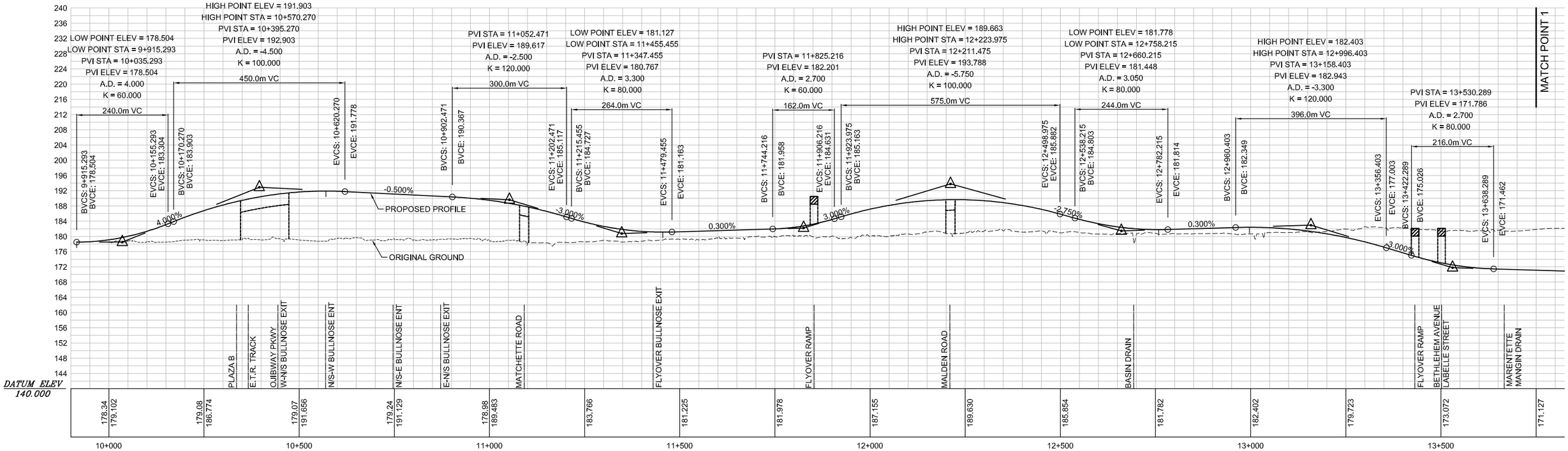
WORK IN PROGRESS

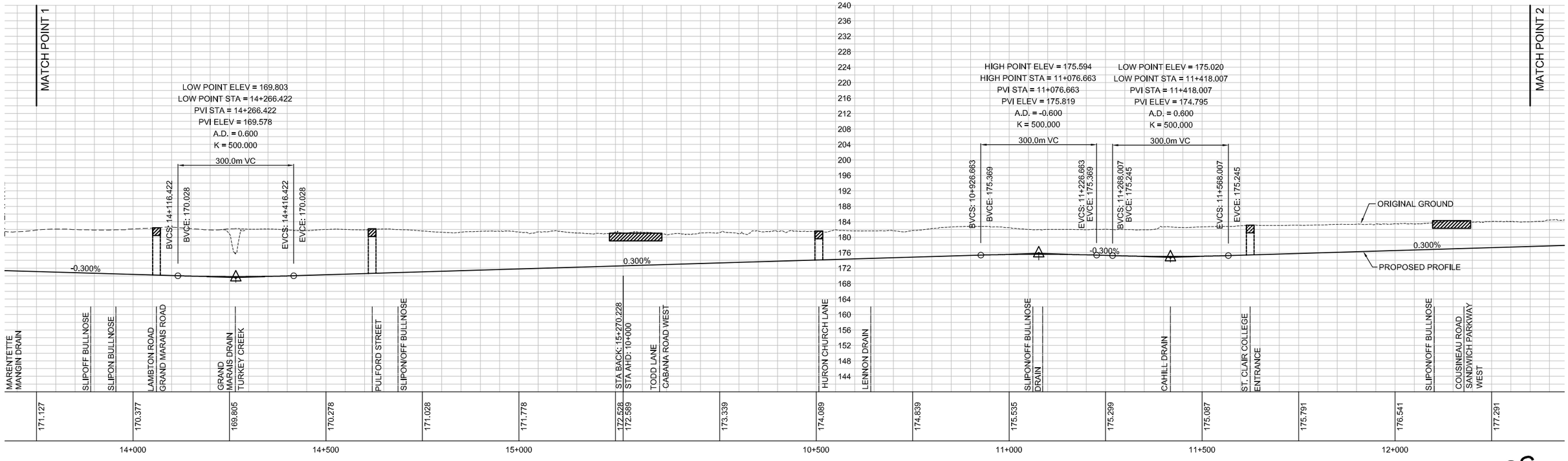



# PROFILE OF HIGHWAY 401 ACCESS ROAD ALTERNATIVE 1A TO PLAZA B - AT GRADE

SCALE 1:10000/1000

WORK IN PROGRESS

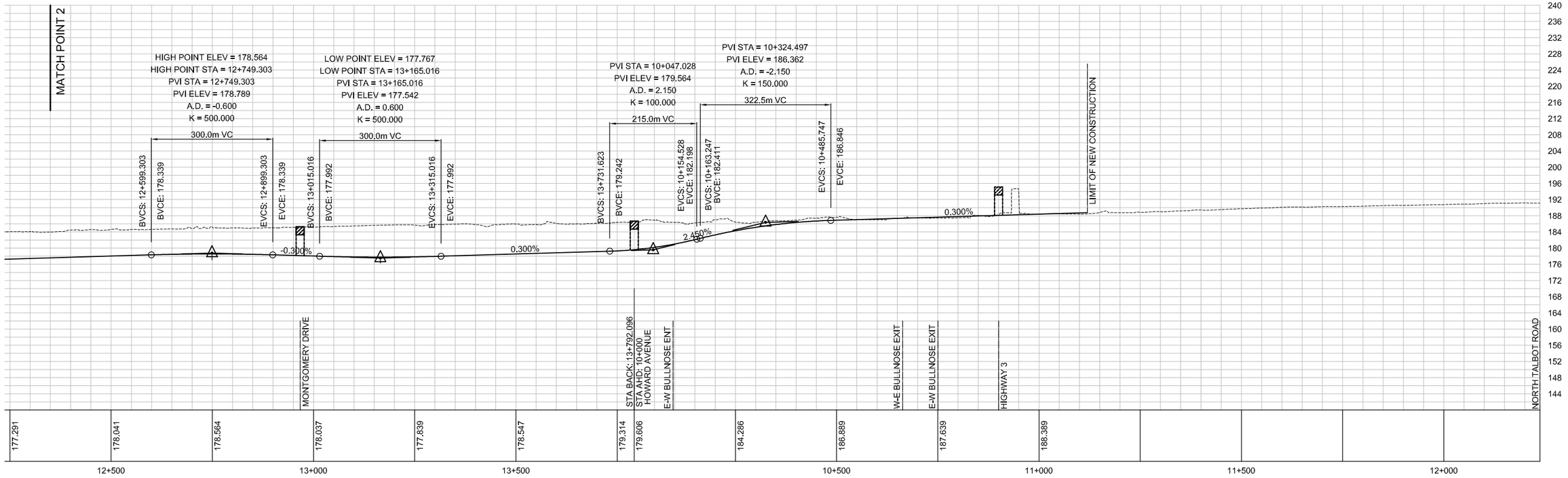



# PROFILE OF HIGHWAY 401 ACCESS ROAD ALTERNATIVE 1B TO PLAZA B - BELOW GRADE

SCALE 1:10000/1000

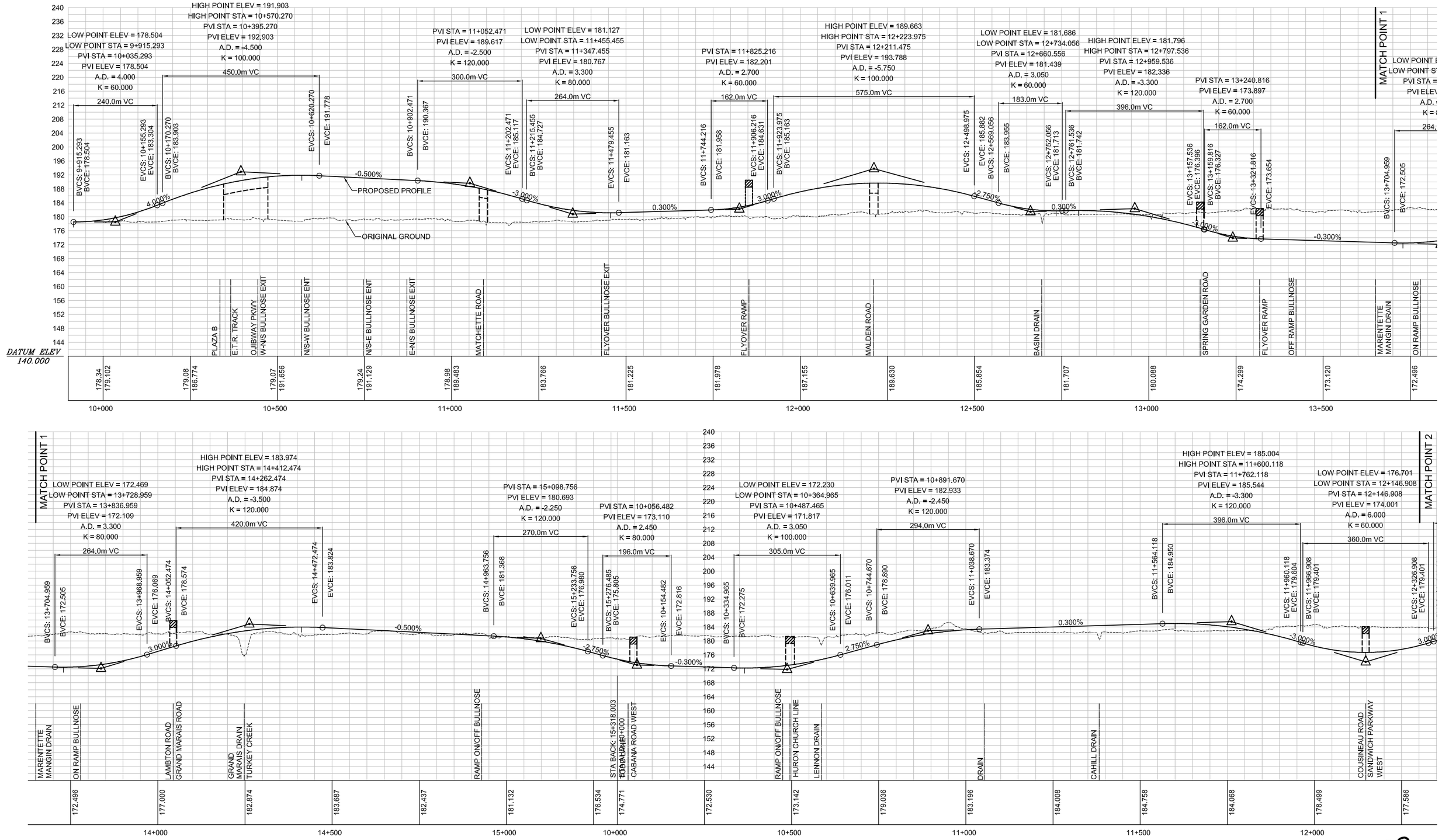
WORK IN PROGRESS




# PROFILE OF HIGHWAY 401 ACCESS ROAD ALTERNATIVE 1B TO PLAZA B - BELOW GRADE

SCALE 1:10000/1000

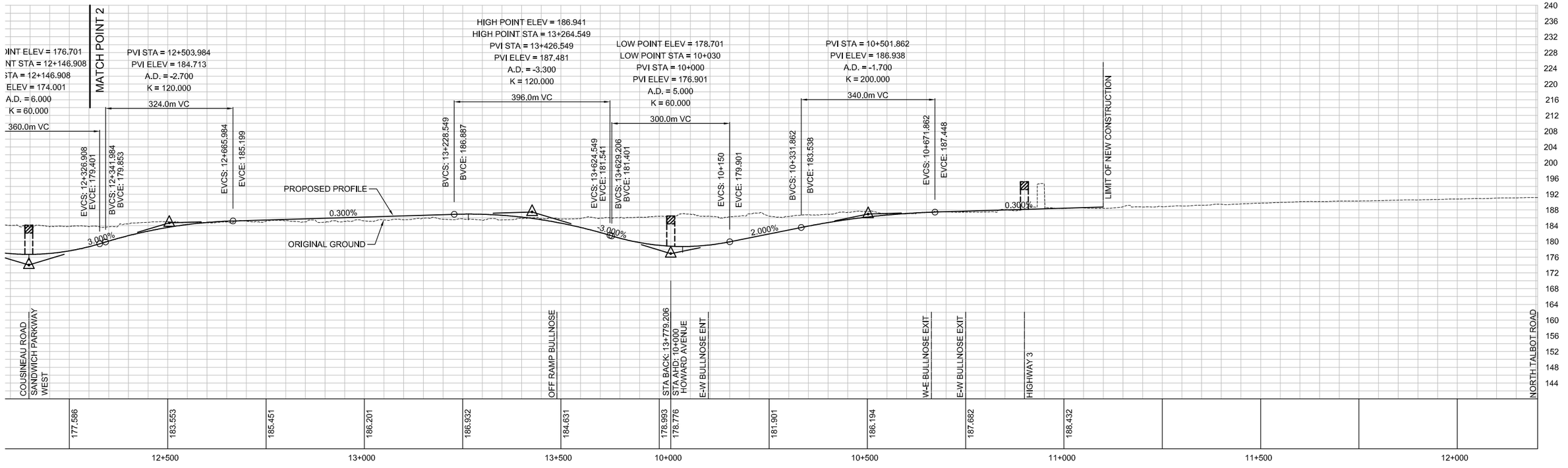
WORK IN PROGRESS




# PROFILE OF HIGHWAY 401 ACCESS ROAD ALTERNATIVE 2A TO PLAZA B - AT GRADE

SCALE 1:10000/1000

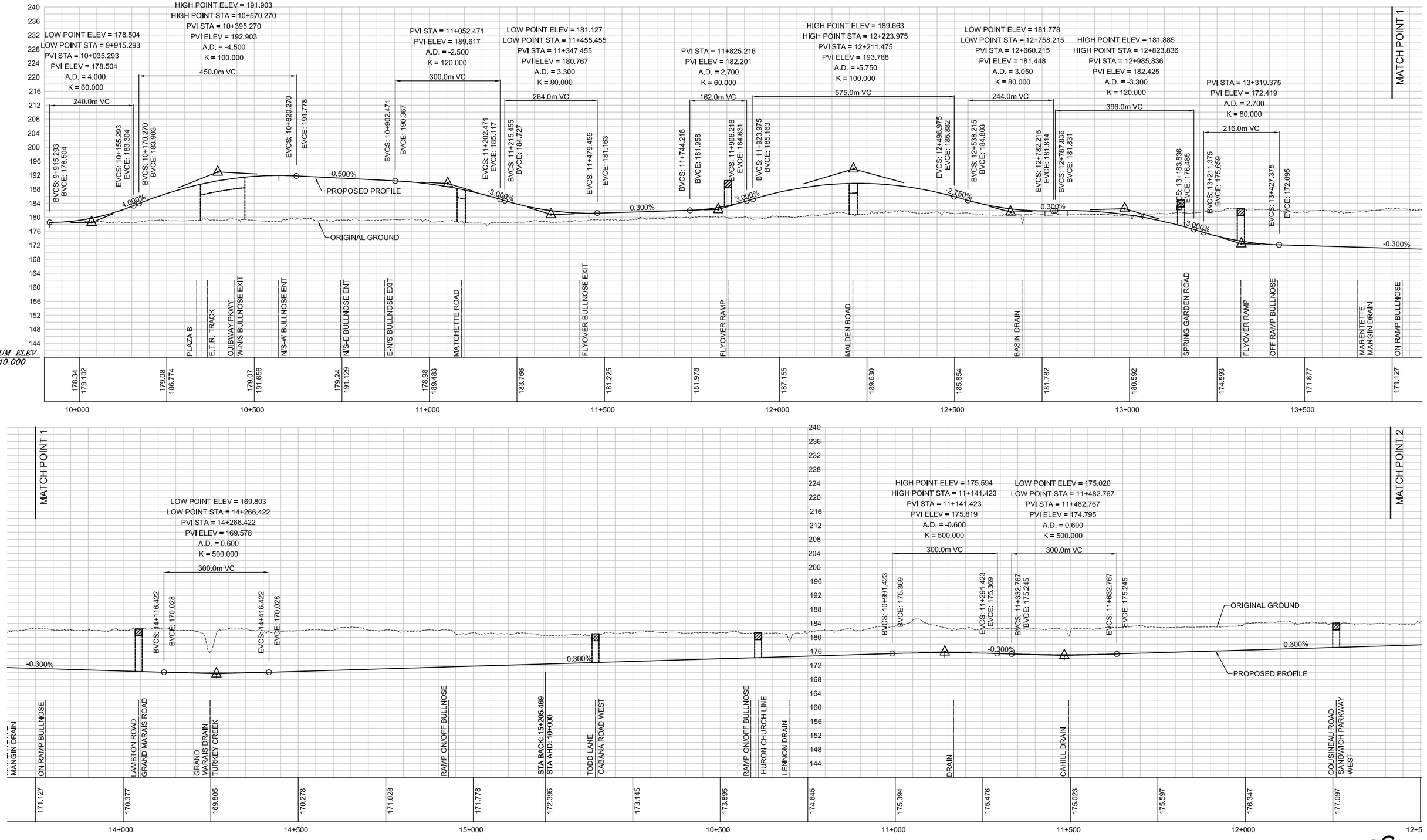
WORK IN PROGRESS




# PROFILE OF HIGHWAY 401 ACCESS ROAD ALTERNATIVE 2A TO PLAZA B - AT GRADE

SCALE 1:10000/1000

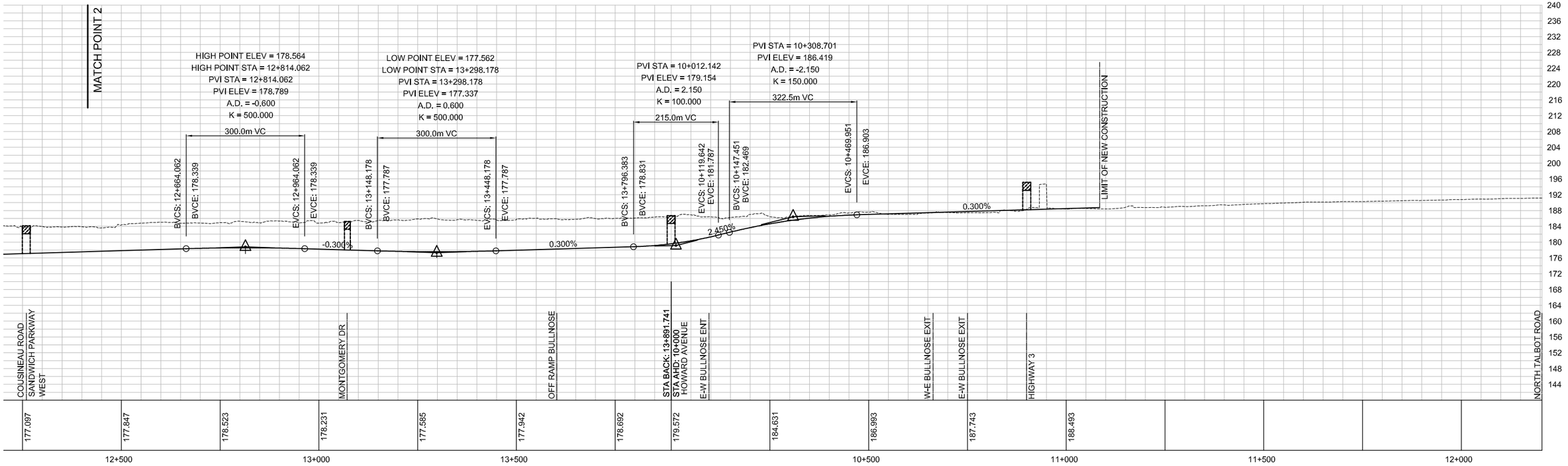
WORK IN PROGRESS




# PROFILE OF HIGHWAY 401 ACCESS ROAD ALTERNATIVE 2B TO PLAZA B - BELOW GRADE

SCALE 1:10000/1000

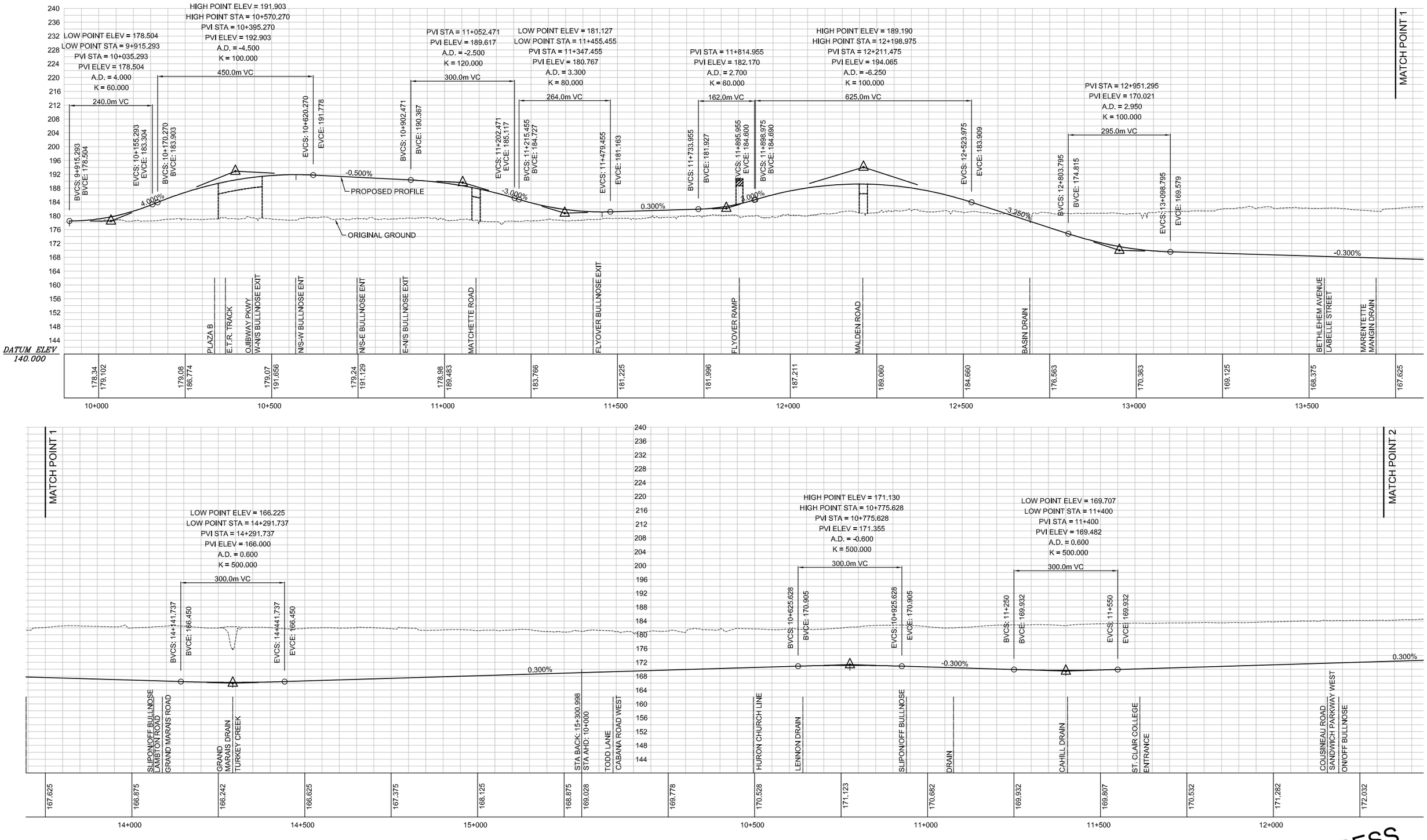
WORK IN PROGRESS




# PROFILE OF HIGHWAY 401 ACCESS ROAD ALTERNATIVE 2B TO PLAZA B - BELOW GRADE

SCALE 1:10000/1000

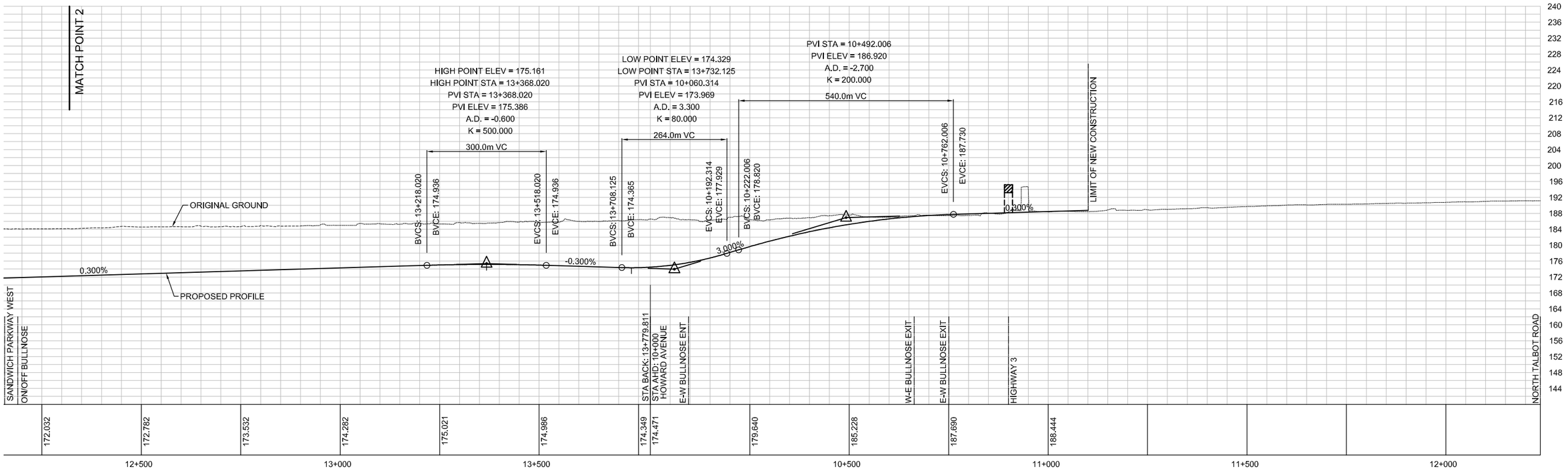
WORK IN PROGRESS




# PROFILE OF HIGHWAY 401 ACCESS ROAD ALTERNATIVE 3 TO PLAZA B - TUNNEL

SCALE 1:10000/1000

WORK IN PROGRESS




# PROFILE OF HIGHWAY 401 ACCESS ROAD ALTERNATIVE 3 TO PLAZA B - TUNNEL

SCALE 1:10000/1000

WORK IN PROGRESS

# APPENDIX C

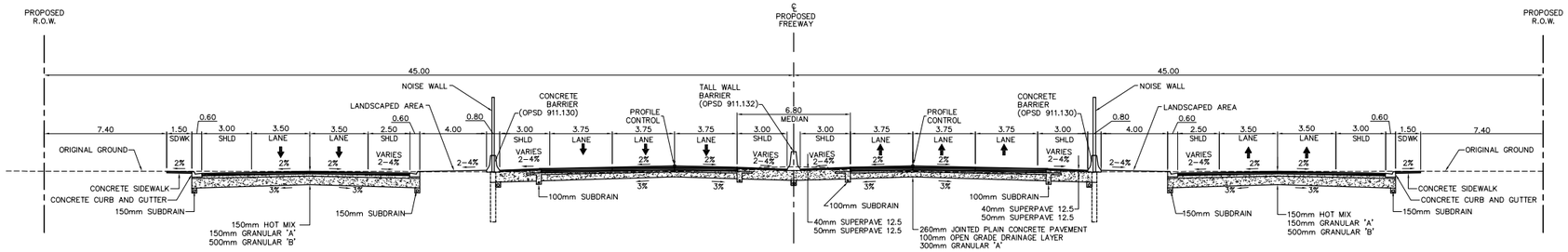
## Typical Cross Sections for Access Road Practical Alternatives

METRIC

| PLATE No | |
|---|---|
| CONT No XXXX–XXXX<br>WP No XXX–XX–XX | |
| TYPICAL SECTIONS<br>Survey _____ Revised _____ | SHEET<br>XXX |

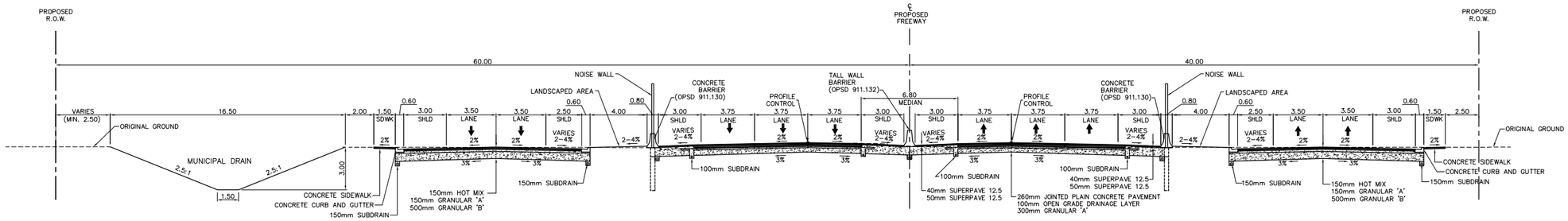
# DETROIT RIVER INTERNATIONAL CROSSING
# HIGHWAY 3/TALBOT ROAD/HURON CHURCH ROAD CORRIDOR

## TYPICAL 6–LANE URBAN FREEWAY SECTION WITH 2–LANE SERVICE ROADS ON BOTH SIDES




CONCEPTUAL

## TYPICAL 6–LANE URBAN FREEWAY SECTION WITH 2–LANE SERVICE ROADS ON BOTH SIDES WITH MUNICIPAL DRAIN




# ALTERNATIVE 1A

SCALE

1.5m 0 3.0m
Horizontal

METRIC

PLATE No
CONT No XXXX–XXXX
WP No XXX–XX–XX

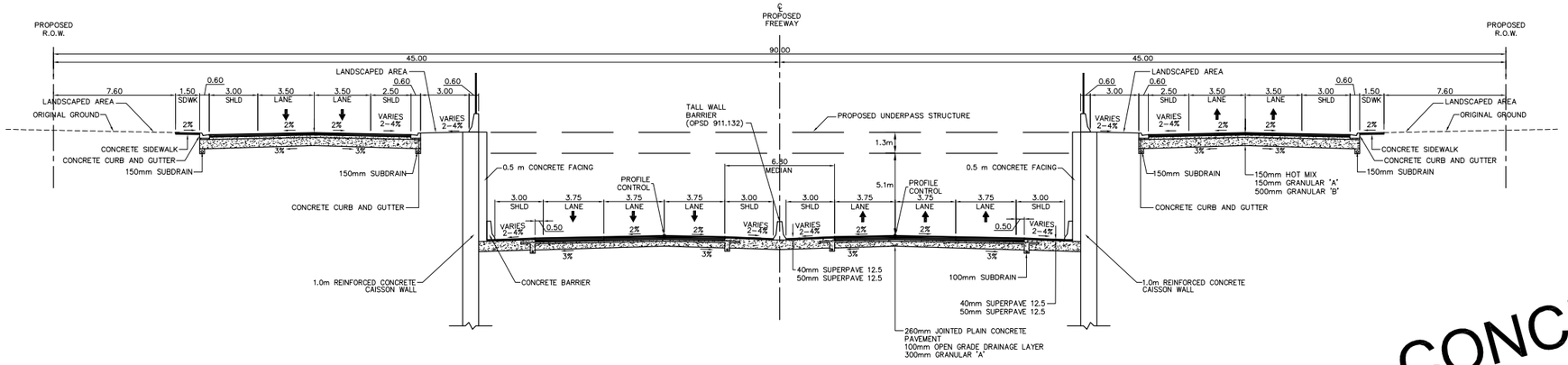
TYPICAL SECTIONS

Survey _____ Revised _____

SHEET XXX

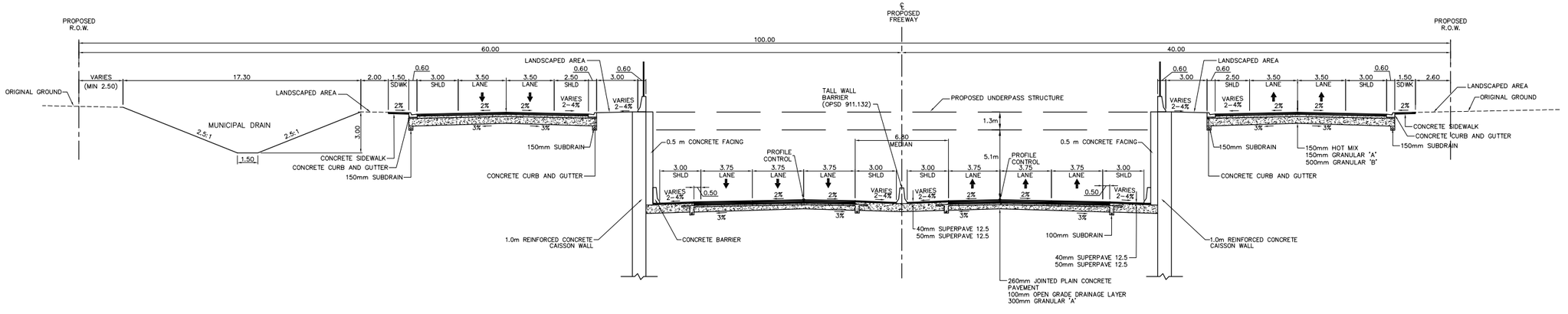
# DETROIT RIVER INTERNATIONAL CROSSING
# HIGHWAY 3/TALBOT ROAD/HURON CHURCH ROAD CORRIDOR

## TYPICAL BELOW–GRADE 6–LANE URBAN FREEWAY SECTION WITH ONE–WAY SERVICE ROADS




CONCEPTUAL

## TYPICAL BELOW–GRADE 6–LANE URBAN FREEWAY SECTION WITH ONE–WAY SERVICE ROADS AND MUNICIPAL DRAIN




# ALTERNATIVE 1B

SCALE

1.5m 0 3.0m
Horizontal

METRIC

PLATE No
CONT No XXXX–XXXX
WP No XXX–XX–XX

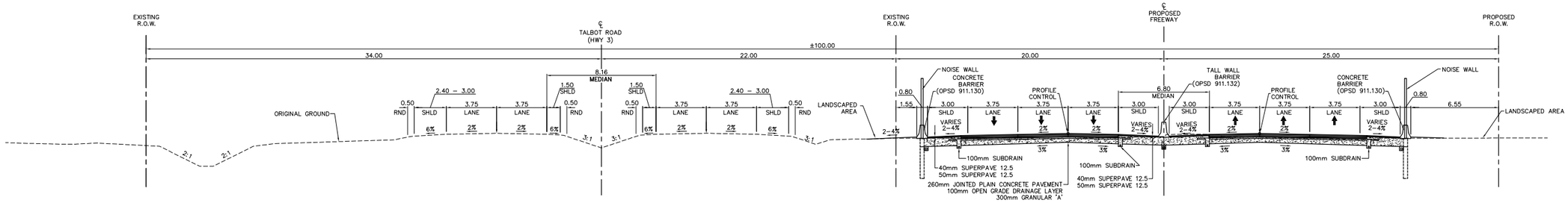
SHEET XXX

TYPICAL SECTIONS

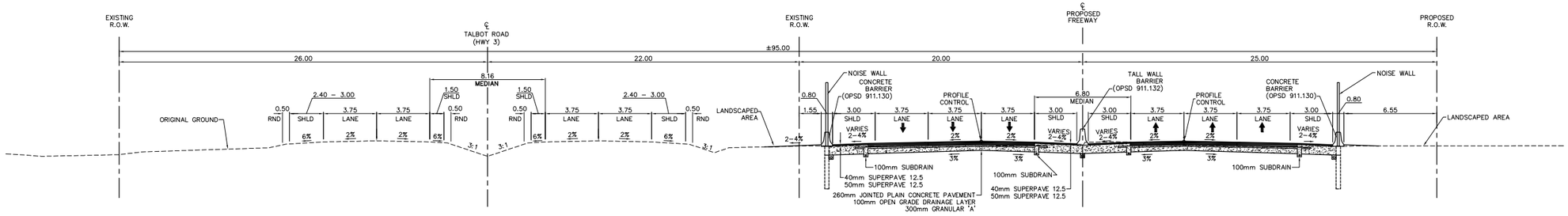
Survey _____ Revised _____

# DETROIT RIVER INTERNATIONAL CROSSING
# HIGHWAY 3/TALBOT ROAD/HURON CHURCH ROAD CORRIDOR

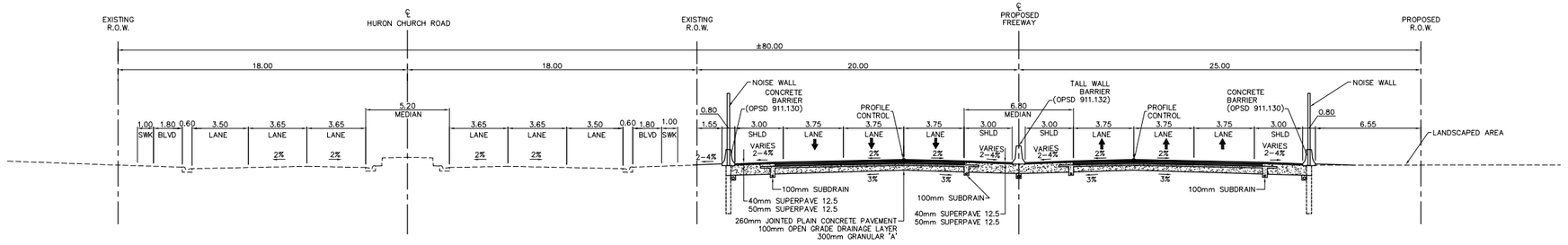
## TYPICAL 6–LANE URBAN FREEWAY SECTION ADJACENT TO TALBOT ROAD
## NOISE BARRIER ON NORTH SIDE WITH NO SERVICE ROAD ON SOUTH SIDE OF URBAN FREEWAY




## TYPICAL 6–LANE URBAN FREEWAY SECTION ADJACENT TO TALBOT ROAD
## NOISE BARRIER ON NORTH SIDE WITH NO SERVICE ROAD ON SOUTH SIDE OF URBAN FREEWAY




## TYPICAL 6–LANE URBAN FREEWAY SECTION ADJACENT TO HURON CHURCH ROAD
## NOISE BARRIER ON NORTH SIDE WITH NO SERVICE ROAD ON SOUTH SIDE OF URBAN FREEWAY




CONCEPTUAL

# ALTERNATIVE 2A

SCALE

1.5m 0 3.0m
Horizontal

METRIC

PLATE No
CONT No XXXX–XXXX
WP No XXX–XX–XX

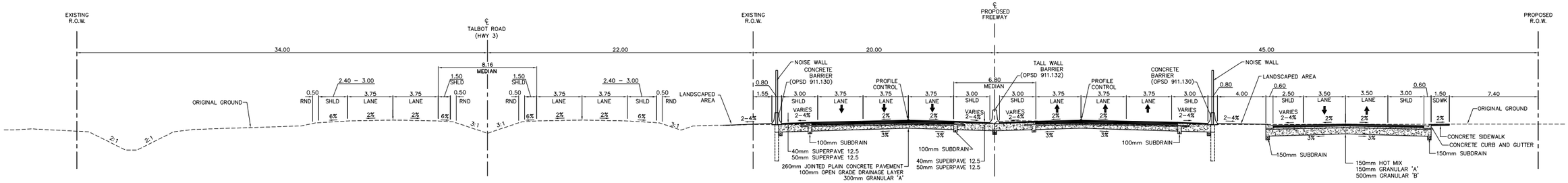
TYPICAL SECTIONS

Survey _____ Revised _____

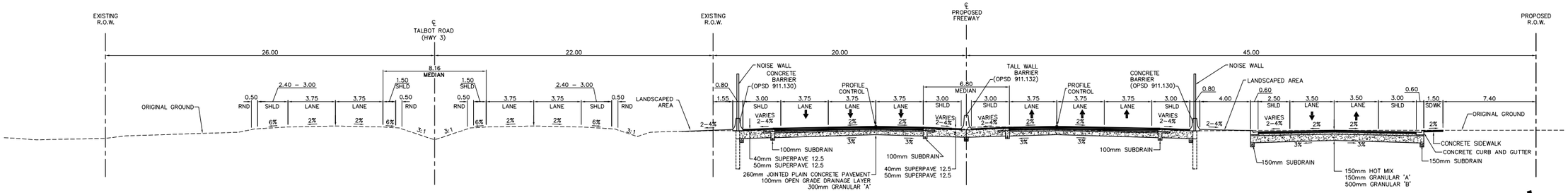
SHEET XXX

# DETROIT RIVER INTERNATIONAL CROSSING
# HIGHWAY 3/TALBOT ROAD/HURON CHURCH ROAD CORRIDOR

## TYPICAL 6–LANE URBAN FREEWAY SECTION ADJACENT TO TALBOT ROAD
## NOISE BARRIER ON NORTH SIDE WITH TWO–WAY SERVICE ROAD ON SOUTH SIDE OF URBAN FREEWAY

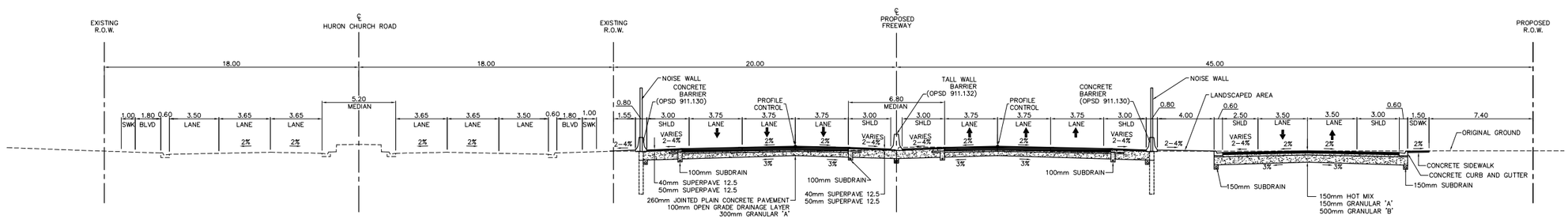



## TYPICAL 6–LANE URBAN FREEWAY SECTION ADJACENT TO TALBOT ROAD
## NOISE BARRIER ON NORTH SIDE WITH TWO–WAY SERVICE ROAD ON SOUTH SIDE OF URBAN FREEWAY




CONCEPTUAL

## TYPICAL 6–LANE URBAN FREEWAY SECTION ADJACENT TO HURON CHURCH ROAD
## NOISE BARRIER ON NORTH SIDE WITH TWO–WAY SERVICE ROAD ON SOUTH SIDE OF URBAN FREEWAY




ALTERNATIVE 2A

SCALE

1.5m 0 3.0m
Horizontal

# DETROIT RIVER INTERNATIONAL CROSSING
# HIGHWAY 3/TALBOT ROAD/HURON CHURCH ROAD CORRIDOR

METRIC

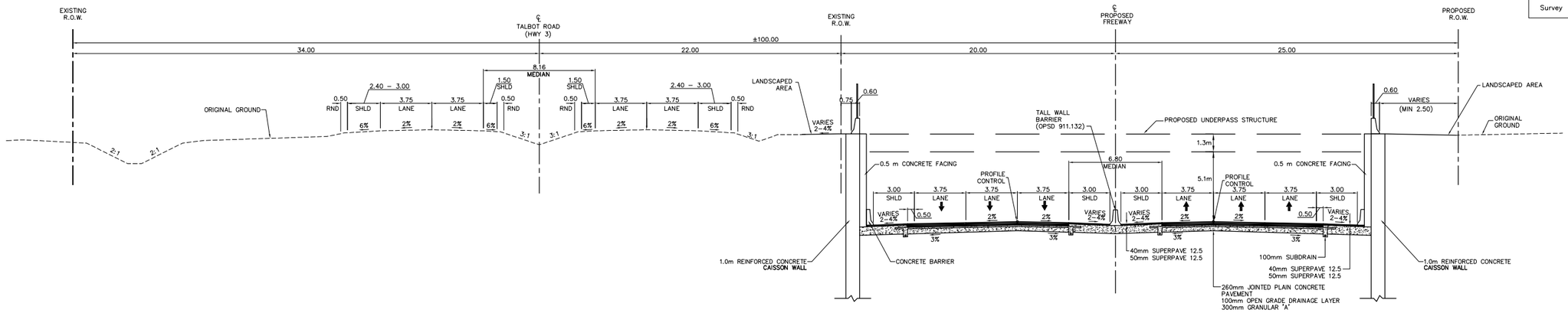
PLATE No
CONT No XXXX–XXXX
WP No XXX–XX–XX

TYPICAL SECTIONS

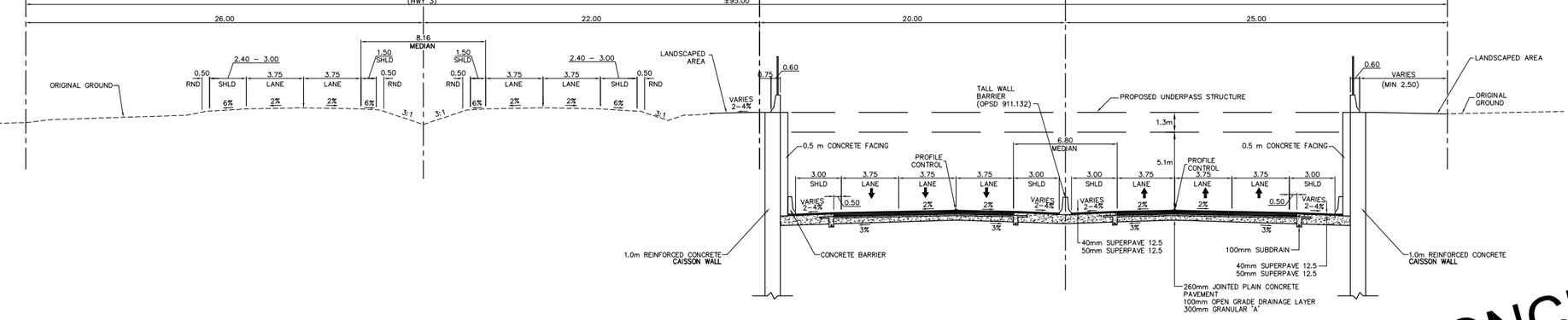
Survey _____ Revised _____

SHEET XXX

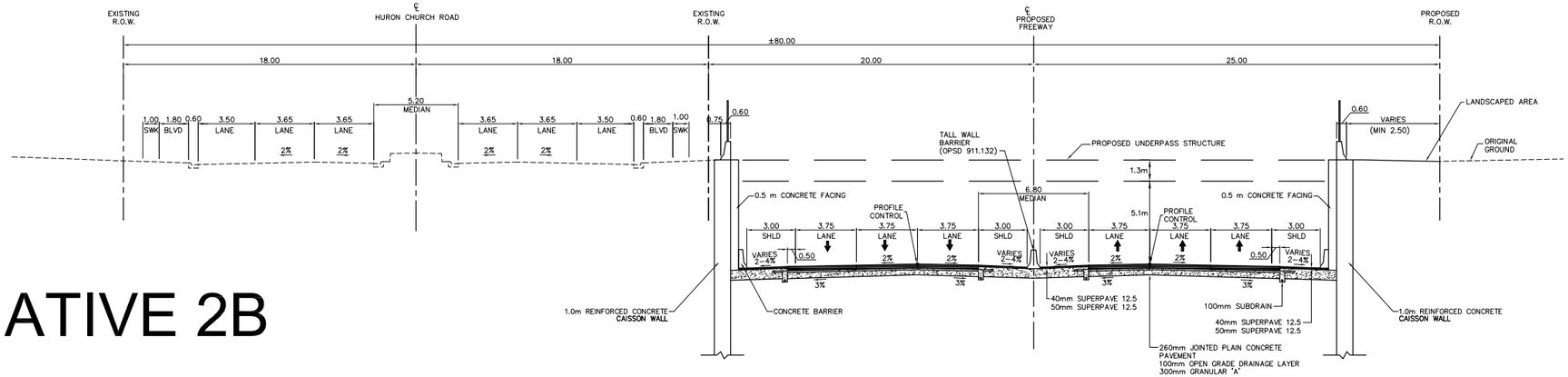
## TYPICAL BELOW GRADE 6–LANE URBAN FREEWAY SECTION ADJACENT TO TALBOT ROAD
## NOISE BARRIER ON NORTH SIDE WITH NO SERVICE ROAD ON SOUTH SIDE OF URBAN FREEWAY




## TYPICAL BELOW GRADE 6–LANE URBAN FREEWAY SECTION ADJACENT TO TALBOT ROAD
## NOISE BARRIER ON NORTH SIDE WITH NO SERVICE ROAD ON SOUTH SIDE OF URBAN FREEWAY




## TYPICAL BELOW GRADE 6–LANE URBAN FREEWAY SECTION ADJACENT TO TALBOT ROAD
## NOISE BARRIER ON NORTH SIDE WITH NO SERVICE ROAD ON SOUTH SIDE OF URBAN FREEWAY




CONCEPTUAL

# ALTERNATIVE 2B

SCALE

1.5m 0 3.0m
Horizontal

METRIC

PLATE No
CONT No XXXX–XXXX
WP No XXX–XX–XX

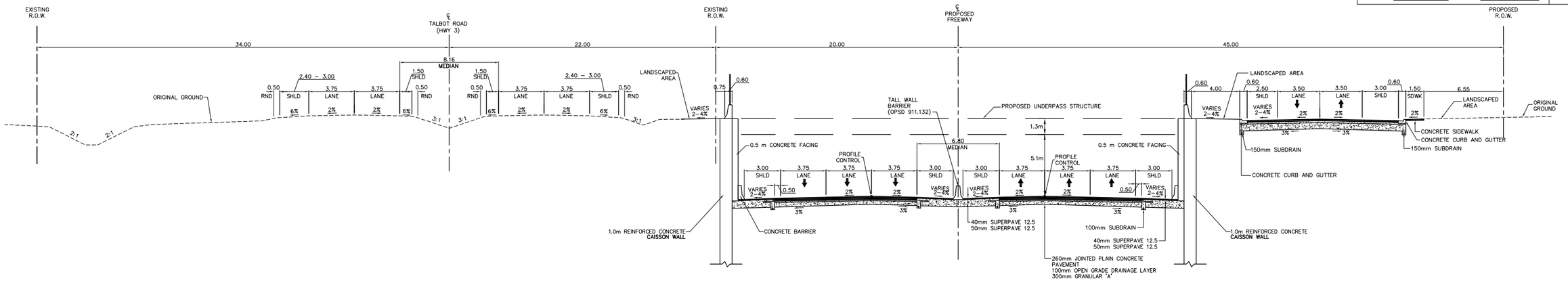
SHEET XXX

# DETROIT RIVER INTERNATIONAL CROSSING
# HIGHWAY 3/TALBOT ROAD/HURON CHURCH ROAD CORRIDOR

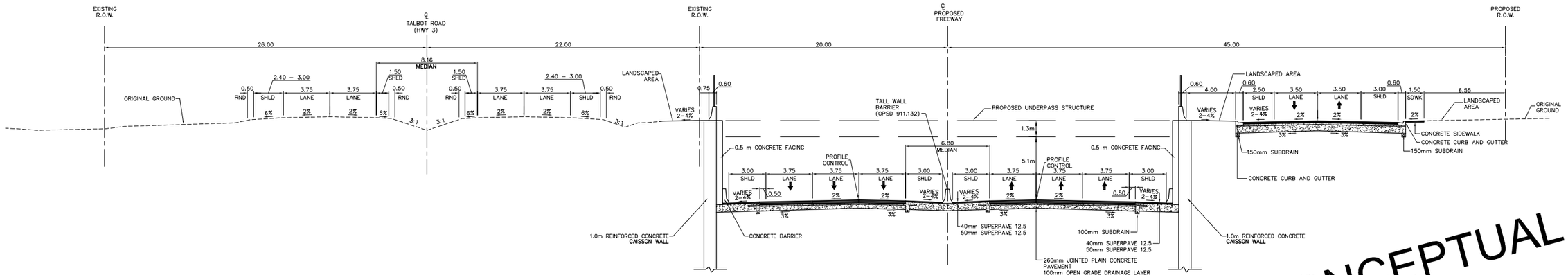
## TYPICAL SECTIONS

Survey _____ Revised _____

### TYPICAL BELOW GRADE 6–LANE URBAN FREEWAY SECTION ADJACENT TO TALBOT ROAD WITH TWO–WAY SERVICE ROAD ON SOUTH SIDE OF URBAN FREEWAY

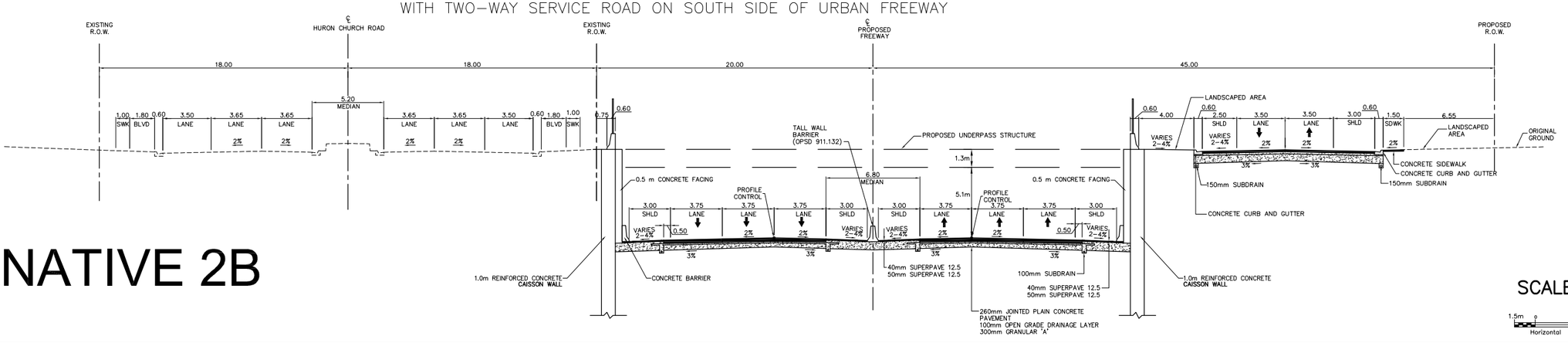



### TYPICAL BELOW GRADE 6–LANE URBAN FREEWAY SECTION ADJACENT TO TALBOT ROAD WITH TWO–WAY SERVICE ROAD ON SOUTH SIDE OF URBAN FREEWAY




CONCEPTUAL

### TYPICAL BELOW GRADE 6–LANE URBAN FREEWAY SECTION ADJACENT TO HURON CHURCH ROAD WITH TWO–WAY SERVICE ROAD ON SOUTH SIDE OF URBAN FREEWAY




ALTERNATIVE 2B

SCALE

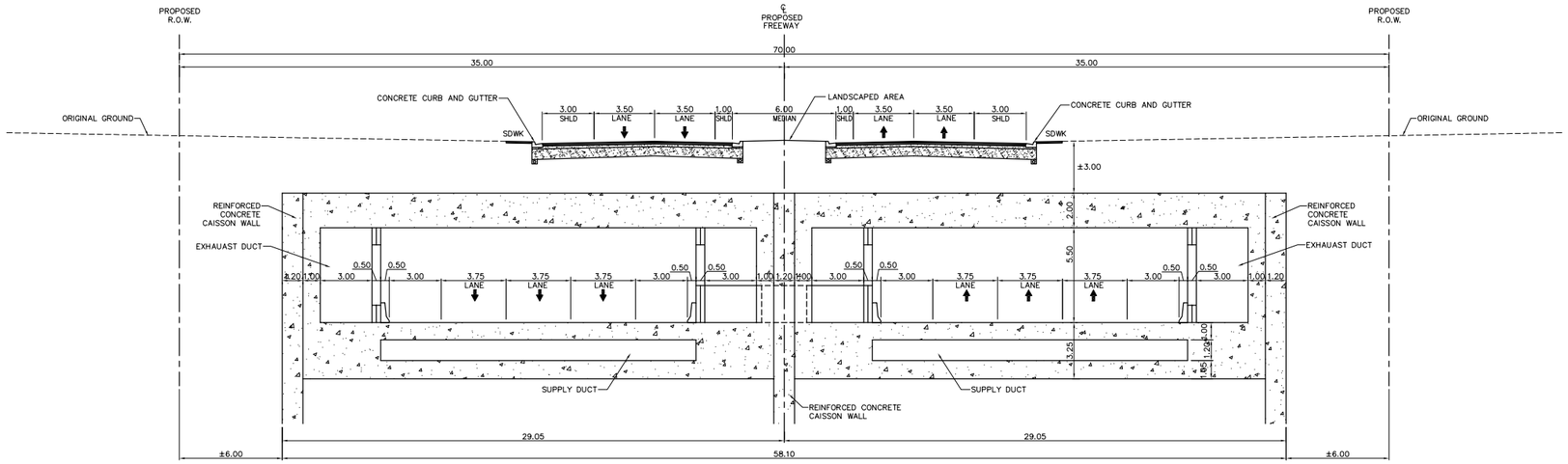
1.5m 0 3.0m
Horizontal

METRIC

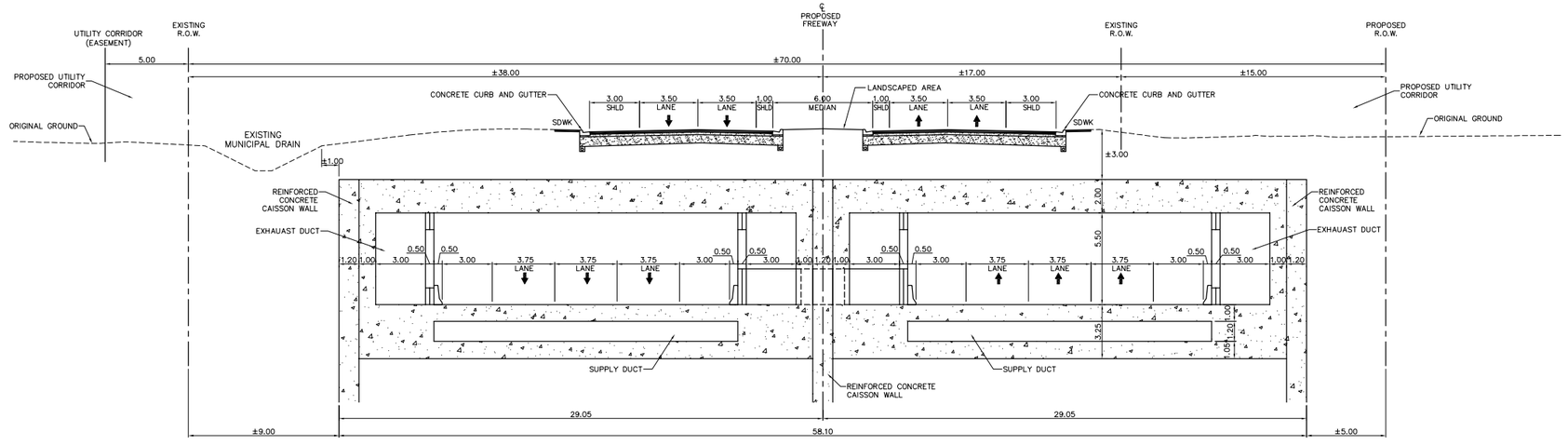
| PLATE No | |
|---|---|
| CONT No XXXX–XXXX<br>WP No XXX–XX–XX | |
| TYPICAL SECTIONS<br>Survey _____ Revised _____ | SHEET XXX |

# DETROIT RIVER INTERNATIONAL CROSSING
# HIGHWAY 3/TALBOT ROAD/HURON CHURCH ROAD CORRIDOR

## CUT AND COVER TUNNEL SECTION




## CUT AND COVER TUNNEL SECTION WITH MUNICIPAL DRAIN




CONCEPTUAL

# ALTERNATIVE 3

SCALE

1.5m 0 3.0m
Horizontal

# APPENDIX D

## Preliminary Unit Costs for Caisson Retaining Wall

**DRIC - Below Grade Section**
**Retaining Walls with 1050 mm Dia Caissons**
**Hwy 401 at about 7 m below ground level**

| No. | Item | Quantity | Unit | Unit Price | Cost |
|---|---|---|---|---|---|
| | | | | | |
| 1 | Supply Equipment for Installing Caissons | 1.0 | L.S. | $1,600 | $1,600 |
| | | | | | |
| 2 | Caisson Piles ( 1050 dia ) | 24.0 | m | $600 | $14,400 |
| | | | | | |
| 3 | Capping Beam | 3.5 | m³ | $533 | $1,867 |
| | | | | | |
| 4 | In Fill Pannel | 3.3 | m³ | $533 | $1,778 |
| | | | | | |
| 5 | Reinforcement Steel | 1.0 | t | $1,667 | $1,667 |
| | | | | | |
| 6 | Abutment Backfill | | m³ | $13 | $0 |
| | | | | | |
| 7 | Roadway Protection | 1.0 | L.S. | $667 | $667 |
| | | | | | |
| 8 | Traffic Protection | 1.0 | L.S. | $267 | $267 |
| | | | | **Sub-Total (one side) =** | **$22,244** |
| | | | | **Total (Both Sides) =** | **$44,489** |
| | | | | **Average Unit Cost per meter =** | **$45,000** |

**DRIC - Below Grade Section**
**Retaining Walls with 1050 mm Dia Caissons**
**Hwy 401 at about 12 m below ground level**

| No. | Item | Quantity | Unit | Unit Price | Cost |
|---|---|---|---|---|---|
| | | | | | |
| 1 | Supply Equipment for Installing Caissons | 1.0 | L.S. | $1,600 | $1,600 |
| | | | | | |
| 2 | Caisson Piles ( 1050 dia ) | 39.0 | m | $600 | $23,400 |
| | | | | | |
| 3 | Capping Beam | 3.5 | m³ | $533 | $1,867 |
| | | | | | |
| 4 | In Fill Pannel | 5.0 | m³ | $533 | $2,667 |
| | | | | | |
| 5 | Reinforcement Steel | 1.5 | t | $1,667 | $2,500 |
| | | | | | |
| 6 | Abutment Backfill | | m³ | $13 | $0 |
| | | | | | |
| 7 | Roadway Protection | 1.0 | L.S. | $667 | $667 |
| | | | | | |
| 8 | Traffic Protection | 1.0 | L.S. | $267 | $267 |
| | | | | **Sub-Total (one side) =** | **$32,967** |
| | | | | **Total (Both Sides) =** | **$65,933** |
| | | | | **Average Unit Cost per meter** | **$65,000** |