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**Halifax Regional Council**  
**January 16, 2007**

**TO:** Mayor Kelly and Members of Halifax Regional Council

**SUBMITTED BY:**   
Mike Labrecque, P.Eng., Director, Transportation and Public Works Services

**DATE:** December 29, 2006

**SUBJECT:** **New Design for Asphalt/Concrete Sidewalks for Suburban and Rural Areas**

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**INFORMATION REPORT**

**ORIGIN**

Halifax Regional Council meeting of September 26, 2006, Item 11.2.

**BACKGROUND**

At the September 26, 2006 Halifax Regional Council meeting, Councillor Meade requested a staff report on a new design for asphalt/concrete sidewalks for suburban and rural areas of HRM as the current designs are costly for areas that have 100 to 300 feet of frontage.

**DISCUSSION**

HRM's Municipal Service Systems Design Guidelines stipulate that rural sidewalks shall be designed and constructed as per the following three options:

1. Rural Type I Sidewalk - sidewalk constructed from concrete and installed with concrete curb and gutter and a grass boulevard with the ditch located behind the sidewalk. Refer to the attached Rural Type I Sidewalk detail.
2. Rural Type II Sidewalk - sidewalk constructed from concrete and installed abutting the concrete curb and gutter with the ditch located behind the sidewalk. Refer to the attached Rural Type II Sidewalk detail.
3. Rural Type III Sidewalk - sidewalk constructed from concrete with the ditch located between the edge of asphalt and sidewalk. There is no concrete curb and gutter in this scenario. Refer to the attached Rural Type III Sidewalk detail.

Typically rural sidewalks have been constructed as per the urban standard (refer to Urban Sidewalk Detail as attached). The Urban sidewalk standard eliminates any ditches and may require a storm system (catch basins, manholes, storm pipe, etc.). The rationale for designing and constructing new rural sidewalks as per the urban standard is largely based on the lack of suitable right-of-way area to accommodate the rural cross sections. It is noted many of these streets and roads were constructed prior to the development and adoption of the Municipal Service Systems Design Guidelines.

When a request is made for a new sidewalk, staff assesses or rates the location based on a set of criteria. Generally speaking the highest rated locations are given priority for advancement to the capital program. Currently there are approximately 210 locations identified on the capital program list for new construction. Based on capital budget levels, 8-10 locations are constructed each year. It is noted staff will be reviewing the criteria in 2007 to ascertain if modifications are warranted. Once the location is identified, approved by Council and constructed, the installation of the new concrete sidewalk (and concrete curb and gutter) is subject to Local Improvement Charges. On April 25, 2006, Halifax Regional Council approved a blended actual costs approach in determining the rate of Local Improvement Charges. The rate is set once the tenders have been completed and the final costs have been determined for the particular year.

As per Councillor Meade's request, staff has reviewed more financially feasible options to the current sidewalk standards. The following outlines the various options and includes advantages and disadvantages of each.

**Option 1: Asphalt Sidewalk versus Concrete (standard urban design)**

Install the sidewalk as per the urban standard with an asphalt pedestrian surface versus concrete. This option incorporates a concrete curb and gutter.

## **ADVANTAGES**

- Less expensive than a concrete sidewalk. In 2005 and 2006 rural concrete sidewalks were constructed at a cost of \$840 to \$1,195 per linear meter. The average cost was \$960 per linear meter. This includes net taxes, concrete curb and gutter, concrete sidewalk, required storm systems and all associated reinstatement. The savings from asphalt to concrete would be approximately \$45 per linear meter. As well if the concrete curb and gutter is replaced with an asphalt curb, the reduction in cost would be an additional \$60 per linear meter.

## **DISADVANTAGES**

- Asphalt pedestrian surface has a shorter life span than concrete and requires a higher level of maintenance.
- Asphalt curb has a shorter life span than concrete and requires a higher level of maintenance. Deteriorated asphalt curb also does not convey storm water as effectively as concrete curb and gutter.

### **Option 2: Asphalt Sidewalk versus Concrete (modified design version)**

Install the sidewalk as per the urban standard with an asphalt pedestrian surface in place of concrete. This option eliminates the requirement for a boulevard, and has an asphalt width of 2.1 meters (as per the Rural Type II Sidewalk detail).

## **ADVANTAGES**

- Less expensive than a concrete sidewalk. Further reduction in costs would be recognized with the removal of the boulevard area and replacement of concrete curb and gutter with asphalt. The savings as outlined in option 1 would be approximately \$45 (concrete sidewalk to asphalt) and \$60 (concrete curb and gutter to asphalt curb) per linear meter, respectively.

## **DISADVANTAGES**

- Asphalt pedestrian surface has a shorter life span than concrete and requires a higher level of maintenance.
- Removal of the boulevard may eliminate some snow storage area and added pedestrian safety.
- Asphalt curb has a shorter life span than concrete and requires a higher level of maintenance. Deteriorated asphalt curb also does not convey storm water as effectively as concrete curb and gutter.

### **Option 3: Asphalt Sidewalk Adjacent to the Travelled Way**

Installation of an asphalt sidewalk adjacent to the travelled way, similar to the Rural Type 1 and Type II Sidewalk details without the installation of a boulevard (Type I) and concrete curb and gutter (Type I and II). This scenario provides for a paved shoulder with a white painted line separating the travel way from the paved shoulder.

#### **ADVANTAGES**

- Inexpensive; on average costing approximately \$60 per linear meter, depending on the width and the amount/type of gravels of the existing gravel shoulder.
- Ease of winter maintenance; the sidewalk (paved shoulder) and road can be plowed and salted in one operation.

#### **DISADVANTAGES**

- Produces a safety hazard for pedestrians as there is no barrier (curb and gutter) separating the pedestrians from the travel way.
- Costs increase significantly if the existing gravel shoulder requires widening to accommodate the paving.
- If reinstatement of the paved sidewalk is to occur as part of a future street upgrade, there will be additional financial pressures on the street paving program.

Staff also reviewed the options of utilizing other materials such as rubber and concrete/brick pavers. However it was determined the costs for these options were higher than conventional concrete. Some advantages and disadvantages though include:

### **Option 4: Rubber sidewalk versus Concrete**

#### **ADVANTAGES**

- Promotes recycling; manufactured from recycled tires.
- Provides a softer surface than concrete.
- Differential offset joints are eliminated.
- Reduced maintenance costs.

## **DISADVANTAGES**

- Increased construction costs (Estimated to be 2-3 times the cost of concrete).
- Limited experience in colder climates.

## **Option 5: Concrete/Brick Pavers versus Concrete**

### **ADVANTAGES**

- Aesthetically pleasing.
- More durable than some materials.

### **DISADVANTAGES**

- Increased construction costs.

It is noted staff conducted a survey of other Municipalities across Canada and the US, and requested information on preferred sidewalk width and materials, life expectancy and reasons for their overall respective sidewalk preference. Staff also determined life-cycle costs between concrete and asphalt. This information is summarized as follows:

- Preferred minimum width = 1.5 meters. This minimum width allows for proper pedestrian accessible and is recommended by the The Nova Scotia Rehabilitation Center. As well the minimum sidewalk snow removal machine width is 1.5 m. These machines are typically utilized on many HRM sidewalk locations.
- Preferred material is concrete. All municipalities surveyed predominantly use concrete for sidewalk construction. Of the 8 municipalities contacted (including HRM), 89.5% (average) of all sidewalks are comprised of concrete. Similarly the average for asphalt is approximately 8%. Reasons for selecting concrete over other materials such as asphalt include: longer lasting, consistent surface, higher durability, more aesthetically pleasing, and lower initial maintenance costs.
- Life Cycle costs for concrete sidewalks have been determined to be less than that of asphalt sidewalks.
- Expected life expectancy - Based on information supplied by the surveyed Municipalities, the average life expectancy for concrete and asphalt sidewalks is 40 and 15 years, respectively.

As a final note HRM will be reviewing alternatives to the current rural road standard under the Regional Plan policy T-2. As part of this initiative, staff will be reviewing possible alternatives to drainage and sidewalk/walkway systems.

**BUDGET IMPLICATIONS**

There are no budget implications at this time.

**FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN**

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Capital and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Capital and Operating reserves, as well as any relevant legislation.

**ALTERNATIVES**

The alternatives are listed in the discussion section of this report.

**ATTACHMENTS**

Rural Type I Sidewalk Detail

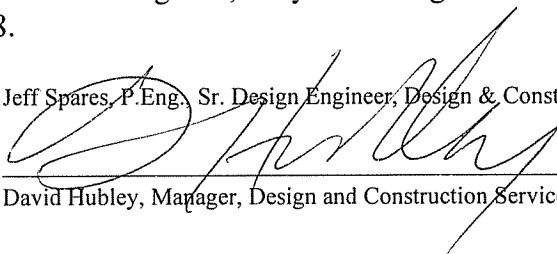
Rural Type II Sidewalk Detail

Rural Type III Sidewalk Detail

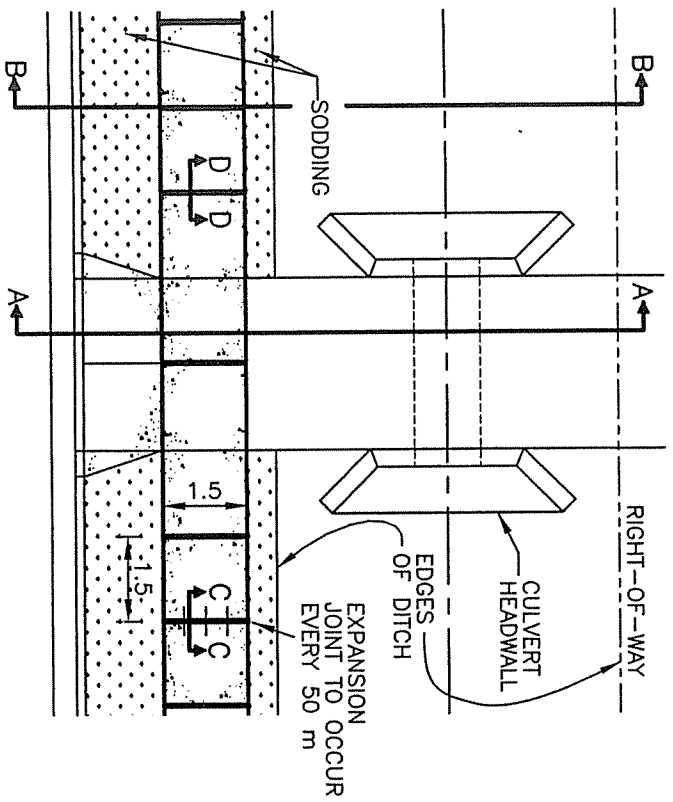
Urban Sidewalk Detail

A copy of this report can be obtained online at <http://www.halifax.ca/council/agendasc/cagenda.html> then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Jeff Spares, P.Eng., Sr. Design Engineer, Design & Construction Services at 490-6820

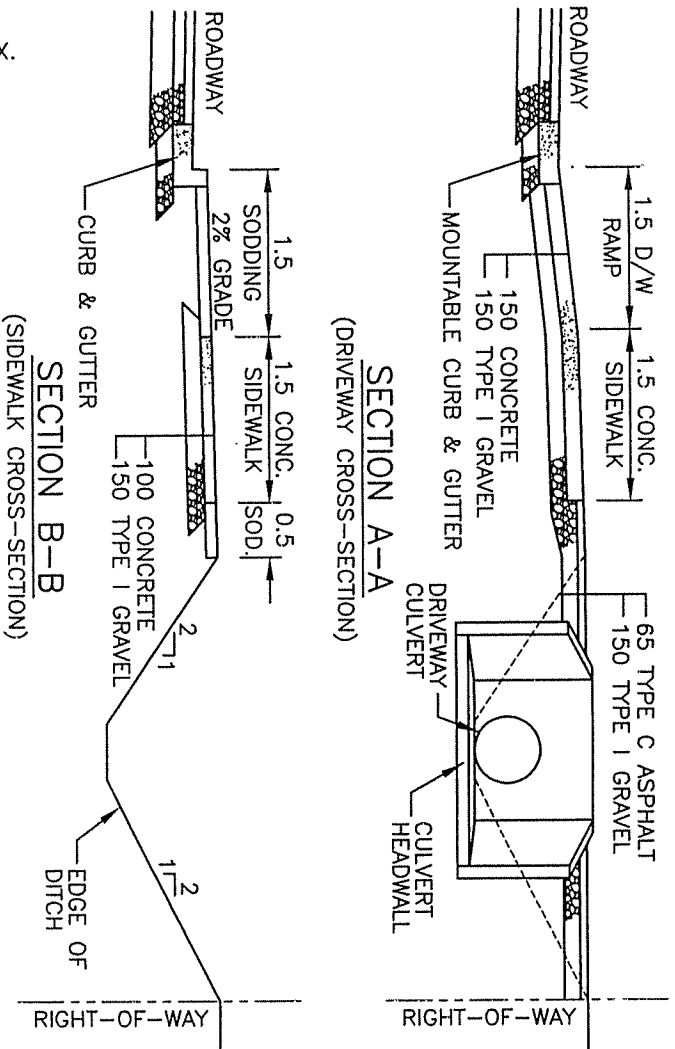
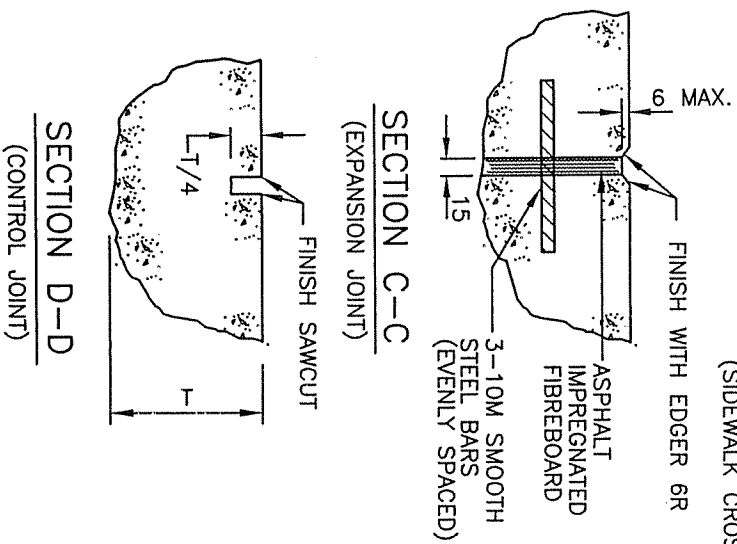
Report Approved by:   
David Hubley, Manager, Design and Construction Services at 490-4845

JS/pm



**NOTES:**

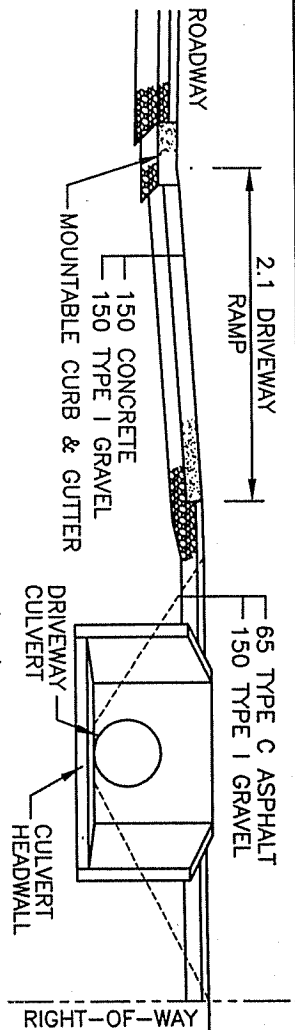
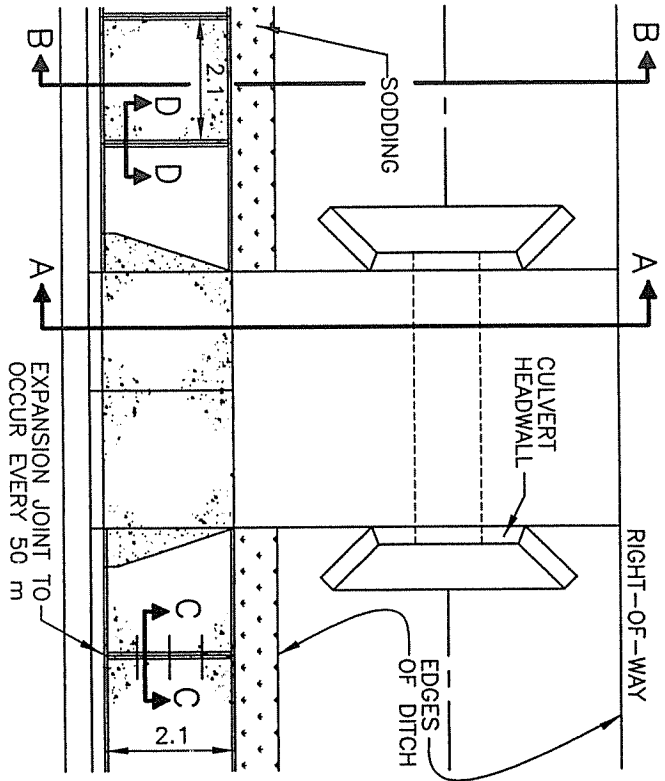
1. CONCRETE SIDEWALK AT COMMERCIAL DRIVEWAY TO BE 150 THICK WITH 150x150 WELDED WIRE MESH;
2. CRUSHED ROCK BASE TO EXTEND 150 BEYOND EDGE OF SIDEWALK STRUCTURE;
3. CONTROL JOINTS ARE TO BE SAW CUT;
4. SIDEWALKS ABUTTING COMMERCIAL AREAS ARE TO BE FULL WIDTH (3 m) AND 150 mm THICKNESS;
5. EXPANSION JOINT BARS ARE TO BE GREASED ON ONE SIDE OF THE JOINT;
6. DURING CONSECUTIVE POURS, THE END OF EACH POUR IS TO OCCUR AT AN EXPANSION JOINT. WHERE THIS IS NOT FEASIBLE, AN ADDITIONAL EXPANSION JOINT IS TO BE INSTALLED;
7. INSTALL A 9 m LONG CONCRETE LANDING PAD AT ALL BUS STOP LOCATIONS, INCREASE THIS TO 16 m FOR ARTICULATED BUS ROUTES.



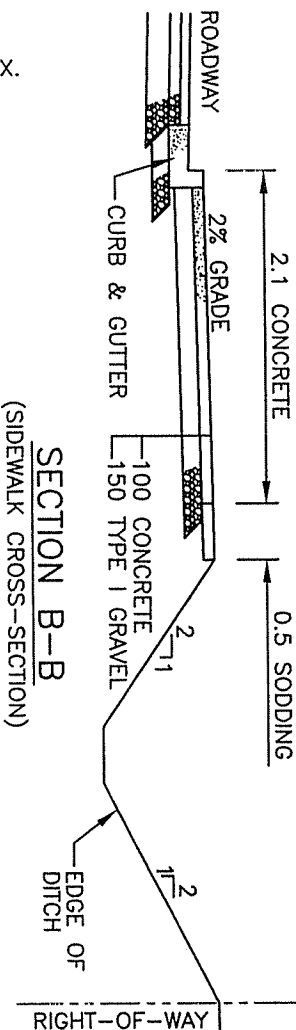
**HAILIFAX**  
REGIONAL MUNICIPALITY  
TRANSPORTATION AND PUBLIC WORKS

STANDARD DETAIL  
**RURAL TYPE I  
SIDEWALK**

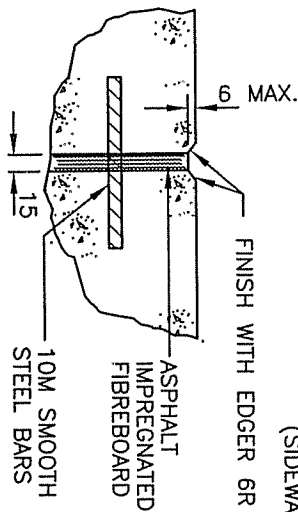
DATE: MAY 2005	REFERENCE	APPROVED
SCALE: NTS		FIG. NO. 8.02630.03



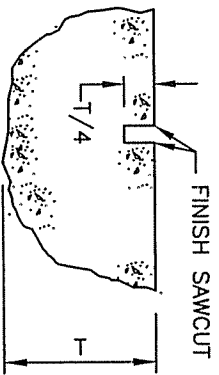
SECTION A-A  
(DRIVEWAY CROSS-SECTION)



SECTION B-B  
(SIDEWALK CROSS-SECTION)



SECTION C-C  
(EXPANSION JOINT)

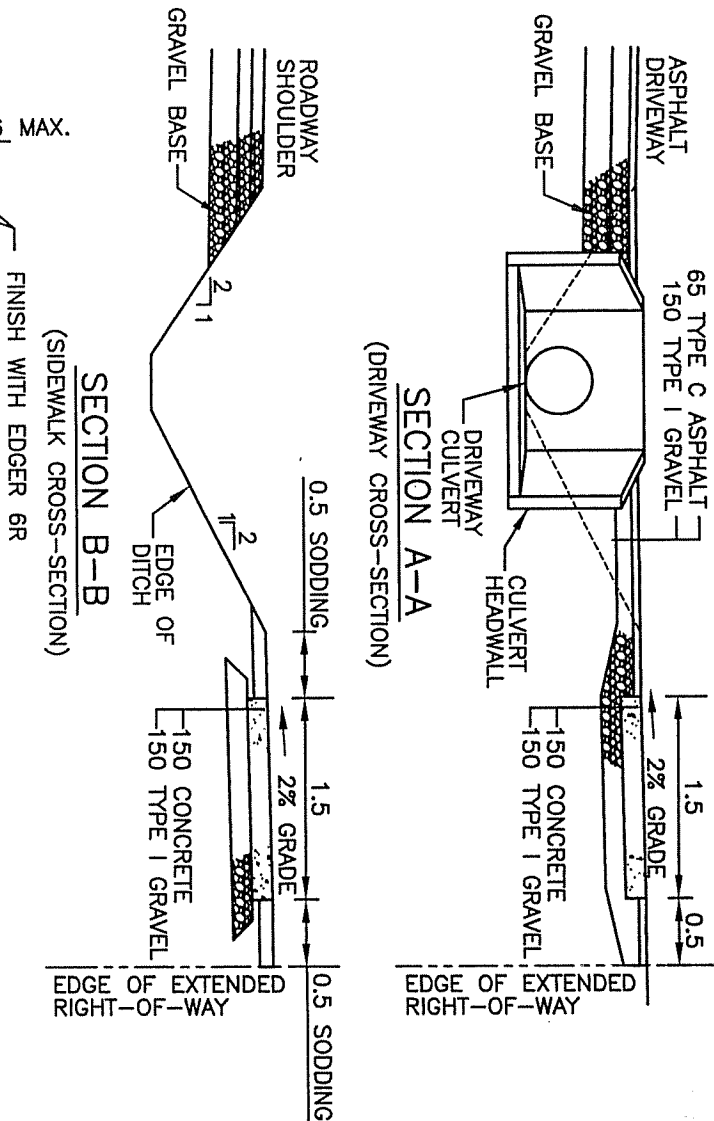
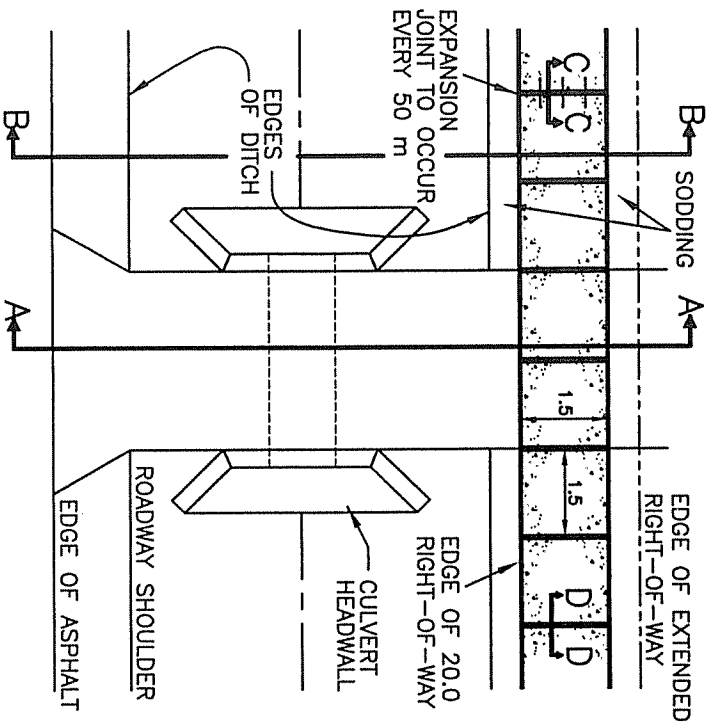


SECTION D-D  
(CONTROL JOINT)

- NOTES:**
1. CONCRETE SIDEWALK AT COMMERCIAL DRIVEWAY TO BE 150 THICK WITH 150x150 WELDED WIRE MESH.
  2. CRUSHED ROCK BASE TO EXTEND 150 BEYOND EDGE OF SIDEWALK STRUCTURE.
  3. CONTROL JOINTS ARE TO BE SAW CUT.
  4. SIDEWALKS ABUTTING COMMERCIAL AREAS ARE TO BE FULL WIDTH (3 m) AND 150 mm THICKNESS.
  5. EXPANSION JOINT BARS ARE TO BE GREASED ON ONE SIDE OF THE JOINT.
  6. DURING CONSECUTIVE POURS, THE END OF EACH POUR IS TO OCCUR AT AN EXPANSION JOINT. WHERE THIS IS NOT FEASIBLE, AN ADDITIONAL EXPANSION JOINT IS TO BE INSTALLED.
  7. INSTALL A 9 m LONG CONCRETE LANDING PAD AT ALL BUS STOP LOCATIONS. INCREASE THIS TO 16 m FOR ARTICULATED BUS ROUTES.

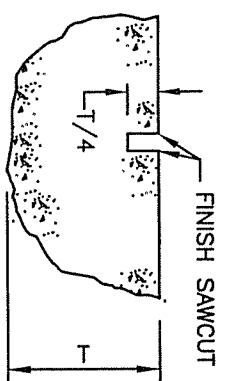
<b>HAITHEAX</b>		REGIONAL MUNICIPALITY	
TRANSPORTATION AND PUBLIC WORKS			
STANDARD DETAIL			
RURAL TYPE II			
SIDEWALK			
DATE: MAY 2005	REFERENCE	APPROVED	
SCALE: NTS		FIG. NO. 8.02630.04	



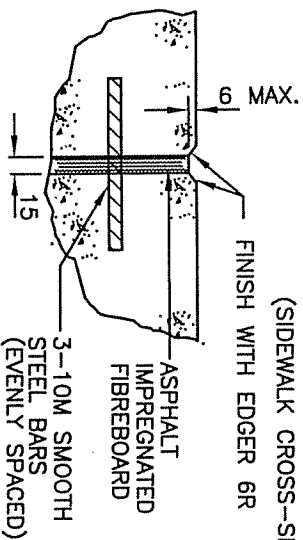


- NOTES:**
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  2. CRUSHED ROCK BASE TO EXTEND 150 BEYOND EDGE OF SIDEWALK STRUCTURE.
  3. CONTROL JOINTS ARE TO BE SAW CUT.
  4. SIDEWALKS ABUTTING COMMERCIAL AREAS ARE TO BE FULL WIDTH (3 m) AND 150 mm THICKNESS.
  5. EXPANSION JOINT BARS ARE TO BE GREASED ON ONE SIDE OF THE JOINT.
  6. DURING CONSECUTIVE POURS, THE END OF EACH POUR IS TO OCCUR AT AN EXPANSION JOINT. WHERE THIS IS NOT FEASIBLE, AN ADDITIONAL EXPANSION JOINT IS TO BE INSTALLED.
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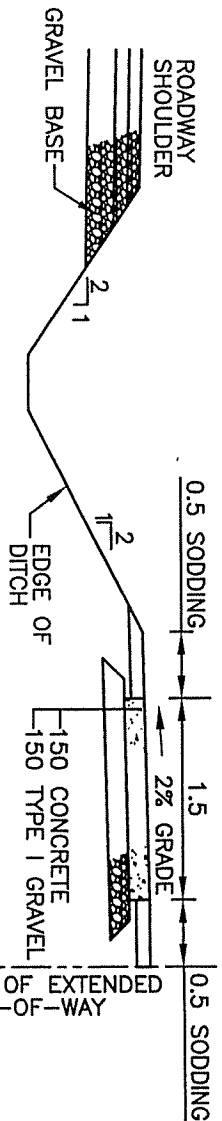
**SECTION D-D**  
(CONTROL JOINT)



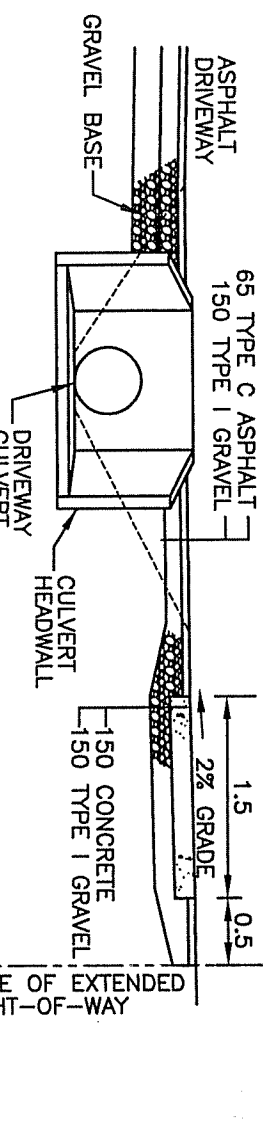
**SECTION C-C**  
(EXPANSION JOINT)



**SECTION B-B**  
(SIDEWALK CROSS-SECTION)



**SECTION A-A**  
(DRIVEWAY CROSS-SECTION)

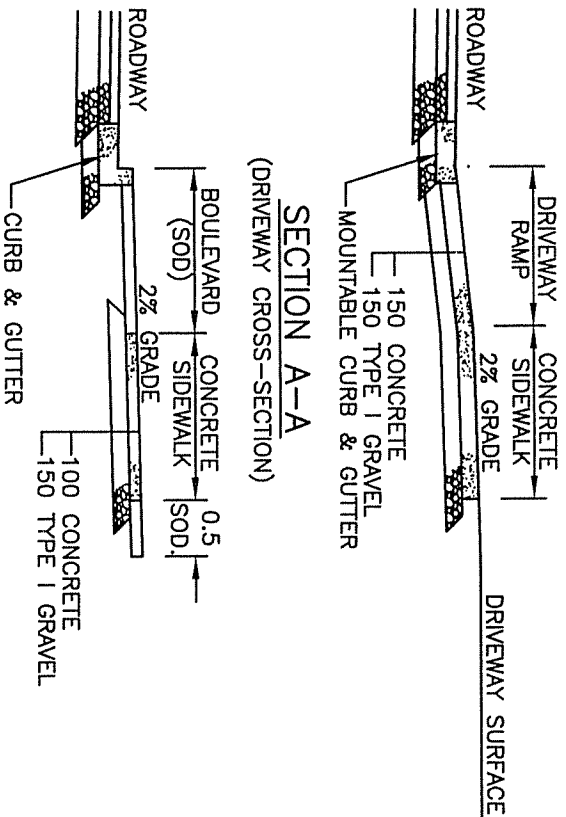
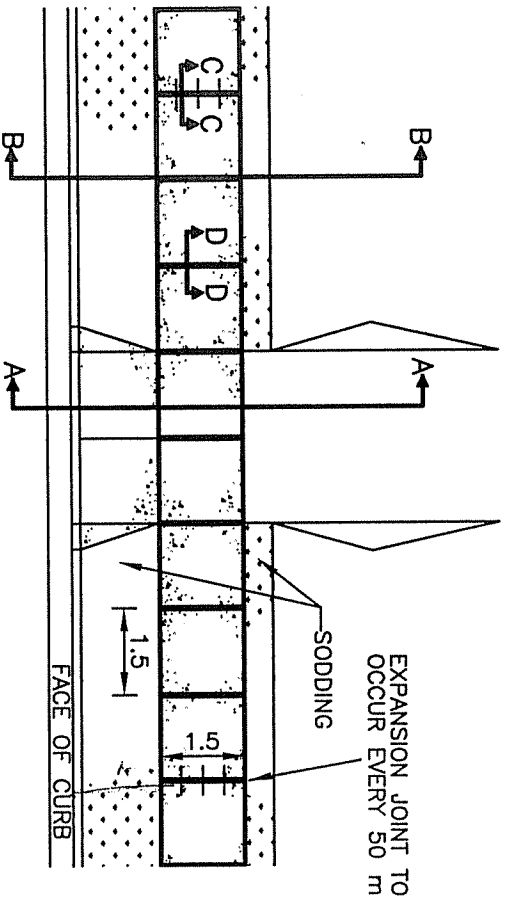


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REGIONAL MUNICIPALITY

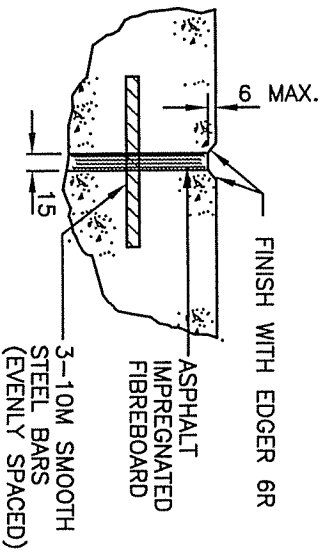
TRANSPORTATION AND PUBLIC WORKS  
STANDARD DETAIL

**RURAL TYPE III SIDEWALK**

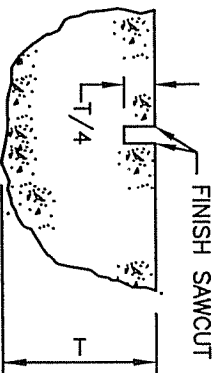
DATE: MAY 2005	REFERENCE	APPROVED
SCALE: NTS		FIG. NO. 8.02630.05



- NOTES:**
1. CONCRETE SIDEWALK AT COMMERCIAL DRIVEWAY TO BE 150 THICK WITH 150x150 WELDED WIRE MESH.
  2. CRUSHED ROCK BASE TO EXTEND 150 BEYOND EDGE OF SIDEWALK STRUCTURE.
  3. CONTROL JOINTS ARE TO BE SAW CUT.
  4. SIDEWALK ABUTTING HIGH DENSITY AREAS SHALL HAVE FULL WIDTH (3 m) SIDEWALKS.
  5. SIDEWALKS ABUTTING COMMERCIAL AREAS ARE TO BE FULL WIDTH (3 m) AND 150 mm THICKNESS.
  6. EXPANSION JOINT BARS ARE TO BE GREASED ON ONE SIDE OF THE JOINT.
  7. DURING CONSECUTIVE POURS, THE END OF EACH POUR IS TO OCCUR AT AN EXPANSION JOINT. WHERE THIS IS NOT FEASIBLE, AN ADDITIONAL EXPANSION JOINT IS TO BE INSTALLED.
  8. INSTALL A 9 m LONG CONCRETE LANDING PAD AT ALL BUS STOP LOCATIONS. INCREASE THIS TO 16 m FOR ARTICULATED BUS ROUTES.



SECTION C-C  
(EXPANSION JOINT)



SECTION D-D  
(CONTROL JOINT)

**HAILEIX**  
REGIONAL MUNICIPALITY

TRANSPORTATION AND PUBLIC WORKS

STANDARD DETAIL

URBAN SIDEWALK  
DETAIL

DATE: MAY 2005	REFERENCE	APPROVED
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