

Appendix **L**

Design Criteria

DESIGN CRITERIA

Date: November 9, 2018		Page 1 of X
Project No.: 60584644	Municipality: City of Pickering	Type of Project: Schedule 'C' Class Environmental Assessment Study
Location: Extension of Notion Road to Squires Beach Road, Realignment of Pickering Parkway, and Realignment of Kellino Street		Length: 2.7 km
Project Limits: Kingston Road to Bayly Street (Church Street S and Brock Road)		

DESIGN PARAMETERS	PROPOSED DESIGN STANDARDS	PICKERING DESIGN STANDARDS	TAC DESIGN STANDARDS
MINIMUM STOPPING SIGHT DISTANCE	85 m	105 m	85 m
EQUIVALENT MINIMUM 'K' FACTOR	20 crest 18 Sag	N/A	11 crest 18 Sag
GRADES MAXIMUM	6.0 % ¹	6.0 %	6.0 %
MAXIMUM SUPER-ELEVATION	Normal Crown ²	Normal Crown ²	6.0% ²
MINIMUM RADIUS	500 m	350 m ³	130 m
PAVEMENT WIDTH	<p>Notion Road – North of Pickering Parkway⁴ 3 lanes, 11 m width 2 curb lanes @ 3.5 m 1 centre left turn lane @ 4 m</p> <p>Notion Road- Between Pickering Parkway and Kellino Street⁵ 4 lanes, 14 m width 2 inside lanes @ 3.5 m 2 curb lanes @ 3.5 m</p> <p>Notion Road- South of Kellino Street 3 lanes, 11 m width 2 curb lanes @ 3.5 m 1 centre left turn lane @ 4 m</p> <p>Pickering Parkway 2 lanes, 12 m width 2 curb lanes @ 6 m</p> <p>Kellino Street 3 lanes, 10.5 m width 2 curb lanes @ 3.5 m 1 inside EB lane @ 3.5 m</p>	4-5 lanes @ 3.60 m 15.25 m min width	4 lanes @ 3.0 m 12 m min width

DESIGN PARAMETERS	PROPOSED DESIGN STANDARDS	PICKERING DESIGN STANDARDS	TAC DESIGN STANDARDS
CYCLETRACK WIDTH ⁶	1.5 m + 1.0 m buffer	N/A	1.8 m min
ROW WIDTH (ROAD & BOULEVARD)	27 m ⁷	27 m	20-45 m
POSTED SPEED	50 km/h	50 km/h	50 km/h
DESIGN SPEED	60 km/h	60 km/h	60 km/h
SIGNALS & ILLUMINATION ⁸	<p>Illumination throughout extended and realigned roads.</p> <p>Traffic signals at Notion Road and Pickering Parkway, and at Squires Beach Road and Kellino Street.</p>	<p>Illumination shall be provided on all roads as directed by City. Traffic signal design shall follow City of Pickering design standards</p>	N/A
EROSION & SEDIMENT ⁸ CONTROLS FOR DESIGN	<p>Shall follow the Greater Golden Horseshoe Area Conservation Authorities ESC guidelines – December 2006 and applicable municipal guidelines.</p>	<p>Shall follow the City of Pickering ESC Plan and the Greater Golden Horseshoe Area Conservation Authorities ESC guidelines – December 2006</p>	N/A

Notes:

1. The maximum grade was identified at 5.0% based on the Town of Richmond Hill design standards, however a reduced grade of 4.75% was applied to better accommodate pedestrians and cyclists. Based on the intersection of Cachet Woods Court east of the Highway 404, a maximum 3.0% grade is recommended for the grade through the intersection and approaches. This is based on the *Geometric Design Manual for Ontario Highways* that recommends that an intersection not occur on a grade steeper than 3.0%.
2. Although roads typically utilize super-elevation based on the design speed of the road, normal crown has been utilized based on Town of Richmond Hill comments at a meeting on April 28, 2014 stating that the Town does not typically utilize super-elevation on their roads. The City of Markham standards state that if the horizontal curve meets their minimum standard of 150 m radius, then normal crown can be utilized. It was also outlined that super-elevation is not recommended due to maintenance and operational issues observed during the winter freeze thaw cycle as per the September 12, 2014 meeting between Markham and the Project Team.
3. There is one existing substandard 100 m radius along Orlando Avenue, just east of Leslie Street. The new road crossing meets minimum radii design standards for the Town of Richmond Hill, however since the section of Orlando Avenue just east of Leslie Street only requires widening, the existing alignment is maintained in this location to minimize the amount of reconstruction and impacts to adjacent properties.
4. The Town of Richmond Hill agreed to a reduction of their typical cross-section standard for an industrial road of four 3.75 m lanes to two 3.5 m inside lanes and two 3.75 m curb lanes at the July 11, 2014 meeting between the Project Team and Richmond Hill.
5. The City of Markham agreed to a reduction of their typical cross-section standard of four 3.5 m lanes to two 3.25 m inside lanes and two 3.5 m curb lanes to reduce property impacts and address property owner concerns in the area. It was documented in the September 12, 2014 meeting between the Project Team and City of Markham.
6. A cycle track is a bicycle facility adjacent to but separated from motor vehicle travel lanes, is designated for exclusive use by cyclists, and is distinct from the sidewalk. The proposed standard for a 1.5 m cycle track with a 1.0 m buffer is consistent with the *Ontario Traffic Manual - Book 18* which defines the minimum requirements for bicycle facilities on roads and the City of Markham's Cycling Design Guidelines.

Based on comments received from the Town of Richmond Hill and City of Markham, the cycle track is to be reconsidered as a potential 3.0m multi-use path within the provided right-of-way during subsequent design stages.

7. Minor variations may be required to accommodate embankment slopes, road infrastructure associated with intersections (traffic signals, medians and turning lanes), and reductions at select locations to mitigate property impacts.
8. Specific design details for the traffic signals and illumination requirements shall follow applicable municipal design standards and will be determined during detail design.
9. Specific design details for erosion sediment controls shall follow applicable municipal design standards and the *Greater Golden Horseshoe Area Conservation Authorities ESC guidelines – December 2006* and will be determined during detail design.