COMMITTEE OF THE WHOLE – JULY 6, 2010

MICRO SURFACING OF ROADWAYS
WARDS 1 - 5

Recommendation

The Commissioner of Engineering and Public Works recommends:

1. That Council approval be given to complete the existing micro surfacing contracts, namely Tender Nos. T09-185, T09-246 and T09-249, and

2. That polymer modified slurry sealing be used as the pavement preservation method on local residential streets on the above mentioned Tenders.

Contribution to Sustainability

Council at its meeting of April 2, 2007 (Item 1, Report No. 14, of the Committee of the Whole (Working Session)) adopted without amendment a report outlining the City's proposed 5 Year Pavement Management Program, which identified a number of activities to maintain, preserve, rehabilitate and replace the City's road infrastructure. Micro surfacing was identified as the preferred method of pavement preservation, to be utilized by the City. The recommendation contained in the current report will support the environmental sustainability of the Pavement Management Program by utilizing a more acceptable pavement preservation technique on local residential streets (low volume, low speed roads).

Economic Impact

The City awarded the following three micro surfacing contracts in 2009:

Tender Number	Awarded Value*	Remaining Value of Work*
T09-185	$255,356.00	$106,024.12
T09-246 (ISF)	$471,941.00	$60,643.46
T09-249 (ISF)	$955,024.30	$955,024.30

* - excluding GST

As indicated in the above table, Tender Nos. T09-246 and T09-249 have been approved as part of the Infrastructure Stimulus Funding (ISF) program. The 2009 Capital Budget accounts EN-1729-09, EN-1784-09 and EN-1793-09 have sufficient funds to complete the work. Therefore, there is no additional economic impact on the 2009 Capital Budget.

In accordance with the requirements of the ISF program, all works for Tender Nos. T09-246 and T09-249 must be completed by March 31, 2011 in order to qualify for funding.

Communications Plan

Upon Council's approval for the completion of the remaining work, Engineering Services staff will advise the Ward Sub-Committee prior to construction resuming. Notices will also be sent to the homeowners on the streets to be slurry sealed and micro surfaced, prior to construction, providing information on the pavement preservation method to be used and its benefits. The locations of the remaining streets to be slurry sealed and micro surfaced can be found in Attachment Nos. 1 to 10.

Purpose

Council approval to resume and proceed with the three current micro surfacing contracts, namely Tender Nos. T09-185, T09-246 and T09-249.

Background - Analysis and Options

At the meeting of Council held on May 10, 2010, Council recommended that Item 1, Report No. 16, of the Committee of the Whole (Working Session) be adopted without amendment:

> **" The Committee of the Whole (Working Session) recommends:**
>
> **1) That staff provide a report on the micro surfaced roads that have been identified as having problems and/or complaints and the necessary methods to rectify the problems or complaints;**
>
> **2) That staff provide an opportunity to view a test site with a sample of the new material recommended for installation;"**

In 2009, a number of streets were micro surfaced in the Maple and Woodbridge communities as part of Tender Nos. T09-185 and T09-246. In Spring of 2010, City staff carried out inspections of all the roads that were previously micro surfaced and a number of deficiencies were identified. The Engineering Services Department then retained the services of Coffey Geotechnics Inc. to carry out a visual inspection of the condition of all the roads that were previously micro surfaced, as well as provide recommendations to rectify all deficiencies identified (in accordance with Ontario Provincial Standards and Specifications).

The micro surfaced road should have a uniform texture, free from excessive scratch marks, tears, indentations or other surface irregularities. Other deficiencies might include a loss of coarse aggregate, edge cracking, exposed base asphalt or longitudinal and transverse cracks.

Based on the visual test results and analysis undertaken by Coffey Geotechnics Inc., deficiencies have been identified that will require remediation. Engineering Services staff will work with both the contractor and consultant to explore alternatives to rectify all deficiencies that may also include a financial penalty applied to the contract.

Two test sites were selected to provide a sample of changes in the micro surfacing product. The first test site was Administration Road (see Attachment No. 1) where a polymer modified slurry seal (type 1) was applied that contained a finer aggregate. The second test site was Corrine Court (see Attachment No. 9) where a standard mix design was applied (the same mix design that was utilized on all streets where micro surfacing was completed in 2009), however, modifications were made to the application process. The changes to mix design as well as the method of application are explained in the April 16, 2010 report to Committee of the Whole (Working Session), which can be found in Attachment No. 11.

The application of the polymer modified slurry seal on Administration Road provided a product with superior aesthetic characteristics than that of the micro surfacing mix design. The slurry seal mix design utilized smaller aggregates that resulted in a smoother finish to the road surface. There also appeared to be less residual aggregate after the application of the product that would have required sweeping. Based on the test results, there does not appear to be any unexpected issues that have arisen by using a polymer modified slurry seal.

Although some improvement was evident, the aesthetic characteristics of the micro surfacing on Corrine Court are consistent with the micro surfacing carried out in 2009. Despite the modifications made to the application of the micro surfacing, the aggregate size is the largest

factor affecting the smoothness of the road. By not altering the size of the aggregate, it did not result in any significant changes in the micro surfacing.

Based on the observations of the pavement preservation techniques at the two test sites, Engineering Services staff recommend that polymer modified slurry seal (type 1) be considered for use on low volume, local, residential roads. Slurry sealing provides improved aesthetic characteristics versus that of a micro surfaced road with minimal tradeoffs in product performance. Micro surfacing will continue to be used on higher volume roads (such as collector or industrial roads) where it is better suited to the traffic characteristics of that road.

The program improvements targeted through the communications plan, design modifications and construction delivery (that are identified in the April 16, 2010 report to Committee of the Whole (Working Session), which can be found in Attachment No. 11) will yield slurry sealed roads that are smoother than previous micro surfacing applications, and ensure an improvement to the overall delivery of pavement preservation activities.

Relationship to Vaughan Vision 2020/Strategic Plan

In consideration of the strategic priorities related to Vaughan Vision 2020, the recommendations of this report will assist in:

- Maintaining corporate assets and infrastructure;
- Enhance environmental sustainability and a healthier environment through the use of alternative construction methodologies; and,
- In compliance with Green Directions Vaughan – Community Sustainability and Environmental Master Plan – the need to support the continuing repair and renewal of our road network is facilitated.

This report is consistent with the priorities previously set by Council.

Regional Implications

Not Applicable.

Conclusion

Based on the proposed changes outlined in this report, it is recommended that:

1) That Council approval be given to complete the existing micro surfacing contracts, namely Tender Nos. T09-185, T09-246 and T09-249, and

2) That polymer modified slurry sealing be used as the pavement preservation method on local residential streets on the above mentioned Tenders.

Attachments

1. Location Plan No. 1 – T09-185
2. Location Plan No. 2 – T09-185
3. Location Plan No. 3 – T09-185
4. Location Plan No. 4 – T09-246
5. Location Plan No. 5 – T09-246
6. Location Plan No. 6 – T09-246
7. Location Plan No. 7 – T09-249
8. Location Plan No. 8 – T09-249
9. Location Plan No. 9 – T09-249

10. Location Plan No. 10 – T09-249
11. April 19, 2010 – Committee of the Whole (Working Session) Staff Report on Micro Surfacing of Roadways

Report prepared by:

Justin Metras, C. Tech., Manager of Construction Services, ext. 3140
Jack Graziosi, P. Eng., M. Eng., Director of Engineering Services, ext. 3101

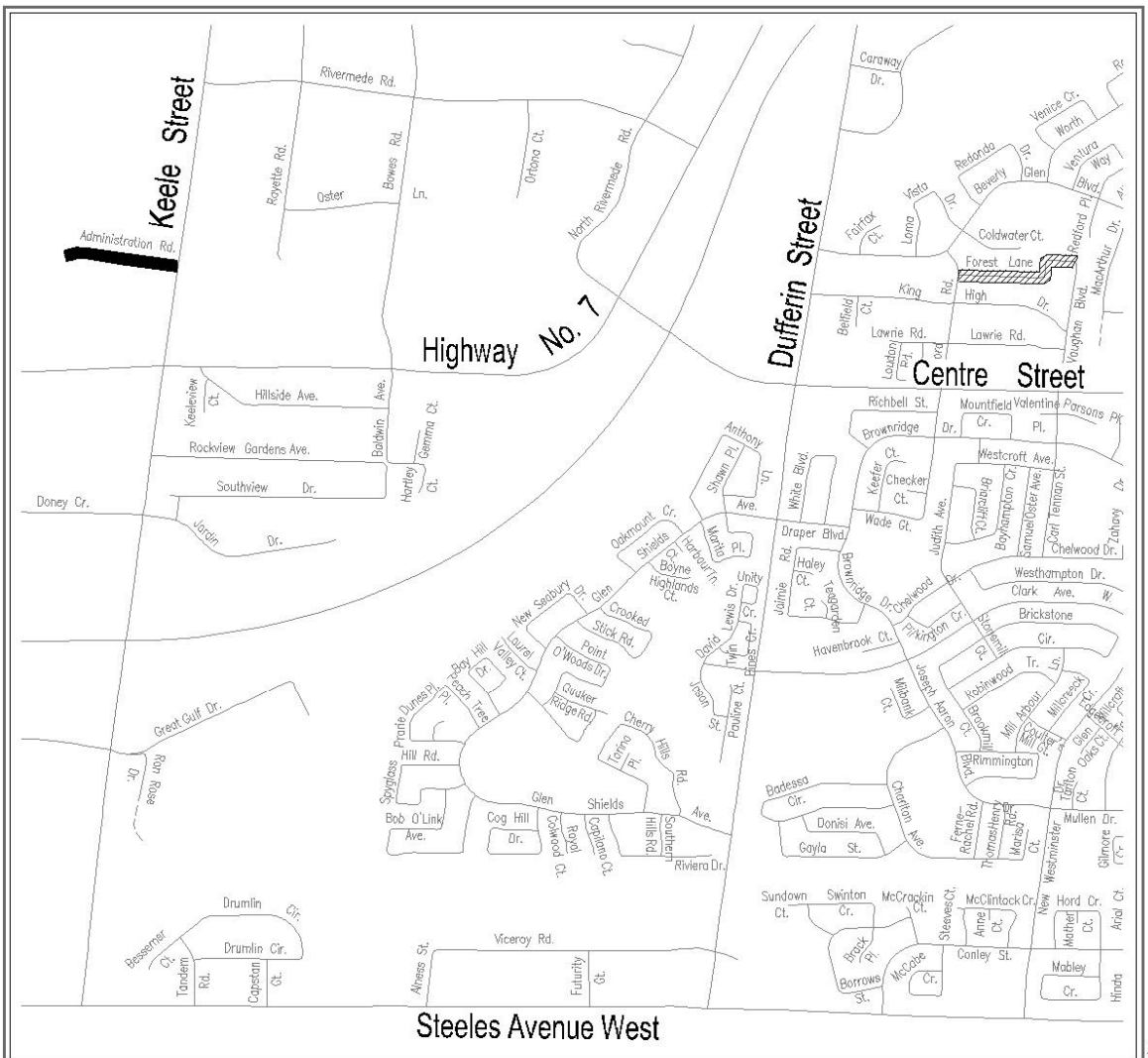
Respectfully submitted,

Bill Robinson, P. Eng.
Commissioner of Engineering and Public Works

Jack Graziosi, P. Eng., M. Eng.
Director of Engineering Services

JG:mc

ATTACHMENT No. 1



2009 MICRO SURFACING
VARIOUS LOCATIONS
T09 - 185

LEGEND

SUBJECT ROADS COMPLETED

SUBJECT ROADS TO BE COMPLETED

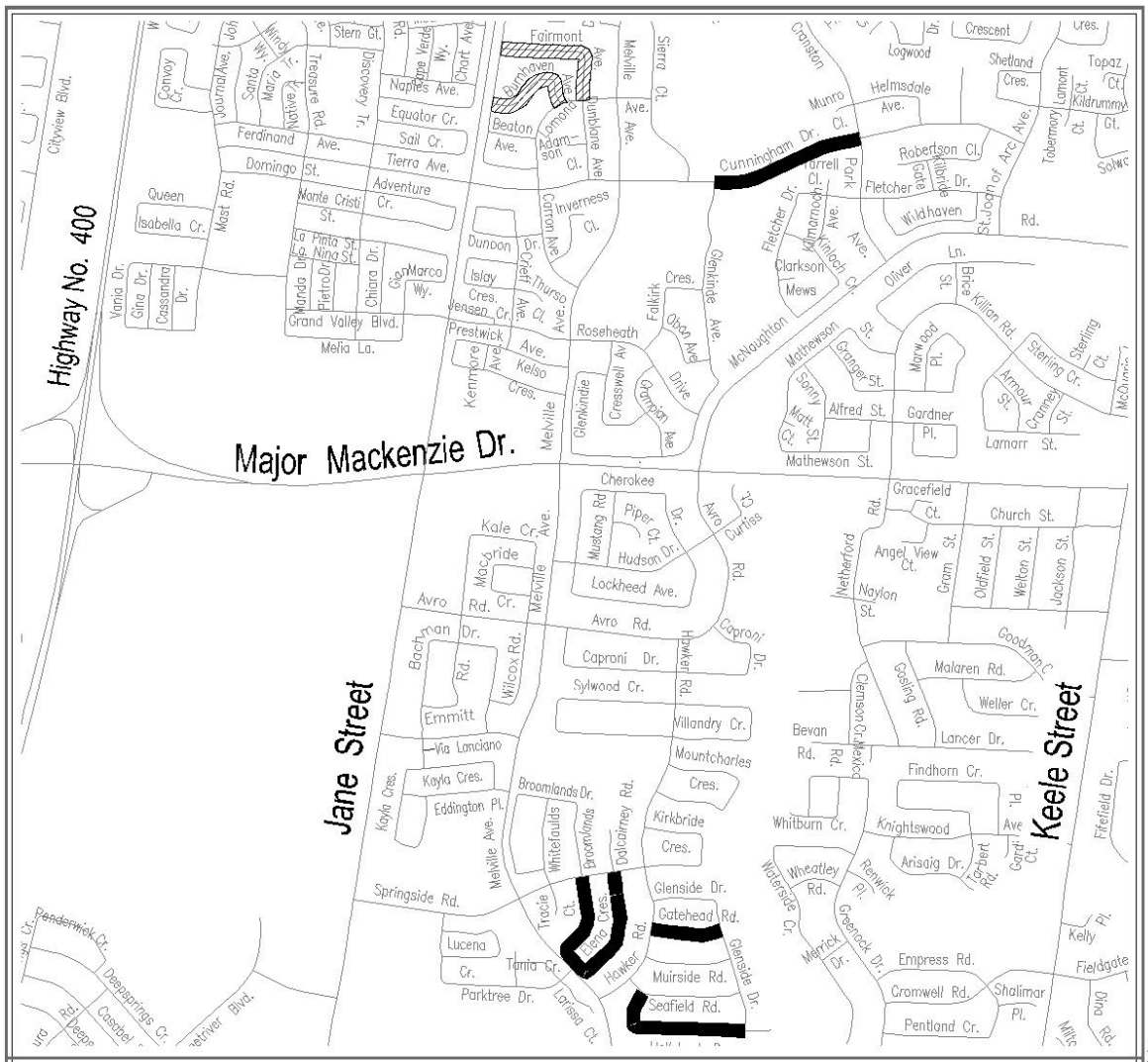
NOT TO SCALE

CITY OF VAUGHAN – ENGINEERING SERVICES DEPARTMENT

DRAFTSPERSON: C.D

Drawing name: C:\Documents and Settings\devero\Desktop\PMP 2009.dwg

ATTACHMENT No. 2



2009 MICRO SURFACING
VARIOUS LOCATIONS
T09 - 185

LEGEND

SUBJECT ROADS COMPLETED

SUBJECT ROADS TO BE COMPLETED

NOT TO SCALE

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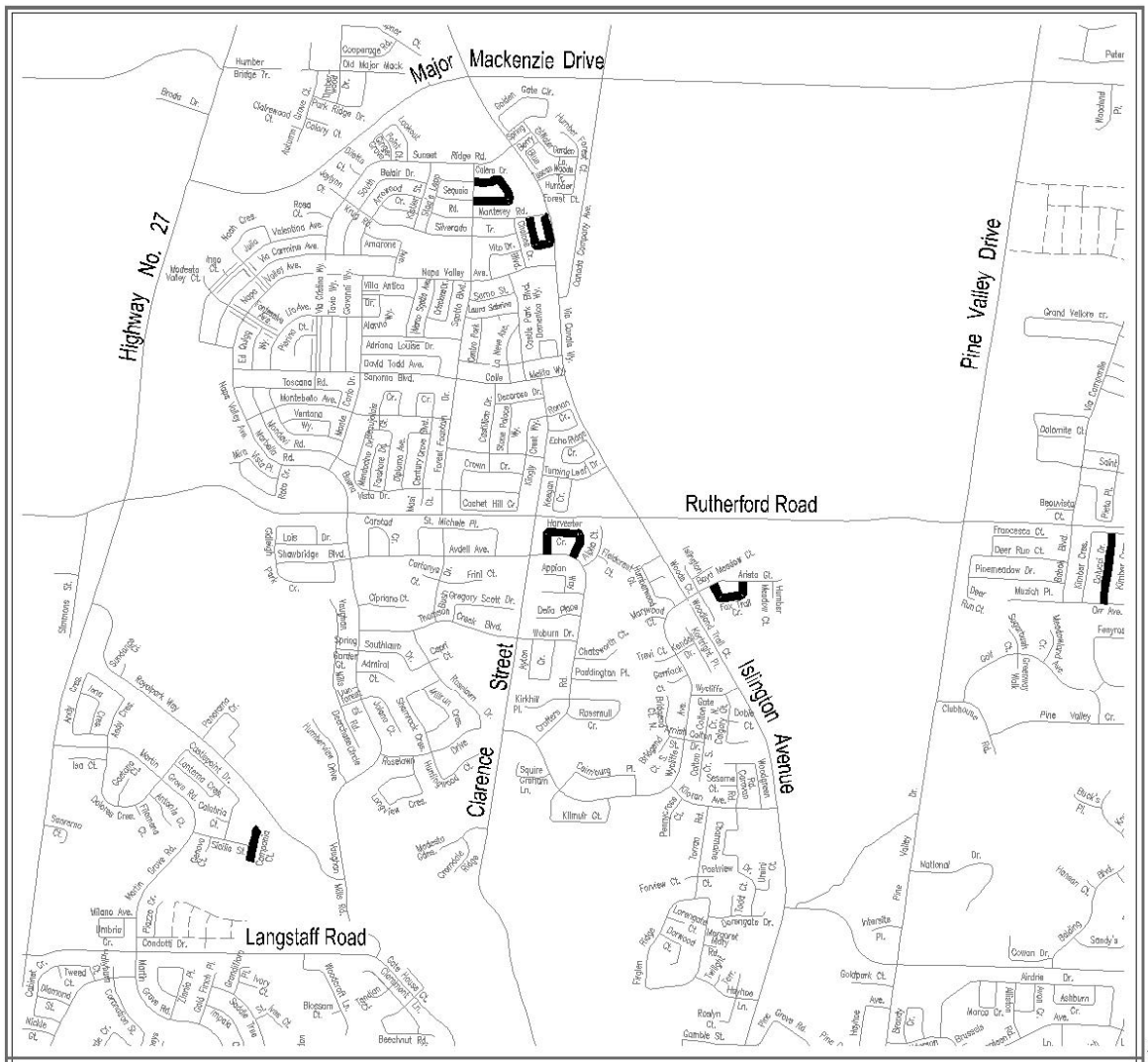
CITY OF VAUGHAN – ENGINEERING SERVICES DEPARTMENT

DRAFTSPERSON: C.D

ATTACHMENT No. 3



2009 MICRO SURFACING
VARIOUS LOCATIONS
T09 - 185

LEGEND

SUBJECT ROADS COMPLETED

SUBJECT ROADS TO BE COMPLETED

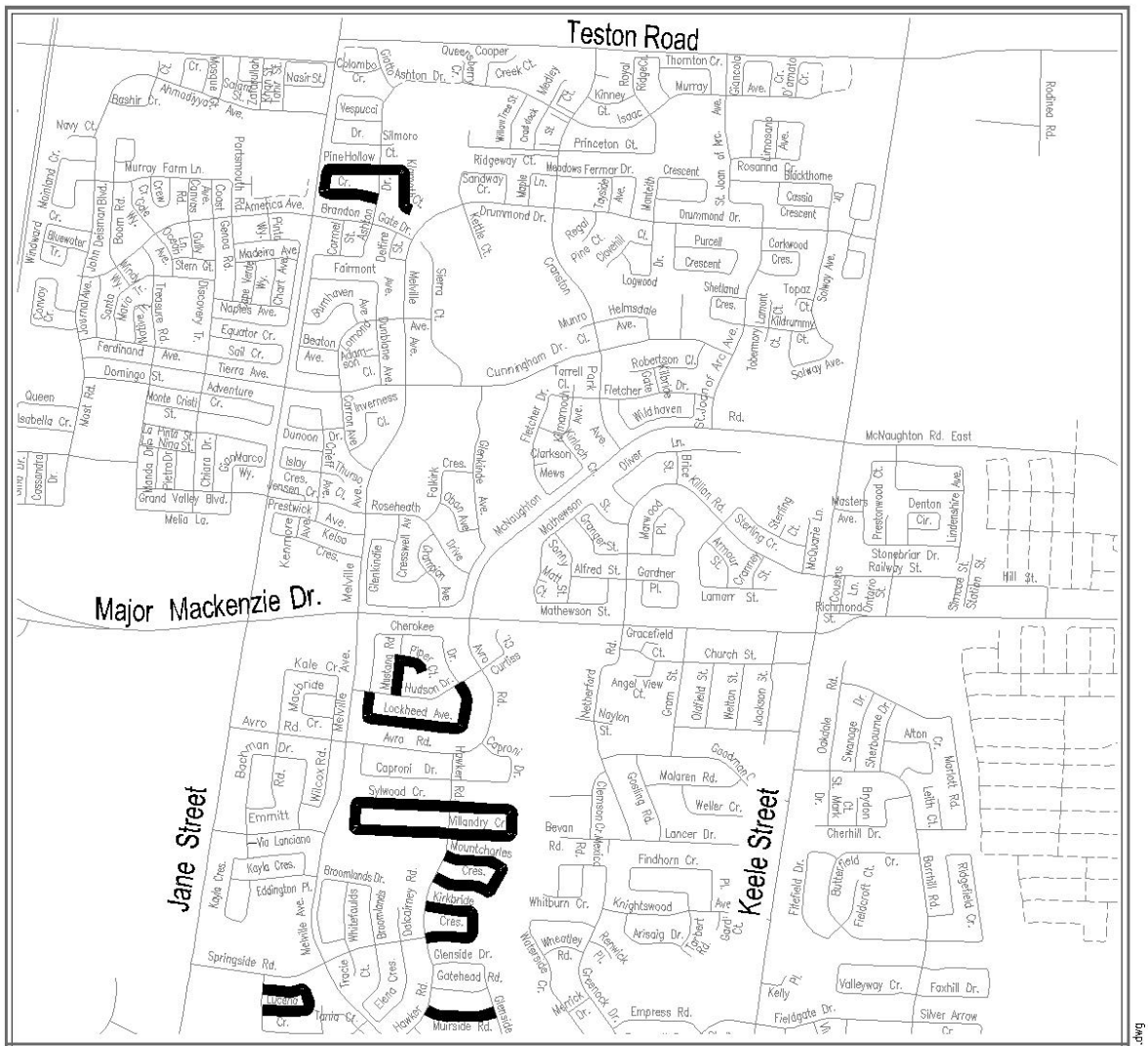
NOT TO SCALE

CITY OF VAUGHAN – ENGINEERING SERVICES DEPARTMENT

DRAFTSPERSON: C.D

Drawing name: C:\Documents and Settings\devero\Desktop\PMP 2009.dwg

ATTACHMENT No. 4



2009 MICRO SURFACING
VARIOUS LOCATIONS - PART I
T09 - 246

LEGEND

SUBJECT ROADS COMPLETED

SUBJECT ROADS TO BE COMPLETED

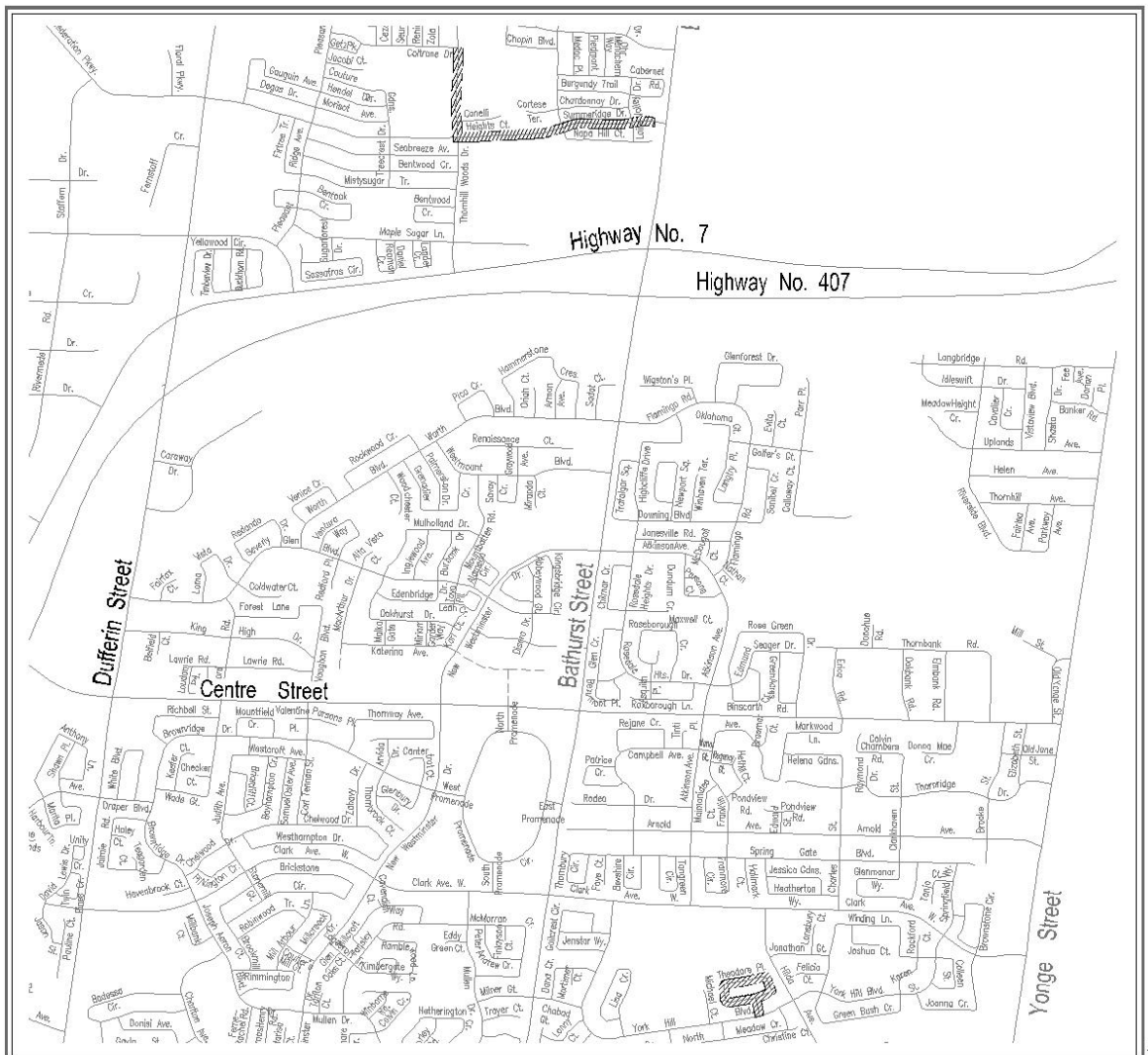
NOT TO SCALE

CITY OF VAUGHAN – ENGINEERING SERVICES DEPARTMENT

DRAFTSPERSON: C.D

Drawing name: C:\Documents and Settings\deverac\Desktop\PMP 2009.dwg

ATTACHMENT No. 5



2009 MICRO SURFACING
VARIOUS LOCATIONS- PART I
T09 - 246

LEGEND

SUBJECT ROADS COMPLETED

SUBJECT ROADS TO BE COMPLETED

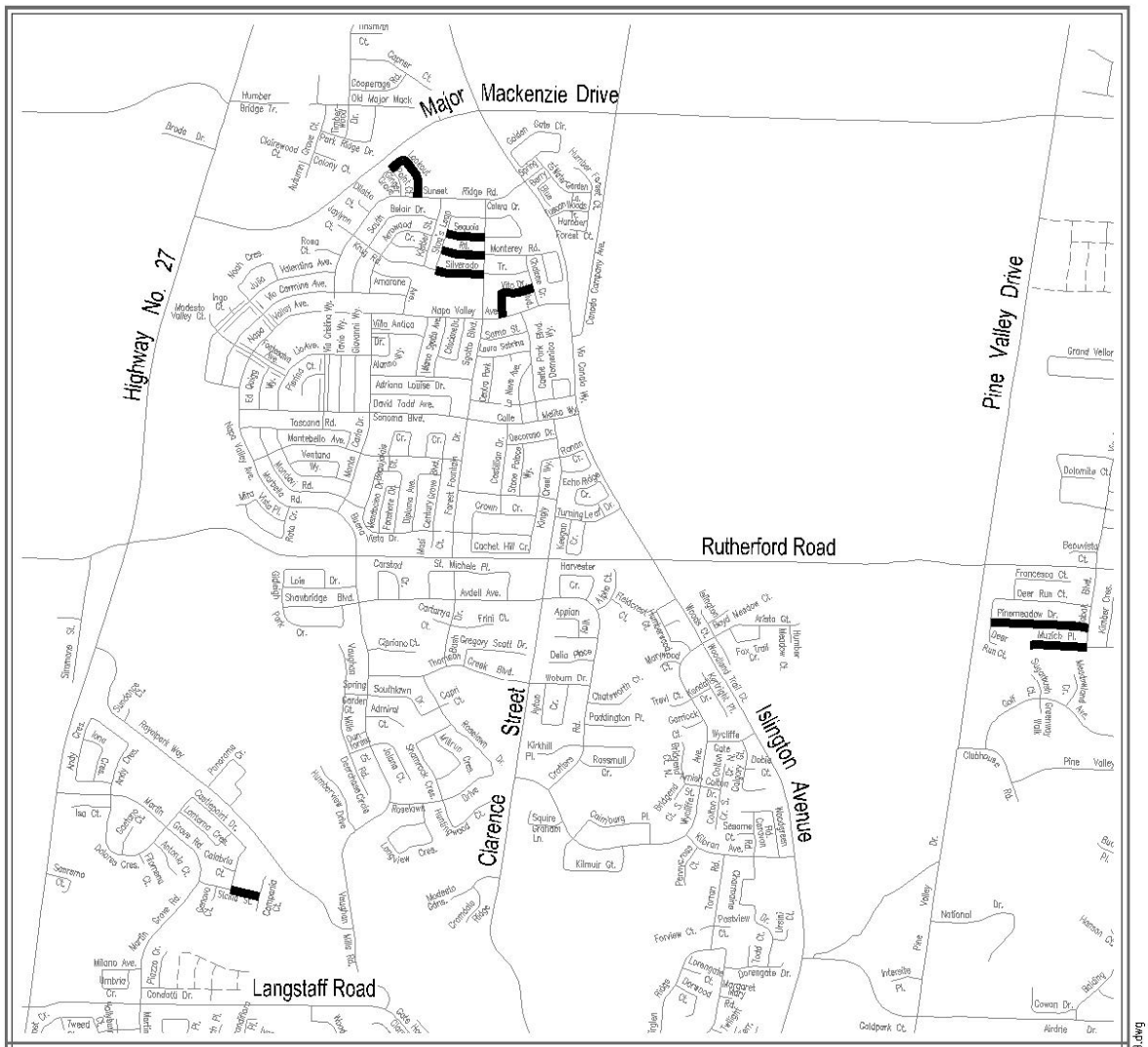
NOT TO SCALE

CITY OF VAUGHAN – ENGINEERING SERVICES DEPARTMENT

DRAFTSPERSON: C.D

Drawing name: C:\Documents and Settings\deverac\Desktop\PMP 2009.dwg

ATTACHMENT No. 6



2009 MICRO SURFACING
VARIOUS LOCATIONS -PART I
T09 - 246

LEGEND

SUBJECT ROADS COMPLETED

SUBJECT ROADS TO BE COMPLETED

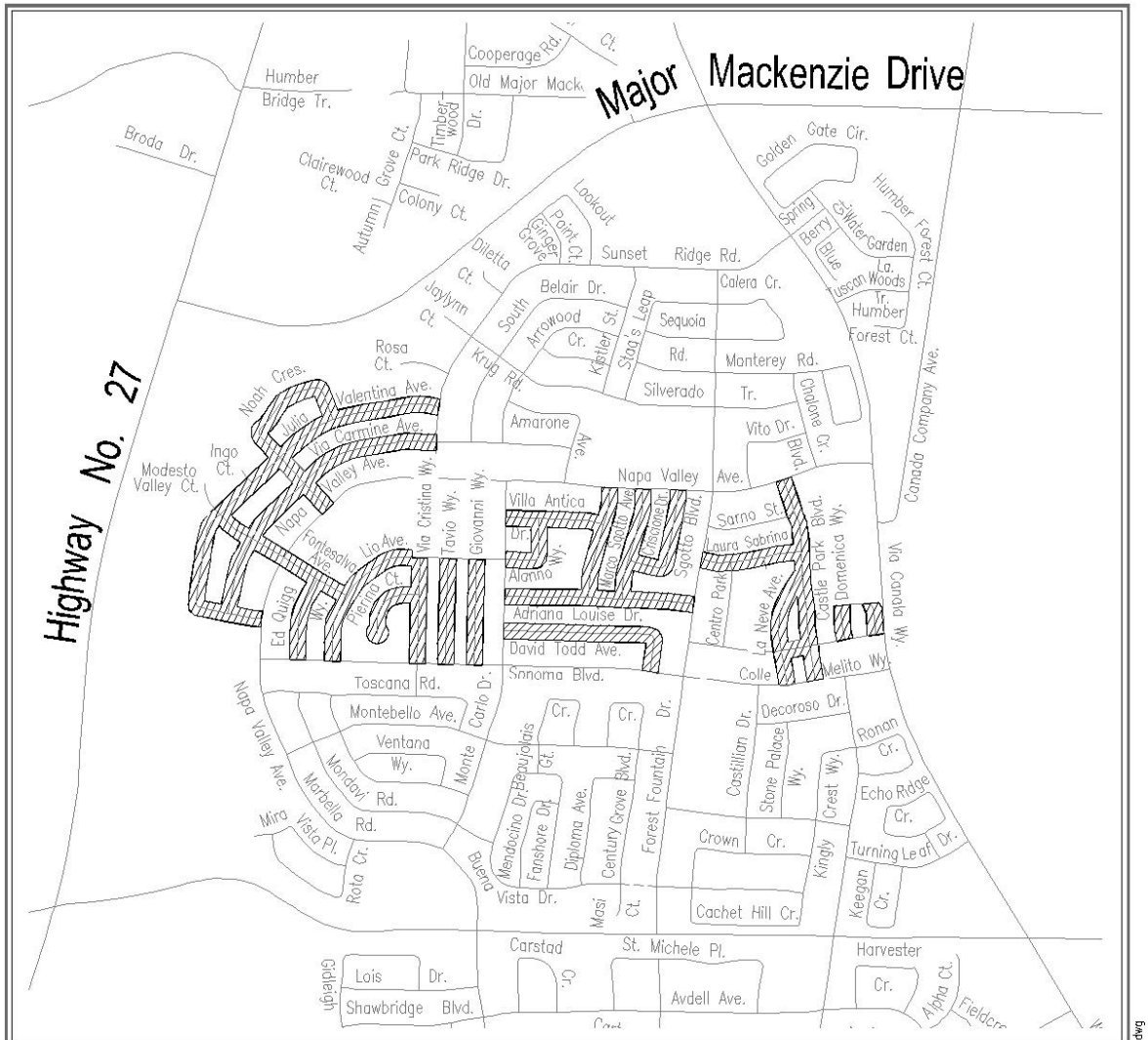
NOT TO SCALE

CITY OF VAUGHAN – ENGINEERING SERVICES DEPARTMENT

DRAFTSPERSON: C.D

Drawing name: C:\Documents and Settings\deverac\Desktop\PMP 2009.dwg

ATTACHMENT No. 7



2009 MICRO SURFACING
VARIOUS LOCATIONS
PART II
T09 - 249

LEGEND

SUBJECT ROADS COMPLETED

SUBJECT ROADS TO BE COMPLETED

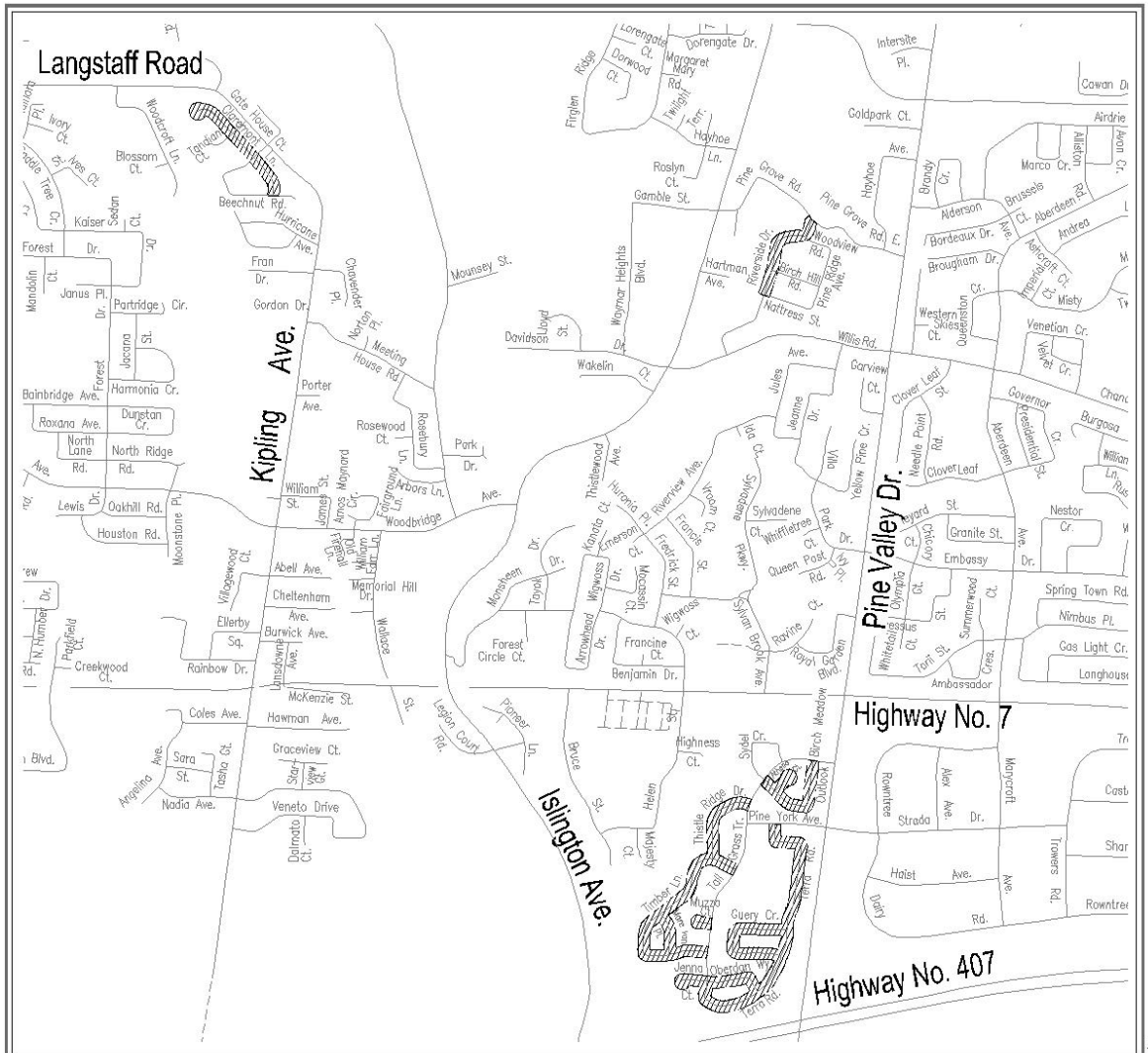
NOT TO SCALE

CITY OF VAUGHAN – ENGINEERING SERVICES DEPARTMENT

DRAFTSPERSON: C.D

Drawing name: C:\Documents and Settings\deverac\Desktop\PMP 2009.dwg

ATTACHMENT No. 8



2009 MICRO SURFACING
VARIOUS LOCATIONS
PART II
T09 - 249

LEGEND

SUBJECT ROADS COMPLETED

SUBJECT ROADS TO BE COMPLETED

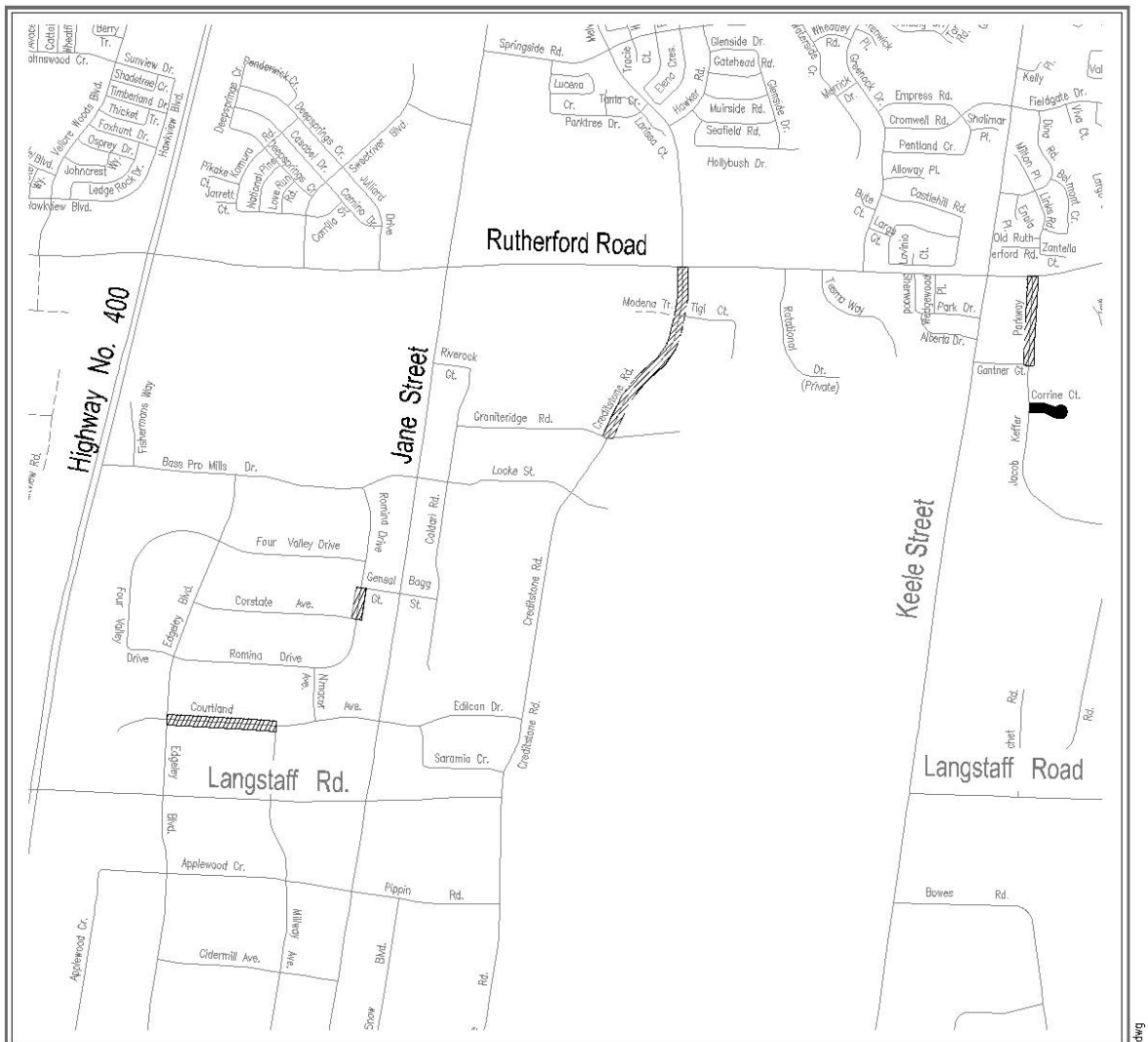
NOT TO SCALE

CITY OF VAUGHAN – ENGINEERING SERVICES DEPARTMENT

DRAFTSPERSON: C.D

Drawing name: C:\Documents and Settings\deverac\Desktop\PMP 2009.dwg

ATTACHMENT No. 9



2009 MICRO SURFACING
VARIOUS LOCATIONS
PART II
T09 - 249

LEGEND

SUBJECT ROADS COMPLETED

SUBJECT ROADS TO BE COMPLETED

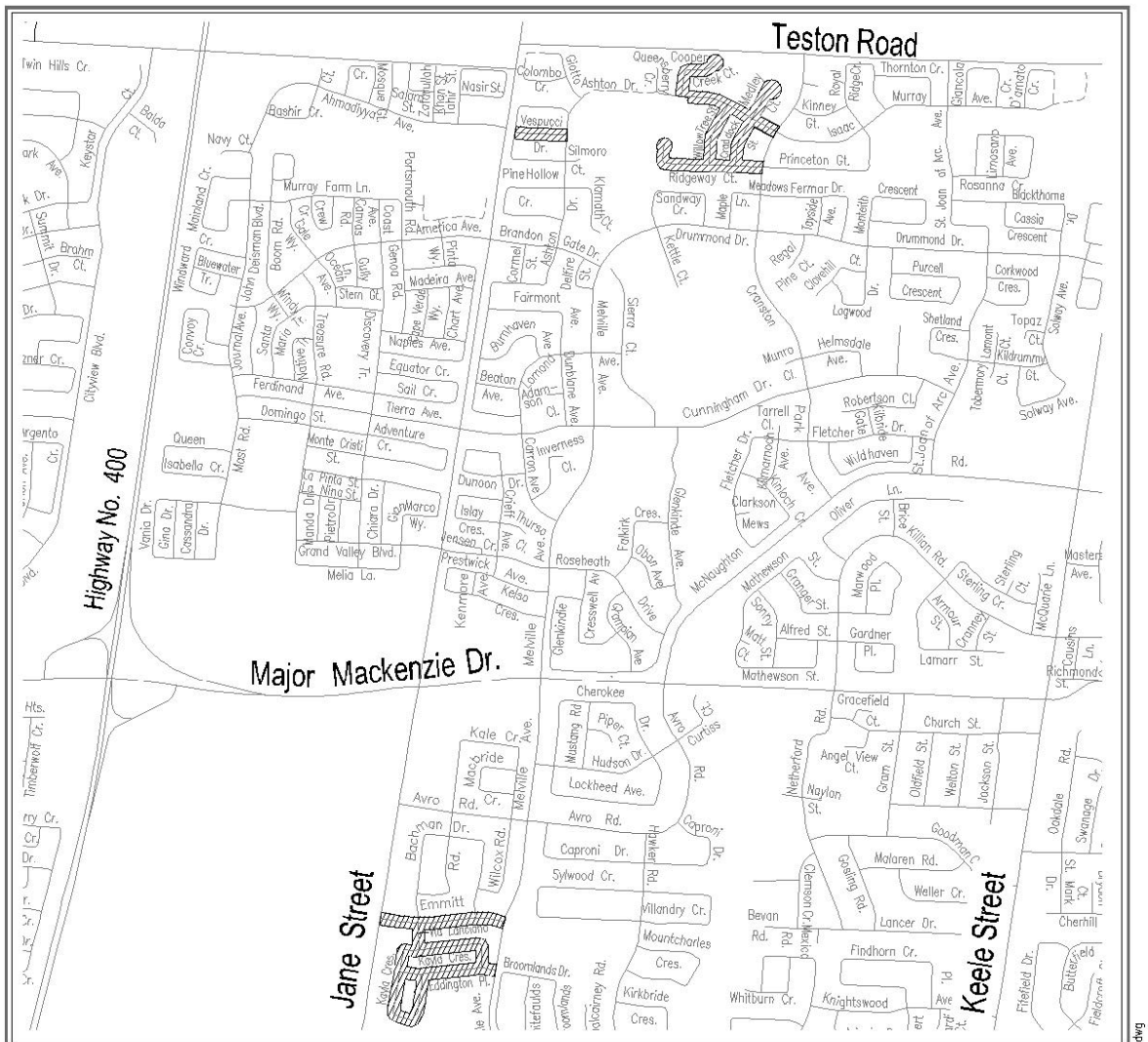
NOT TO SCALE

CITY OF VAUGHAN – ENGINEERING SERVICES DEPARTMENT

DRAFTSPERSON: C.D

Drawing name: C:\Documents and Settings\deverac\Desktop\PMP 2009.dwg

ATTACHMENT No. 10



2009 MICRO SURFACING
VARIOUS LOCATIONS
PART II
T09 - 249

LEGEND

SUBJECT ROADS COMPLETED

SUBJECT ROADS TO BE COMPLETED

NOT TO SCALE

CITY OF VAUGHAN – ENGINEERING SERVICES DEPARTMENT

DRAFTSPERSON: C.D

Drawing name: C:\Documents and Settings\deverac\Desktop\PMP 2009.dwg

ATTACHMENT NO. 11

CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF MAY 4, 2010

Item 1, Report No. 16, of the Committee of the Whole (Working Session), which was adopted without amendment by the Council of the City of Vaughan on May 4, 2010.

1 **MICRO SURFACING OF ROADWAYS**

The Committee of the Whole (Working Session) recommends:

1) **That staff provide a report on the micro surfaced roads that have been identified as having problems and/or complaints and the necessary methods to rectify the problems or complaints;**

2) **That staff provide an opportunity to view a test site with a sample of the new material recommended for installation;**

3) **That the following report of the Commissioner of Engineering and Public Works, dated April 19, 2010, be received; and**

4) **That the written submission from Councillor Tony Carella, dated April 18, 2010, be received.**

Recommendation

The Commissioner of Engineering and Public Works recommends:

That Council approval be given to complete the existing micro surfacing contracts, namely Tender Nos. T09-185, T09-246 and T09-249 in accordance with the proposed changes outlined in this report.

Contribution to Sustainability

Council at its meeting of April 2, 2007 (Item 1, Report No. 14, of the Committee of the Whole (Working Session)) adopted without amendment a report outlining the City's proposed 5 Year Pavement Management Program, which identified a number of activities to maintain, preserve, rehabilitate and replace the City's road infrastructure. Micro surfacing was identified as the preferred method of pavement preservation, to be utilized by the City. The recommendation contained in the current report will support the environmental sustainability of the Pavement Management Program by providing a more acceptable micro surface application on residential streets (local, low volume, low speed roads).

Economic Impact

The City awarded the following three micro surfacing contracts in 2009:

Tender Number	Awarded Value*	Remaining Value of Work*
T09-185	$255,356.00	$106,024.12
T09-246 (ISF)	$471,941.00	$60,643.46
T09-249 (ISF)	$955,024.30	$955,024.30

* - excluding GST

As indicated in the above table, Tender Nos. T09-246 and T09-249 have been approved as part of the Infrastructure Stimulus Funding(ISF) program. The 2009 Capital Budget accounts EN-1729-09, EN-1784-09 and EN-1793-09 have sufficient funds to complete the work. Therefore, there is no additional economic impact on the 2009 Capital Budget.

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Communications Plan

Upon Council's approval for the completion of the remaining work, Engineering Services staff will advise the Ward Sub-Committee prior to construction resuming. Notices will also be sent to the homeowners on the streets to be micro surfaced, prior to construction, providing information on the micro surfacing process to be used and its benefits. The locations of the remaining streets to be micro surfaced can be found in Attachments 1 through 7.

Purpose

Council approval to resume and proceed with the three current micro surfacing contracts, namely Tender Nos. T09-185, T09-246 and T09-249.

Background - Analysis and Options

At the meeting of Council held on October 13, 2009, Item 194, Council recommended:

> ***"THAT Item 4, Environment Committee Report No. 7 be adopted and amended as follows:***
>
> ***By approving that staff contact all appropriate parties for a full review of the micro surfacing process and report back to a Committee of the Whole meeting prior to rescheduling the recommendation of the projects."***

Overview of Micro Surfacing

In 2006, the Engineering Services Department embarked on developing a 5 year Pavement Management Program for the maintenance, preservation, rehabilitation and replacement of the City's roads. This Program deviates from the previous practice of rehabilitating/replacing the "worst" roads first, and is based on a "life-cycle" methodology. Council at its meeting of April 2, 2007 (Item 1, Report No. 14, of the Committee of the Whole (Working Session)) adopted without amendment a report outlining the proposed 5 Year Pavement Management Program for 2007 - 2011. Micro surfacing was identified as the preferred method for pavement preservation in the Pavement Management Program.

Micro surfacing is a cold-mix paving methodology that consists of applying an asphalt lift of approximately 6mm in thickness over the existing asphalt pavement. It is a low cost, preventative maintenance treatment that slows the deterioration of the underlying pavement, improves the functional condition of the roadway and extends the pavement's service life when applied on suitable candidate roads.

Micro surfacing seals and waterproofs the surface of the road, which delays the appearance of surface defects caused by the environment and the associated oxidization of the existing surface. When applied at ambient temperature, micro surfacing is environmentally friendly, as it has low energy requirements and emits no airborne pollutants. By micro surfacing the road, it will extend the life of the existing pavement an additional 7-10 years. This method is becoming the preferred choice of pavement preservation for several road authorities in York Region and elsewhere.

The cost of micro surfacing is approximately one third of that to resurface a road (by way of placing hot-mix asphalt). Therefore, more roads can be preserved by way of micro surfacing in any given year than by way of hot-mix asphalt resurfacing, resulting in more cost effective pavement preservation. In addition to cost savings it also employs an environmentally friendly method of construction as it provides a better balance between cost effectiveness and the environmental impact than thin hot-mix overlay technologies.

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Program Improvements

In 2009, a number of streets were micro surfaced in the Maple and Woodbridge communities as part of Tender Nos. T09-185 and T09-246. The City received a number of comments and concerns from residents on streets that were micro surfaced. Many of these comments and concerns were investigated by Engineering Services staff, which have been categorized into three primary areas, namely Communication Plan, Design Modifications and Construction Delivery. Since that time, staff have been working with members in the pavement industry to develop the following methodologies and recommended changes to the Micro Surfacing Program to mitigate the concerns identified.

Communication Plan

A communication plan has been developed to inform the citizens of Vaughan about the many benefits of the Micro Surfacing Program. As part of the communication plan, Engineering Services staff will deliver an informative Construction Notice to all affected residents and businesses on streets to be micro surfaced. The Notice will also include a detailed explanation about micro surfacing, why it is being carried out on their street and what to expect during and following construction.

In addition to the Construction Notice, a notification will be delivered through the form of a "door hanger" 48 hours in advance of construction, to all affected residents. The "door hanger" will provide specific instructions about the impact of the construction, as well as post construction related activities to be carried out.

For residents seeking additional information, a Frequently Asked Questions document will be developed and made available on the Corporate Web Page. The link to this document will be listed on the Construction Notice. The Frequently Asked Questions document will provide more detailed information about micro surfacing and the benefits of this type of construction.

On future micro surfacing projects the communication plan will be expanded to include a Design Notice, which will be delivered in late Winter/early Spring, to advise residents of the micro surfacing activities to be carried out on their street later in the year. Other forms of notification to be explored may include communicating information in the Public Works Spring Newsletter, as well as a Public Notice in the local newspapers.

Design Modifications

Engineering Services staff, in co-operation with local industry representatives, will be applying different techniques to the micro surfacing specification that are targeted at improving the aesthetic characteristics of the micro surfaced road with minimal tradeoffs in product performance.

One method focused on developing a mix design utilizing smaller aggregates, which will result in a smoother finish to the road surface. This new mix design has never been utilized before for micro surfacing. To validate the research, the design was submitted to the Materials Engineering and Research Office of the Ministry of Transportation – Ontario for analysis. Their review of the recommended mix design suggests that the mix design referred to above is acceptable for use on low volume, low speed residential roads.

Staff also carried out research into modifying the method of application, which will also reduce the surface roughness of the micro surfaced road. The changes in the method of application were discussed with the General Contractor, and believe that the aesthetic characteristics of the micro surfaced road can be improved through these modifications.

The results of the above mentioned design modification will be closely monitored in the field. Engineering Services staff may also consider utilizing a combination of the two methods to achieve optimum results.

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Construction Delivery
One of the more common observations, was the aggregate debris left behind following the product application. To address this issue, Engineering Services staff will ensure that greater emphasis be placed on post-construction sweeping and clean up, including an initial sweeping of the road, within one week of the application, and additional sweeping as required. Staff will be diligent to ensure that workmanship issues are corrected in a timely manner, to reduce the number of deficiencies.

Another concern raised by some residents pertained to tracking of the emulsion on to driveways. To mitigate this, traffic will be kept off the freshly micro surfaced road for a longer period of time to allow it to achieve a higher level of curing, thereby reducing the risk of tracking emulsion.

The program improvements targeted through the communications plan, design modifications and construction delivery will yield a micro surfaced road that is smoother than previous applications, and ensure an improvement to the overall delivery of pavement preservation activities.

Relationship to Vaughan Vision 2020/Strategic Plan

In consideration of the strategic priorities related to Vaughan Vision 2020, the recommendations of this report will assist in:

- Maintaining corporate assets and infrastructure;
- Enhance environmental sustainability and a healthier environment through the use of alternative construction methodologies; and,
- In compliance with Green Directions Vaughan – Community Sustainability and Environmental Master Plan – the need to support the continuing repair and renewal of our road network is facilitated.

This report is consistent with the priorities previously set by Council.

Regional Implications

Not Applicable.

Conclusion

Based on the proposed changes outlined in this report, it is recommended that Council approval be given to complete the existing micro surfacing contracts, namely Tender Nos. T09-185, T09-246 and T09-249.

Attachments

1. Location Plan No. 1
2. Location Plan No. 2
3. Location Plan No. 3
4. Location Plan No. 4
5. Location Plan No. 5
6. Location Plan No. 6
7. Location Plan No. 7

Report prepared by:

Tom Ungar, P. Eng., CHRP, Design Engineer, ext. 3110
Jack Graziosi, P. Eng., M. Eng., Director of Engineering Services, ext. 3101

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CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF MAY 4, 2010

Item 1, CW(WS) Report No. 16 – Page 5

JG:mc

(A copy of the attachments referred to in the foregoing have been forwarded to each Member of Council and a copy thereof is also on file in the office of the City Clerk.)