2017 Traffic Impact Study Update for Proposed Colacem Cement Plant, L'Orignal, Ontario

Prepared by :

Christopher Lyon, M.Eng., P.Eng.

Verified by :

Gerry Doucette, P.Eng.

PROJECT Nº A000559A
October 2017

240 Catherine Street, Suite 110
Ottawa ON K2P 2G8
CANADA

Phone : 613-860-2462
Fax : 613-860-1870
www.cima.ca

2017 Traffic Impact Study Update for
Proposed Colacem Cement Plant
L'Orignal, Ontario

TABLE OF CONTENTS

Page

2017 Traffic Impact Study Update for
Proposed Colacem Cement Plant L'Orignal, Ontario

EXECUTIVE SUMMARY

In 2015, CIMA+ was retained to undertake an initial review of future impacts associated with the proposed development of a new Colacem cement plant, proposed to be located on County Road 17, West of L'Orignal Ontario.

In July 2017, CIMA+ was asked to substantially revise our original traffic analysis addressing revised traffic impacts associated with the opening of the proposed cement plant. The revisions were founded on restated future plant truck traffic coming to and from the development site. Advanced research conducted by the client confirmed the 2017 rate at which boats could be unloaded of raw materials at the Port of Montreal and then trucked to the proposed cement plant.

Overview on New Traffic Projection Associated with the Proposed Cement Plant

The cement plant proposed for development is to be situated at land parcel number 020900700123700 in Champlain Township within the United Counties of Prescott and Russell.

The primary objective of this Traffic Impact Study (TIS) is to verify whether new development-related traffic on impacted roads will be in conformity to relevant policies and regulations related to use of impacted roadways.

Summary of Study Findings

- At full development the Colacem Cement Plant is expected to operate at full-staff complement daily during regular business hours (7 am to 3:30 pm), 320 days per year. Additional ongoing operations at the site will vary based on market demand and ongoing operational priorities. The plant is expected to produce bulk cement powder based on a combination of locally available materials and materials imported via the Port of Montreal. The L'Orignal development is to produce cement powder and not a ready-mix concrete mix plant.

- Regular day-shift workers are to total 110 staff per day. This will be augmented with an additional 40 shift workers (20 home-based; 10 night-time shift workers (7:30 pm to 8 am); and 10 daytime shift workers (7:30 am to 8:00 pm).

- Sales of cement will vary with demand, and will be available an estimated 16 hour/day, 5 day/week, from 3 am to 7 pm. Delivery of locally sourced raw and processed materials will operate 8 hours per day, 229 days per year, 5 days/week for 11 months per year predominately from 9:00 a.m. to 5:00 p.m.

- Raw materials imported by boat through the Port of Montreal (Petcoke, Gypsum and Bauxite) will be transferred to the plant by truck. Due to operational limitations, it is assumed that one boat will be unloaded at a time. Materials offloaded more

quickly will be stored in bulk at the Port and delivered gradually to the plant. For each boatload of raw materials, trucks are expected to convey materials to the L'Orignal Plant site 24 hours per day for a number of days (Petcoke representing the largest load is expected to be transferred over a period of up to 5 days). The actual number of truckloads required to convey a boatload varies with the amount and density of the raw material.

- At the peak, the combined fleet of trucks delivering raw material to the site and delivering the processed cement to third party users will generate an additional 12 inbound trucks per hour and 12 outbound trucks per hour. This represents an average of 1 additional truck every two minutes.

- The existing 2015 PM Peak Hour 2-Way Volume is 652 vehicles per hour (vph; PM Peak Hour) for County Road 17 (confirmed through recent traffic counts at the site). This is well within the estimated roadway two-way capacity of 2800 vph for a Rural Arterial highway. Growth of the background traffic is projected at 2% per year based on available data.

- It is determined that the amount of traffic to be added to the adjacent roadway system from the fully developed plant (Inbound and Outbound) is expected to add 46 vehicles per hour to the Peak Daily Hour (PM) for County Road 17 East of the Plant Site and 7 vehicles per hour West of the plant site. This traffic is comprised of both heavy vehicles involved in the conveyance of raw materials good movement and delivery of cement to/from the market area. Plant staff arrivals and departures are scheduled outside the afternoon roadway peak traffic hours.

- Total Traffic, mostly due to anticipated background growth (estimated 2% per annum) as well as new Colacem Plant-related traffic is expected to reach approximately 29% of County Road 17 capacity by 2023, or approximately 809 vph in the peak afternoon hour (4 pm to 5 pm).

1. STUDY PURPOSE

This 2017 Traffic Impact Study (TIS) is for the Colacem Cement Plant proposed for L'Orignal, Ontario. The cement plant is proposed for lands described as land parcel number 020900700123700 in Champlain Township within the United Counties of Prescott and Russell (UCPR). The proposed development site is located immediately East of Colacem's existing aggregate extraction operations at 2410 County Road 17 (historically Ontario Highway 17). The two sites are proposed to access County Road 17 at a single new intersection to be located approximately 35 m West of the current Colacem aggregates extraction access driveway intersection. The recommendation that a single combined entrance be engineered for the adjacent Colacem properties came as a recommendation from the United Counties of Prescott-Russell, Public Works Department.

The primary objective of this TIS is to verify whether new development related traffic on impacted roads will be in conformity to relevant policies and regulations. Consistent with professional traffic engineering standards, our analysis will investigate the impacts of the proposed new site entrance on County Road 17 during the peak weekly traffic period. Historic background traffic counts supplied by the road authority (United Counties of Prescott-Russell (UCPR)) from 2011 suggest that the morning peak traffic hour is from 7:45 to 8:45 am and the afternoon peak is 4:00 to 5:00 pm. The analysis years will be for the first operational year (estimated 2019) and a five year forecast (2023).

2. PROPOSED DEVELOPMENT AND DEVELOPMENT LANDS

The cement plant is proposed to be located on Lot 217 which is approximately 5 kms west of County Road 11. The site is East of the property where Colacem Canada currently operates an aggregate extraction operation at 2410 County Road 17 (Lot 214, 215, 216 Concession).

The proposed site for the cement plant is for a lot that is 138 acres. The owner has submitted an application for an amendment to the Official Plan and rezoning to permit the use of a Cement Plant which is expected to be operational by 2019.

While the proposed cement plant is expected to be operational 24 hours per day, the daily staff period is anticipated to last approximately 8.5 hours per day with extended hours possible during peak demand or during critical shipping and receiving periods (raw materials delivery). The plant operation includes receiving raw material, processing the raw material and shipping the processed material to end users.

Truck delivery of materials to the proposed facility will generally occur spread out over regular business hours (8 hours), 5 days per week. The total days of trucking operation is expected to be 229 days per year. Some raw materials will be shipped to the site via tankers docked in the Port of Montreal, with materials arriving by tanker trucked 1 to 2 times per year.

To project truck traffic more accurately, this updated version of the Traffic impact Study is based on updated information related to materials handling at the Port of Montreal acquired by the owners. Consistent with Port economics, boats are unloaded as quickly and efficiently as is

reasonable, with the port providing for storage of bulk materials on-site. In regard to Colacem import of raw materials from the Port (Petcoke, Bauxite, and Gypsum), it is expected that trucks will transfer raw material continuously (24 hours per day), with each full boat load requiring up to 5 days to transfer all materials to L'Orignal. For the purposes of traffic analysis, we anticipate that tankers will be off-loaded one after the other. This approach has been confirmed with the site owners, and more reasonably reflects trucking operations in Quebec and East Ontario.

Based on current market supplies for raw materials, the raw materials will most likely be imported via Country Road 17 although some is simply received via the internal road system from the Colacem aggregate extraction site located immediately to the west.

Finally, the proposed cement plant site would produce cement which would then be transported by bulk truckload to end users throughout eastern Ontario and western Quebec. There are no retail operations (store front, etc.) expected on the proposed Colacem cement plant site.

3. CURRENT DEVELOPMENT PLAN AND SITE ROADWAY CONFIGURATION

The cement plant will be on the North side of County Road 17 (formerly Ontario Highway 17). Site access is proposed through a single two-way entrance shared with the Colacem aggregate extraction site immediately west of the proposed cement plant. The location of the shared driveway and associated internal roadway linkages is yet to be engineered, but is proposed to be located approximately 35 West of the existing two-way entrance to the Colacem aggregates extraction facility.

4. PROPOSED ACCESS TO PUBLIC ROADS

4.1 COUNTY ROAD 17 POLICIES AND DIRECTION

County Road 17 is a "Primary Arterial" according to Schedule "D" in the Official Plan of the UCPR (1999 Official Plan consolidated in 2006). County Road 17 generally has a rural cross section with 3.75 m lanes and paved shoulders.

In close proximity to the Colacem site however County Road 17 includes:

- two travelled lanes (estimated at 3.75 m per lane) for eastbound and westbound traffic;
- two 3.5 m paved shoulders (one eastbound, one westbound), as well as
- various additional paved areas historically designed to provide traffic lay-by supports to Colacem lands. These addition hard surfaces area include a raised median (+/- 1.5 m) as well as a paved service roadway (near side to Colacem (+/- 4.0 m wide). Beyond the paved areas the Colacem entrance area is a vertical curve crest with nominal ditches (Colacem side) and standard highway ditching (far side from Colacem).

The UCPR Official Plan (OP) also includes general policies on the broad principles of transportation and the creation of a hierarchical road system which passes traffic

generated by land. The following OP policies (Section 3.3.3 Primary Arterial, 1999 Official Plan, Consolidated 2006,) apply to this site for roads designated primary artery:

4. *Lot creation for commercial or industrial development outside of the Urban or Community Policy Area may be permitted in accordance with the applicable land use designation provided that the lot access is located at a minimum of 200 metres from the closest existing road access on the same side of the road and provided that there are no traffic safety or hazardous conditions. The design and location of the lot access shall be subject to the approval of the Prescott and Russell Public Works Department and shall generally require the construction of acceleration and deceleration lanes. Turning lanes may also be required where it is established through a traffic impact analysis completed to the satisfaction of the Director of Public Works, that the development will generate substantial traffic volumes.*

5. *Development on lots of record existing as of the day of adoption of this Official Plan may be permitted in accordance with the applicable land use designation policies and local zoning regulations and provided that new accesses are kept to a strict minimum by enforcing, where possible, a minimum 200 metres separation distance from existing accesses on the same side of the road. Alternatively, safety issues may be addressed through engineered solutions such as turning lanes, acceleration lanes or deceleration lanes.*

6. *The minimum 200 metre separation distance required in policies 4 and 5 above may be reduced by the United Counties of Prescott and Russell Public Works Department without amendment to this Plan where sufficient frontage exists which would normally permit the maintenance of the separation distance but where topographical or safety considerations would dictate that a lesser separation distance may be reasonable.*

7. *A minimum development setback of 15 metres from the property line shall be required.**

*Note: * [The 2015 Amendment to the Official plan proposes the following: (b) Deleting in policy 7 the words "15 metres from the property line" and replacing them with the words "half the minimum right of way identified on Schedule D from the centre line of the road"; c) Adding in policy 7 the words "and implemented in local zoning by-law" after the word "required";]*

5. TRAFFIC ANALYSIS

5.1 SURVEY OF EXISTING TRAFFIC

The most recent 2015 traffic volumes on County Road 17 in close proximity to the development were acquired through peak period traffic counts conducted by CIMA on Tuesday 14 July 2015 (Morning Peak Period) and Thursday 16 July 2015 (Afternoon Peak Period).

The results of these counts and traditional Roadway Classification capacities for these public roads are provided in Table 1.

Table 1: Existing Traffic Counts, Survey Results & Classification Related Capacities

Roadway	Official Plan Classification	AM Peak Hour Traffic (2015) 7:30 am to 8:30 am (vehicles per hour)	PM Peak Hour Traffic (2015) 4:00 pm to 5:00pm (vehicles per hour)	Estimated Capacity by Roadway Classification (vehicles per hour)
CR 17 Eastbound	Primary Arterial	306	311	~ 1400
CR 17 Westbound	Primary Arterial	219	341	~ 1400
CR 17 Total Two-Way Traffic	Primary Arterial	525	652	~ 2800

5.2 ANTICIPATED GROWTH IN BACKGROUND TRAFFIC 2019 – 2023 (TRAFFIC GROWTH UNRELATED TO THE PROPOSED DEVELOPMENT)

Traffic background growth rates are used when projecting future traffic on major arterials roadways to capture the impact of anticipated changes in trip making. In rural areas of Ontario, where the number of residences can be growing or declining, it is difficult to determine whether background traffic levels are rising, falling or staying static.

To assist CIMA+ in the determination of peak hour background growth rates on County Road 17, the UCPR supplied vehicle traffic counts from Friday 20 May 2011. The daily volume recorded for 2011 at a location 0.8 km west of County Road 17 intersection is 7,597 vehicles per day (vpd). The 2015 Average Annual Daily Traffic (AADT) estimated from CIMA traffic counts completed on the Tues 14 July 2015 and Thursday, 16 July 2015 is 8,287 vpd (based on a surveyed value of 652 vehicles per hour (vph) for p.m. peak hour). Assuming that traffic data reflects a relatively stable population rate of change and stable levels of economic development; we estimated that the growth of background traffic for County Road 17 is approximately 2% per annum. Given the fact that some municipalities in the area face population loss, it is understood that this is a conservatively high background growth rate for this region.

Traffic impacts are established for the first year when the Plant is to operational (estimated 2019) and after 5 years of operation (2023). Table 2 includes a summary of projected background traffic on County Road 17 for both of these years.

5.3 DEVELOPMENT-RELATED PEAK HOUR TRAFFIC GENERATION AND ASSIGNMENT

In order to establish the impact of new traffic impacts particularly attributable to the proposed cement plant development, we evaluated the Peak Hour Traffic generated for the site. It was determined that the proposed development will generate traffic in the form of:

1. Employees arriving and leaving the site (Employee Traffic)

2. Vehicles delivering raw material and leaving the site (Goods Movement Traffic)
3. Vehicles distributing the processed cement. (Products Shipping Traffic)

Based on information provided by the developer as well as information drawn from local experience and conditions, it is confirmed that the majority of the trucking will occur during weekdays over an approximate 8 hour period (estimated 9 a.m. to 5:00 p.m.).

New Traffic Impacts of Employees

Regular daily employees travelling to and from the site will travel outside the daily peak roadway hour of 4 pm to 5 pm. This is concluded as employees arrive at the plant site before the 7:00 am start time, and depart shortly after the 3:30 pm. Employee arrivals and departures will therefore not contribute additional traffic to the assessed roadway morning or afternoon peak traffic hours. The shift workers are not expected to contribute significant additional traffic to the peak traffic hours; only 10 employees would be arriving and leaving the site during morning peak hour, and no shift workers would be on the road in the afternoon peak hour.

New Traffic Impacts of Raw Goods Movements

Raw Goods Movement Traffic associated with trucks travelling to and from the proposed plant was calculated based on the monthly demand of the plant. Given that plant functions can fluctuate seasonally, it is determined that the months of May and November will likely have the greatest projected raw material demand. To ascertain traffic impacts when traffic impacts could be highest, the month of November was selected as the test period for traffic impact analysis. During this period regular staffing and sales are expected to be at their highest, while raw goods movement truck movements will be highest as this is a period when restocking of raw materials from the Port of Montreal is anticipated. For the purpose of our analysis, we have adopted Petcoke raw materials transfers, the largest of the raw materials loads to be transferred from the Port of Montreal, as the worst case for a five-day transfer period.

To allow us to assess the traffic demands of this 'worst case' month of November, we have analyzed the amount of new traffic associated with regular plant operation as well as truck traffic raw materials shipments. This analysis is presented in Appendix A.

Based on the updated understanding of the Port of Montreal transfer capabilities, we have assessed the daily impact of the transfer of raw materials from Port of Montreal; based on 24 hours a day operations for a maximum of five days per boatload. Boats will be off-loading and transferred one at a time consistent with Port and trucking industry capabilities. Based on the analysis presented in Appendix A, we have developed a project truck volume based on 12 trucks loaded at the port per hour (average of one truck every 2 minutes) associated with the transfer of raw materials arriving by boat. Consistent with Port of Montreal operations the arrival and departure of these trucks is assumed to be evenly distributed over the 24 hour period.

Processed Cement Traffic

The sales and market distribution of new cement products sold from the Colacem Plant has been developed by Colacem based on market analysis. While sales in the Winter and

Spring are expected to be lower, regular cement sales are expected over the annual period from May to November. It is estimated that monthly trips in the selected peak month of November will include 3,476 loads distributed evenly over the hours from 3 am to 7 pm daily. This translates into an additional 10 total (inbound and outbound) trips per peak hour both East and West of the plant.

Combined Impacts of New Cement Plant Operations on the Roadway Peak Hour

Employee Traffic: Consistent with standard analytical practices for roadway traffic analysis, our assessment of traffic impacts is focussed on the roadway Peak Hour of Traffic, which for County Road 17 is between 4:00 pm and 5:00 pm. As noted earlier in the report, we conclude that regular plant employee traffic will occur daily between 6:30 and 7:30 am; and again between 3:00 and 4:00 pm. Shift worker traffic will occur daily between 7:30 and 8:30 am and 7:30 and 8:30 pm. It is concluded that no employee traffic is expected during the Peak Hour of Traffic (4:00 and 5:00 pm).

Heavy Truck Movements associated with Raw Goods Movements and Processed Cement
To project the number of new truck trips associated with the proposed cement plant, CIMA+ developed a projected number of inbound and outbound trips associated with raw material and cement sales based on materials haulage information provided by Colacem.

The updated materials haulage projections for this Traffic Impact Study have been developed based on a review of expected cement plant operations and capacity to transfer boat loads of raw materials from the Port of Montreal. This analysis recognizes that the largest boat load of raw materials destined for the proposed new Colacem Plant can be off-loaded and transferred to L'Orignal by a fleet of trucks working 24 hours per day over a period of five (5) days. The other clarification in this analysis is that boats of raw materials unloaded through the Port are unload sequentially.

For the purpose of this study, we have used the November Port delivery of Petcoke, resulting in an additional 12 vehicles per hours accessing the plant during the five days of load transfer activities. Petcoke is the largest monthly haulage product, and therefore represent the largest amount of truck traffic associated with Colacem's Port of Montreal operations. Other raw materials (Gypsum and Bauxite) represent much small tonnages, with proportionally smaller trucking volumes.

To ensure that our analysis represents the highest month of traffic expected from the proposed Colacem Cement Plant the estimated number of heavy trucks movements was developed based on:

- Normal peak month cement sales and deliveries
- November (Peak Month International Haulage) haulage of raw Petcoke

Our analysis of Total Heavy Truck Movements associated with Raw Goods Movements and Processed Cement, and the associated impact on Peak Hour Traffic is summarized in Appendix A.

From this analysis, we conclude that:

- During the month of November, 53 Total New Trips will travel to and from the new cement plant in the roadway peak travel hour (4 to 5 pm). Based on the market

served and the location of raw materials being delivered to the plant, these 53 trips include an increase in 7 new PM PK HR trips using County Road 17 West of the plant site; and 46 new PM PK HR trips using County Road East of the plant site.

- Due to lack of a retail store at the plant very few additional trips are expected.

- Total New Trips are expected to include a high percentage of trucks.

- In regard trip assignment, it is estimated that 87% of all trucks movements will be directed eastward (46 vph) on County Road 17, while 13% of all truck movements will be to/from the West (7 vph) on County Road 17. This is consistent with current supplier location relative to the proposed plant development site.

- In regard to staff vehicle trips and how they impact the daily peak hour of travel, we note that daily employee arrivals and departure times fall outside the daily peak hour and therefore do not have an impact on future peak traffic projections.

- Peak Hour Traffic impacts from the plant are considered highest during the Month of November when raw material deliveries peak with 12 trips per hour arriving from the Port of Montreal. This accounts for a large percentage of the projected PM PK HR impact East of the plant site (24 vph (52%) of the projected 46 vph New PMPKHR trips on County Road 17, East of the Plant site).

5.4 TOTAL FUTURE TRAFFIC IMPACT ANALYSIS

Based on standard Canadian Institute of Traffic Engineers (CITE) traffic engineering analysis CIMA's analysis provides an analysis of the 'Total Future Traffic' based on Existing Traffic, Background Growth and Development-Related.

The following projections for County Road 17 for the first year of operation (2019) and for five years after opening (2023) are provided in Table 2. These estimates are provided for CR17 immediately East of the proposed development site as the Easterly leg of CR17 attracts the greatest amount of new traffic during the Peak Traffic Hour.

Table 2: Projected Total (Post-Development) Traffic for Peak Daily Hour on CR 17 (East of Proposed Colacem Cement Plant)

Horizon Year	Peak Daily Hour Traffic (PM Peak Hr) based on 2% growth per year (vph)	New PM Peak Hour Trips on CR 17 (East of Plant Site (vph)	Projected Future PM Peak Hour East of Plant Site (vph)	Estimated Capacity by Roadway Classification (vph)	Continued Compliance to Official Plan Classifications Norms
2015 (Existing)	652	0	652	~ 2800	Yes
2019 (Year One)	705	46	751	~ 2800	Yes
2023 (Year Five)	763	46	809	~ 2800	Yes

Based on the traffic projections summarized in Table 2, it is concluded that the projected traffic levels on County Road 17 remain well below the estimated roadway per hour capacity over all horizon years. Projected peak hour traffic is estimated at 29% of available traffic capacity by the year 2023. It should be noted that the majority of increased traffic associated with year 2023 projects relate to generalized background growth and are not attributable to development related demands.

New Access Considerations

Through a detailed on-site survey of County Road 17 it was confirmed that the proposed new site access is located along a level section of CR 17. The horizontal alignment has no horizontal curves. The site access feasibility was investigated using the using the Ministry of Transportation (MTO) *Geometric Design Standards for Ontario Highways* criteria. For a highway with a design speed of 110 km/h the Desirable Decision Sight Distance is 440 m.

In terms of site access, the existing sight-lines along CR 17 fully meets and exceeds minimum requirements set out under the MTO Desirable Decision Sight Distance.

It should be noted that in additional to traffic issues addressed within this Updated Traffic Impact Study (2017) that CIMA+ is expecting to produce a technical memorandum and conceptual design of a proposed site entrance configuration including a general design narrative pertaining to the provision of a dedicated left turn lane to support Colacem-related traffic. At the time of publication, it is expected that the new entrance for the proposed cement plant will share a common access with the Colacem aggregates extraction facility immediately West of the cement plant lands.

6. FINDINGS AND RECOMMENDATIONS

Based on a careful review of existing traffic on County Road 17 at the proposed development property at land parcel number 020900700123700, Champlain Township, United Counties of Prescott and Russell (UCPR) (adjacent east of 2410 County Road 17), this study addresses new traffic impacts associated with the proposed Colacem Cement Plant located approximately 5 kilometres west of the intersection of CR11 and CR 17.

Findings:

- At full development the Colacem Cement Plant is expected to operate at full-staff complement daily during regular business hours (7 am to 3:30 pm), 320 days per year. Additional ongoing operations at the site will vary based on market demand and ongoing operational priorities. The plant is expected to produce bulk cement powder based on a combination of locally available materials and materials imported via the Port of Montreal. The L'Orignal development is to produce cement powder and not a ready-mix concrete mix plant.

- Regular day-shift workers are to total 110 staff per day. This will be augmented during peak seasons with an additional 40 shift workers (20 home-based; 10 night-

time shift workers (7:30 pm to 8 am); and 10 daytime shift workers (7:30 am to 8:00 pm).

- Sales of cement will vary with demand, and will be available an estimated 16 hour/day, 5 day/week, from 3 am to 7 pm. Delivery of locally sourced raw and processed materials will operate 8 hours per day, 229 days per year, 5 days/week for 11 months per year predominately from 9:00 a.m. to 5:00 p.m.

- Raw materials imported by boat through the Port of Montreal (Petcoke, Gypsum and Bauxite) will be transferred to the plant by truck. Due to operational limitations, it is assumed that one boat will be unloaded at a time. Materials offloaded more quickly will be stored in bulk at the Port and delivered gradually to the plant. For each boatload of raw materials, trucks are expected to convey materials to the L'Orignal Plant site 24 hours per day for a number of days (Petcoke representing the largest load is expected to be transferred over a period of up to 5 days). The actual number of truckloads required to convey a boatload varies with the amount and density of the raw material.

- At the peak, the combined fleet of trucks delivering raw material to the site and delivering the processed cement to third party users will generate an additional 12 inbound trucks per hour and 12 outbound trucks per hour. This represents an average of 1 additional truck every two minutes.

- The existing 2015 PM Peak Hour 2-Way Volume is 652 vehicles per hour (vph; PM Peak Hour) for County Road 17 (confirmed through recent traffic counts at the site). This is well within the estimated roadway two-way capacity of 2800 vph for a Rural Arterial highway. Growth of the background traffic is projected at 2% per year based on available data.

- It is determined that the amount of traffic to be added to the adjacent roadway system from the fully developed plant (Inbound and Outbound) is expected to add 46 vehicles per hour to the Peak Daily Hour (PM) for County Road 17 East of the Plant Site and 7 vehicles per hour West of the Plant Site. This traffic is comprised of both heavy vehicles involved in the conveyance of raw materials good movement and production of cement to/from the market area. Plant staff arrivals and departures are scheduled outside the afternoon roadway peak traffic hours.

- Total Traffic, mostly due to anticipated background growth (estimated 2% per annum) as well as new Colacem Plant-related traffic is expected to reach 29% of County Road 17 capacity by 2023, or approximately 809 vph in the peak afternoon hour (4 pm to 5 pm).

Appendix A

Trips Generated by Site Development

Traffic Projections Based on Colacem Raw Materials and Cement Sales: Full Development

Material Being Moved	Production/ Supply Site(s)	Location of Raw Goods or Destination of Sales	Calcuation of Full-Trucks Trips based on Haulage		Expected County Rd 17 Traffic Scenario					
					Calculation of Trucks Trips per Peak Roadway Hour including Full Trips and Empty returns					
							Eastbound		Westbound	
			West of Site	East of Site	Assumed Hours Per Day for Delivery	Assumed Days per Month for Delivery	Inbound	Outbound	Inbound	Outbound
Limestone for raw meal	Coming from L'Orignal quarry - Internal Trucks	Trip is Internal to Site	1811	0						
Limestone for Sales	Leaving from quarry by trucks (20% to Ottawa; 80% to Montreal)	West (20%) / East (80%)	838	3353						
Shale	Coming from quarry 90 Km east of L'Orignal	East of Proposed Plant	0	221	8	21	0.0	1.3	1.3	0.0
Silica sand	Coming from quarry 90 Km east of L'Orignal	East of Proposed Plant	0	365	8	21	0.0	2.2	2.2	0.0
Iron	Coming from IVACO Steel Mill east of site	East of Proposed Plant	0	58	8	21	0.0	0.3	0.3	0.0
Petcoke	Coming from abroad by ship	East of Proposed Plant	0	1416	24	5	0.0	11.8	11.8	0.0
Limestone for Cements	Coming from L'Orignal quarry - Internal Trucks	Trip is Internal to Site	94	0						
Silica Fume for Cements	Coming by trucks	Even Split East & West of Plant	16	16	8	21	0.1	0.1	0.1	0.1
Fly Ash for Cements	Coming by trucks	Even Split East & West of Plant	44	43	8	21	0.3	0.3	0.3	0.3
Cement Product Retail Delivery	Leaving from cement plant by trucks (30% to Ottawa; 70% to Montreal)	West (30%) / East (70%)	1043	2433	16	21	3.1	7.2	7.2	3.1
			3847	7905			3	23	23	3
					Total New Truck Trips on CR 17 West of Site		26.00			
					Total New Truck Trips on CR 17 East of Site				26.00	
					Total New Truck Trips in Roadway Peak Hr>		54.00			