TRAFFIC IMPACT ASSESSMENT
FERMA - CARDEN QUARRY
FERMA CRUSHED STONE INC.

LY

JUNE 1994

JOB NO. 92-8977 O/M

PREPARED BY

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1.0 INTRODUCTION

Ferma Crushed Stone Inc. is proposing a quarry development on Lots 7, 8, 9, and Part of Lots 6 and 10, Concession IX, Carden Township in Victoria County (refer to Figure 1).

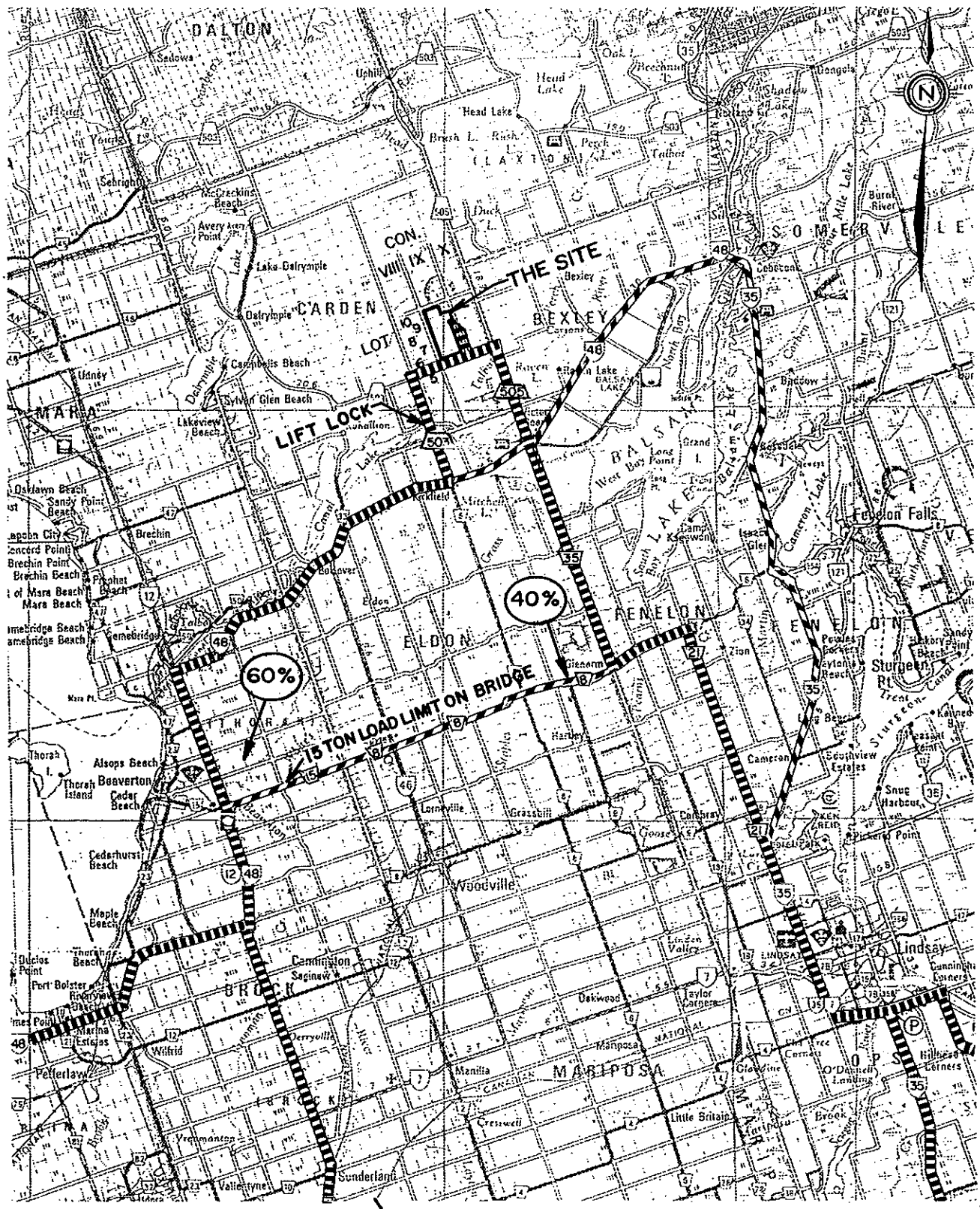
The proponent is part of the Ferma group of construction and ready-mix companies active in South Central Ontario between Mississauga, Trenton, and Lindsay/Peterborough. The intention of this quarry development is to secure aggregate supplies for Ferma construction contracts.

This impact assessment of anticipated truck traffic resulting from quarry development is prepared in support of an application to amend the Carden Township Official Plan, and Quarry License application in accordance with the Aggregate Resources Act.

2.0 QUARRY GENERATED TRAFFIC VOLUMES

At the outset of quarry operation, the annual extraction rate is expected to be less than 250,000 tonnes of limestone product. This rate is anticipated to increase gradually, reaching an upper limit of 1,000,000 tonnes annually after 10 years. Actual annual production may be less, reflecting market demand.

With no hauling during half-load restrictions (six to eight weeks), statutory holidays, and Sundays, there remains potentially 250 hauling days a year.



DATE: JUNE 1994	OLIVER, MANGIONE, McCALLA & ASSOCIATES LIMITED CONSULTING ENGINEERS, HYDROGEOLOGISTS & PLANNERS	DWG. No. 92-8977
SCALE: 1:250 000	TITLE: HAUL ROUTES — FERMA—CARDEN QUARRY	FIG. 1

A forecasted schedule of daily truck movement to and from the quarry is presented in Table 1.

TABLE 1

DAILY TRUCK TRAFFIC
FERMA - CARDEN QUARRY

Year	Tonnes/Year	Total Generated Trips*	
		Average	Summer
1995	250,000	53	80
2005	1,000,000	210	315

* At 38 tonnes/load

$\frac{1,000,000}{(250)(38)} \times 2 = 210$ pass. hr/day = 12

$\frac{1,000,000}{(250)(38)} \times 2 = 229$ pass. hr/day = 19/hr.

With increased demand during peak construction periods (May to September), there will be a 50% increase in average daily material delivery. Conversely, there will be a 50% reduction during the off season (December to April).

3.0 HAUL ROUTES

Factors affecting haul route selection include; product destination, travel distance, traffic volume, road condition, load restrictions, village and hamlet locations.

Product destination, and percent distribution will correspond to the weighted geographic distribution of Ferma construction activity which is estimated as follows.

Southwest Bound (Toronto and area)	60%
Southeast Bound (Lindsay/Peterborough and south)	40%

Haul route selection and impact assessment, is based on this market distribution.

The following is a review of alternate haul routes for various destinations, haul routes are shown on Figure 1.

3.1 Local

The purpose of this quarry development is to service a more distant market place where Ferma contract activity occurs, and where a higher demand exists for quarry product. The anticipated volume of material destined for local markets is considered insignificant, and is inclusive of the analysis pertaining to southwest and southeast bound truck traffic.

3.2 Southwest Bound

The following routes are available for 60% of quarry product destined for the Toronto and area market via Highways 12 and/or 48:

Route SW1 Highways 503 ↔ 48 ↔ 12
Route SW2 Highways 505 ↔ 48 ↔ 12
Route SW3 Highway 505 ↔ Victoria Rd 35 ↔ Victoria Rd 8 ↔ Durham Rd 15 ↔ Highway 12

With the near completion of Victoria Road 35 reconstruction, Route SW3 provides a potentially attractive haul route. However, a 15 tonne load restriction on the Cameron Bridge over White's Creek on Durham Road 15 eliminates Route SW3.

In considering the preferred haul route between the site and Highway 48, Highways 505 and 503 are compared as follows:

Traffic Volumes

The 1991 summer average week day traffic volume was 1,350 for Highway 503, and 610 for Highway 505. Additional traffic volumes would not impact either highway in terms of highway capacity.

Road Structure

Both highways are structurally and geometrically adequate to accommodate quarry truck traffic, although, Highway 503 is superior to Highway 505 in this regard.

Exposure

Southwest bound traffic via Highway 505 would pass through the hamlets of Victoria Road and Kirkfield.

Southwest bound traffic via Highway 503 would pass through the Kirkfield lift locks, and that portion of Kirkfield fronting Highway 503 and Highway 48 west of Highway 503.

The following number of dwellings front onto each road section between the site and the intersection of Highways 503 and 48:

Road Section	Number of Dwellings
Site to Hwy 48 via Hwy 505	26
Site to Hwy 48 via Hwy 503	44
Hwy 48 between Hwys 505 and 503	98

Directing southwest bound traffic via Highway 505 rather than Highway 503 would expose an additional 80 residences to same.

Highway 503 passes through the Kirkfield lift locks, a local tourist attraction. Existing parking facilities accommodate vehicular traffic visiting the lift locks. At periods of peak visitation (typically summer Saturday afternoons and Sundays), there will be no quarry generated truck traffic.

Side Road 5/6

The entrance to the quarry site will be located on Carden Line 5/6 (McNanee Road) at the unopened road allowance between Concessions IX and X, approximately 1.2 km west of Highway 505, and 2.8 km east of Highway 503.

Side Road 5/6 consists of a gravel surface treated roadway and would require upgrading to an accepted standard, including asphalt or other suitable surface treatment.

Other Quarry Traffic

Preston Quarry (Kirkfield Aggregates Limited) is located on Highway 503, north of the Kirkfield lift locks and south of Side Road 5/6. Highways 503 and 48 are the primary haulage routes for this operation. The present quarry license is for approximately 450,000 tonnes annually.

Existing quarry generated truck traffic on Highway 505 is not apparent.

In terms of exposure to residences, southwest bound quarry generated traffic would have less impact if directed to Highway 48 via Highway 503. For this reason, Route SW1 is recommended over Route SW2 for Toronto and area bound product.

3.3 Southeast Bound

Potential haul routes for 40% of quarry product destine for southeast markets via Highways 35 and/or 7, include:

Route SE1	Highway 505 ↔ 48 ↔ 35
Route SE2	Highway 505 ↔ Victoria Rd 35 ↔ Victoria Rd 8 ↔ Victoria Rd 21 ↔ Highway 35

Route SE1 is less desirable due to extended travel distances, and existing high traffic volumes on Highway 35.

The possibility of utilizing Highway 503 - Victoria Road 6 - Victoria Road 8, was not considered due the existing poor condition of County Road 6 between Kirkfield and County Road 8.

All SE2 road segments will be in good structureal condition once the reconstruction of County Road 35 is completed. Further, since this route is the most direct to southeasterly markets and relatively lightly travelled, it is the preferred southeast haul route.

Highway 503 may be substituted for Highway 505 for both Routes SE1 and SE2. However, this would increase southeast bound truck traffic exposure to residence conversely as concluded in comparing southwest bound Routes SW1 and SW2.

3.4 Preferred Routes

The preferred haul routes are summarized as follows:

TABLE 2

PREFERRED HAUL ROUTES
FERMA - CARDEN QUARRY

Route		Roads	Average Daily Trips	
Destination	**No.**		**1995**	**2005**
Local		Scattered		
Southwest	SW1	Hwys 503 ↔ 48 ↔ 12	32	126
Southeast	SE2	Hwy 505 ↔ VRd 35 ↔ VRd 8 ↔ VRd 21 ↔ Hwy 35	21	84

By distributing quarry generated truck traffic in this manner, the potential impacts of same on any one route will be reduced.

Existing and projected average summer weekly day traffic volumes for haul route road sections are summarized on Table 3.

TABLE 3
HAUL ROUTES
SUMMER AVERAGE WEEK DAY TRAFFIC VOLUMES (SAWDT)
FERMA - CARDEN QUARRY

Road	Section	1991 SAWDT	Annual % Growth Assumed	Projected SAWDT		Quarry SAWDT	
				1995	2005	1995	2005
Township Roads							
SR 5/6	Site - Hwy 503	<50		<100	<100	48	189
SR 5/6	Site - Hwy 505	<50		<100	<100	32	126
Provincial Highways							
Hwy 503	SR 5/6 - Hwy 48	1,350	4.0	1,600	2,300	48	189
Hwy 48	Hwy 503 - Hwy 12	5,000	3.5	5,700	8,100	48	189
Hwy 505	SR 5/6 - Hwy 48	610	1.0	640	700	32	126
Victoria County Roads							
Rd 35	Hwy 48 - Rd 8	1,950	5.0	2,400	3,900	32	126
Rd 8	Rd 35 - Rd 21	3,450	5.0	4,200	6,800	32	126
Rd 21	Rd 8 - Hwy 35	2,340	5.0	2,800	4,600	32	126

Abbreviations:

SR - Side Road
Rd - Victoria County Road

Notes:

1) Highest traffic count per section used. 1991 estimates for Provincial and County roads supplied by same. Traffic counts for Side Road 5/6 are based on observation.
2) Summer average day quarry truck volume = 1.5 x annual average day truck volume.
3) Percent growth based on historical trends and published projections.

4.0 IMPACTS

4.1 Road Capacities

The capacity of a two lane highway on flat terrain is in excess of 9,000 vehicles per day before an appreciable impact is felt. Form Table 3, quarry generated truck traffic will not impact existing highway capacity.

Quarry truck traffic will occur during weekdays between 6:00 am. and 7:00 pm, with a significant reduction in traffic on Friday afternoons, and Saturdays mornings between 6:00 am and 12:00 am. No hauling will occur on Saturday afternoons, and Sundays. This schedule should not conflict with summer weekend traffic, and more specifically, peak tourist periods at the Kirkfield lift locks.

No analysis of the broader spectrum of the provincial highway system is undertaken due to variability with respect to specific destinations, and relative volume of quarry generated traffic travelling to those destinations via various transportation routes.

Side Road 5/6 should be upgraded to applicable municipal standards to accommodate higher traffic volumes, and weight of haulage vehicles. Similarly, the unopened road allowance between Concessions IX and X must be constructed to an acceptable standard from Side Road 5/6 to the proposed site entrance(s).

4.2 Intersections

There will be extra turns introduced at various haul route intersections. The following is a review of major intersections, and possible impacts:

Concession X and Side Road 5/6

There are no site distance limitations on Side Road 5/6 at this location. The new intersection should be constructed with adequate turning radii, and a stop sign on the concession road.

Side Road 5/6 and Highway 503

Good site distances in both directions, and low traffic volumes do not necessitate turning lanes.

Side Road 5/6 and Highway 505

Same as above, although turning radii should be improved when Side Road 5/6 is reconstructed.

Highways 48 and 503

Located in a built-up area, speed limits are reduced to 50 kmph in all directions. Intersection improvements are not required due to low travel speeds. Traffic signals may be considered in the future depending on Highway 48 traffic growth.

Highways 48 and 12

Signal lights and turning lanes are in place.

Highway 48 and Highway 505/Victoria Road 35

Anticipated quarry traffic flow will be straight through this intersection in a north-south direction on Highway 505 and Victoria Road 35.

East and west site distances on Highway 48 are adequate. Although turning movement is not expected, there are deceleration lanes on Highway 48 in both directions.

A knoll on Highway 505 just north of the intersection reduces approach site distance from the north. In addition, a downward gradient travelling towards the intersection increases required stopping distance.

As a minimum, a flashing stoplight visible from beyond the brow of the knoll warning southbound vehicles on Highway 505 of the approaching stop, should be erected. However, a four-way flashing light with red north-southbound stop, and amber east-westbound warning, would increase the factor of safety to motorists travelling in all directions. Approaching stop warning signs for southbound traffic on Highway 505 are in place.

Victoria County Roads 35 and 8, and Roads 8 and 21

Traffic volumes on these roads are relatively low in terms of road capacity, and sight distances are adequate. Adjustments to both intersections should be determined in consultation with the County of Victoria.

Highway 35 and Victoria County Road 21

Intersection improvements at Highway 35 at County Road 21 should be determined in consultation with the Ministry of Transportation and County of Victoria.

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JSG:rb

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