Shadow Study Report

Proposed Residential Mid-Rise Development

242 West Side Road
Port Colborne
Ontario

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242 West Side Road

Shadow Study Report

Contents

Appendices

Appendix 1 –

Shade Study Reports

1.0 Introduction

Purpose of the Report:

The purpose of this report is to demonstrate the effect of the proposed development of an 8-storey residential and building upon the current location and upon adjacent properties. This is done by using a computer generated Shadow Diagram, which generates the Shadow Pattern which is cast upon the ground by buildings upon adjacent properties. The study conforms to the Dates and Times set out typically for Shadow studies in Southwestern Ontario Municipalities. These can be found in Site Plan Standard "Design Reference Notes" or in "Standards for Shadow Studies."

Description of the Proposed Development:

The land parcel is approximately 5663 square meters of area coverage. 68.1m lot frontage onto Franklin Ave (after Franklin Ave has been extended, as part of this development or a preceding development), and 44.4m frontage onto West Side Road. There are two buildings currently on the subject lands: both buildings are single family dwellings. The balance of the site is the dwellings front and rear yards. There are some existing trees on the site. Both single family dwellings will be demolished to accommodate the new proposed development.

The proposed residential development will include an 8-storey building of 1590 square meters in floor area. The balance of the site is proposed to be divided between a surface parking lot of 2377 square meters in area, and a landscaped open space of 1700 square meters in area. The Landscaped Open Space will comprise of sidewalks for pedestrian circulation, ground cover plantings as well as trees for privacy. The landscaped space is proposed on all sides of the development.

There are two existing buildings on the site occupying approximately 311 m2 of land coverage or approximately 5 percent of the land parcel area. A summary of existing building massing is provided in the following chart:

	Existing Building Name	Footprint Area		Maximum Bldg. Height		Average Height of Building Mass	
		sq. metres	sq. feet	metres	feet	metres	feet
1	246 West Side Road	168	1811	5	16	5.85	19
2	242 West Side Road	143	1541	6.7	22		

The existing building will be demolished and one new residential building is proposed which will have shadow impact. A summary of the proposed building massing is provided in the following chart:

	New Building Name	Footprint Area		Maximum Bldg. Height		Average Height of Building Mass	
		sq. metres	sq. feet	metres	feet	metres	feet
1	New Residential Mid-Rise Building	1590	17,100	30.5	100	30.5	100

Neighbouring Properties:

To the East:

An unopened back lane allowance measuring approximately 20 meters in width. Across the subject property are 4 residential lots with a mix of split level 1.5 storey houses. The residential lots are largely sized and appear to be 'double depth' lots measuring approximately 90m in depth. The resulting back yards facing the development are approximately 60 meters deep – further separating the dwellings from the proposed development.

Further to the east (not adjacent to the subject property) continues the same existing residential development comprising of a mix of 1 and 2 storey dwellings.

To the West:

Regional road, West Side Road, measuring approximately 30m in width; total 5 lanes on the highway with 2 lane in each direction separated by 1 common turning lane in between.

Further to the west across West Side Road, two residential lots with a 1 storey and 2 storey house, respectfully, as well as a roadway, Coronation Drive, measuring approximately 20 meters in width, which will align with the extension to Franklin Ave.

Note that diagonally opposite West Side Road is an undeveloped parcel which may currently be in the approvals stages for a new development by others.

To the North:

The future extension of Franklin Ave, measuring approximately 20 meters in width. Across Franklin Ave from the subject property are 4 vacant lots which are in the process, or have already been, amalgamated into a single lot for the purpose of a private road townhouse unit development. Discussions with the Owner of this property suggest the development may be moving forward with Site Plan Agreement and subsequent Building Permit and construction phases in the near to mid future, and some level of municipal approvals has already been received.

To the South:

The immediately adjacent property to the south, 238 West Side Road and 232 West Side Road are residentially zones, with existing houses on the properties.

Beyond this property (not adjacent to the subject property) are two additional residential lots with single family dwellings.

2.0 Methodology

The City of Port Colborne has bylaws, which govern property development. One of the criteria being analysed under the broader application is the requirement that the proposed development address the bylaw requirements and that the development proponent make materials available to the Municipality for evaluating development applications.

Specifically this study is addressing the issue of new building height and effect of the shadows created upon neighbouring properties and the subject property itself as a result.

This shadow study also provides shadow diagrams for 4 periods of the day which is representative of different shadow patterns cast over the course of the day as the sun arcs through the sky.

Because the Sun changes its angle of arc, our study also analyses the typical shadow patterns, which reflect the solar solstice periods over the course of the year, and represent the highest and the mid points of the sun over the year.

The findings of a computer generated simulation provides data as to building height, shadow length, solar angle and solar rotation over the course of the typical day over the periods of study and presents this data in comparative chart form.

Location Factors

In Appendix “A” the shadow diagrams contained within that section illustrate the maximum shadows to be created at specific times and associated technical data. The analysis was conducted based upon a

geodetic location of 42.8865 degrees North and 79.2509 degrees west, which is central to Port Colborne where the proposed new buildings would be located.

Building Height Assumption

The analysis will base the shadow correlation of a building with a maximum height of 30.5 metres above the geodetic ground level set for the finished ground floor level, established at approximately 175 metres above sea level for the purpose of the Study. The study takes into account the general terrain of the site and surrounding lands relative to the geodetic ground level as this will vary the shadow correlation.

The diagrams provided illustrated shadow patterns for 3-4 times at 2 specific dates of the year. The analysis of the shadow diagrams identify the typical shadows, which are cast in the summer and fall periods. On each shadow plan the report will discuss the surface pattern for each of the dates and times and will identify characteristics of those shadows and the anticipated impact upon the immediate site and neighbouring sites.

Criteria for determining an Impact

By way of priority, the report would weigh adverse impact of shadows as whether they firstly cast onto neighbouring private lands or public spaces. If there are new shadows created in the initial findings, secondary analysis will compare the change caused by the development against the background of existing shading conditions and by what extent or region of the neighbouring site being impacted. Specific concern would be identified for amenity spaces or predominantly pedestrian-utilized areas affected.

3.1 Shadow Study: Pre-Development

3.1.1 Summer Shadows: June 21st

Assumptions of shadows cast upon the site or from the site of the subject property are as follows:

- Shadows cast upon subject property: the shadows from the adjacent dwelling at 238 West Side Road do not appear to significantly cast upon the subject property. No other significant shadows are observed.
- Shadows cast from the site of the subject property: The existing two single family dwellings on the subject property are not observed to cast any shadows beyond the subject property limits at this time of year.

3.1.2 Fall Shadows: September 21st

Assumptions of shadows cast upon the site or from the site of the subject property are as follows:

- Shadows cast upon subject property: the shadows from the adjacent dwelling at 238 West Side Road do cast upon the subject property, extent of the shadow trespass does not exceed approximately 1-2 meters. No other significant shadows are observed.
- Shadows cast from the site of the subject property: The existing two single family dwellings on the subject property are not observed to cast any shadows beyond the subject property limits at this time of year.

3.2 Shadow Study: Post-Development

POST DEVELOPMENT: (8-STOREY MODEL) ANALYSING THE IMPACT OF THE SHADOW OF NEW RESIDENTIAL BUILDING ON THE PROPERTIES SURROUNDING THE PROPOSED DEVELOPMENT.

3.2.1 Summer Shadows: June 21st

A summary of the summer shadow impact of the proposed development upon the subject property and surrounding area is as follows:

The morning sun rises at approximately 5:38 am

3.2.1A 10:00am (see Appendix 1, Page 1, drawing 1)
The shadow length is approximately 21 metres
Altitude 55.5 degrees, Azimuth 113.1 degrees

At this time, the shadow extends beyond the subject property by approximately 5 meters to the west, resulting in west side road being 1/5th shaded for approximately half of the length fronting the subject development.

Likewise, the shadow will extend beyond the subject property by approximately 3 meters to the north, resulting in the extension to Franklin Avenue being approximately 1/5th shaded for approximately ¼ of the length fronting the subject development.

At this time, no shadows cast beyond the subject property to the South and East.

At this time, no shadows cast onto any adjacent private properties in any direction.

3.2.1B 12:00pm (see Appendix 1, Page 1, drawing 2)
The shadow length is approximately 10 metres
Altitude 70.2 degrees, Azimuth 167.4 degrees.

At this time, the shadow will extend beyond the subject property by approximately 3 meters to the north, resulting in the extension to Franklin Avenue being approximately 1/5th shaded for approximately 1/5 of the length fronting the subject development.

At this time, no shadows cast beyond the subject property to the South, East and West.

At this time, no shadows cast onto any adjacent private properties in any direction.

3.2.1C 2:00pm (see Appendix 1, page 1, drawings 3)
The shadow length is approximately 13 metres
Altitude 61.4 degrees, Azimuth 235.2 degrees.

At this time, the shadow will extend beyond the subject property by approximately 10 meters to the east, resulting in the unopened road allowance being approximately half shaded for approximately 1/4 of the length fronting the subject development.

At this time, no shadows cast beyond the subject property to the North, South, and West.

At this time, no shadows cast onto any adjacent private properties in any direction.

3.2.1D 4:00pm (see Appendix 1, page 1, drawings 4)
The shadow length is approximately 35 metres
Altitude 40.7 degrees, Azimuth 265.2 degrees.

At this time of day the sun is descending below mid-way point in the sky.

At this time, the shadow will extend beyond the subject property by approximately 32 meters to the east, resulting in the unopened road allowance being entirely shaded for approximately 1/4 of the length fronting the subject development. The remaining ¾ of the unopened road allowance fronting the development will not be shaded by the proposed building. The shadow also extends onto 2 residential lots located to the east of the unopened road allowance by approximately 10 meters and will shade approximately 15% of the back yard of the residence at 17 Woodside Drive, and approximately less than 1% of the back yard of the residence at 21 woodside drive. At this time the shadow does not reach the houses at these addresses.

At this time, no shadows cast beyond the subject property to the North, South, and West.

The sun sets at 8:59 pm

3.2.2 Fall Shadows: September 21st

A summary of the Fall shadow impact of the proposed development upon the subject property and surrounding area is as follows:

The sun rises at approximately 7:04am

3.2.2A 10:00am (see Appendix 1, page 1, drawings 5)
The shadow length is approximately 28 metres
Altitude 38.9 degrees, Azimuth 136.3 degrees.

At this time, the shadow extends beyond the subject property by approximately 10 meters to the west, resulting in west side road being 2/5th shaded for approximately half of the length fronting the subject development.

Likewise, the shadow will extend beyond the subject property by approximately 22 meters to the north, resulting in the extension to Franklin Avenue being approximately entirely shaded for approximately half of the length fronting the subject development. The shadow also extend onto one property to the north of the extension to Franklin Avenue by approximately 2 meters and is observed to shade approximately less than 1% of the property.

No shadows cast beyond the subject property to the South and East.

3.2.2B 12:00pm (see Appendix 1, page 1, drawings 6)
The shadow length is approximately 27 metres
Altitude 47.9 degrees, Azimuth 176.2 degrees.

At this time, the shadow will extend beyond the subject property by approximately 22 meters to the north, resulting in the extension to Franklin Avenue being entirely shaded for approximately 1/3 of the length fronting the subject development. The shadow also extend onto one property to the north of the extension to Franklin Avenue by approximately 2 meters and is observed to shade approximately less than 1% of the property.

At this time, no shadows cast beyond the subject property to the South, East and West.

3.2.2C 2:00pm (see Appendix 1, page 1, drawings 7)
The shadow length is approximately 28 metres
Altitude 41.3 degrees, Azimuth 217.9 degrees.

At this time, the shadow will extend beyond the subject property by approximately 12 meters to the north, resulting in the extension to Franklin Avenue being approximately 2/3rd shaded for approximately 1/3rd of the length fronting the development.

Likewise, the shadow will extend beyond the subject property by approximately 17 meters to the east, resulting in the unopened road allowance being approximately 4/5th shaded for approximately 1/3 of the length fronting the subject development.

At this time, no shadows cast beyond the subject property to the South and West.

At this time, no shadows cast onto any adjacent private properties in any direction.

3.2.2C 4:00pm (see Appendix 1, page 1, drawings 8)
The shadow length is approximately 75 metres
Altitude 23.9 degrees, Azimuth 247.2 degrees.

At this time of day the sun is descending below mid-way point in the sky.

The shadow will extend beyond the subject property by approximately 69 meters to the east, resulting in the extension the unopened road allowance being entirely shaded for approximately 1/2rd of the length fronting the development. The shadow also extends onto 2 residential lots located to the east of the unopened road allowance by approximately 39 meters and will shade approximately 60% of the back yard of the residence at 21 Woodside Drive, and approximately less than 5% of the back yard of the residence at 17 woodside drive. At this time the shadow does not reach the houses at these addresses.

At this time, no shadows cast beyond the subject property to the North, South and West.

The sun sets at 7:15pm

4.0 Shadow Impact

Summary of Impact by the proposed 8-storey development.

4.1 The shadows cast from this proposed development are larger in the Fall (September 21st) than in the Summer (June 21st):

- In the fall, the shadow is on average 100% larger than the average shadow in the summer. The shadow casts on average 39.5m in the fall, compared to an average of 19.75m in the summer, based on the 4 times of day measured in this study.
- The affect will be in the morning, afternoon, and evening.
- As the shadow sweeps across the neighbouring properties and roadways, the roadways immediately adjacent to the proposed development are most affected, and as the distance from the proposed development increases, the duration for which the neighbouring property is shaded decreases;
- During the periods measured, the Shadows only affect 2 residential properties which are located on Woodside Drive. The shadows have very little impact on the two subject

residential properties (measured by % shaded). The Shadows do not reach the dwellings on the 2 residential properties during the periods measured.

- The Shadows are mostly limited to West Side Road, the extension of Franklin ave, and the unopened road allowance to the east.

4.2 The shadows cast from this proposed development during the Summer:

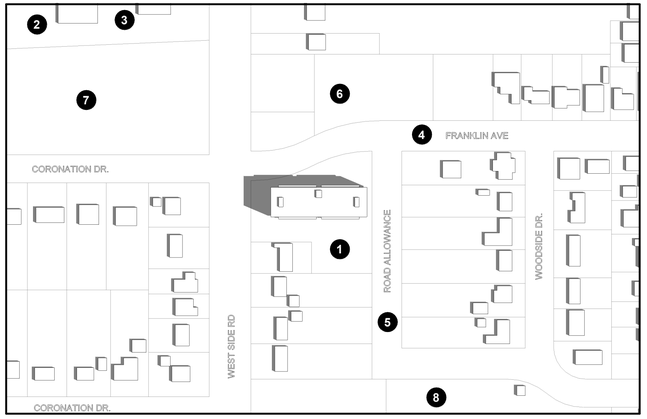
- Shadows during the summer are much smaller and less impactful.
- Shadows during the summer do not reach any private properties to the North, West and South, and do not have substantial impact to the properties to the East – in the summer at the time measured in the study.

4.3 General Comment Regarding Buffers surrounding a Building:

- The properties to the north are buffered by a 6m-24m setback within the subject property which includes trees. The properties are further separated by the width of the future extension to Franklin Ave.
- The properties to the East are buffered by a 3.8m setback within the subject property which includes trees. The properties are further separated by the width of the unopened road allowance to the east of the subject property. The two affected residential lots to the east (Woodside Drive) are deep lots, with the dwellings positioned further away from the impacted area, resulting in an additional separation from the shadowed area and lessening the impact.
- The properties to the West are buffered by a 14m setback within the subject property which includes trees. The properties are further separated by West Side Road. Very little shadows cast beyond these two buffers/separations.
- The properties to the south are buffered by a 16m setback within the subject property which includes trees. These properties are not impacted by shadows as they are located south of the subject property and shadows are generally cast north, east, and west.

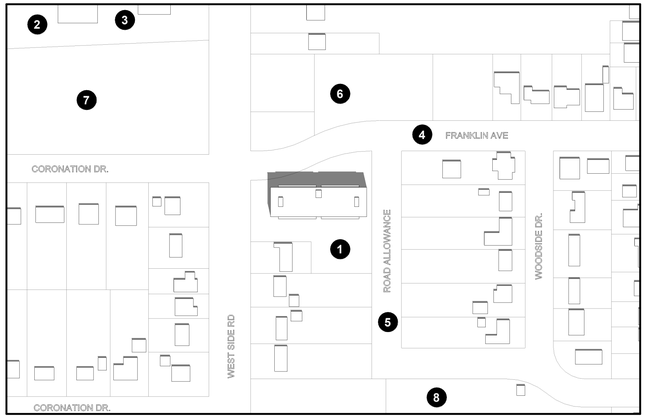
Should you have any questions regarding this report, please feel free to contact Quartek Group Inc.

Matthew Trendota, OAA



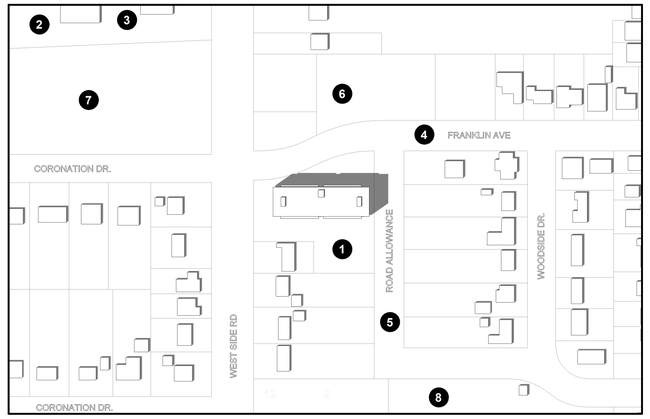
1 ASK-1 June 21 at 10am

Technical Data: Altitude 55.5 degrees, Azimuth 113.1 degrees



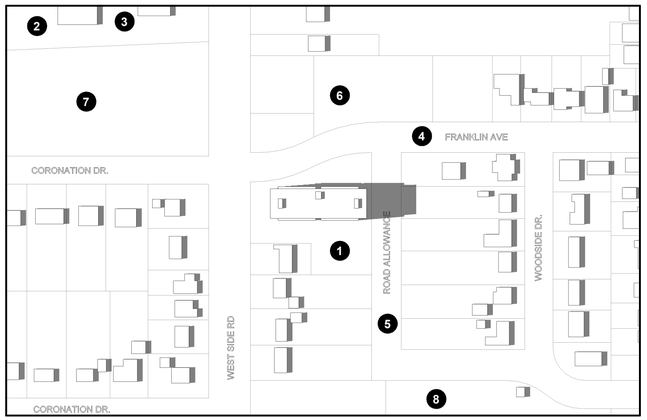
2 ASK-1 June 21 at 12pm

Technical Data: Altitude 70.2 degrees, Azimuth 167.4 degrees.



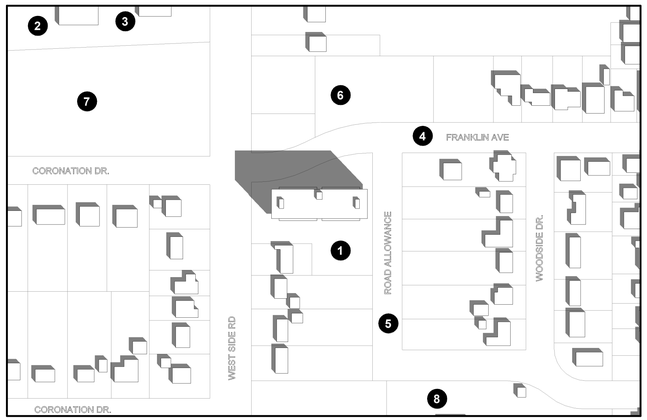
3 ASK-1 June 21 at 2pm

Technical Data: Altitude 61.4 degrees, Azimuth 235.2 degrees.



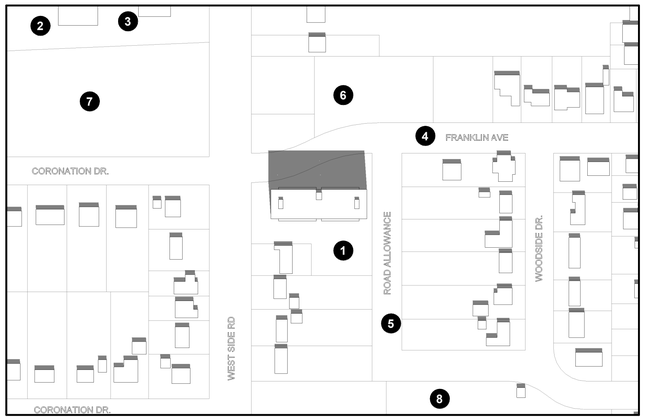
4 ASK-1 June 21 at 4pm

Technical Data: Altitude 40.7 degrees, Azimuth 265.2 degrees.



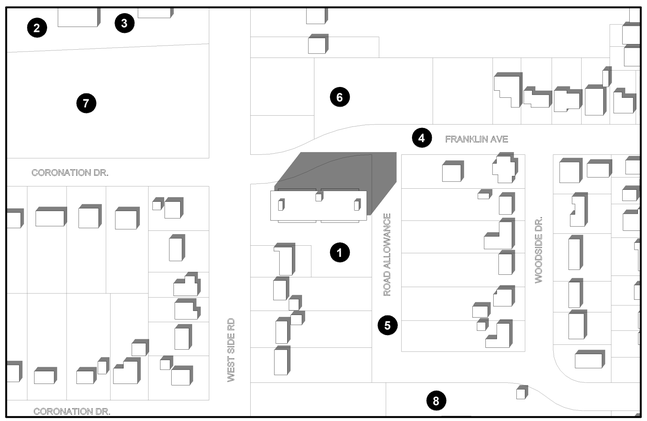
5 ASK-1 September 21 at 10am

Technical Data: Altitude 38.9 degrees, Azimuth 136.3 degrees.



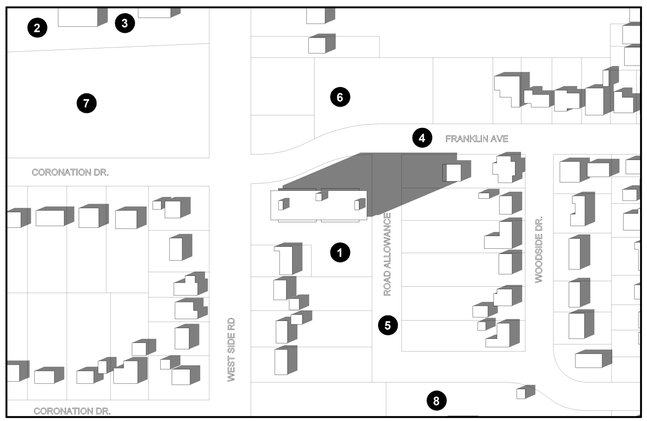
6 ASK-1 September 21 at 12pm

Technical Data: Altitude 47.9 degrees, Azimuth 176.2 degrees.



7 ASK-1 September 21 at 2pm

Technical Data: Altitude 41.3 degrees, Azimuth 217.9 degrees



8 ASK-1 September 21 at 4pm

Technical Data: Altitude 23.9 degrees, Azimuth 247.2 degrees.

SHADOW STUDY LEGEND

1. PROJECT SITE: 242 WEST SIDE RD
2. PORT COLBORNE MALL
3. TIM HORTONS
4. EXTENSION OF FRANKLIN AVE
5. UNOPENED ROAD ALLOWANCE
6. FUTURE CONCURENT DEVELOPMENT ON FRANKLIN AVE (BY OTHER DEVELOPER)
7. FUTURE DEVELOPMENT: WEST SIDE RD (BY OTHER DEVELOPER)
8. OAKWOOD PUBLIC SCHOOL YARD

TECHNICAL DATA

LOCATION: 242 WEST SIDE ROAD, PORT COLBORNE, ONTARIO, CANADA

LONGITUDE AND LATTITUDE: 42.8865 DEGREES NORTH, 79.2509 DEGREES WEST

N

Issue	Issued for	Date	Init.
B	FOR ZBA/OPA	27MAR2024	MT
A	For Coord	18MAR2024	MT

Seal

Do not scale drawings. Report any discrepancies to Quartek Group Inc. before proceeding.

Drawings must be sealed by the Architect and / or Engineer prior to the use for any building permit applications and / or government approval. Seals must be signed by the Architect and / or Engineer before drawings are used for any construction.

All construction to be in accordance with the current Ontario Building Code and all applicable Ontario regulations.

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Project Title

WEST SIDE ROAD
INFILL LOFTS
242 WEST SIDE ROAD
PORT COLBORNE, ON

Drawing Title

SHADOW STUDY

Drawn	Designed by
MT	MT

Scale	Date Created
	18 MAR 2024

Job Number	Issue
22138	B

Drawing Number

ASK-1

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