



Planning and Land Use Committee Report For the Meeting of January 14, 2015

To: Planning and Land Use Committee **Date:** December 18, 2015
From: Jonathan Tinney, Director, Sustainable Planning and Community Development
Subject: Development Permit Application No. 000445 for 845 Yates Street

RECOMMENDATION

Staff recommend that Committee forward this report to Council and that Council consider the following motion:

"That Council authorize the issuance of Development Permit Application No. 000445 for 845 Yates Street, subject to registration of a legal agreement securing a maintenance schedule for the mural to the satisfaction of staff, in accordance with:

1. Plans date stamped November 5, 2015.
2. Development meeting all *Zoning Regulation Bylaw* requirements.
3. The Development Permit lapsing two years from the date of this resolution."

LEGISLATIVE AUTHORITY

In accordance with Section 920(2) of the *Local Government Act*, Council may issue a Development Permit in accordance with the applicable guidelines specified in the Community Plan. A Development Permit may vary or supplement the *Zoning Regulation Bylaw* but may not vary the use or density of the land from that specified in the Bylaw.

Pursuant to Section 920(8) of the *Local Government Act*, where the purpose of the designation is the revitalization of an area in which a commercial use is permitted, a Development Permit may include requirements respecting the character of the development, including landscaping, siting, form, exterior design and finish of buildings and other structures.

EXECUTIVE SUMMARY

The purpose of this report is to present Council with information, analysis and recommendations for a Development Permit Application for the property located at 845 Yates Street (The Wave). The proposal is to replace the existing ceramic tile mosaic with a painted mural and replace a portion of the thin stone cladding with paint. There are no variances related to this Application.

The following points were considered in assessing this Application:

- the property is subject to regulations under Development Permit Area 2 (HC) Core Business and is generally consistent with the applicable Design Guidelines in the *Official Community Plan* (OCP) and the *Downtown Core Area Plan* (DCAP)
- the proposed painted mural would be subject to a maintenance agreement that would be secured through a Section 219 Covenant.

BACKGROUND

Description of Proposal

The proposal is to replace the existing ceramic tile mosaic with a painted mural and replace a portion of the thin stone cladding with paint. Specific details include:

- removal of the existing ceramic tile and replacing it with a painted mural consisting of a 10cm x 10cm square grid
- removal of the thin stone cladding on the east elevation and a portion on the north elevation facing the concrete stair enclosure and replacing this with painted concrete of a similar colour in neutral grey
- a maintenance plan to ensure the appearance of the mural indefinitely.

Sustainability Features

The applicant has not identified any sustainability features associated with this proposal.

Active Transportation Impacts

The applicant has not identified any active transportation impacts associated with this Application.

Public Realm Improvements

No public realm improvements are proposed in association with this Development Permit Application.

Existing Site Development and Development Potential

The site is presently occupied by an existing 13-storey building with ground-floor commercial and residential above.

Relevant History

On September 18, 2003, Council approved a Rezoning Application for the property to permit the land to be developed as a residential building and, on November 27, 2003, Council authorized the issuance of a Development Permit for the same property. The approved motion noted that "Final Plans be in accordance with plans identified above with responses to Advisory Design Panel's (ADP) recommendations to the satisfaction of the Director of Planning and Development." A mosaic was proposed as part of the ADP review process as a way of animating the east-facing wall. A mosaic colour palette, dated-stamped September 2, 2004, for consideration by Advisory Design Panel, showed eight colours associated with the wave design.

In 2011, some of the quartzite stone and ceramic tile that was installed on the east elevation of the exit stair tower became detached and fell off the building face. A report by RDH Building Engineering Ltd. recommended that the complete removal of the tile finish from the second floor to the roof was necessary.

At its regular meeting of April 17, 2014, the Planning and Land Use Committee (PLUC) considered Development Permit Application No. 000347 for 845 Yates Street (attached) and discussed whether a painted mural was an appropriate substitute for the tile. At that time Council passed the following motion:

That Committee recommends that Council postpone consideration of the motion until the applicant provides more information on the need for replacement of the tiling.

This information was provided by RDH Engineering and was presented to the PLUC in a subsequent report dated May 22, 2014 (attached). At the PLUC meeting of June 5, 2014, it was moved that Council decline the approval of Development Permit Application No. 000347 with a request that the tile be reinstalled in a way that will be long lasting and durable.

Community Consultation

The Application does not include variances, therefore, consistent with the Community Association Land Use Committee (CALUC) procedures related to development applications, it was not circulated to the Downtown Residents Association for comment.

ANALYSIS

Development Permit Area and Design Guidelines

The *Official Community Plan* (OCP) identifies this property within Development Permit Area 2 (HC), Core Business. One of the objectives of this designation is to enhance the area through high-quality architecture, landscape and urban design. While the replacement of the tile with a painted mural may be considered to be of a lower-quality material, the inclusion of a maintenance agreement would ensure the mural retains its appearance indefinitely. The proposal is therefore considered to be consistent with the applicable Design Guidelines.

Downtown Core Area Plan

With respect to local area plans, the *Downtown Core Area Plan, 2011* (DCAP) applies to the subject site. Within the DCAP, the subject property is identified in the Central Business District. There are no specific objectives that relate to the visual appearance of buildings within this district other than scale and character. However, there are general guidelines that encourage high-quality architecture and urban design.

Appearance of the Proposed Wave Image

While the proposed work employs a different medium and approach in representing the wave image, it is considered that the location of the image lends itself more appropriately to distant views. Therefore, the resulting visual effect of using a different material for the image will not be significant.

The proposed grid is consistent with the existing tiles at 10cm x 10cm squares which will result in minimal differences in how the mural is viewed from its current form. In addition, the colour

palette has been carefully selected using sample tiles of each of the eight tile colours in the existing mural. While an exact match may not be achieved, the applicant has committed to employing colour matching technology to ensure the proposed paint is as close as realistically possible to the original tiles. The proposed painted mural would therefore result in a minimal change to how the mural will be viewed from afar and provides sufficient visual interest to the east elevation of the building.

Durability and Resulting Maintenance of a Painted Finish

As detailed in the applicant's letter, dated November 5, 2015, a methodology is proposed to ensure a high-quality paint application followed by a step-by-step maintenance program based on the Master Painters Institute (MPI) guidelines and specifications. This includes removing the existing tile, stone and mortar, grinding the mortar off the concrete surface and cleaning this prior to the paint application. This would then be followed by one coat of water based primer, two coats of colour exterior acrylic latex and a UV resistant clear protective coating. A comprehensive grid system is proposed in the engineering drawings that follows the "paint by number" approach in the 10cm² grid pattern.

It is understood that the proposed painted finish would have a life expectancy of approximately 10 years under favourable conditions. While the life expectancy of an effectively applied tile finish would be in the order of 25 to 30 years, ongoing maintenance and re-application of the painted finish will be the responsibility of the building's strata corporation. The condition of a painted mural is entirely dependent on the successful maintenance over time. The applicant has detailed proposed maintenance procedures at increments of two, seven and 20 years. Staff are recommending this maintenance program be secured through a Section 219 Covenant. The applicant is amenable to entering into this agreement.

CONCLUSIONS

The resulting visual effect of using a painted grid versus a tile mosaic for the image would not be significant, especially given the size of the grid being consistent with the existing wave mural. In addition, the Section 219 Covenant for the maintenance agreement would ensure the condition of the mural keeps its appearance indefinitely. Staff, therefore, recommend for Council's consideration that Development Permit No. 000445, be approved subject to the applicant entering into a legal agreement to secure the maintenance of the painted mural.

ALTERNATE MOTION

That Council decline Development Permit Application No. 000445 for the property located at 845 Yates Street.

Respectfully submitted,



Charlotte Wain
Senior Planner – Urban Design
Development Services Division



Jonathan Tinney, Director
Sustainable Planning and Community
Development Department

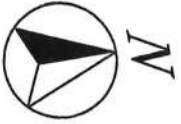
Report accepted and recommended by the City Manager:



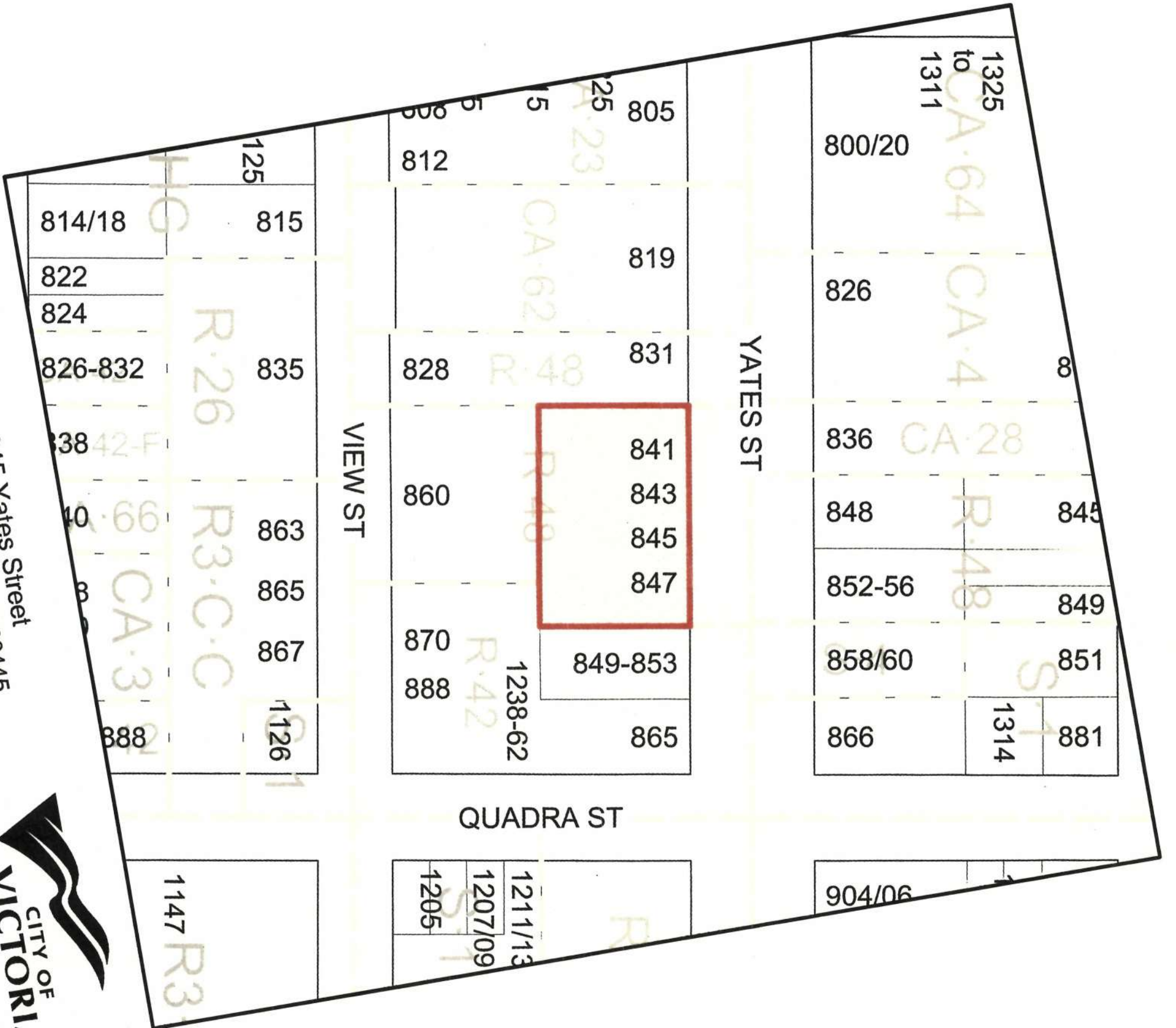
Date: December 29, 2015

List of Attachments

- Subject map
- Aerial map
- Staff report for Development Permit Application No. 03-30B dated November 14, 2003
- Staff report for Development Permit Application No. 000347 dated April 3, 2014
- Update staff report for Development Permit Application #000347 dated May 22, 2014
- Applicant letter dated November 5, 2015
- Engineering plans dated November 5, 2015
- *RDH Building Engineering Ltd. Performance Review of Tile and Adhered Thin Stone* dated January 20, 2012.



845 Yates Street
Development Permit #000445





845 Yates Street
Development Permit #000445



Committee of the Whole Report



Date: November 14, 2003
To: Mayor and Council
From: Mickey Lam, Head Urban Design
Department: Planning & Development
837– 847 Yates St.
Development Permit 03-30B
Subject: Application of de Hoog & Kierulf Architects
W. 40' of Lot 322 and Lot 1, Plan VIP65204
Zoning: R-48 (pending – under rezoning)
Proposed 13 storey residential condominiums

1.0 Executive Summary:

At its meeting on September 18, 2003, Council approved the rezoning application for 837 – 847 Yates St. but referred the Development Permit application to Committee of the Whole.

The applicant has since submitted a revised proposal and a letter dated November 7, 2003 (copy appended) describing the improvements in response to comments provided by Council, neighbours and the Advisory Design Panel. The main changes to the previous proposal include:

- Reduction of number of units from 104 to 97.
- The 10-storey building wing along the Yates St. frontage is reduced to 9-storeys. The 13-storey wing is maintained with adjusted siting.
- For the 13-storey wing, setbacks on the south, east and north (Yates St.) property lines have been increased. Further setbacks on upper floors are also provided.
- Increase in setback of the 9-storey wing along Yates St. provides additional landscaped area in front of the retail ground floor.

The previous proposal was reviewed by Advisory Design Panel on July 23, 2003 and recommended for approval subject to review by Advisory Design panel prior to Building Permit stage. (See Section 3.5)

The applicant has by letter dated October November 7, 2003 (copy appended) requested variances on height and build-to-line distance. The requested variances for height and build-to-lines are supported. (see Section 3.4)

The Development Permit application is not subject to a notification requirement and a hearing.

2.0 Recommendations:

That Council authorize the issuance of a Development Permit in accordance with:

1. Plans stamped "Development Permit Application 03-30B" dated November 7, 2003.
2. Development meeting all bylaw requirements with the following variances:
 - Section 3.67.5(2) Relax height from 30m to 44.2m and relax number of storeys from 10 to 13.
 - Section 3.67.6(a) Relaxation of build-to-line distance for percentage of wall face.
 - Section 3.67.6(b) Relaxation of build-to-line for non-residential use from 0.5m to 0.8m
3. Review by Advisory Design Panel prior to Building Permit stage.

4. Final plans to be in accordance with plans identified above with responses to Advisory Design Panel's recommendations to the satisfaction of the Director of Planning & Development.

Respectfully submitted,



Mickey Lam, Head
Planning & Development



John R. Basey, Director
Planning & Development

3.0 Background / Analysis

- 3.1 As the site lies within the Development Permit Area 8 (Harris Green), Council's approval is required for the exterior design, finishes and landscaping of the development.
- 3.2 The amended application is for a Development Permit to construct a 13-storey residential condominium building with street frontage retail/café uses at 837-847 Yates St. replacing the existing single storey commercial buildings, car sale lot and surface parking. The 97 units proposed are arranged in an L-shape consisting of 2 tower blocks with heights of 9 and 13-storeys. The 2 blocks are joined with a glazed lobby on each floor from the bottom to the top. The arrangement frees up space for a south and west facing courtyard. Underground parking is provided with access from Yates St.
- 3.3 Materials include painted concrete, perforated and corrugated aluminum panels, glass and aluminum handrails and aluminum windows.
- 3.4 Staff have reviewed the proposal and have no objection. Staff also made the following comments:

The height variance is supportable given the rationale provided by the applicant:

- Extra floor heights for retail and residential units that adds to quality and livability of the proposal.
- The building massing of a linked 9 storey and 13 storey building blocks allow the creation of a landscaped private courtyard on the south (rear) and a public forecourts and landscaped areas on the Yates St. frontage.
- Impact of the extra height is lessened given that only the narrow end of the block faces the street.

The build-to-line variance is also supportable given the creation of the landscape forecourts along the street frontage as a result. The objective is consistent with the Harris Green Urban Design Guidelines.

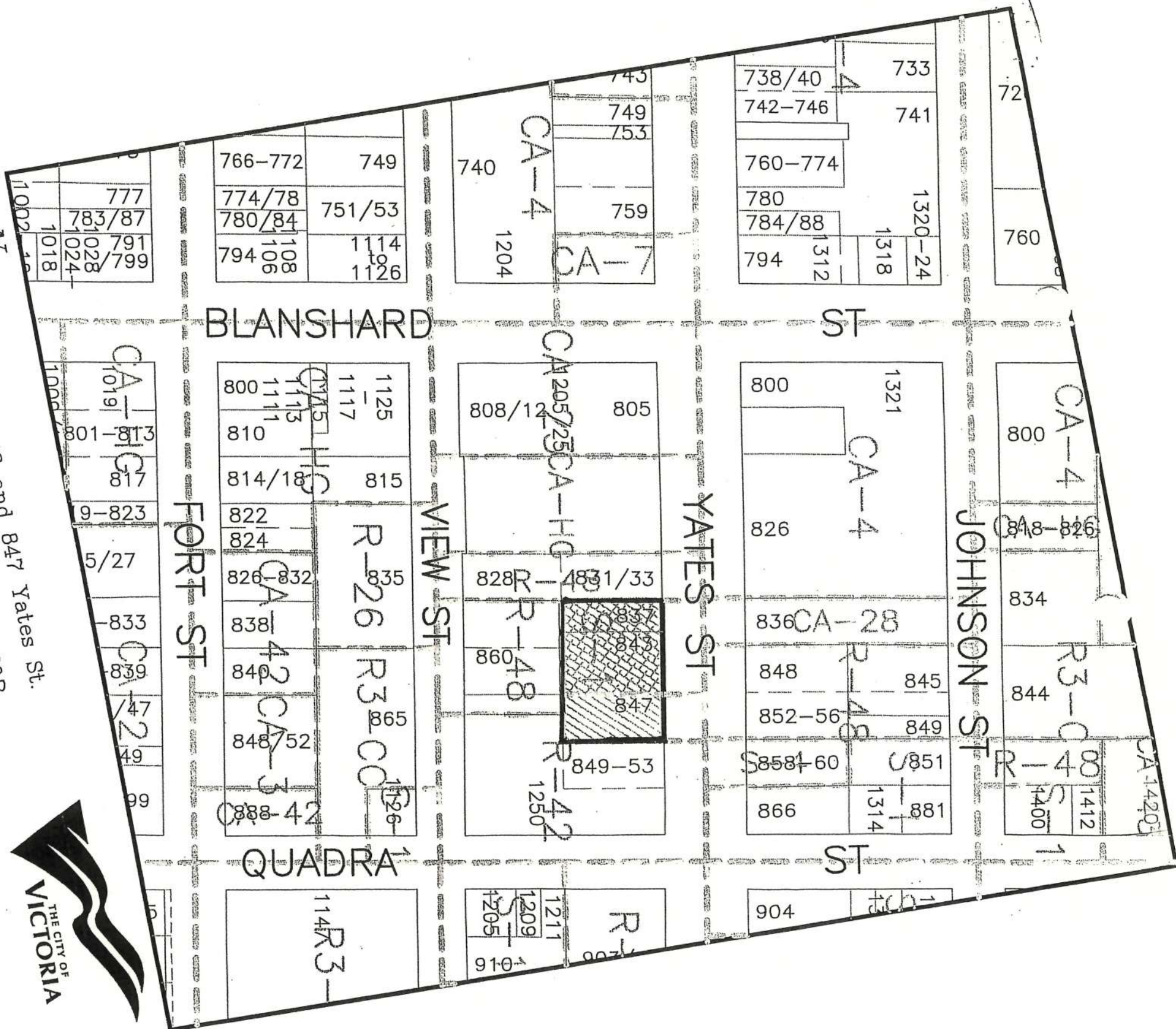
- 3.5 The Advisory Design Panel at its meeting of July 23, 2003 reviewed the proposal and recommended its approval subject to review by the Advisory Design Panel prior to Building Permit stage.

The Panel also commented that:

1. The applicant should reconsider the east elevation to provide more architectural detail.
2. The landscaping should be more contemporary in design to coordinate with the building design.

c. Applicant

Neighbourhood





07 November 2003

Mayor and Members of Council
City of Victoria
#1 Centennial Square
Victoria, BC
V8W 1P6

Re: Rezoning Application, 837 - 843 Yates Street

Your Worship and Members of Council:

On behalf of our client, Mr. Austin Hamilton, we are pleased to submit this application for a development permit for the above named property.

Council recently approved a rezoning of several of the lots from S-1 Service Commercial, to R-48 Harris Green, but the Development Permit application associated with that rezoning was declined. That application was reviewed by and received Design Panel approval in July.

This application shows the revised redevelopment. The following summarizes the significant modifications that have been made to the previous submission:

1. Building height

The original submission showed the building at two different heights: the east wing at 13 storeys and the north wing at 10 storeys with a total of 104 units. Our revised submission shows east wing unchanged but the north wing reduced to 9 storeys. The total unit count is now 97. This compares to a unit count of 96 if both wings were kept to the allowable 10 storey maximum building height.

2. Setbacks

Setbacks from property lines have been increased on three sides of the project.



- a. South property line setback has been increased to 3.2 m from 2.5 m.
- b. East property line setbacks have been increased to 2.4 m (stairwell) and 5.0 m (upper floors) from 1.8 m (stairwell) and 3.8 m (upper floors).
- c. North (Yates Street) property line setbacks have been increased along the retail frontage to .8 m and 2.6m at the new planters. The upper floors (2nd to 7th) of the north wing have been set back 3.5 m (from 1.8m) with the 8th and 9th floors having an increased setback to 5.0m.

3. Yates Street Landscaping

In order to accommodate some landscaping elements on the Yates Street frontage, the north wing of the building was set back an additional 2.3m. This change has resulted in the creation of three significantly scaled landscaped areas, one at the east end, one by the residential entry and one beside the parking ramp. These planters measure approximately 5m x 2.5m and are designed to have adequate soil (min. 0.9m depth) to accommodate significant planting. These planters will be below grade to ensure that the soil will be at the level of adjacent sidewalk grades.

The main objective of the design is to create a high quality residential apartment building that maximize the light and view potentials of the apartment units and maximize the garden open space. We propose to construct an 'L' shaped building consisting of a thirteen storey wing along the east side and a 9 storey wing along Yates Street. This organization frees up a significant contiguous portion of the site for a garden courtyard on the south and west sides of the proposed building. Four two-storey townhouses with grade entries face onto the courtyard. The Yates Street frontage is dedicated to commercial use and as described above, will have significant landscape elements.

In order to maximize the size of the interior courtyard the two wings of the building have been kept as narrow as possible. The 13 storey east wing is 11.9 metres wide and has been set back sufficiently from the property lines to allow for generous windows to the apartment units. This wing has been set back 4.2 metres from Yates Street providing a street side patio that could become the forecourt of a future café. A tiled graphic image representing a stylized wave will be installed on the east-facing wall of the exit stair. This graphic element is approximately 15' wide x 45' high and will be visible to anyone approaching the city centre along Yates Street. The wall below the image will be clad in stone tile.

The 9-storey north wing is 18.6 metres wide. Joining the two wings is a glass fronted elevator lobby that rises the full height of the building. To accommodate the massing and setbacks of the St. Vincent de Paul building, the west end of the north wing has been set back 9.8m from the Yates Street property line.

The project envisions a total of 97 apartment and townhouse units. To maintain affordability, apartments have generally been kept small (500 sq.ft. for studios to 800 sq.ft. for one bedroom units). South facing penthouse units in the 9-storey wing have mezzanines that give access to rooftop patios.

Two levels of under building parking providing a total of 70 parking stalls as well as bicycle storage will support these apartment units. Access to parking will be provided by a ramp located at the existing sidewalk crossing at 837 Yates Street. There will be no surface parking in the project.

This application request several variances to the R-48 zone:

1. Build to Line:

R-48 requires that at least 75% of the building frontage be located 0.5 metres from the street frontage. Our proposal shows approximately 50% of the retail frontage is an average of 1.6m metres from the street and an additional 25% of the frontage is set back 4.5m to accommodate a landscaped forecourt. These setbacks are consistent with requirements in the Harris Green Neighbourhood Plan. As well, the Harris Green Charrette urban design guidelines recommends the creation of small landscaped public spaces with a minimum 3 m set back. The objective is to create small landscaped pockets of green open space to soften the impact of larger buildings.

2. Building Height:

R-48 limits a building height to 10 stories or 30 metres when the first storey is primarily retail. Our proposal shows two wings at different heights. The 9-storey wing is 30.2m high. The R-48 zone accommodates an average of 3 m per storey. The extra height in our proposal results from an over-height ground floor at 4.53m and an average floor to floor height of 3.05 m.

The 13-storey wing is 42.0 m high. This additional height is the result of transferring the available floor area from the 10th floor of the Yates Street wing. Our design is predicated on creating an interesting composition of building masses, one lower and wider set off by a taller narrower portion and connected by a transparent lobby. These masses then define the south facing private garden courtyard and public forecourt, which together account for 48% landscaped site open space. From an urban design perspective, we believe that the differential height of the two wings significantly improves the massing of the building, and with the addition of the graphic wave panels, greatly enhances the contribution to the Yates Street skyline.

The height of our proposed building is consistent with other recent developments in the neighbourhood:

- The Manhattan at 930 Yates Street is 15 storeys
- The Chelsea at 865 View Street is 12 Storeys
- The Metropolitan at 835 View Street is 13 Storeys

The proposed redevelopment reinforces a number of goals and objectives outlined in the Harris Green Neighbourhood Plan:

1. Goal 3.2.3: Encourage housing with ground oriented units (page 4).
 Objective 3.3 "Dwellings on the lower floors should be designed to offer the possibility of direct ground access from the unit."
 Objective 3.4 "Include "townhouse" units in large apartment projects."
2. The plan also indicates a preference for attractive landscaping or shop windows at street level rather than blank walls and wind tunnels.
3. Goal 5.2.4: Maximize variety of store fronts along sidewalks (Page 11)
 Objective 5.5 "Improve residential development viability by allowing a limited amount of non-residential uses catering to community needs."
4. Goal 6.2: Co-operate with existing businesses at ease the transition to residential- mixed use
 Objective 6.3.1 "Vacant industrial and services commercial sites are to be redeveloped for residential mixed use."
 Objective 6.3.2 "Relocate in more favourable locations, uses that re incompatible with high density residential areas."
5. Goal 7.2.3: Provide convenient parking and loading space for residents, businesses and handicapped individuals.
 Objective 7.3.4 "Encourage new developments to supply enough parking to meet all projected demands of residents and customers and to encourage new developments to supply bicycle facilities."
 Objective 7.3.6 "Minimize commuters' use of neighbourhood street parking."
6. Goal 9.2.1: Make the neighbourhood the "garder:" for Downtown with attractive private green space for residents and visitors.
 Goal 9.2.2: Provide a variety of private recreational facilities to meet resident needs for meetings games etc.
 Objective 9.3.2 "Establish at least one significant private green space in each block."
 Objective 9.3.4 "To free up maximum space for landscaping, most parking should be enclosed within the building..."

7. Goal 10.2.1: Strive for excellence in design of buildings, private landscaping and public space.

Goal 10.2.3: Create an attractive sidewalk environment.

Objective 10.3.5 "Design building frontage along sidewalks ... to maximize pedestrian convenience and interest and to 'open-up' the street level environment.

Objective 10.3.8 "Maintain a feeling of personal safety in the built environment."

The proposed development will make a strong positive contribution to the Harris Green neighbourhood. We have explored every opportunity to meet the goals and objectives of the Harris Green Plan. This development will create a significant mid-block open green space, while enhancing the public street frontage of the 800 Block Yates. We believe the variances requested are minor in nature and will significantly improve the design of the project.

We respectfully request your support for this application.

Sincerely,

A handwritten signature in black ink, appearing to read 'Peter de Hoog', with a stylized flourish at the end.

Peter de Hoog, MAIBC



**THE CITY OF
VICTORIA**

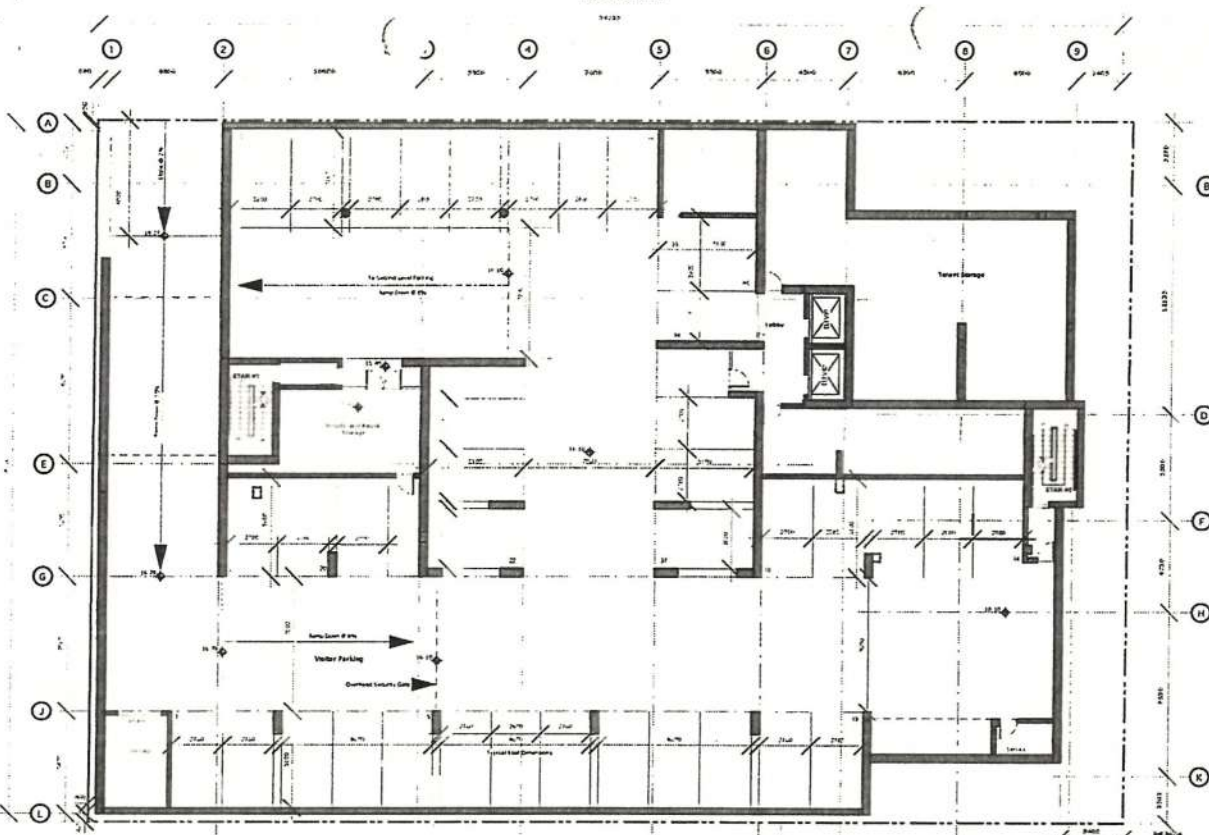
837, 843 and 847 Yates St.
Development Permit 03-30



 *the Wave*
837 - 847 Yates Street

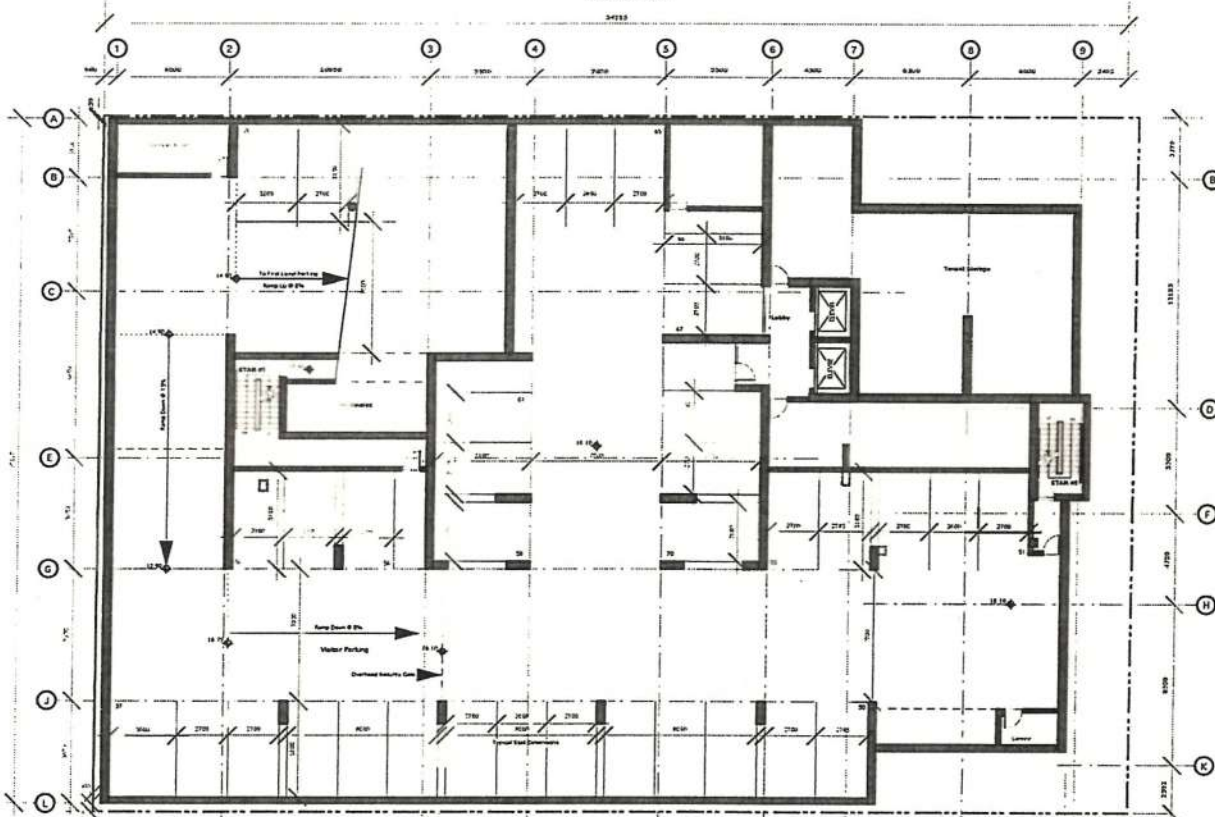
de Hoog & Klerulf architects
205 - 5325 Cordova Bay Road
Tel: 250.658.3367

YATES STREET



Parking Level One
Parking For 37 Cars

YATES STREET



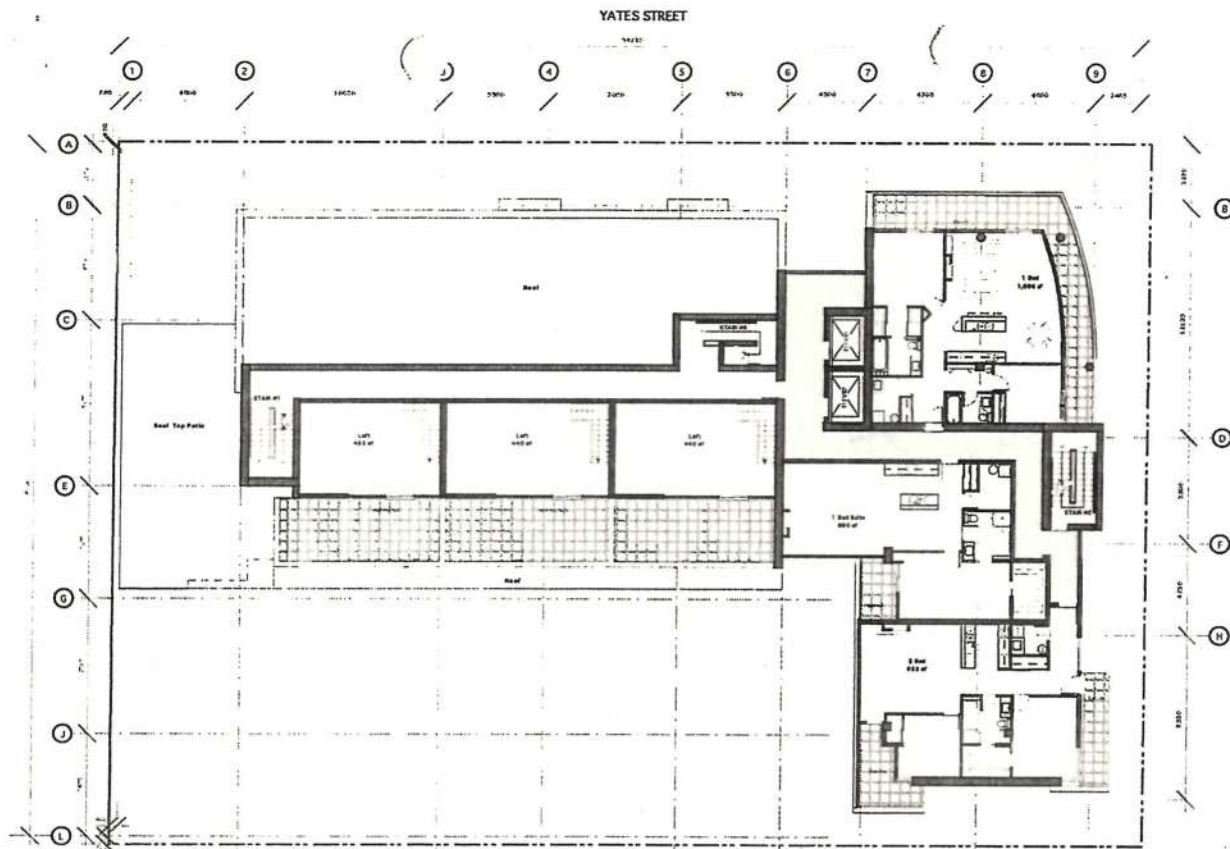
Parking Level Two
Parking For 34 Cars

1:100

November 05, 2003

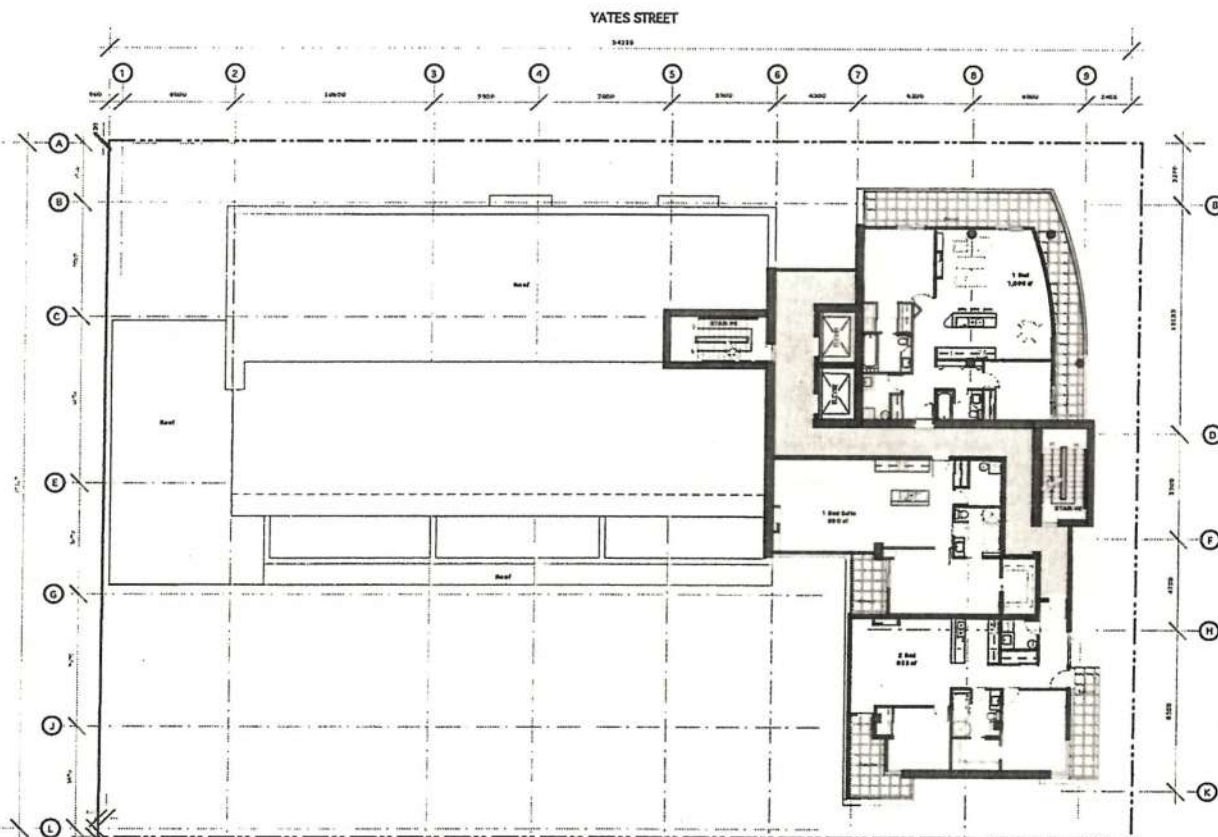
the Wave
837 - 847 Yates Street

de Hoog & Kierulf architects
205 - 5325 Cordova Bay Road Victoria B.C. V8Y 2L3
Tel: 250.658.3367 Fax: 250.658.3397



10th Floor Plan

Gross Floor Area: 604 (6,500 sf.)



11th - 13th Floor Plans

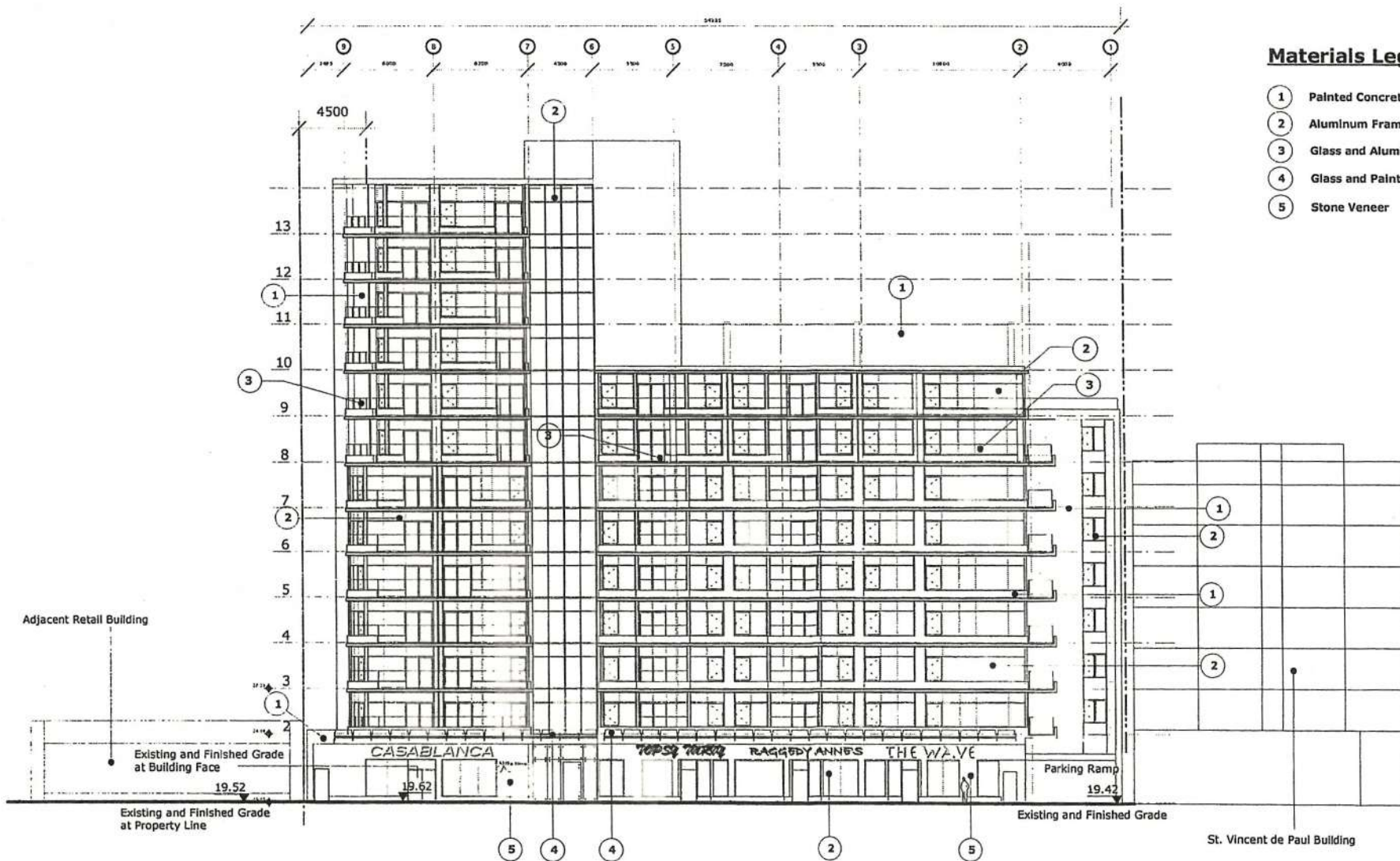
Gross Floor Area: 410 (4,413 sf.)

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November 05, 2003

the Wave
837 - 847 Yates Street

de Hoog & Kierulf architects
205 - 5325 Cordova Bay Road Victoria B.C. V8Y 2L3
Tel: 250.658.3367 Fax: 250.658.3397



Materials Legend:

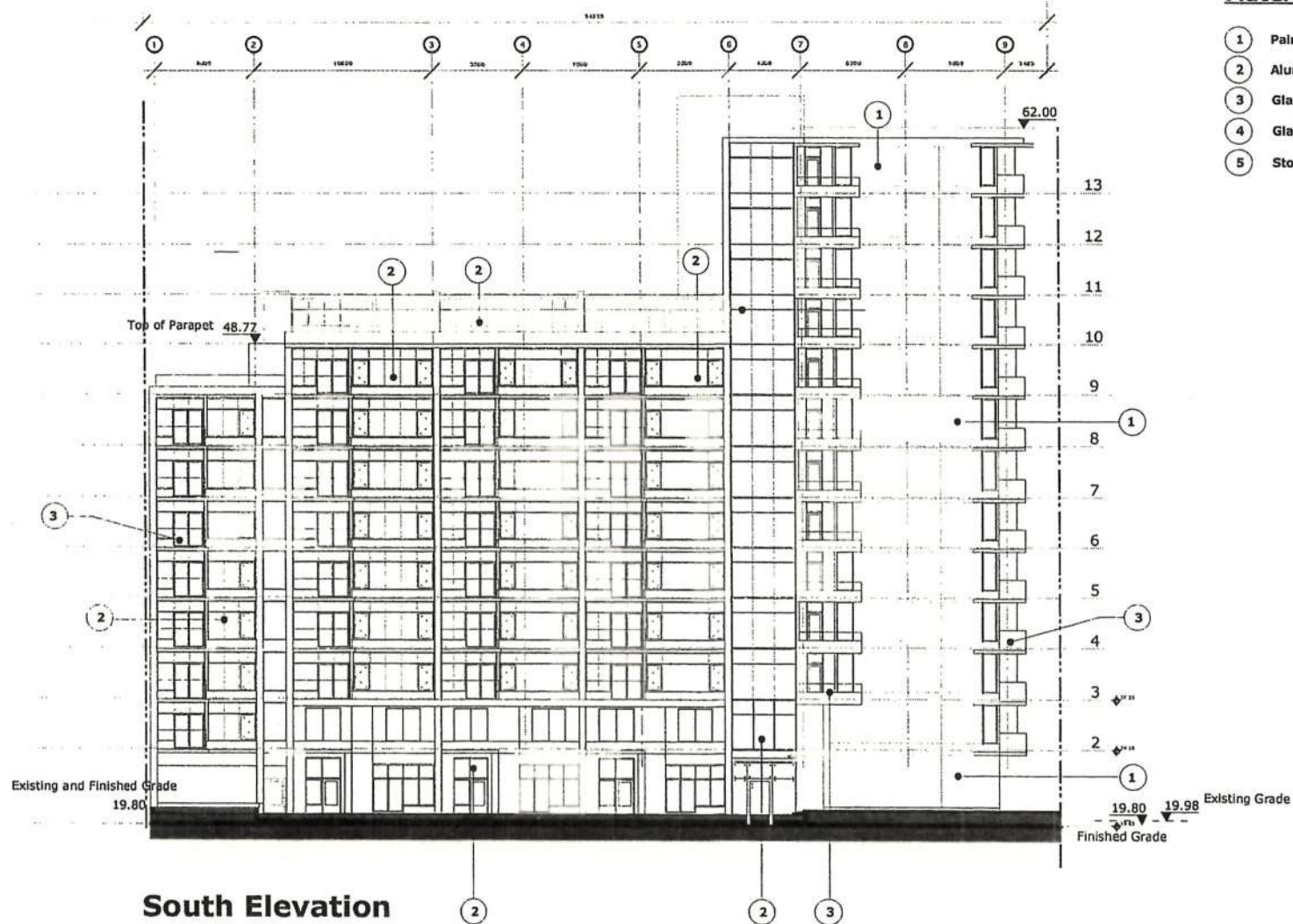
- ① Painted Concrete
- ② Aluminum Framed Windows
- ③ Glass and Aluminum Balcony Guards
- ④ Glass and Painted Steel Canopy
- ⑤ Stone Veneer

North Elevation

the Wave
837 - 847 Yates Street

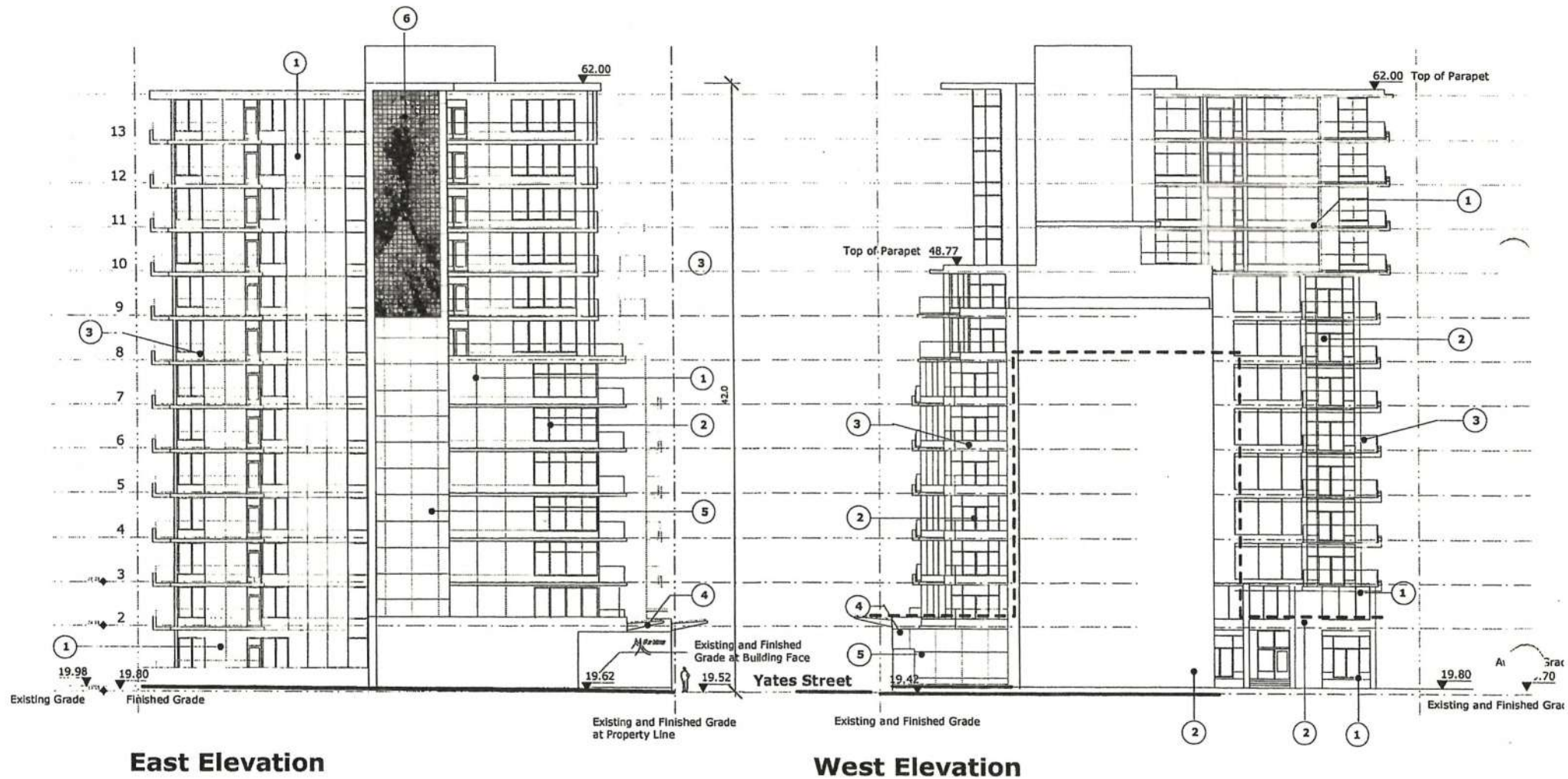
November 05, 2003

de Hoog & Kierulf architects
205 - 5325 Cordova Bay Road
Tel: 250.658.3367
Victoria B.C. V8Y 2L3
Fax: 250.658.3397



Materials Legend:

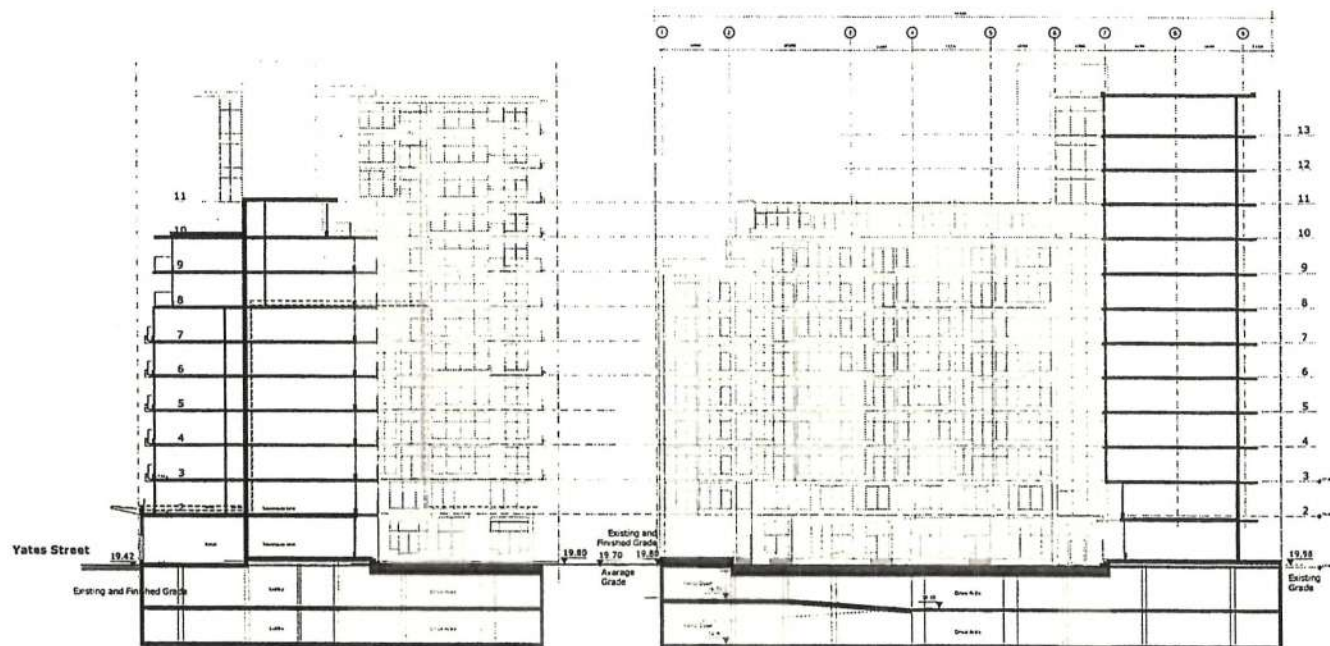
- ① Painted Concrete
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- ③ Glass and Aluminum Balcony Guards
- ④ Glass and Painted Steel Canopy
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the Wave
837 - 847 Yates Street

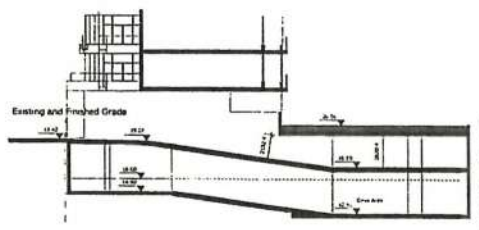
November 05, 2003

de Hoog & Kierulf architects
205 - 5325 Cordova Bay Road Victoria B.C. V8Y 2L3
Tel: 250.658.3367 Fax: 250.658.3397



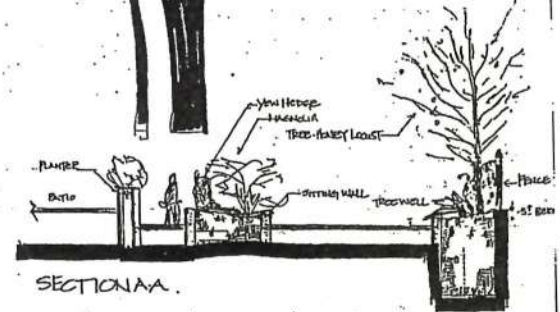
Section Through North Wing

Section Through East Wing



Section Through Parking Ramp

Sections



de Hoog & Kierulff architects

301 • 3301 Corbo's Bay Road Vieux-Québec, Q.C. G1R 2A3
Tél: 514.638.3107 Fax: 514.616.3197



Planning and Land Use Committee Report

Date: April 3, 2014

From: Murray G. Miller, Senior Planner

Subject: **Development Permit Application #000347 for 845 Yates Street**

Application to remove existing tile on the east elevation and apply a painted mural.

Executive Summary

The purpose of this report is to present Council with information, analysis and recommendations regarding a Development Permit Application for the property located at 845 Yates Street.

The proposal is to remove the existing wave mural (quartzite tiles) from the east elevation of the exit stair tower that extends from the second floor level up to the roof. The proposed exterior finish would instead consist of a painted mural to replace the existing wave image.

The key issues associated with this Application are the appearance of the proposed wave image that would likely result from the change in materials and the contemporary interpretation of the original image and the durability and resulting maintenance requirements of a painted finish. The subject property is within the DPA 2 (HC): Core Business Urban Place Designation and the Downtown and Harris Green Neighbourhood.

Staff recommends that Committee support this application subject to the applicant reducing the size of the proposed grid to be more representative of the existing grid.

Recommendation

That Council authorize the issuance of Development Permit #000347, subject to the applicant reducing the size of the proposed grid to the satisfaction of the Director of Sustainable Planning and Community Development.

Respectfully submitted,

Murray G. Miller
Senior Planner
Development Services

Deb Day, Director
Sustainable Planning and Community
Development Department

Report accepted and recommended by the City Manager:

Jason Johnson

Date: _____

MGM:aw

1.0 Purpose

The purpose of this report is to present Council with information, analysis and recommendations regarding a Development Permit Application for the property located at 845 Yates Street. The proposed exterior finish would consist of a painted mural finish, replacing the existing mosaic tile wave image.

2.0 Background

2.1 Description of Proposal

This proposal consists of the removal of the existing quartzite tile that extends from the second floor level up to the roof. The area of work would be within the narrow section of wall that forms the east elevation of the exit stair tower. The scope of work includes the repair and reconditioning of the existing concrete substrate prior to the application of a painted mural.

The proposed work would increase the colour pallet of the original design from eight to dozens of colours. It would also increase the grid size of the existing mural making the proposed grid approximately three times the size of the present design. The proposed mural will be an abstract contemporary interpretation of the present design. The balance of the wall that is not mural will be painted concrete.

2.5 Legal Description

Strata Lots 1-100 of Lots 318, 319 and 322, Victoria City, Strata Plan VIS6115 together with an interest in the common property in proportion to the unit entitlement of the Strata Lot as shown on Form V.

2.6 Relevant History

On September 18, 2003, Council adopted Bylaw No. 03-71 Zoning Regulation Bylaw, Amendment Bylaw (No. 673) to rezone land known as 837 and 843 Yates Street to the R-48 Zone, Harris Green District, to permit the land to be used for construction of a residential building of 10 and 13 storeys, with height and setback relaxations.

In September 2003, revisions to the design in response to Design Panel and Council requests were provided to Mayor and Council. Included in these changes was "a ceramic tile mosaic representing a stylized wave" to be installed on the east-facing wall of the exit stair.

On November 27, 2003, Council authorized the issuance of a Development Permit for 837-847 Yates Street in accordance with conditions, including Plans stamped "Development Permit Application #03-30B" dated November 7, 2003. The motion also noted that, "Final Plans be in accordance with plans identified above with responses to Advisory Design Panel's recommendations to the satisfaction of the Director of Planning and Development." A mosaic colour palette, dated-stamped September 2, 2004, for consideration by Advisory Design Panel, shows eight colours associated with the wave design.

In 2011, some of the quartzite stone and tile that was installed on the east elevation of the exit stair tower became detached and fell off the building face. A recent report by RDH Group has recommended that the complete removal of the tile finish from the second floor to the roof was necessary.

3.0 Issues

The key issues associated with this Application are:

- the appearance of the proposed wave image; and
- the durability and resulting maintenance requirements of a painted finish.

4.0 Analysis

4.1 Appearance of the Proposed Wave Image

While the proposed work employs a different medium and approach in representing the wave image, it is considered that the location of the image lends itself more appropriately to distant views. Therefore the resulting visual effect of using a different material for the image will not be significant.

The proposed increase in the size of the grid from 4" squares to 9" squares represents an increase in the grid size of 225%. This will have a considerable visual effect resulting from the intended abstract contemporary interpretation of the present design. The proposed increase in grid size in conjunction with an increase in the colour palette would considerably transform the recognizable image. While the intention of the proposed tile replacement is to ensure a durable finished product, the proposed increase in the grid size is not necessary to achieve this objective. Staff have discussed the possibility of reducing the grid size with the applicant and the applicant has indicated a strong preference to proceed with the 9" squares as reducing the grid size increases costs.

4.2 Durability and Resulting Maintenance of a Painted Finish

The proposed finish would be two coats of artist's paint and a clear top coat by Golden Paints. The surface preparation of a direct-adhered finish is understood to be critical in relation to its durability. According to the Application Information Sheet for Painting Exterior Murals prepared by Golden Artist Colours, a major coatings manufacturer, states that as much as 80% of all coating failures can be directly related to insufficient surface preparation. It is understood that the proposed painted finish would have a life expectancy of approximately ten years under favourable conditions. While the life expectancy of an effectively applied tile finish would be in the order of twenty-five to thirty years, ongoing maintenance and re-application of the painted finish will be the responsibility of the building's strata corporation.

6.0 Options

Option One (Recommended)

That Council authorize the Development Permit #000347, subject to the applicant reducing the size of the proposed grid to the satisfaction of the Director of Sustainable Planning and Community Development.

Option Two (Application as submitted)

That Council authorize the Development Permit #000347, as submitted.

Option Three (Decline)

That Council decline the application.

7.0 Conclusions

The resulting visual effect of using a painted grid versus a tile mosaic for the image will not be significant, however, the proposed increase in the size of the grid will likely have a considerable visual effect resulting from the contemporary interpretation of the existing wave mural. Staff therefore recommend that Council authorize Development Permit #000347, subject to the applicant reducing the size of the proposed grid to the satisfaction of the Director of Sustainable Planning and Community Development.

8.0 Recommendation

That Council authorize Development Permit #000347 for 845 Yates Street, subject to the applicant reducing the size of the proposed grid to the satisfaction of the Director of Sustainable Planning and Community Development.

9.0 List of Attachments

- Zoning map
- Aerial map
- Letters from applicant dated January 20, 2014, and March 18, 2014
- Plans stamped "Revised drawings Planning & Development DP #000347" dated March 19, 2014.



Planning and Land Use Committee Report

Date: May 22, 2014

From: Murray G. Miller, Senior Heritage Planner

Subject: **Development Permit Application #000347 for 845 Yates Street**

Application to remove existing tile on the east elevation and apply a painted mural.

Executive Summary

The purpose of this report is to present Council with updated information, analysis and recommendations regarding a Development Permit Application for the property located at 845 Yates Street. This report responds to the Planning and Land Use Committee (PLUC) motion of April 17, 2014 which was:

That Committee recommends that Council postpone consideration of the motion until the applicant provides more information on the need for replacement of the tiling.

The applicant has provided this information and while it is noted that technically tiles could be used in a new mosaic, the applicant's preferred approach is to remove the existing wave mural (quartzite tiles) from the east elevation and replace it with a painted mural.

The key issues associated with this Application are the appearance of the proposed wave image that would likely result from the change in materials and the contemporary interpretation of the original image and the durability and resulting maintenance requirements of a painted finish. The subject property is within the DPA 2 (HC): Core Business Urban Place Designation and the Downtown and Harris Green Neighbourhood.

Staff recommends that Committee support this application subject to the applicant reducing the size of the proposed grid to be more representative of the existing grid.

Recommendation

That Council authorize the issuance of Development Permit #000347, subject to the applicant reducing the size of the proposed grid to the satisfaction of the Director of Sustainable Planning and Community Development.

Respectfully submitted,

Murray G. Miller
Senior Heritage Planner
Community Planning

Deb Day, Director
Sustainable Planning and Community
Development Department

Report accepted and recommended by the City Manager:

Jason Johnson

Date: _____

MGM:aw

1.0 Purpose

The purpose of this report is to present Council with additional information regarding the reasons why the quartzite tile failed and outline specifications for materials that were considered by the applicant as potential substitutes for the tile.

2.0 Background

2.1 Description of Proposal

This proposal consists of the removal of the existing quartzite tile that extends from the second floor level up to the roof. The area of work would be within the narrow section of wall that forms the east elevation of the exit stair tower. The scope of work includes the repair and reconditioning of the existing concrete substrate prior to the application of a painted mural.

The proposed work would increase the colour pallet of the original design from eight to dozens of colours. It would also increase the grid size of the existing mural, making the proposed grid approximately three times the size of the present design. Staff have concerns that the size of the grid proposed which is discussed in the original report and the staff recommendation aims to address these concerns. The proposed mural will be an abstract contemporary interpretation of the present design. The balance of the wall that is not a mural could be painted concrete.

2.2 Legal Description

Strata Lots 1-100 of Lots 318, 319 and 322, Victoria City, Strata Plan VIS6115 together with an interest in the common property in proportion to the unit entitlement of the Strata Lot as shown on Form V.

2.3 Relevant History

At its regular meeting of April 17, 2014, the Planning & Land Use Committee considered Development Permit Application # 000347 for 845 Yates Street (report attached) and discussed whether a painted mural was an appropriate substitute for the tile. The Planning & Land Use Committee moved:

That Committee recommends that Council postpone consideration of the motion until the applicant provides more information on the need for replacement of the tiling.

3.0 Issues

The key issues associated with the additional information are:

- reasons why the quartzite tile failed
- options considered by the applicant as potential substitutes for the tile.

4.0 Analysis

4.1 Reasons Why the Quartzite Tile Failed

The findings of the report entitled *RDH Building Engineering Ltd. Performance Review of Tile and Adhered Thin Stone* (attached) can be summarized as follows:

- surface irregularity of stone resulted in offsets and ledges at most joints

- cracks and gaps in the grout at stone/tile joints were widespread
- removal of “hollow” sounding stone/tile units revealed poor adhesion
- the joint between the stone and the concrete structure was filled with mortar. The mortar had failed in locations providing an opening for water entry.
- the tile and adhered thin stone should have been installed in accordance with the British Columbia Building Code with professional design and field review
- insufficient levelling prior to installation
- lack of consistent “back buttering” resulting in inconsistent contact between stone and mortar
- improper installation of control joints and/or lack of control joints
- lack of sealant at tile/stone interfaces
- it was recommended that the Owners review options to remove the existing tile and adhered thin stone
- it was recommended that if the Owners wish to reinstate the “mosaic-like” wave representation, that alternate assemblies be identified and the installation of exterior tile or adhered thin stone on the existing concrete substrate be avoided.

4.2 Options Considered by the Applicant as Potential Substitutes for the Tile

In RDH's presentation of options to the Strata Corporation (attached) entitled *Stone Tile Repair – Design Option Presentation*, the three key approaches can be summarized as follows:

- Option 1: New Mosaic Tile and Stone Cladding
- Option 2: Painted Mural and Stone Cladding
- Option 3: Painted Mural and Painted Concrete.

In discussions with the applicant, staff learned that although a new tile mosaic is possible the strong preference, primarily related to costs, is to introduce a painted mural and painted concrete (Option 3.) Staff also explored with the applicant the possibility of introducing a tile mosaic in the location of the existing wave mosaic and then using painted concrete on the lower portions of this elevation to reduce costs. However, the contractor, through the applicant, indicated that such an option had not been considered because of a desire to eliminate the current liability of having tile on the side of the building.

5.0 Conclusions

The resulting visual effect of using a painted grid versus a tile mosaic for the image will not be significant; however, the proposed increase in the size of the grid will likely have a considerable visual effect resulting from the contemporary interpretation of the existing wave mural. Staff therefore recommend that Council authorize Development Permit #000347, subject to the applicant reducing the size of the proposed grid to the satisfaction of the Director of Sustainable Planning and Community Development.

6.0 Recommendations

6.1 Staff Recommendation

That Council authorize Development Permit #000347 for 845 Yates Street, subject to the applicant reducing the size of the proposed grid to the satisfaction of the Director of Sustainable Planning and Community Development.

6.2 Alternate Recommendation (Application as submitted.)

That Council authorizes the Development Permit #000347, as submitted.

6.3 Alternate Recommendation (Decline.)

That Council decline the application.

7.0 List of Attachments

- Staff report for Development Permit Application #000347, dated April 3, 2014
- *RDH Building Engineering Ltd. Performance Review of Tile and Adhered Thin Stone*, dated January 20, 2012
- *Stone Tile Repair – Design Option Presentation*, dated July 18, 2013



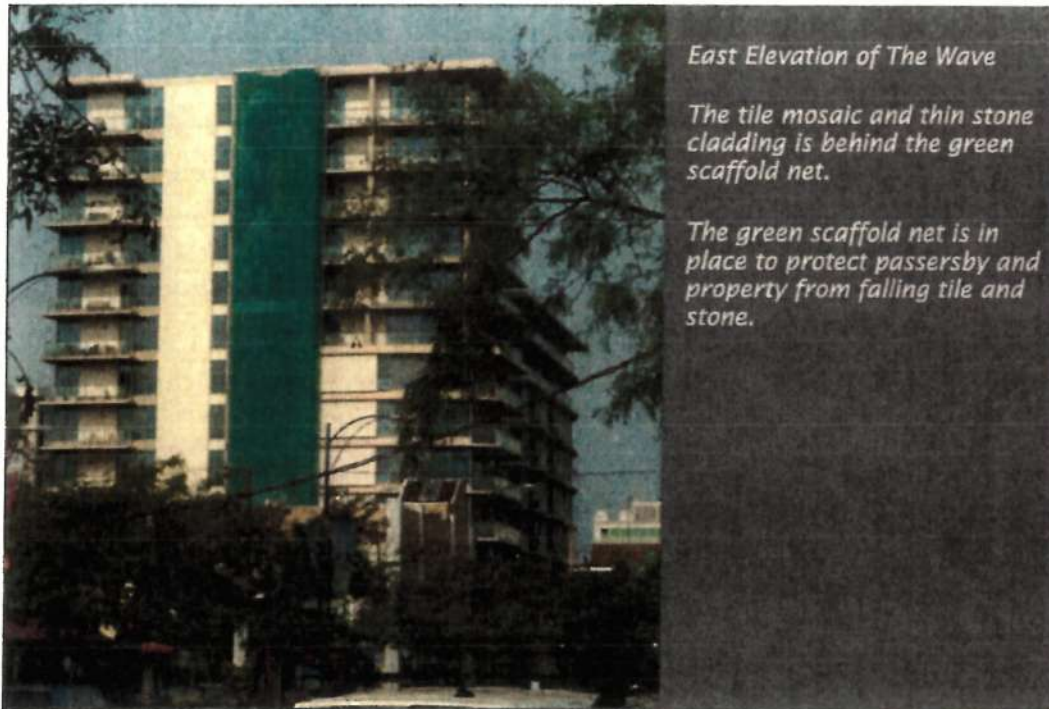
TO **Mayor and Council**
C/O Charlotte Wain
Senior Planner – Urban Design
Development Services Division
City of Victoria
1 Centennial Square
Victoria BC V8W 1P6

5098.054
845 Yates Street
Development Permit

DATE November 05, 2015

REGARDING **The Wave - 845 Yates Street**
Development Permit Application for the Replacement of Tile Mosaic and Thin Stone Cladding

This development permit application pertains to the replacement of the existing ceramic tile mosaic and thin stone cladding on the east, and a portion of the north, facing exterior walls of the concrete stair enclosure at the building known as The Wave located at 845 Yates Street. It is proposed that the tile mosaic be recreated in paint, and the thin stone cladding be replaced with paint.



East Elevation of The Wave

The tile mosaic and thin stone cladding is behind the green scaffold net.

The green scaffold net is in place to protect passersby and property from falling tile and stone.

Background

Built 2006, The Wave is decorated with a ceramic tile mosaic of a wave installed on the exterior wall of the concrete stair enclosure at the east facing elevation of the building. The remainder of the stair enclosure wall is finished with adhered thin stone and painted concrete. Both the ceramic tiles and thin stone are adhered directly to the cast-in-place concrete substrate with mortar.

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Planning & Development Department
Development Services Division

Sometime after installation, tiles were found to have fallen from the building. In December 2011 the strata retained RDH Building Engineering Ltd. (RDH) to review the condition of the tiles and thin stone and in January 2012 RDH issued a Performance Review (See Appendix A) that made the following recommendations:

- Remove the existing tile and thin stone
- Avoid installation of exterior tile or adhered thin stone directly to the existing concrete substrate
- Install a different assembly for reinstatement of the "mosaic-like" wave image.

In May of 2013, RDH was retained by the Strata to develop Design Options for the replacement of the tile and thin stone and in July of 2013 presented three design options to the Strata for consideration. None of the options involved adhering tile or stone directly to concrete. The three options presented were:

1. New Tile Mosaic embedded in a stucco assembly that is attached to girts fastened to the existing concrete wall (girts allow the assembly to be made plumb, and provide a drainage space behind the tile and stucco) and 3" thick Stone. The stone would be built up in rows bonded with mortar, supported on steel angles bolted to the existing concrete wall, and tied back to the concrete with masonry ties.
2. Painted Mural and 3" thick Stone assembly as above
3. Painted Mural and Painted Concrete

Each option was evaluated in terms of construction costs and the municipal approval process.

Shortly after having received the presentation of the above design options, the Strata attempted to reach a negotiated settlement with a number of the parties associated with the original construction. In June of 2014 the conditions of an initial settlement related to what was a painted solution ended when it was rejected by City Council.

Subsequently, in November of 2014, the Strata approved the replacement of the existing adhered thin stone and tile with RDH's design for engineered stone and tile assemblies. However, because of the high cost of the new assemblies and the uncertainty of reaching a monetary settlement to cover their cost, the Strata approached City Council to reconsider a Development Permit application based on a painted solution. In March of 2015, City Council indicated that it would consider such a Development Permit application.

The following is a description of the essential qualities and characteristics of the proposed method of replacing the tile and thin stone that is the basis of this Development Permit application.

Painted Replacement of Existing Ceramic Tile and Thin Stone

Two critical issues were identified in the April 2014 Planning and Land Use Committee Report prepared by the Planning Department for the original Development Permit application. These were:

- The appearance of the proposed wave image.

- The durability and maintenance requirements of the painted finish.

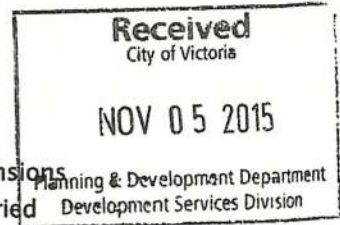
Appearance

It is the intention that the replacement wave image replicate the original grid dimensions and colours as exactly as practical. To accomplish this the following has been carried out:

- The existing mosaic has been recorded in detail with photographs and these photographs examined to:
 - Determine the number of rows and columns that make up the grid
 - Identify the colour of each square.
- Field review confirmed the existing tile module as 100mm x 100mm (4"x4").
- Sample tiles of each of the eight tile colours were collected
- Standard Benjamin Moore colours that are close matches to the original tile colours have been selected. (These colours will be further refined prior to carrying out the project by use of colour matching technology).

Each colour has been given a number, and each square within the grid has been assigned the colour number corresponding with the original tile colour. Once the concrete substrate has been prepared, and the grid laid out, colour will be applied to each square according to its colour number. This is graphically represented on sheet A-4, Methodology, of the Development Permit application drawing set.

Because of the distances from which it can be seen, there will be little or no change in the visual aspect of the wave image from tile to paint. The stylized adaptation of Hokusai's wood cut print, "The Great Wave of Kanawaga", will once again be present in the streetscape.



The thin stone will also be replaced with paint. The texture of the stone and sparkle of the mica flecks within it are not possible to replicate with paint. However, the majority of the stone on the stair tower is hidden behind buildings (see street views on sheet A-0, Cover, of the Development Permit application drawing set). Rather than try to replicate the stone in paint, a neutral grey, similar in hue and tone to the stone, has been selected. This will provide a suitable 'frame' for the mural.

Durability and Maintenance

Tile and stone are generally naturally durable materials and in themselves have the potential to maintain their visual qualities for the lifetime of a building. Paint, however, is subject to fading and deterioration and requires maintenance over the life of a building.

An issue with stone and tile, in this application, is not the quality of the materials but the method employed to fasten them to the building. Tile or stone adhered with mortar to a smooth concrete surface are subject to delamination. This can be caused, for instance, by the accumulated effects of differential expansion and contraction of the cladding materials and concrete substrate from solar heat gain, or the forces generated by the expansion of ice formed from water that has infiltrated behind the tile or stone. These potentials are further exacerbated where materials are applied in a substandard manner. Whereas paint failure will only have a deleterious effect on visual qualities, on a high wall, the failure of tile and stone are a safety concern. When properly specified, applied, and maintained, paint can be effectively as durable a material as tile and much safer.

The following is a general description of the methodology employed to ensure a high quality paint application and is based on the Master Painters Institute (MPI) guidelines and specifications. MPI approved products will be used and the work inspected by an MPI Accredited Quality Assurance Association inspector.

→ Preparation

- Remove existing tile, stone and mortar.
- Grind residual mortar off of concrete surface.
- Clean the concrete surface (acid etch if necessary).

→ Paint

- Apply one coat of water based, alkali resistant, latex primer.
- Apply two coats of colour exterior acrylic latex to create the wave image.
- Apply UV resistant clear protective coating over the image.

The clear coat is to maintain the integrity, vividness and colour fastness of the colour coat, and to act as the 'wear' course

To maintain the painted surfaces the following procedures will be carried out:

- Every two years - low pressure wash-down of painted area to remove particulates from city traffic, organic growth, etc.
- Every seven years - Renew clear coat

- At 20 years
 - Sand clear coat
 - Clean surfaces
 - Apply two new colour coats
 - Apply new clear coat



By conducting the above maintenance tasks as scheduled, the mural will maintain its appearance indefinitely.

Summary

By replacing the existing ceramic tile mosaic and surrounding thin stone cladding with a painted mural as described above, the public space along Yates will once again be enhanced with the presence of the wave image as originally conceived. Visually the painted wave image will be identical to the ceramic tile version, its durability assured by the quality of the paint application and a commitment to an ongoing maintenance program, and public safety will also be assured.

Yours truly,

A handwritten signature in black ink, appearing to read "Grant Laing".

Grant Laing | Architect MAIBC, MRAIC
Project Architect
glaing@rdh.com
RDH Building Engineering Ltd.

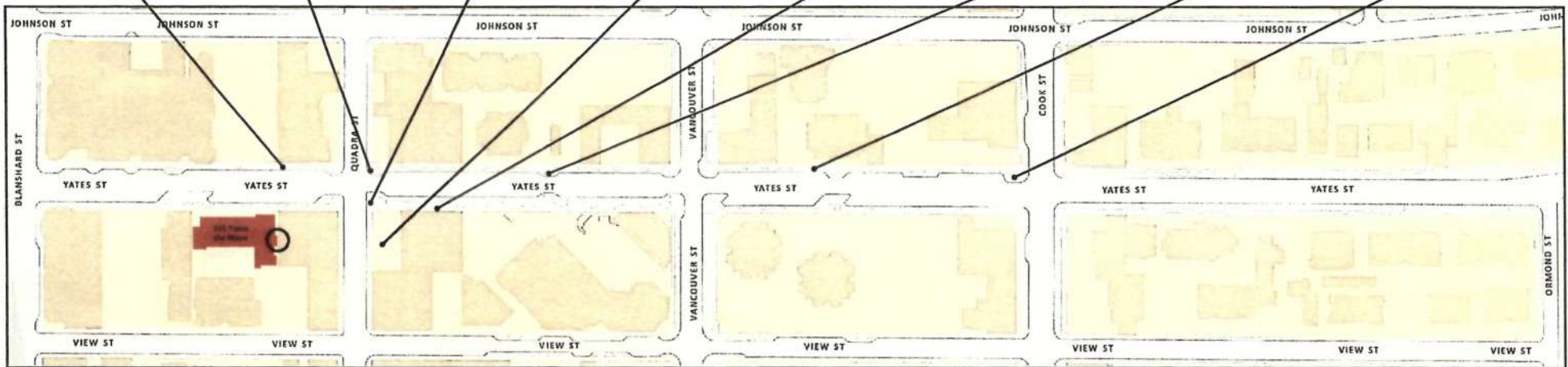
encl.

cc Geoff Kearney, Cornerstone Properties Ltd.
Eric Metson, Strata Plan VIS6115

EMAIL geoff@cornerstoneproperties.bc.ca

845 YATES STREET THE WAVE

REPLACEMENT OF TILE MOSAIC AND THIN STONE CLADDING



LOCATION PLAN & STREET VIEWS



Owner	Strata Plan V56115
Civic Address	845 Yates Street, Victoria BC
Legal Address	Lot 103, Strata Plan V56115
Project Description	Replacement of Tile Mural and Thin Stone Cladding
Zoning	R-48
DP Area	DPA 2 (HC)



TILE



THIN STONE

cover sheet



CONTENTS

- A-0 COVER SHEET
- A-1 PLANS
- A-2 ELEVATIONS
- A-3 METHODOLOGY
- A-4 COLOUR BOARD

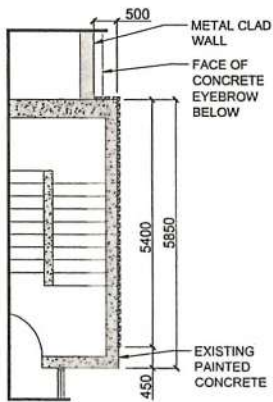
the Wave
845 Yates Street, Victoria BC
replacement of tile mosaic and thin stone cladding

RDH
Making Buildings Better

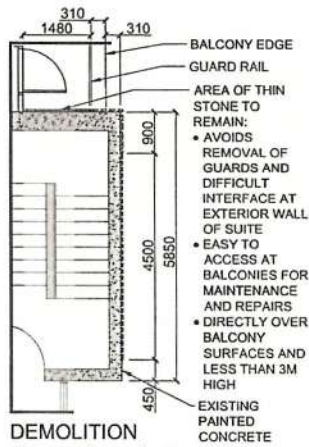
3795 Carey Road #500
Victoria, BC V8Z 6T8

Date: November 05, 2015
Scale: as noted

A-0



DEMOLITION
floors 2 through 7



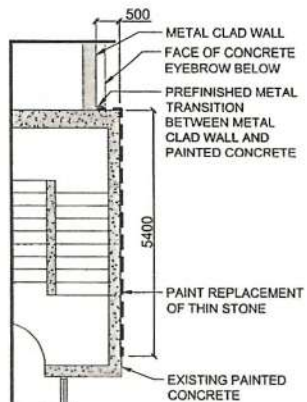
DEMOLITION
floors 8 through 13

LEGEND

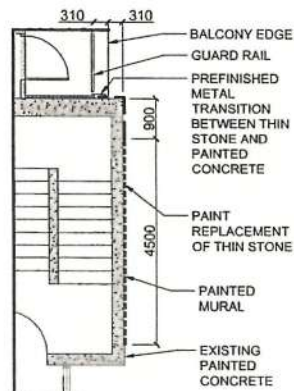
- DEMOLISHED CERAMIC TILE
- DEMOLISHED THIN STONE
- EXISTING THIN STONE TO REMAIN
- PAINT TO REPLACE THIN STONE
- PAINTED MURAL



METAL TRANSITION



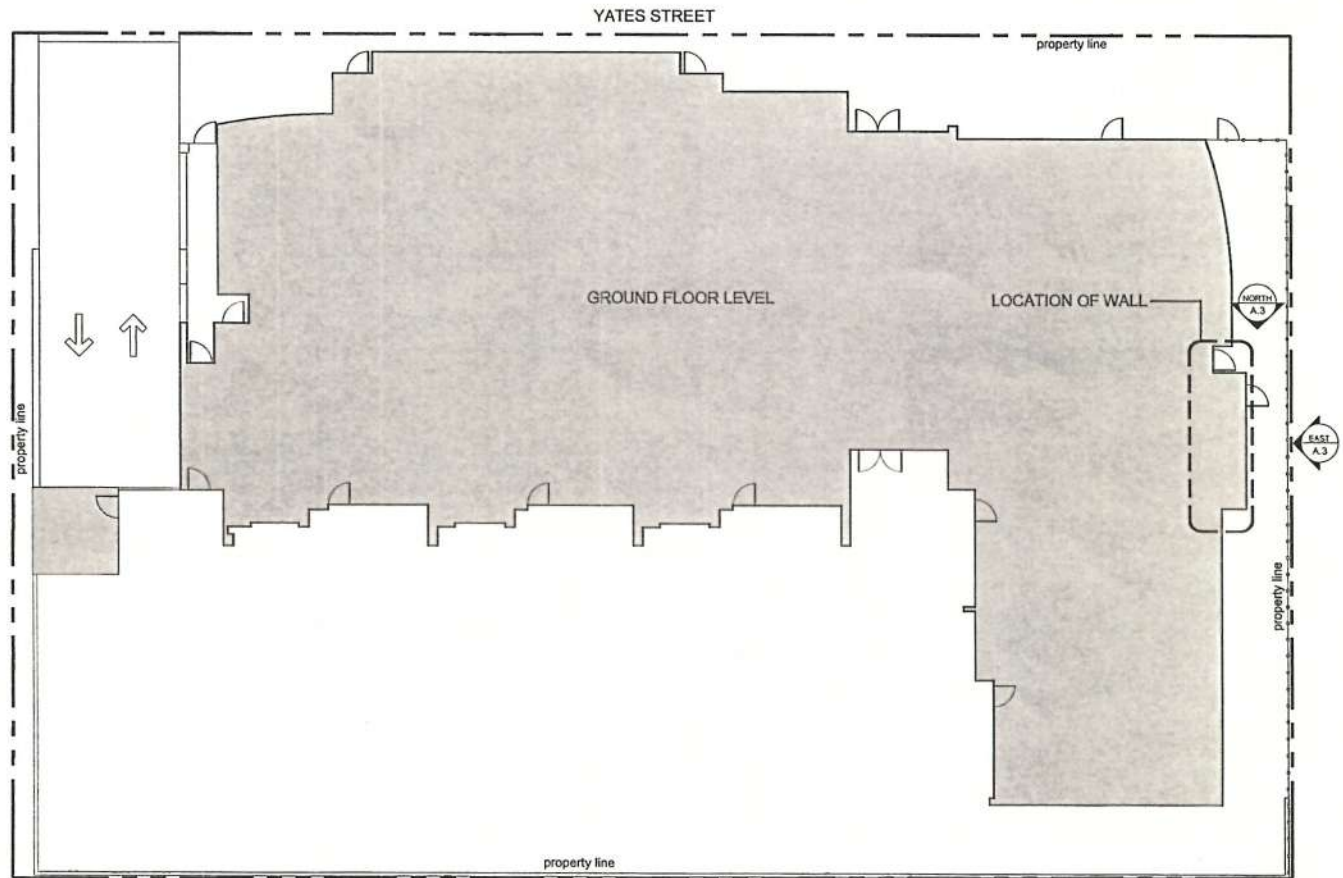
EXTENT OF RENEWAL
floors 2 through 7



EXTENT OF RENEWAL
floors 8 through 13



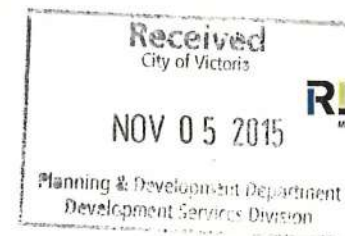
ZONING



SITE PLAN

plans

the Wave
845 Yates Street, Victoria BC
replacement of tile mosaic and thin stone cladding



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3795 Carey Road #500
Victoria, BC V8Z 6T8

Date: November 05, 2015
Scale: as noted

A-1

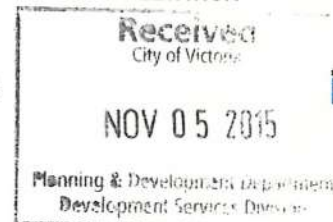
EXISTING



the Wave
 845 Yates Street, Victoria BC
 replacement of tile mosaic and thin stone cladding

elevations

PROPOSED

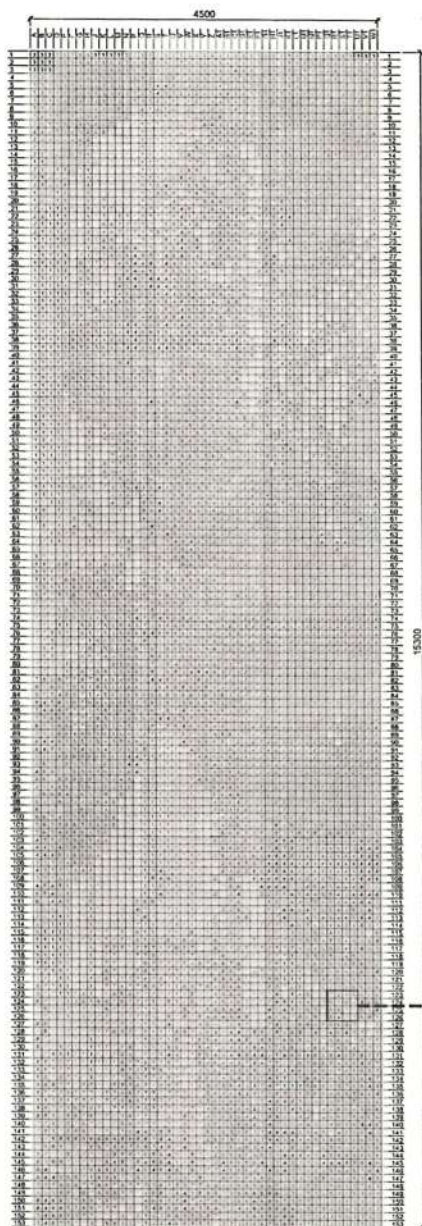


RDH
 Making Buildings Better

3795 Carey Road #500
 Victoria, BC V8Z 6T8

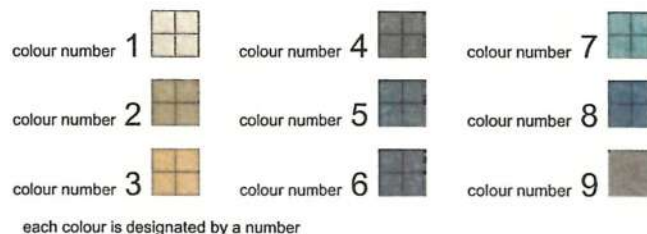
Date: November 05, 2015
 Scale: as noted

A-2



the mural forms a grid of 6885 squares

SCALE - 1:30



LOCATION

- The mural is a grid of 6885, 100mm x 100mm squares.
- It is 153 squares high and 45 squares wide.
- A number designates each horizontal row of squares.
- A letter designates each vertical column of squares.
- Each individual square in the grid can be located by row number and column letter [eg. the square at row 23, column S].

COLOUR

- There are a total of 9 existing colours - 8 tile colours plus the colour of the thin stone veneer.
- Each existing tile is colour matched with a paint colour.
- Each of the paint colours has a number designation.
- Each individual square in the mural is given a colour number corresponding to the original tile colour at that location.

IMAGE

- The grid of 100mm x 100mm squares will be layed out on the wall.
- Each individual square will be painted with the colour corresponding to its colour number.
- At a distance, the image of the wave will emerge as the individual squares are painted.

	COLUMN Q1	COLUMN R1	COLUMN S1	COLUMN T1
ROW 123	7	2	4	6
ROW 124	8	7	8	3
ROW 125	8	8	7	1
ROW 126	5	4	7	7

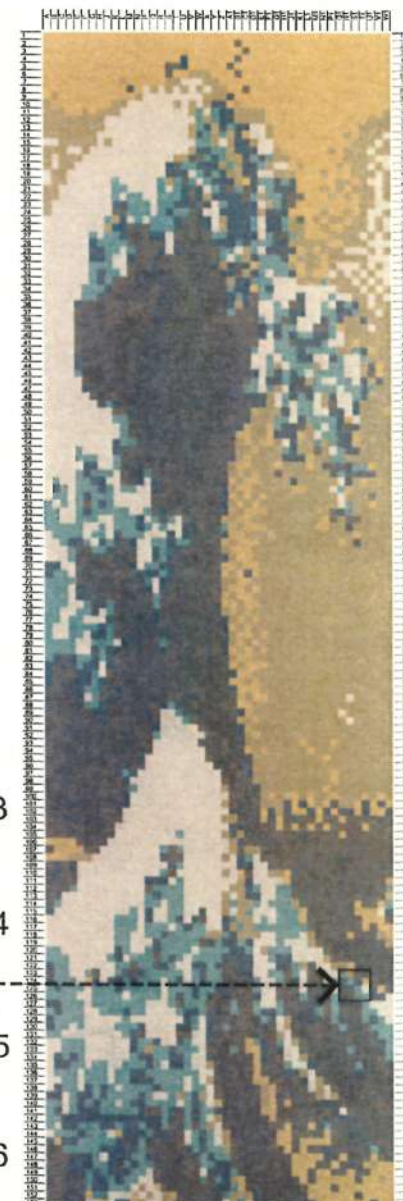
each square is given a colour number

SCALE - 1:2

	COLUMN Q1	COLUMN R1	COLUMN S1	COLUMN T1
ROW 123	7	2	4	6
ROW 124	8	7	8	3
ROW 125	8	8	7	1
ROW 126	5	4	7	7

each square is painted in the colour corresponding to its number

SCALE - 1:2



from numbers to colours, to wave image

SCALE - 1:30

the Wave
845 Yates Street, Victoria BC
replacement of tile mosaic and thin stone cladding

methodology

NOV 05 2015

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3795 Carey Road #500
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Date: November 05, 2015
Scale: as noted

A-3

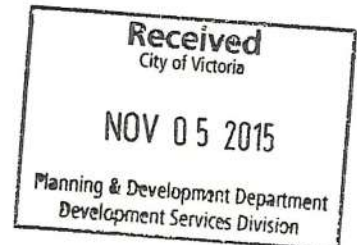
Planning & Development Department
Development Services Division

TO **Geoff Kearney**
Cornerstone Properties Ltd.
301- 1001 Cloverdale Avenue
Victoria BC V8X 4C9

EMAIL geoff@cornerstoneproperties.bc.ca

**5098.10 – 845 Yates Street
Adhered Stone and Tile Review**

January 20, 2012

REGARDING **Performance Review of Tile and Adhered Thin Stone**

Dear Mr. Kearney,

RDH Building Engineering Limited was retained by Strata Plan VIS 6115 to review the condition of the tile and adhered thin stone applied to the east exterior concrete wall of the building known as the Wave, located at 845 Yates Street, Victoria, BC (refer to RDH proposal dated November 30, 2011).

Background Information

Construction of the Wave was completed in or around the fall of 2006. The building is a concrete structure 13 stories in height containing approximately 101 residential suites. The tile and adhered thin stone in question is located on the east elevation of the building. The tile is located above the ninth floor level arranged with multi-colour units to provide a mosaic-like representation of a wave. The thin stone is applied from the 2nd floor level to the 13th floor. The wall area in question is the exterior wall of a stair tower.

The writer has been advised that at some prior time the owners became aware that tiles have fallen from the building. The ground area below the wall area in question is an area with restricted access designated as a means of emergency egress from the building.

Out of concern for additional falling tiles, the owners retained Knight Contracting to arrange access and review the installed tile and thin stone. A swing stage was erected and a review of the wall area confirmed three areas of loose tile and/or stone. Large areas of stone were removed from the 5th and 9th floor levels, a small area of tile was removed from the 9th floor level, and a large area of tile was removed from the 11th floor level.

Tile and Adhered Thin Stone

RDH was not provided with a set of construction documents or any formal confirmation of the materials and processes approved for use during construction. A review of previous correspondence from the Project Architect (Mr. Michael Levin, MAIBC of Praxis Architects Inc.) indicates that the project specifications may not have been followed.

At the present time the following summary represents the writer's understanding of the materials and processes implemented during the installation of the adhered tile and thin stone at the Wave:

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Development Services Division

- the tile was specified and reviewed by Praxis and supplied by C&S Ceramic Tile Distributors of Vancouver
- the stone (quartzite) was approved and supplied by the developer (source of stone is unknown)
- the thin set mortar used for both the tile and stone was "Megalite", manufactured by Custom Building Products,
- no information was provided for the grout material used at the tile and stone joints
- the tile and stone were installed by Pacific Coast Floor Coverings after the wall surface was washed and prepared by the general contractor. The details of surface preparation are not known. Once the surface was washed, the tile and stone installer proceeded as described below:
 - › acid washed surface
 - › installed control joints
 - › applied thin set
 - › installed the tile/stone
 - › applied grout & sealer (no information related to materials or sequence)
- no information has been provided related to project specific testing, site inspections, certification or any independent quality control/assurance processes implemented during construction

Codes and Industry Standards

Without review of the design documentation and construction drawings, it is not possible to confirm which version of the BCBC was in effect for the design and construction of the Wave.

The 1998 and 2006 British Columbia Building Codes (BCBC) do not provide specific requirements for exterior tile or adhered thin stone installation. The tile and adhered thin stone would however have been required to satisfy the performance requirements outlined in Part 5 of either edition of the code, including referenced Canadian Standards Association standard "*CSA A371 Masonry Construction*". Although the A371 standard provides mandatory design requirements and prescriptive installation procedures for "*thin veneers secured individually by mortar adhesion*" the standard only applies where the stone is installed at elevations less than 3 meters above the foundation level (clause 10.5.1 and Annex A). The requirements outlined in A371 would not have been applicable to the adhered thin stone at the Wave.

In addition to the BCBC and CSA standards, the following associations and industry standards provide assistance and guidance with respect to the installation of tile and adhered stone:

- Marble Institute of America (MIA)
- Building Stone Institute (BSI)
- Terrazzo Tile & Marble Association of Canada (TTMAC)

The design and installation of the tile and adhered thin stone at the Wave would have also been beyond the prescribed application of the above standards and would have required professional design and field review to confirm compliance with the BCBC.

Performance Review

The writer attended the site on December 6, 2011 to review the condition of the tile and adhered thin stone. Access to the building face was provided by swing stage.



The condition of the tile and stone was assessed by hammer tapping, removal of "hollow" sounding stones, removal of grout at stone and tile joints, and visual examination. The following key observations are provided:

Thin Stone

- The stone is a natural grey quartzite stone (metamorphic sandstone) containing quartz grains and mica. With close visual review, some of the original sedimentary layers that persist after metamorphism are still identifiable. The surface condition is considered somewhat friable raising a question as to the long term reliability of any bond achieved at time of placement.
- The stone was placed on the wall with the stone grain parallel to the wall surface.
- The stones vary in thickness with cut edges measuring 10-20 mm in thickness, the majority being approximately 15 mm.
- Joints between stones also varied from tight to approximately 5 mm (Photo 4,5)
- Surface irregularity of stone resulted in offsets and ledges at most joints (Photo 6).
- Cracks and gaps in the grout at stone joints were widespread (Photo 7).
- Efflorescence (white staining) at stone joints was widespread (Photo 6).
- At locations of prior stone removal, observations were made of large areas of undisturbed notched mortar (Photo 8 & 9).
- Removal of "hollow" sounding stone units revealed poor adhesion (Photo 9).
- One removed stone had been scored with a saw (Photo 9).
- A metal control joint was covered with grout (Photo 10 & 11)
- The joint between the stone and the concrete structure was filled with mortar. The mortar had failed in locations providing an opening for water entry (Photo 12).
- The joint between the stone and an adjacent cladding panel was filled with mortar. The mortar has failed in locations providing an opening for water entry (Photo 13).

Tile Observations

- The tile can be described a "100x 100 mm vitreous through coloured clay tile".
- The width of grout joints in the tile varied from 1/8 to 3/8 of an inch (Photo 14).
- Metal control joints were installed in the tile (Photo 14 & 15).
- Cracks and gaps in the grout between tiles were observed (Photo 14, 16 & 17).

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- White staining was observed on the surface of the tiles. The stains originate from joints between tiles (Photo 14 & 18).
- Removal of "hollow" sounding tiles confirmed poor adhesion (Photo 19 & 20).
- The mortar at locations of tile removal appear compressed and in contact with the back of the tiles (Photo 21).
- Tile and concrete interfaces were not sealed to prevent water entry (Photo 22 & 23).
- Removed tiles revealed poor mortar adhesion (Photo 24).

Discussion

The following comments are provided related to the design, installation and performance of the tile and adhered thin stone at the Wave.

Design

At the time of this review there was no confirmation which design professional was responsible for the design of the installed tile and adhered thin stone at the Wave. In addition to missing design information there also appears to have been a lack of inspection or certification of the work by a design professional.

By any industry standard, the tile and adhered thin stone at the Wave should have been installed in accordance to the BCBC with professional design and field review.

Installation

The tile and stone appear to have been installed with a modified Portland cement mortar that was applied to the wall with a notched trowel and some level of "notched and/or spot back-buttering" for the installed stone. Observations of the installed tile and adhered thin stone indicate that (1) the bond between the stone and the mortar appears poor and (2) the bond between the mortar and the concrete appears satisfactory.

The poor bond could be the result of a general incompatibility between the stone and the mortar. The surface condition of the stone does not appear conducive to achieving a reliable bond (friable mica content and/or possible pyrite content). Improper surface preparation (lack of leveling) and/or excessive setting of the mortar prior to stone/tile installation could also have had a negative impact on the amount of bond achieved at time of installation. Additional testing of the stone and mortar would be required to further examine the significance of the above factors.

Other installation issues observed:

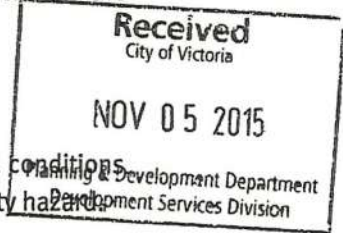
- Insufficient leveling prior to installation.
- Lack of consistent "back buttering" resulting in inconsistent contact between stone and mortar (much less than the normally required 95% - 100%).
- Improper installation of control joints (covered by grout) and/or lack of control joints.
- Lack of sealant at tile/stone interfaces with adjacent cladding surfaces

Performance

There are two main problems with the performance of the tile and adhered thin stone at the Wave.

Poor Bond

Falling tile/stone, hollow sounding tile/stone and easily removed tile/stone are all conditions that confirm "poor bond". Poor bond is a significant performance problem and safety hazard.



Hollow sounding stone units and stone surfaces free of mortar adhesion are observations that confirm poor bond. The degree of bond will not improve over time, and depending on the cause of the poor bond, it is likely that the condition will worsen with time resulting in additional incidences of loose/falling tile/stone units.

Poor bond could be a result of:

- poor design (incompatible stone and mortar),
- excessive stress in the mortar as a result of restrained movement caused by improperly installed and spaced control joints (concrete shrinks, tile/stone undergo cyclic thermal movements)
- poor tile/stone installation (mortar exposed too long before tile/stone placement, insufficient back-buttering/leveling), or
- deterioration due to water ingress and weather effects such as freeze/thaw.

Lack of Water-Tightness

Unsealed grout joints that have weathered, deteriorated or cracked and allow excessive water entry behind the tile/stones also represent a significant performance problem.

White stains on the surface of the tile/stone is an indication that an excessive amount of moisture is present behind the surface of the tile/stone causing dissolved salts to wash to the exterior and reform on the tile/stone surface – causing the white stain (efflorescence). Although this efflorescence can be washed away it is an indication of a moisture problem that needs to be resolved to prevent ongoing deterioration of the mortar from erosion and/or freeze/thaw damage.

The lack of water-tightness could result from:

- poor grout installation,
- poor sealing of potential water entry points such as interface joints with adjacent construction,
- cracks in the grout caused by restrained movement resulting from improper movement joint installation, or
- voids behind stone due to poor workmanship (poor surface leveling and/or poor stone installation)

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Discussion

Poor bond and a lack of water tightness are performance problems that share common potential causes.

In order to assess the contribution of potential mortar and stone incompatibility requires highly specialised material testing. The testing will require the collection of additional samples and the costs of testing would be approximately \$5,000 to \$10,000.

In the event that testing confirms an inherent material incompatibility, it will be necessary to remove the stone from the building.

In the event that testing confirms that the stone and mortar are compatible, the existing condition of poor bond will be attributed to poor tile/stone installation, defective control joint installation, water ingress and/or weather effects (freeze/thaw). The recommended repairs that would be necessary to resolve the poor bond condition and existing deficiencies (in a manner including professional design assurance and certification) would likely result in full removal and replacement of the existing tile and adhered thin stone.

Recommendations

Based on the information reviewed, and the writer's field assessment of the existing performance problems, it is recommended that the Owners review options to remove the existing tile and adhered thin stone.

Confirmation of compatibility between the thin stone and the mortar will require material testing. Testing will however not address the existing performance problems or resolve concerns related to public safety. If the matter is not likely to be resolved in the short term, the installation of netting over the wall area in question, to contain any additional falling tile or stone, is recommended.

If the Owners wish to reinstate the "mosaic-like" wave representation it is recommended that alternate assemblies be identified and the installation of exterior tile or adhered thin stone on the existing concrete substrate be avoided.

Yours truly,

RDH Building Engineering Ltd.



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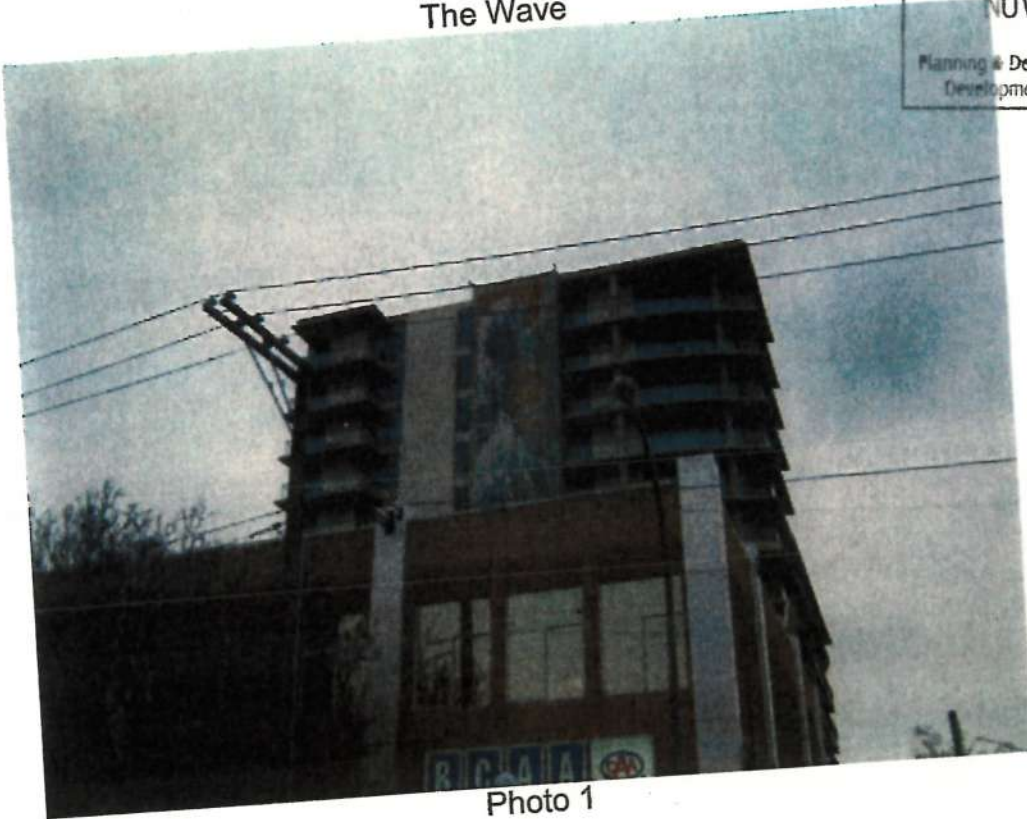


Photo 1



Photo 2

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Tile removed

Tile and stone
removed

Stone removed

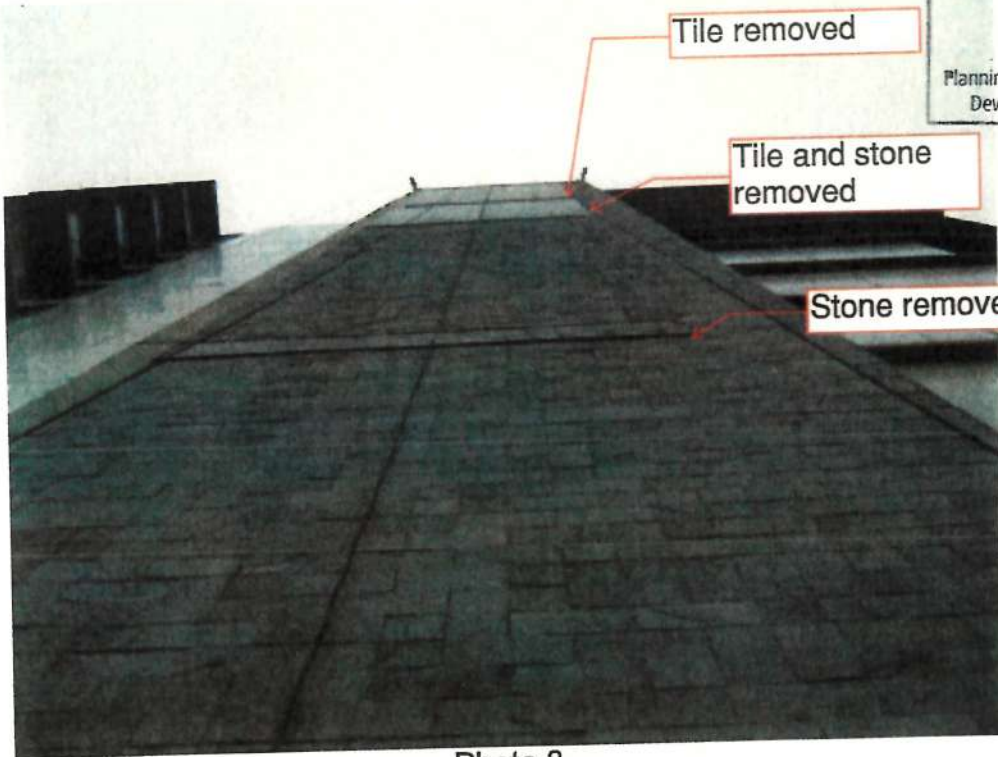


Photo 3

Wide Joint

Tight Joint

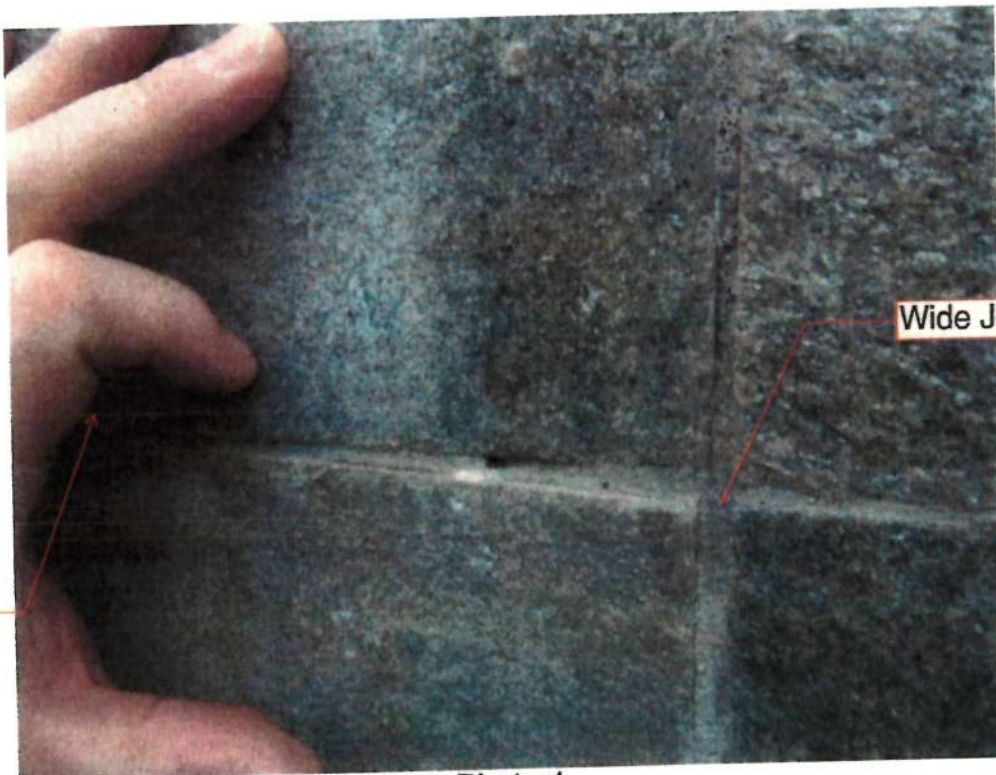


Photo 4

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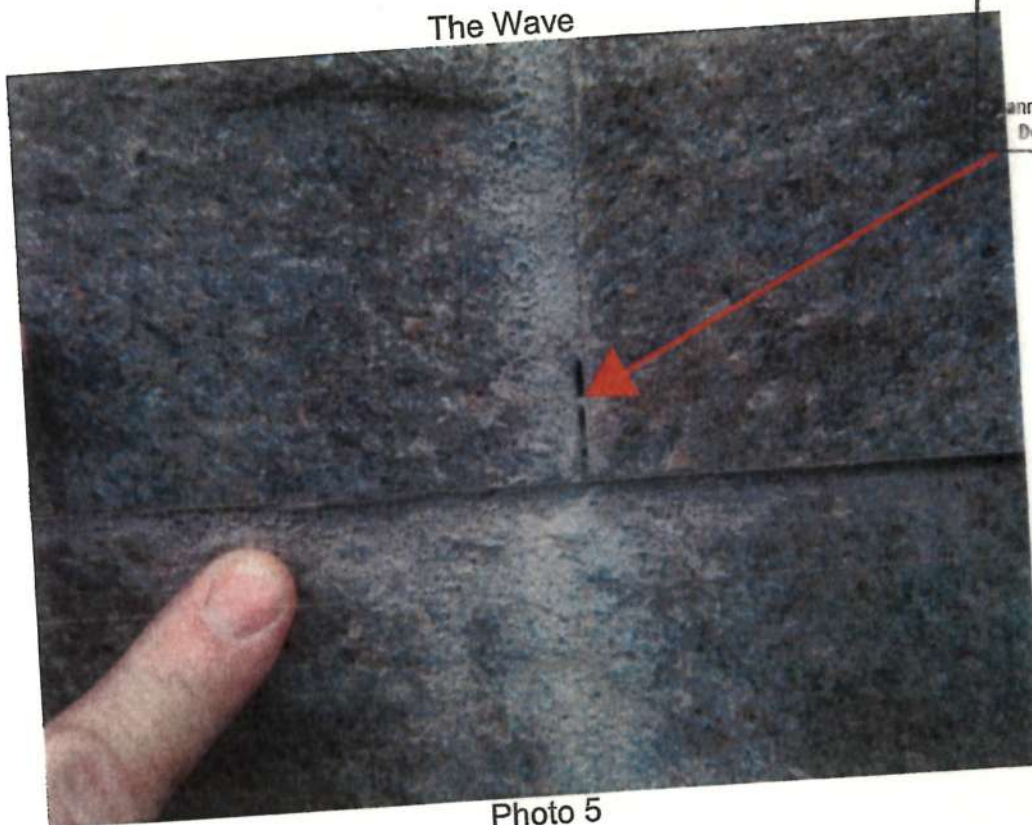


Photo 5



Photo 6
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Photo 7

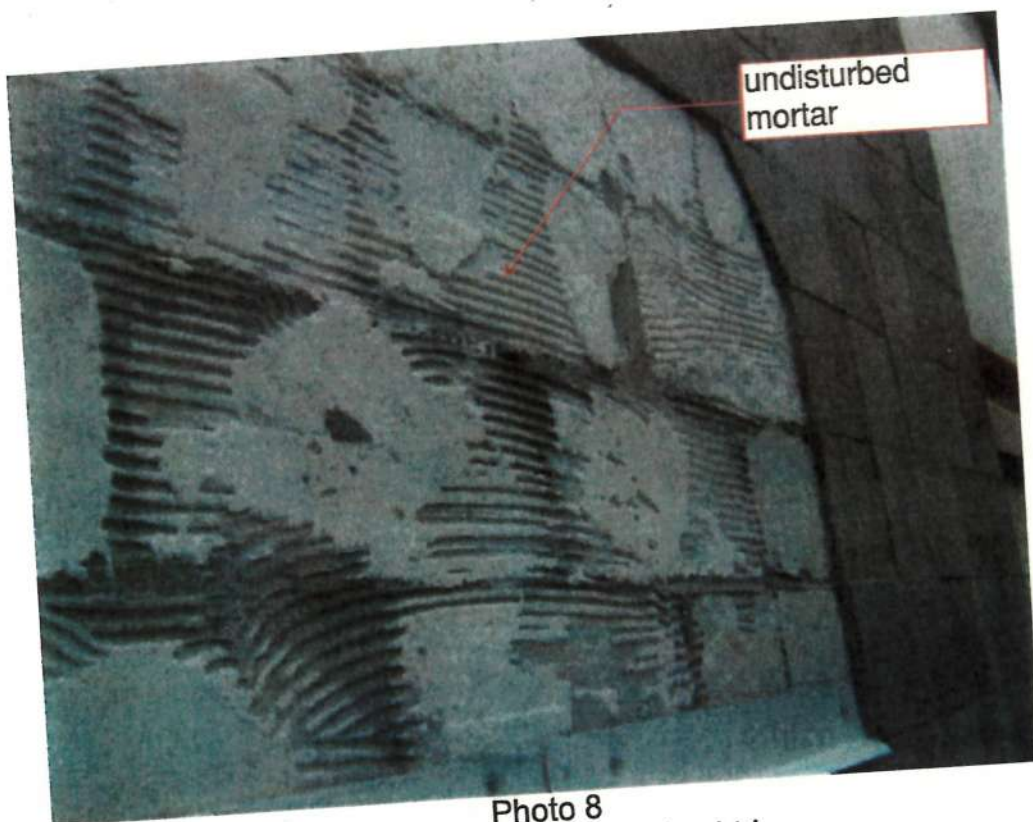


Photo 8
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Poor Bond

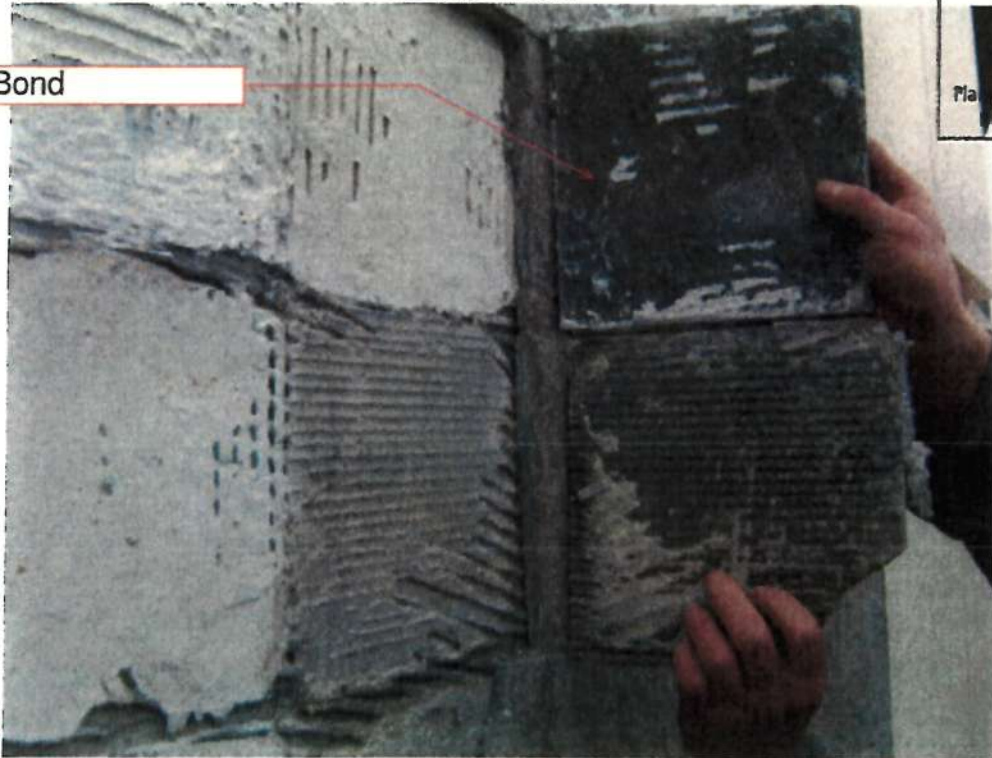


Photo 9



Photo 10

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control joint
covered by
grout

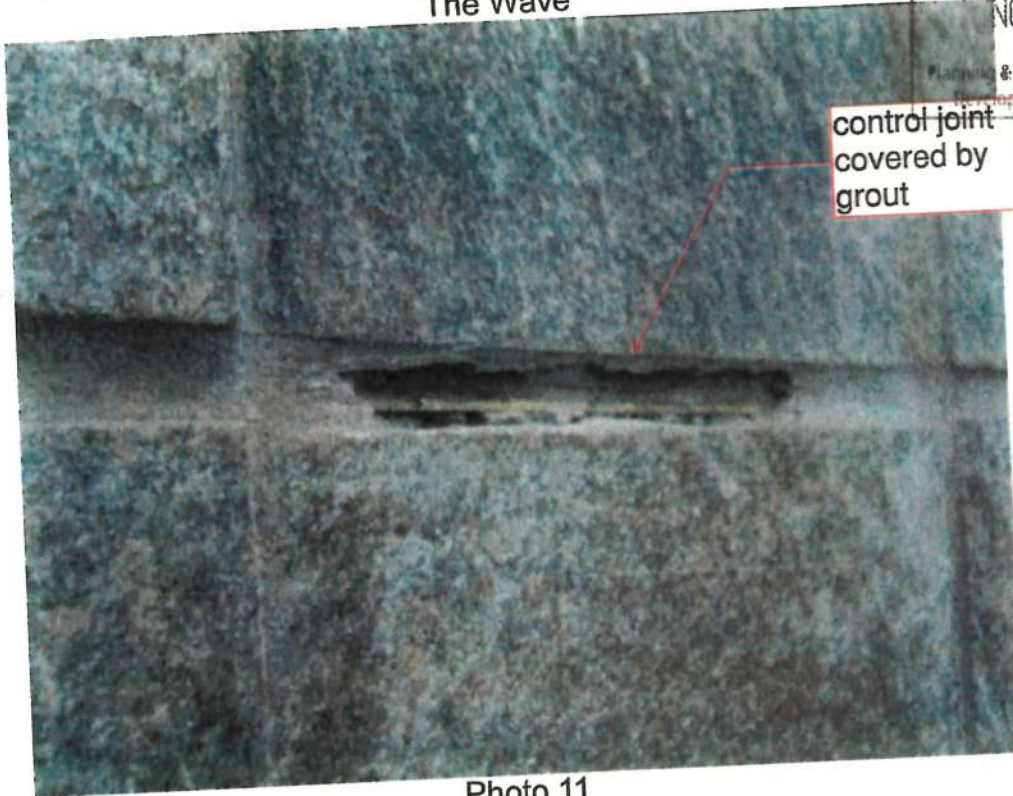


Photo 11



Photo 12

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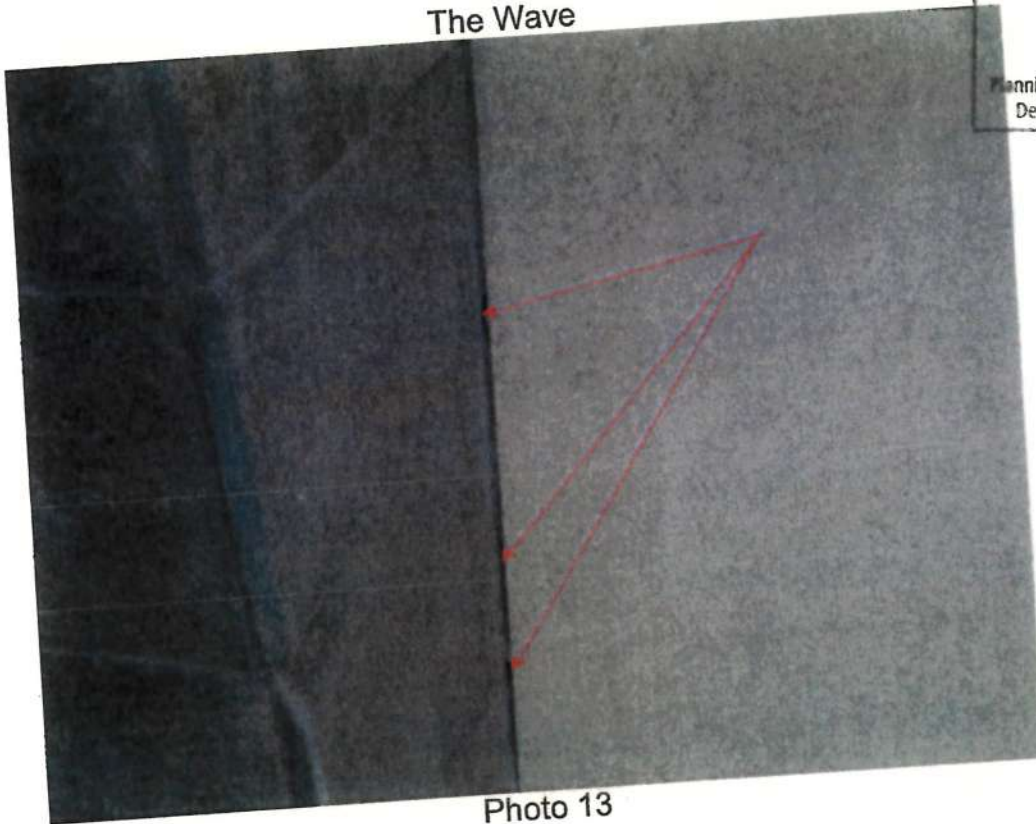


Photo 13



Photo 14
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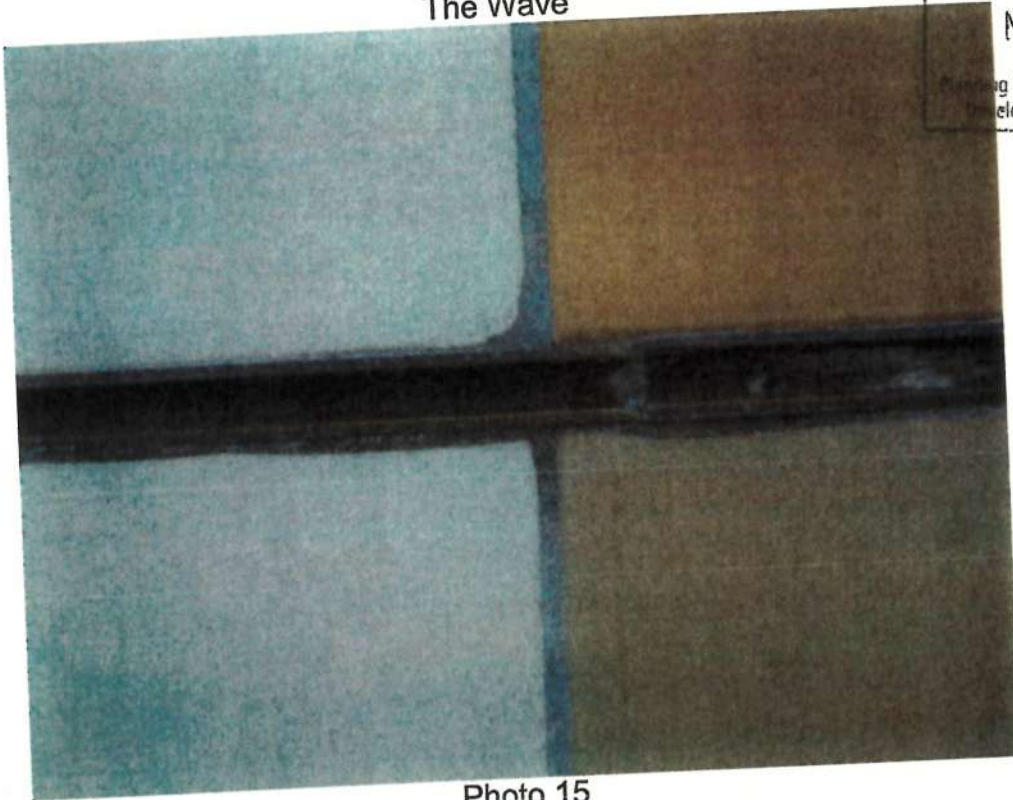


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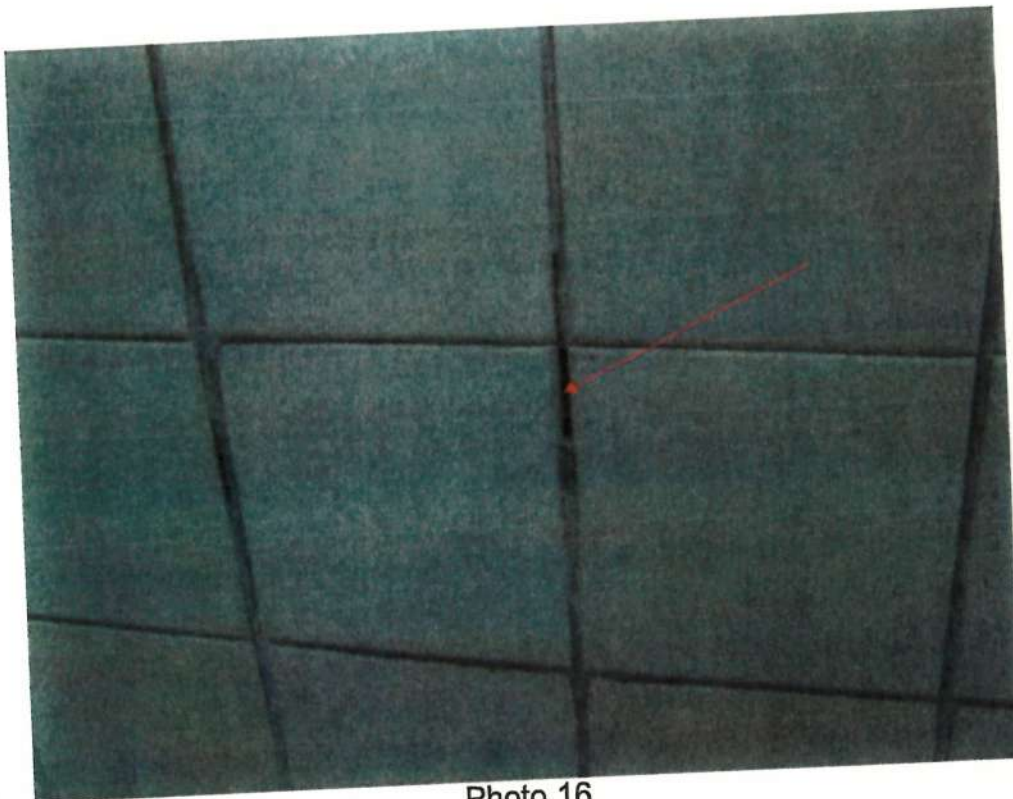


Photo 16

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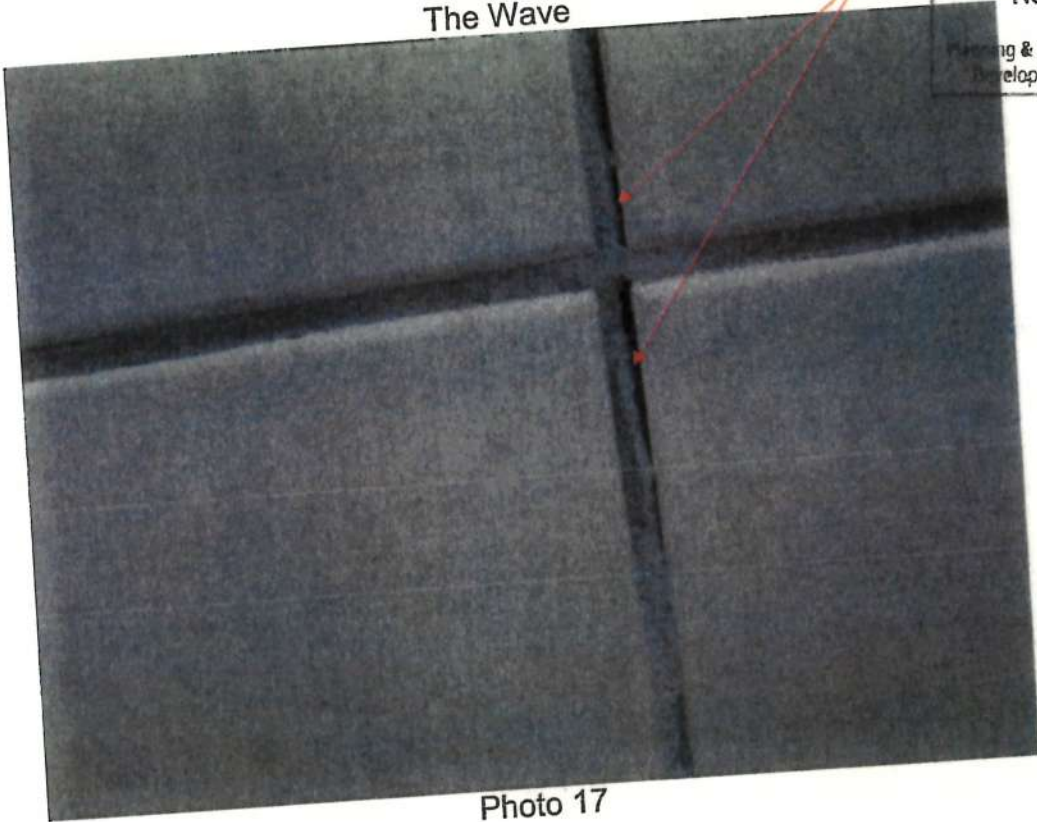


Photo 17



Photo 18
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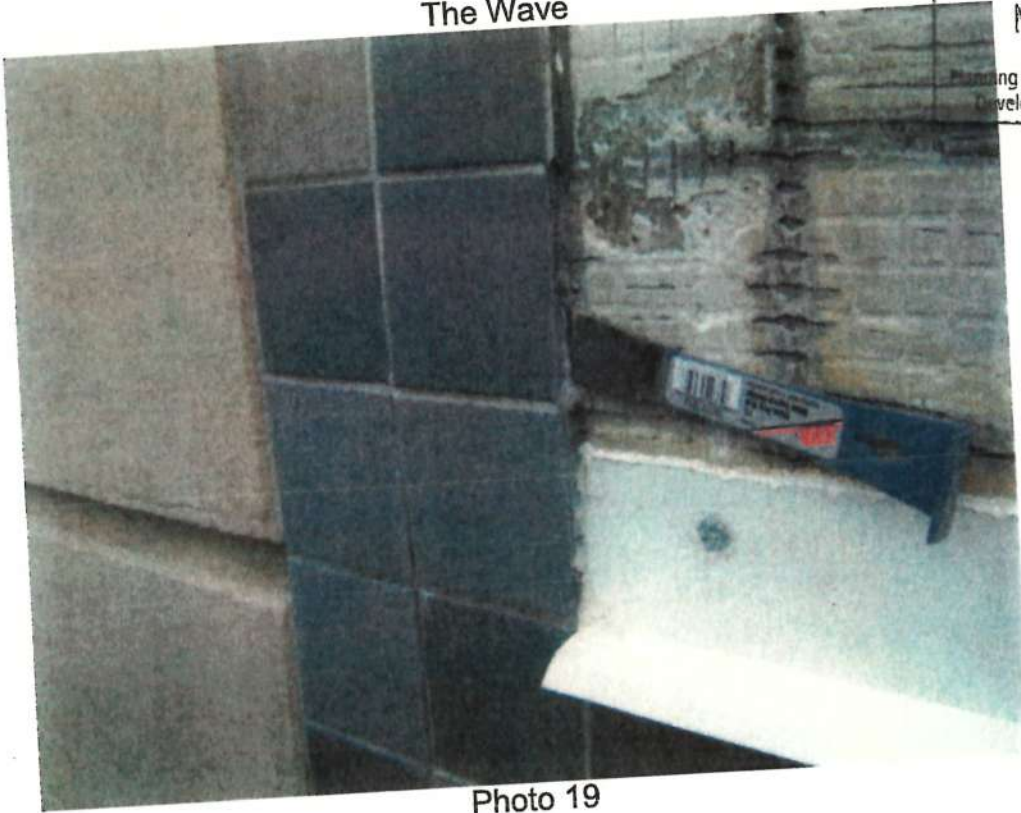


Photo 19



Photo 20

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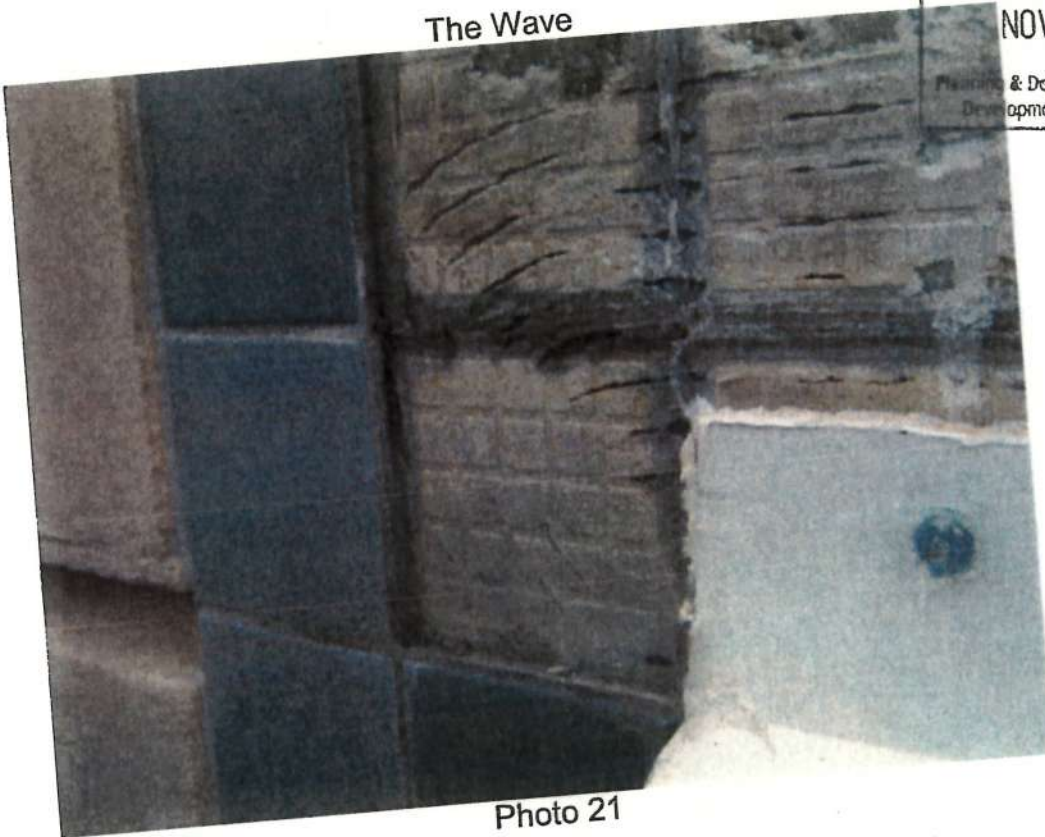


Photo 21

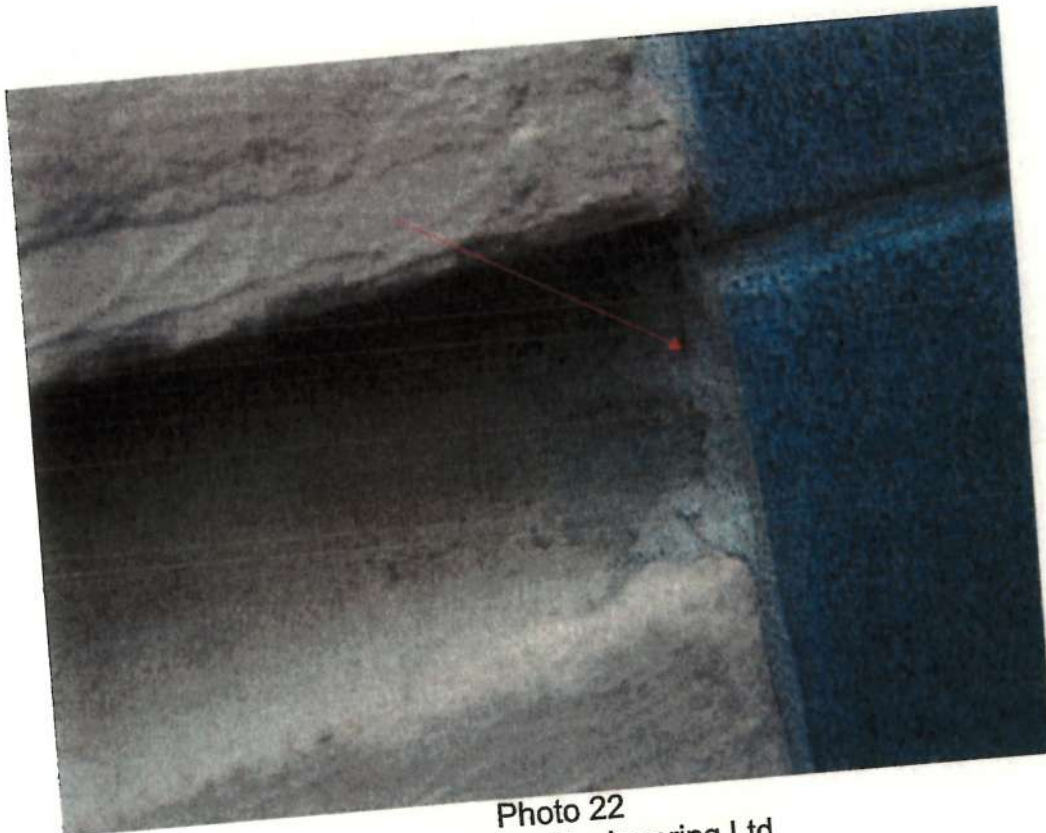


Photo 22

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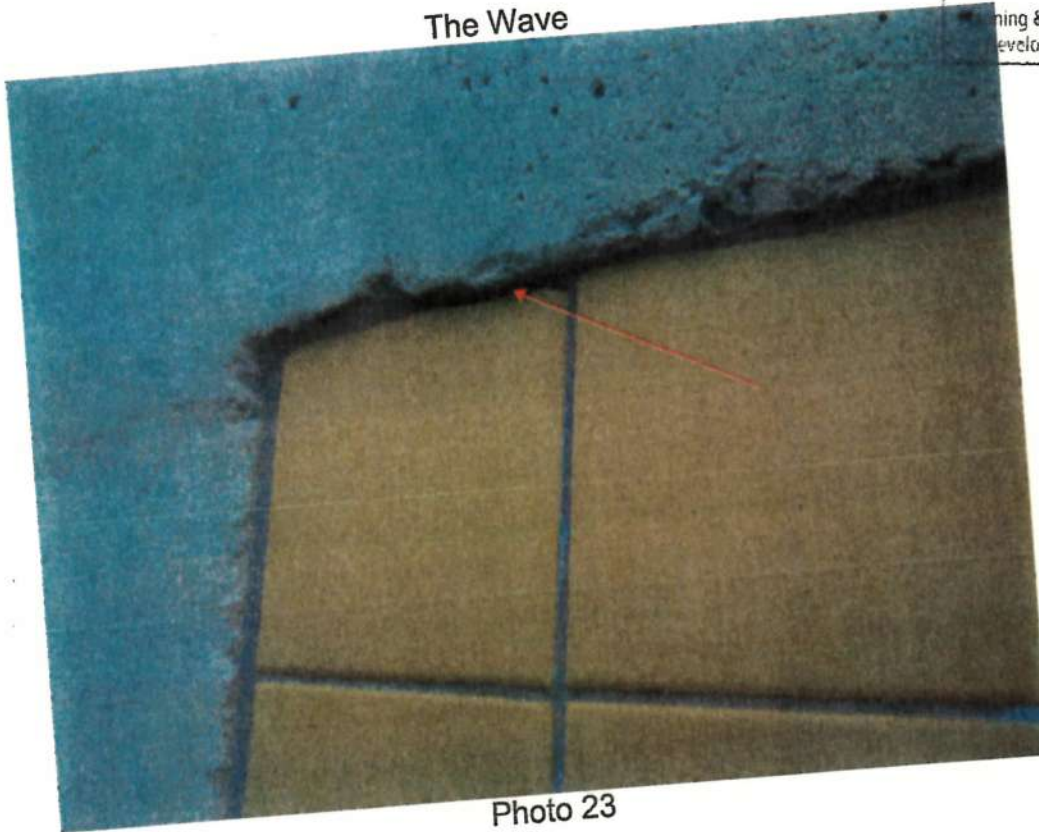


Photo 23



Photo 24

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