STRUCTURAL CONDITION ASSESSMENT
1600 Washington Ave
Miami Beach, Florida 33139

June 5, 2025
H190070

PREPARED BY

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Youssef Hachem Consulting Engineering

TABLE OF CONTENTS

I. Introduction	Page 3
II. Methodology	Page 4
III. Structural System	Page 4
IV. Structural Evaluation	Page 5
V. Lab Concrete Testing	Page 6
VI. Recommendations	Page 9
Appendix A - Photos	Page 10
Appendix B – NV5 Report	Page 14

STRUCTURAL CONDITION ASSESSMENT for
1600 Washington Ave
Miami Beach, Florida 33139

I. INTRODUCTION

General

We have conducted a visual structural condition assessment on the existing structure located at 1600 Washington Ave, Miami Beach, FL 33139.

The Folio for this address contains three building, this report is for the West building.

The purpose of the inspection is to assess the structural condition of the structure, to evaluate the structural capacity of the building.

Property appraiser information

Based on Miami Dade County property appraiser, the structure was built in 1938, the building is of 2 stories with a living area of approximately 5,022 square feet.

II. METHODOLOGY

This inspection was visual in nature from the exterior and interior of the building. Our office did not perform any destructive or non-destructive testing; however, Ownership did engage NV5 to perform concrete core samples to test for:

1- Concrete compressive strength
2- Extent of Carbonation
3- Chloride Content

The report in its entirety is in Appendix B. Discussion of the results are to follow in this report.

No structural analysis was performed on the building to determine the capacity of the structural systems. It's our opinion that the current structural system of the building does not comply Florida Building Code 2023 (8th edition), HVHZ (High Velocity Hurricane Zone) edition, due to the current design standards and due to the damage to the structural systems of the building where they have lost most of the load carrying capacities.

III. STRUCTURAL SYSTEMS

The structure is a two-story building. The building's structural system is as follows:

- First Floor - Crawl Space
    - Shallow foundations.
    - Elevated wood floor joist on stem walls.
- Second Floor:
    - Wood Joist seated on top of the wall without any strap connector.
    - Unreinforced masonry block with tie beams and columns.
- Roof:
    - Wood joist rafter system on wood knee walls.
    -

Performing the inspection visually was useful to determine spalling and cracking issues on the concrete structure. Our office coordinated to perform some destructive and non-destructive test to determine the capacity of the structural systems. Notice in this report we are addressing the results of the test in Appendix B.

III. STRUCTURAL EVALUATION

Building constructions and standards of the 1930's are considered deficient by today's standards. This applies to this structure and other structures built in the 1930's. This building does not comply with the current building code. The structure's roof connections for wind uplift forces and for wind lateral resistance are non-existent. Moreover, openings protection and CMU reinforcing is also non-existent. This building lacks the load carrying capacities to make it safe to use. This building has to be demolished and rebuilt to comply with the current Florida Building Code.

According to the structural inspection we determined that the following:

- Several linear cracking on the walls.
- Extensive concrete spalling and deterioration in columns and beams
- Extensive reinforcing rebar corrosion, and complete loss of rebar
- Extensive wood joist and decking deterioration due to rot, moisture damage and termites.
- Completer floors failures that made it unsafe to access some areas of the structure

All the issues described above are addressed according to our visual inspections (see Appendix A).

We did not find any structural as built plan or historical plan available to review.

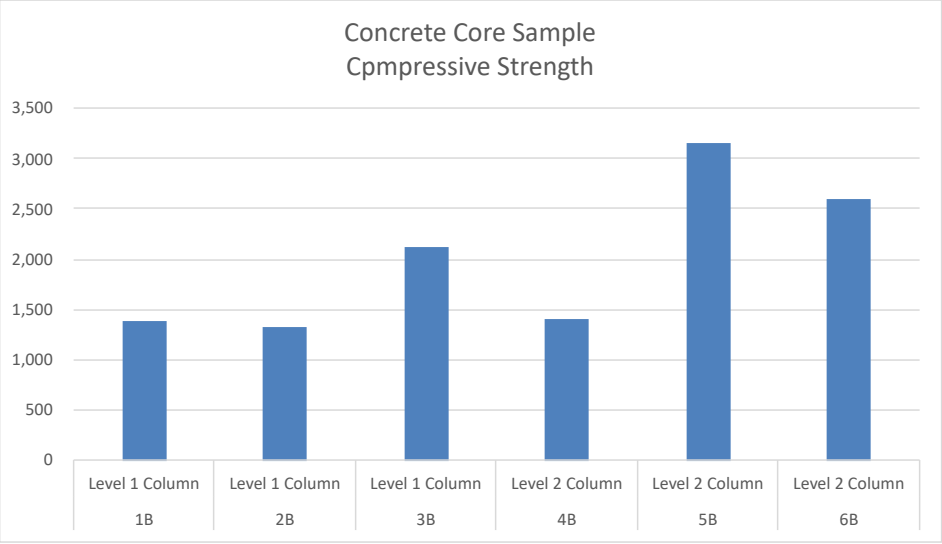
The building is in poor condition and does not comply with current building code as it presents damage described above like cracking and spalling (See images in appendix a). Concrete elements such as columns and beams exhibited loss of strength and lack of capacity to support subjected live and dead loads.

V. LAB CONCRETE TESTING

Ownership engaged NV5, Inc. to conduct concrete laboratory testing on the building to obtain compressive strength, carbonation depth, and chloride content. The laboratory extracted three (12) concrete core samples of sizes 3.00 in diameter by 6.00 in length approximately, which also were used to test for carbonation and chloride.

-Concrete compressive: the results of the testing for concrete strength are tabulated and charted as follows:

Core Number	Location	Compressive Strength [PSI]
1B	Level 1 Column	1,380
2B	Level 1 Column	1,330
3B	Level 1 Column	2,130
4B	Level 2 Column	1,400
5B	Level 2 Column	3,150
6B	Level 2 Column	2,600



The Concrete compressive strength ranged from 1,330 to 3,150 psi.

-Carbonation depth: Carbon dioxide from air reacts with the calcium hydroxide in concrete to form calcium carbonate, this process is called carbonation. Carbonation, naturally starts from the exterior surface and progresses inwards. Carbonation actually increases the compressive strength of concrete; however, it also decreases alkalinity, which is essential for corrosion prevention of the reinforcement steel. The results of the testing for carbonation depth are tabulated and charted as follows:

Core	Location	Carbonation Depth

Number		[IN]
1A	Level 1 Column	0"- 8.00"
2A	Level 1 Column	2.50"- 8.0"
3A	Level 1 Column	0"- 2.8" & 4.75"- 8.00"
4A	Level 2 Column	0"- 8.00"
5A	Level 2 Column	5.75" - 8.00"
6A	Level 2 Column	0" - 0.88" & 6.25" - 8.38"

The carbonation found in the samples ranged between 2.8" – 8" (Full Depth), Indicating full loss of rebar protection.

- Chloride Content: Chloride salts react with the concrete and reduce its alkalinity. When that happens, the protective layer surrounding the rebar is broken and rebar corrosion starts.

The chemical analysis of concrete core No. 1A, 2A, 3A, 4A, 5A, 6A were labeled and bagged separately and sent to A&S Laboratories to be tested for water-soluble calcium chloride and carbonation. Chloride testing was performed at depths of 0"-1", 1"-2" from the top facing the exterior and the bottom 1" interior in general accordance with the test method described in ASTM C1218 15, Standard Test Method for Water Soluble Chloride in Mortar and Concrete.

Core Number	Core Locations	Top 0"-1"	Top 1"-2"	Bottom 1"
1A	Level 1	0.038	0.038	0.2945
	Column			
2A	Level 1	0.4655	0.5367	0.3515
	Column			
3A	Level 1	0.0617	0.0428	0.7505
	Column			
4A	Level 2	0.209	0.133	0.4988
	Column			
5A	Level 2	0.323	L4230	16150
	Column			
6A	Level 2	0.095	0.3373	00G17
	Column			

According to the publication 'Design and Control of Concrete Mixtures', chlorides may be introduced into concrete with the separate mix ingredients (admixtures, aggregates, cement, and mixing water) or through exposure to deicing salts, seawater, or salt laden air in coastal environments. An acceptable limit depends primarily upon the type of structure and the environment to which it is exposed during its service life. ACI 318R 14, table 19.3.2.1 shows that the maximum water-soluble chloride ion (CI) content in concrete (percent by weight of cement) shall be 0.30% for non pre stressed concrete exposed to moisture but not to an external source of chloride and 0.15% for non-pre-stressed concrete exposed to moisture and an external source of chloride from deicing chemical, salt, brackish water, seawater, or spray from these sources.

VI. RECOMMENDATIONS

Currently, the elevation of the building is below floods level (6.87’ NGVD). Pursuant to FEMA, if the cost of the renovations exceeds 50% of the value of the structure without the land, the structure has to be elevated to meet current flood requirements. The foundations of the structure cannot endure the elevation process, and will fail during the process. Therefore, raising the house up to needed elevations for compliance is not feasible.

In order to raise the structure, scaffolding and temporary framing will be installed under the foundation to jack up the structure. The foundation of the house is weak enough to crumble under such loads during the jacking process, due to the footer being on shallow foundation. Hence in order to raise the structure a complete foundation rehabilitation and redesign need to occur to sustain the jacking loads.

All the main structural members of the structure are compromised, and need to be demolished and replaced. Hence, we recommend the demolition of the structure.

APPENDIX A

PHOTOS

West Elevation view	Partial East elevation

Concrete beam spalling and rebar corrosion	Concrete beam spalling and rebar corrosion
Concrete beam spalling and rebar corrosion	Critical Linear Crack concrete grade beam
Concrete cracking	Wood Damage and failure

2nd floor wood failure	1st floor wood failure
Roof Failure	2nd floor concrete beam damage
2nd floor wood failure	Roof moisture penetration damage

Stud wall damage	2nd floor damage

APPENDIX B

NV5- Report

NV5

January 6, 2020

Ms. Flavia Winschel
Claro Development
1035 North Miami Ave. Suite 201
Miami, FL 33136

Re: **Report of Core Compressive Strength and Chemical Analysis Tests**
1600 Washington Avenue – Concrete Core Tests
1600 Washington Avenue
Miami Beach, Florida 33139
NV5 Project No. 16765.00

Dear Ms. Winschel:

NV5, Inc. submits this report in fulfillment with the Scope of Services described in our revised proposal No. 19-1039 dated December 11, 2019. The work was authorized by acceptance of our professional agreement. This report contains the data collected, describes the procedures used, and presents results for the laboratory tests conducted.

PROJECT INFORMATION

The proposed development is located at 1600 Washington Ave. in Miami Beach, Florida. It is bounded to the north/south by similar residential/commercial developments, to the west by Miami Beach Parking Garage and to the east by Lincoln Place. The site currently is occupied by a two-story building with hardscape and landscape areas.

Ms. Flavia Winschel with Claro Development at the direction of the Structural Engineer Mr. Youssef Hachem with YHCE has requested thru an email to extract concrete cores. The request was to determine the condition of the existing concrete columns by testing for compressive strength, water-soluble calcium chloride and depth of carbonation.

NV5 representatives visited the site on December 06, 2019 for a walk-through. The walk-trough was in the presence of the structural engineer and the owner's representative to point out the twelve (12) concrete core locations. NV5 was informed to extract twelve (12) cores from the columns facing the south side of the building at full depth at levels 1 and 2.

- Six (6) cores for compressive strength
- Six (6) cores for chemical analysis (water-soluble calcium chloride and depth of carbonation)

GPR scanning was performed to locate reinforcement steel bars prior core drilling. Sampling and testing were performed in general accordance with appropriate ASTM procedures.

The concrete cores were to be extracted from the locations depicted in Figure 1.

Figure 1: 1600 Washington Ave. - Approximate Concrete Core Locations

PURPOSE

The purpose of our services on this project was to: provide a report summarizing the data collected from the concrete core compressive strength tests, and chemical analysis tests.

FIELD WORK

NV5 GPR scanned the areas indicated by the structural engineer and collected the core samples on December 19, 2019. Twelve (12) concrete cores were retrieved at levels 1 and 2 from the columns facing the south and southeast side of the building. Due to tightly spaced reinforcing steel, the cores diameter was 3.21 and 3.22 inches. Although the core samples were below the recommended diameter described by ASTM C42-18, they were drilled in compliance with section 7.1.2 of ASTM C42-18. Multiple cracks found on the inside of the columns were noted by NV5.

Subsequently, the core samples were bagged within the time limit indicated in ASTM C42-18 standard. The core samples were transported to our laboratory for testing. Photographs of the extracted core locations are included in Appendix A.

LABORATORY TESTING

A. Cores - Compressive Strength Test

The extraction and compressive strength testing of the concrete cores were performed in substantial compliance with ASTM C42-18, Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete. Core No. 1B, 2B, 3B, 4B, 5B, 6B were cut for appropriate test correction factor of approximately 2:1 length to diameter ratio. The core samples were capped with a high-strength capping compound (TMI CA-0100 Capping Compound) and later subjected to compressive strength testing. The compressive strength results ranged from 1,330 to 3,150 pounds per square inch (psi).

Details of the compressive strength results of the individual core samples are summarized in Table 1 as well as Appendix C - NV5 Report - Core Compressive Strength Results. Photographs of the core samples obtained in the field and tested in the laboratory are included in Appendix B.

B. Cores – Chloride Ion Content Test

The chemical analysis of concrete core No. 1A, 2A, 3A, 4A, 5A, 6A were labeled and bagged separately and sent to A&S Laboratories to be tested for water-soluble calcium chloride and carbonation. Chloride testing was performed at depths of 0"-1", 1"-2" from the top facing the exterior and the bottom 1" interior in general accordance with the test method described in ASTM C1218-15, Standard Test Method for Water Soluble Chloride in Mortar and Concrete.

According to the publication 'Design and Control of Concrete Mixtures', chlorides may be introduced into concrete with the separate mix ingredients (admixtures, aggregates, cement, and mixing water) or through exposure to deicing salts, seawater, or salt laden air in coastal environments. An acceptable limit depends primarily upon the type of structure and the environment to which it is exposed during its service life. ACI 318R-14, table 19.3.2.1 shows that the maximum water-soluble chloride ion (Cl^-) content in concrete (percent by weight of cement) shall be 0.30% for non-pre-stressed concrete exposed to moisture but not to an external source of chloride and 0.15% for non-pre-stressed concrete exposed to moisture and an external source of chloride from deicing chemical, salt, brackish water, seawater, or spray from these sources.

Based on the core samples tested, the percent chlorides obtained ranged from 0.0380% to 1.6150%. The percent chloride by mass of cement of each individual sample has been included in A&S Laboratories Test Reports shown in Table 1 and in Appendix D.

The percent chlorides presented in the report were based on a 10 gram pulverized sample of the hardened concrete mixture. In the absence of the concrete mix design, we assumed that the cement weight is approximately 400-pound (lbs.) for a 3,000 pounds per square inch (psi) concrete strength. Therefore, the percent chloride by mass of cement is an estimated value to the best of our knowledge and available information.

C. CORES – DEPTH OF CARBONATION TEST

A specific testing method for the Depth of Carbonation testing was not provided. However, a reference to depth of carbonation testing is included in ASTM C856-18, *Standard Practice for Petrographic Examination of Hardened Concrete.*

Carbonation is one of the two main causes of corrosion of steel in concrete and grout; the other is chloride attack. The depth of carbonation was performed on the freshly exposed section of the core samples by spraying with an indicator spray such as phenolphthalein. The concrete core sample turns pink when the concrete is alkaline (above pH 9.2) but remains colorless where the concrete is carbonated, usually as more or less even zone extending from the surface. A&S Laboratories conducted the depth of carbonation up to different content and carbonation was found present in all the core samples. The carbonation test results and photographs are disclosed in Table 1 and in Appendix E.

Table 1: Core Samples – Columns
NV5 Test Results
And A&S Laboratories Chemical Test Results

Core Number	Core Locations	Core Compressive Strength Results (psi)	Chloride Ion Content By Mass of Cement (%)			Core Sample Carbonation Test (in)
			Top 0"-1"	Top 1"-2"	Bottom 1"	Full Depth
1A	Level 1 Column	---	0.0380	0.0380	0.2945	0" – 8.00"
1B	Level 1 Column	1,380	---	---	---	---
2A	Level 1 Column	---	0.4655	0.5367	0.3515	2.50" – 8.00"
2B	Level 1 Column	1,330	---	---	---	---
3A	Level 1 Column	---	0.0617	0.0428	0.7505	0" – 2.80" & 4.75" – 8.00"
3B	Level 1 Column	2,130	---	---	---	---
4A	Level 2 Column	---	0.2090	0.1330	0.4988	0" – 8.00"
4B	Level 2 Column	1,400	---	---	---	---
5A	Level 2 Column	---	0.3230	1.4230	1.6150	5.75" – 8.00"
5B	Level 2 Column	3,150	---	---	---	---
6A	Level 2 Column	---	0.0950	0.3373	0.0617	0" – 0.88" & 6.25" – 8.38"
6B	Level 2 Column	2,600	---	---	---	---

CLOSURE

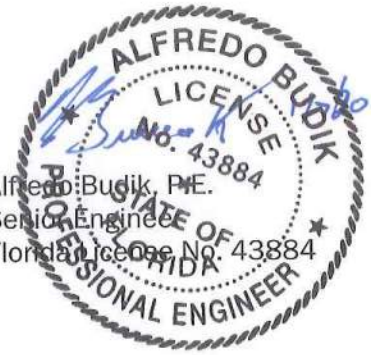
We appreciate the opportunity to provide engineering and material testing services on this project. This report has been prepared for the exclusive use of the current project owners, and other members of the design team for the specific application to the project described in this report. This report has been prepared in accordance with generally accepted local engineering practices; no other warranty is expressed or implied.

If you have questions about information contained in this report, please contact the undersigned at 305-666-3563.

Sincerely,

NV5, Inc.

Ilya Liberman, PhD, CBO
CMT Manager



Alfredo Budik, P.E.
Senior Engineer
Florida License No. 43884

Distribution: 2 Copies to Addressee via U.S. Mail
Copy to NV5 File

Attachments:
Appendix A: Drawing of Core Sample Locations (1 page)
Appendix B: Photographs of The Core Samples (3 pages)
Appendix C: NV5 - Core Compressive Strength Report (1 page)
Appendix D: A&S Lab Report: Percent Chloride by Mass of Cement Test Results (18 pages)
Appendix E: A&S Lab Report: Carbonation Test Results and Photographs (3 pages)

F:\DOC\NV5 Reports\16765.00 - 1600 Washington Avenue - Concrete Core Tests_1600 Washington Avenue_Miami Beach_FL_Claro Development_Concrete Core Compressive Strength, Chloride Ion Content, Carbonation Tests_Report_1-06-2020.docx

APPENDIX A
Drawings of Extracted Cores
Locations

Site Vicinity Map

Approximate Scale in Feet

LEGEND:

Core Samples - Locations

1) Level 1: Core #1 Column SE Side of Building Mid Height

2) Levels 1 & 2: Cores #2 to #6 - Column South Side of Building Mid Height

NOTES:

1. Test locations shown are approximate.
2. Test location symbols are not to scale.

NV5	**DRAWING TITLE:** *Drawing of Core Sample Locations*				**DWN BY:** *RN*
	PROJECT NAME: *1600 Washington Avenue - Concrete Core Tests*				**CKD BY:** *IL*
	PROJECT LOCATION: *1600 Washington Avenue, Miami Beach, Florida*	**Folio No.:** *Not Provided*	**DATE:** *01/06/2020*	**DWG NO:** *1*	**APD BY**

APPENDIX B
Photographs of The Core Samples

Figure 2: Photograph of Core Samples Level 1 Column
(Compression/Chloride/Carbonation Samples)

Figure 3: Photograph of Core Samples Level 1 Column
(Compression/Chloride/Carbonation Samples)

Figure 4: Photograph of Core Samples Level 1
(Compression/Chloride/Carbonation Samples)

Figure 5: Photograph of Core Samples Level 2
(Compression/Chloride/Carbonation Samples)

Figure 6: Photograph of Core Samples Level 2
(Compression/Chloride/Carbonation Samples)

Figure 7: Photograph of Core Samples Level 2
(Compression/Chloride/Carbonation Samples)

APPENDIX C
NV5 - Core Compressive Strength Report

CORES COMPRESSIVE STRENGTH REPORT

NV5, INC.
14486 COMMERCE WAY, MIAMI LAKES FL 33016
TELEPHONE NO. 305-666-3563 FAX NO.: 305-666-3069

PROJECT NAME: 1600 Washington Avenue
PROJECT NUMBER: 16765
DATE: 12/26/2019

CLIENT: Claro Development
SAMPLE BY: P. Varas
SET NO.: 1

CONTRACTOR: YHCE
SPECIFIED STRENGTH: N/P AT N/P DAYS
PAGE NO.: 1

TEST METHOD: In general accordance with ASTM C42-18a
CONCRETE SUPPLIER: N/P

Core Number	Core Location	Core Sample ID	Core Dimensions					Compressive Strength				Fracture Type	Maximum Nominal Aggregate Size	Pour Date	Core Date	Preparation Date	Test Date	Core Weight (lbs.)	Core Unit Weight (lbs./ft³)
			Diameter (inches)	Lengths			Cross Sectional Area (sq.inches)	Maximum Load (lbs.)	L/D	Correction Factor	Approx. Compressive Strength (psi)								
				Original (inches)	w/o cap (inches)	with cap (inches)													
1B	Level 1 Column	SE Side of Bldg. Mid Height	3.21	7.63	4.78	4.95	8.09	11,580	1.54	0.96	1,380	3	#67	Not Provided	12/19/2019	12/20/2019	12/26/2019	2.806	125.34
2B	Level 1 Column	South Side of Bldg. - Mid Height	3.21	8.00	6.18	6.32	8.09	10,760	1.97	1.00	1,330	3	#67	Not Provided	12/19/2019	12/20/2019	12/26/2019	3.689	127.46
3B	Level 1 Column	South Side of Bldg. - Mid Height	3.22	7.88	6.16	6.29	8.14	17,330	1.95	1.00	2,130	4	#67	Not Provided	12/19/2019	12/20/2019	12/26/2019	3.783	130.32
4B	Level 2 Column	South Side of Bldg. - Mid Height	3.21	8.25	6.13	6.29	8.09	11,330	1.96	1.00	1,400	4	#67	Not Provided	12/19/2019	12/20/2019	12/26/2019	3.686	128.39
5B	Level 2 Column	South Side of Bldg. - Mid Height	3.22	7.88	6.45	6.32	8.14	25,650	1.96	1.00	3,150	4	#67	Not Provided	12/19/2019	12/20/2019	12/26/2019	3.843	126.43
6B	Level 2 Column	South Side of Bldg. - Mid Height	3.22	8.25	6.20	6.31	8.14	21,180	1.96	1.00	2,600	4	#67	Not Provided	12/19/2019	12/20/2019	12/26/2019	3.846	131.63

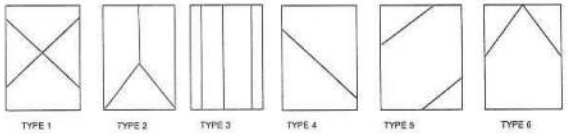
Notes

1 According to ACI 318 and Note 4 of ASTM C42-18, "The concrete represented by the cores is considered structurally adequate if the average strength of three cores is at least 85% of the specified strength and no single core strength is less than 75% of the specified strength". Compressive strength results should be reviewed by the Engineer of Record for acceptance.

2 According to ASTM C42-18, Section 7.3.3 — "Allow the cores to remain in the sealed plastic bags or nonabsorbent containers for at least 5 days after last being wetted and before testing, unless stipulated otherwise by the specifier of tests".

3 Direction of load application is Perpendicular and moisture condition is bagged.

FRACTURE TYPE



NV5

APPENDIX D
A&S Laboratories
Percent Chloride by Mass of Cement Test Results

A & S Laboratories
2550 Success Dr.
Odessa, FL 33556
Phone: (727)375-0388

TEST REPORT

A & S Project Number:	784539
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Top of Core 1A
Client Identification:	0-1"
Project Number:	16765
Sample Characteristics:	pH=11.1
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	40 ppm
Percent Chloride Content:	0.0040 %
Percent Chloride by Mass of Cement:	0.0380 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

A & S Laboratories
2550 Success Dr.
Odessa, FL 33556
Phone: (727)375-0388

TEST REPORT

A & S Project Number:	784540
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Top of Core 1A
Client Identification:	1-2"
Project Number:	16765
Sample Characteristics:	pH=11.0
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	40 ppm
Percent Chloride Content:	0.0040 %
Percent Chloride by Mass of Cement:	0.0380 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

A & S Laboratories
2550 Success Dr.
Odessa, FL 33556
Phone: (727)375-0388

TEST REPORT

A & S Project Number:	784541
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Bottom of Core 1A
Client Identification:	0-1""
Project Number:	16765
Sample Characteristics:	pH=11.2
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	310 ppm
Percent Chloride Content:	0.0310 %
Percent Chloride by Mass of Cement:	0.2945 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

A & S Laboratories
2550 Success Dr.
Odessa, FL 33556
Phone: (727)375-0388

TEST REPORT

A & S Project Number:	784542
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Top of Core 2A
Client Identification:	0-1""
Project Number:	16765
Sample Characteristics:	pH=13.3
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	490 ppm
Percent Chloride Content:	0.0490 %
Percent Chloride by Mass of Cement:	0.4655 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

A & S Laboratories
2550 Success Dr.
Odessa, FL 33556
Phone: (727)375-0388

TEST REPORT

A & S Project Number:	784543
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Top of Core 2A
Client Identification:	1-2"
Project Number:	16765
Sample Characteristics:	pH=13.6
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	565 ppm
Percent Chloride Content:	0.0565 %
Percent Chloride by Mass of Cement:	0.5367 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

A & S Laboratories
2550 Success Dr.
Odessa, FL 33556
Phone: (727)375-0388

TEST REPORT

A & S Project Number:	784544
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Bottom of Core 2A
Client Identification:	0-1"
Project Number:	16765
Sample Characteristics:	pH=11.8
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	370 ppm
Percent Chloride Content:	0.0370 %
Percent Chloride by Mass of Cement:	0.3515 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

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TEST REPORT

A & S Project Number:	784545
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Top of Core 3A
Client Identification:	0-1"
Project Number:	16765
Sample Characteristics:	pH=11.3
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	65 ppm
Percent Chloride Content:	0.0065 %
Percent Chloride by Mass of Cement:	0.0617 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

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Phone: (727)375-0388

TEST REPORT

A & S Project Number:	784546
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Top of Core 3A
Client Identification:	1-2"
Project Number:	16765
Sample Characteristics:	pH=11.3
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	45 ppm
Percent Chloride Content:	0.0045 %
Percent Chloride by Mass of Cement:	0.0428 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

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Phone: (727)375-0388

TEST REPORT

A & S Project Number:	784547
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Bottom of Core 3A
Client Identification:	0-1"
Project Number:	16765
Sample Characteristics:	pH=10.9
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	790 ppm
Percent Chloride Content:	0.0790 %
Percent Chloride by Mass of Cement:	0.7505 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

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Phone: (727)375-0388

TEST REPORT

A & S Project Number:	784548
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Top of Core 4A
Client Identification:	0-1"
Project Number:	16765
Sample Characteristics:	pH=11.0
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	220 ppm
Percent Chloride Content:	0.0220 %
Percent Chloride by Mass of Cement:	0.2090 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

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TEST REPORT

A & S Project Number:	784549
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Top of Core 4A
Client Identification:	1-2"
Project Number:	16765
Sample Characteristics:	pH=10.8
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	140 ppm
Percent Chloride Content:	0.0140 %
Percent Chloride by Mass of Cement:	0.1330 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

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Phone: (727)375-0388

TEST REPORT

A & S Project Number:	784550
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Bottom of Core 4A
Client Identification:	0-1"
Project Number:	16765
Sample Characteristics:	pH=10.8
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	525 ppm
Percent Chloride Content:	0.0525 %
Percent Chloride by Mass of Cement:	0.4988 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

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TEST REPORT

A & S Project Number:	784551
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Top of Core 5A
Client Identification:	0-1"
Project Number:	16765
Sample Characteristics:	pH=12.8
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	340 ppm
Percent Chloride Content:	0.0340 %
Percent Chloride by Mass of Cement:	0.3230 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

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TEST REPORT

A & S Project Number:	784552
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Top of Core 5A
Client Identification:	1-2"
Project Number:	16765
Sample Characteristics:	pH=13.5
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	1500 ppm
Percent Chloride Content:	0.1500 %
Percent Chloride by Mass of Cement:	1.4250 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

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TEST REPORT

A & S Project Number:	784553
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Bottom of Core 5A
Client Identification:	0-1"
Project Number:	16765
Sample Characteristics:	pH=11.3
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	1700 ppm
Percent Chloride Content:	0.1700 %
Percent Chloride by Mass of Cement:	1.6150 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

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TEST REPORT

A & S Project Number:	784554
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Top of Core 6A
Client Identification:	0-1"
Project Number:	16765
Sample Characteristics:	pH=12.2
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	100 ppm
Percent Chloride Content:	0.0100 %
Percent Chloride by Mass of Cement:	0.0950 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

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Odessa, FL 33556
Phone: (727)375-0388

TEST REPORT

A & S Project Number:	784555
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Top of Core 6A
Client Identification:	1-2"
Project Number:	16765
Sample Characteristics:	pH=13.2
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	355 ppm
Percent Chloride Content:	0.0355 %
Percent Chloride by Mass of Cement:	0.3373 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

A & S Laboratories
2550 Success Dr.
Odessa, FL 33556
Phone: (727)375-0388

TEST REPORT

A & S Project Number:	784556
Purchase Order Number	N/A
Customer:	NV5
Project Name:	1600 Washington Avenue
Attention:	Ralph Numa

The results of tests performed in accordance with ASTM C1218-15 Water Soluble Chloride in Mortar and Concrete are as follows:

Sample Location:	Bottom of Core 6A
Client Identification:	0-1"
Project Number:	16765
Sample Characteristics:	pH=11.5
Date Core Extracted:	12/19/19
Date Sample Tested:	01/05/20
Design Compressive Strength:	N/A
Cement Weight (lbs.):	400
Chloride Content (mg/kg)	65 ppm
Percent Chloride Content:	0.0065 %
Percent Chloride by Mass of Cement:	0.0617 %*

Gregory P Allen
Lab Director

*This result is based on client supplied data. The percent chloride by mass of cement may be an estimated value. The client should provide a mix design when possible for an accurate calculation.

APPENDIX E
A&S Laboratories Carbonation
Test Results and Photographs

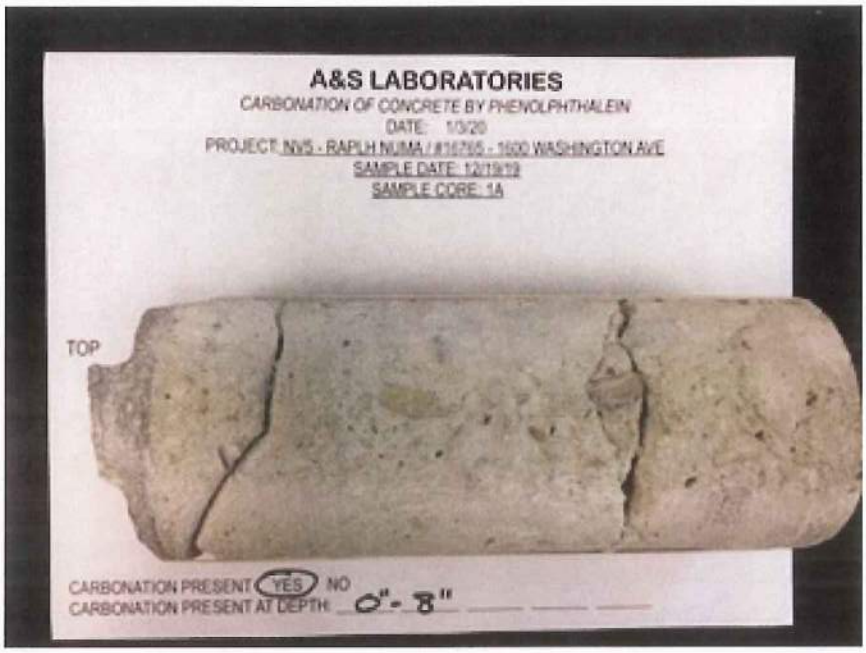

Figure 8: Carbonation Core Sample No. 1A: Level 1 Column

Figure 9: Photograph Core Sample No. 2A: Level 1 Column

Figure 10: Photograph Core Sample No. 3A: Level 1 Column

Figure 11: Photograph Core Sample No. 4A: Level 2 Column

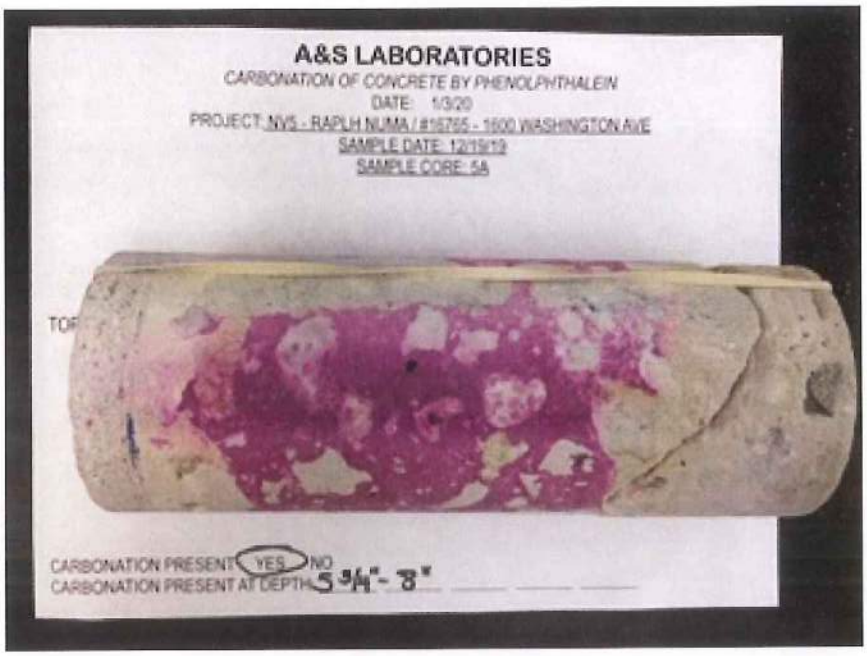

Figure 12: Photograph Core Sample No. 5A: Level 2 Column

Figure 13: Photograph Core Sample No. 6A: Level 2 Column