July 31, 2025

PROJECT NO. MDBCH25002

Marci L. Forbes, PE, CFM
Community Development Director
City of Madeira Beach
300 Municipal Dr.
Madeira Beach, FL 33708

**RE: LIMITED STRUCTURAL FLOOD HARDENING STUDY OF MADEIRA BEACH CITY HALL
MADEIRA BEACH CITY HALL RENOVATION & FLOOD HARDENING
300 MUNICIPAL DR.
MADEIRA BEACH, FL 33708**

Dear Ms. Forbes,

In September of 2024 portions of the 1st floor of the Maderia Beach City Hall Building were flooded from the waters of Hurricane Helene. On February 3, 2025, at your request, a walkthrough was conducted by Pennoni, Sofarelli & Associates, and City of Madeira Beach stakeholders to review the scope of and discuss the proposed renovations. In advance to the repairs and renovations to the city hall building, Pennoni was contracted to complete a limited structural hardening study with GPR investigation to investigate the original construction of the building and to propose repairs to the structure.

This report will summarize Pennoni's findings and recommendations.

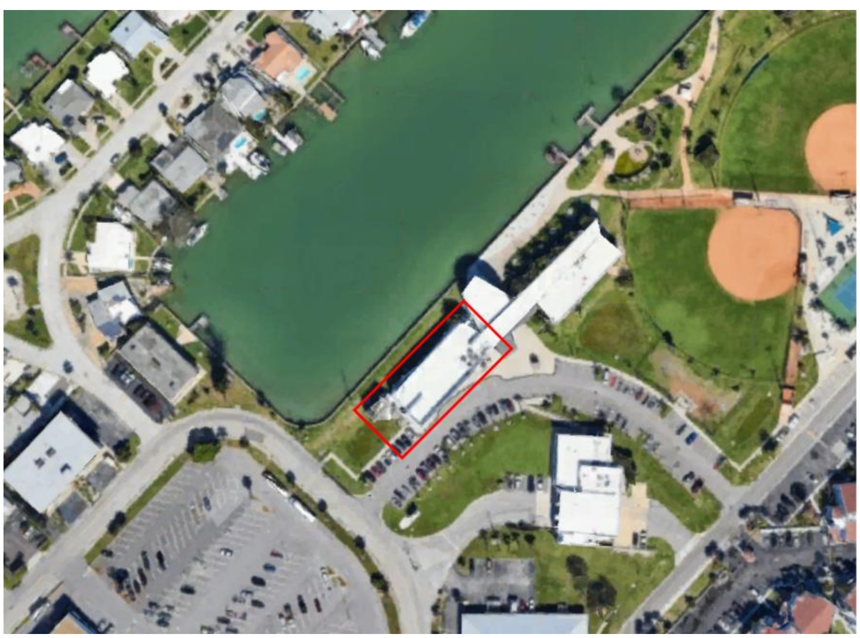


Figure 1 – Subject Building with Area under Review Highlighted

1.0 BACKGROUND INFORMATION

The building analyzed in the report is the Madeira Beach City Hall Building. The building is a 2-story city hall complex. The foundation of the building is a concrete slab on grade with wire mesh reinforcement. Original drawings for the 2-story portion of the building were not provided for our review. It is our understanding that the first-floor enclosed area was originally open with ground level parking. This area was then converted into occupied space as described below in 2020.

The exterior walls are infilled between concrete columns and comprise of 8" CMU with #5 vertical reinforcing at a maximum spacing of 48" on center. Vertical filled cell reinforcing is also located at surrounding openings. The ground floor of the building is supported by a 4" unreinforced slab on grade. Pennoni was provided with 2 sets of Built-Out Drawings by John A. Bodziak, one for permit dated 11/22/2019 and a revision set dated 10/22/2020 for our review.

2.0 GEOPHYSICAL SCANNING BY GEOVIEW AND VERIFICATION OF EXISTING CONDTIONS

At Pennoni's request, the ground penetrating radar (GPR) was utilized by GeoView Inc. to scan the exterior walls and ground floor to identify the slab on grade thickness, reinforcing in the walls and slab, and determine if the building was constructed in compliance with the 2020 permit drawings issued by the Architect, John A. Bodziak. The presence of reinforcing and filled cells in the masonry walls provides resistance to lateral forces such as wind pressures and flood waters. The full report can be found in **Exhibit A**.

Based on the results of the scanning, the slab on grade is between 4" and 5" thick depending on location. There is no steel reinforcing or wire mesh reinforcing in the slab. This matches what was specified on the 2020 drawings plan review comments we received as part of our review document. One major difference from as-built conditions was that the permit drawings show interior thickened concrete grade beams, the GeoView findings reported that there are no interior grade beams present in the floor slab. The GeoView report also notes that the interior columns are independent from the slab. GeoView suspects that the columns that extend to the second floor are supported by driven piles as shallow foundations were not identified by the GPR.

The thickened slab edge was found to have longitudinal pieces of rebar. This longitudinal rebar was located 6" below the top of slab and at 4" on center. GeoView was unable to confirm reinforcing in the bottom portion of thickened slab edge.

The exterior CMU walls were found to have concrete filled cells with vertical steel reinforcement. The locations of the reinforcing closely resembled what was shown on the 2020 drawings.

Therefore, the as-built conditions generally match the conditions described in the October 29, 2020 letter issued by John A. Bodziak, Architect to the Maderia Beach building official that states the following. Relevant Pennoni Comments are shown in **Blue**.

Page 1-

<u>Revision #1</u>

Revisions previously implemented included the introduction of a Frangible Slab, replacing the Structurally Reinforced Slab with Cross Slab Footings.

Upon further Review with Structural Consultant, the introduction of the Frangible Slab negates the necessity of the Cross Slab Reinforced Footings that are now shown, as deleted on this 10/29/2020 Revision.

This Revision also notes the Epoxied #5 Rebar Dowling into existing Reinforced Columns, as shown on Page A-2.0.

PAI Comment – Based on Scanning of the structure no reinforcement of the slab was found.

Page 6 -

21. Several drawing sheets indicate all concrete slabs below BFE be frangible. Sheet A-1.0 calls for 6x6 WWM reinforcement in 4" slab and shows rebar in thickened edge details on A-1.0 and A-2.0. Is fiber mesh in Cart Storage slab allowable for a frangible slab? Please clarify.

<u>*AOR Response:*</u>

All concrete slabs below BFE are to be frangible. WWM has been deleted from References on Pages A-1.0 and A-2.0. Scoring Line in Surface at juncture of 4" Concrete Slab to Perimeter of the thickened Footing and at all internal Column intervals as shown on Pages A-1.0 and A-2.0.

PAI Comment – Based on Scanning of the structure no reinforcement of the slab was found.

Infill wall to existing column connections are specified in the below detail on sheet A-2.0

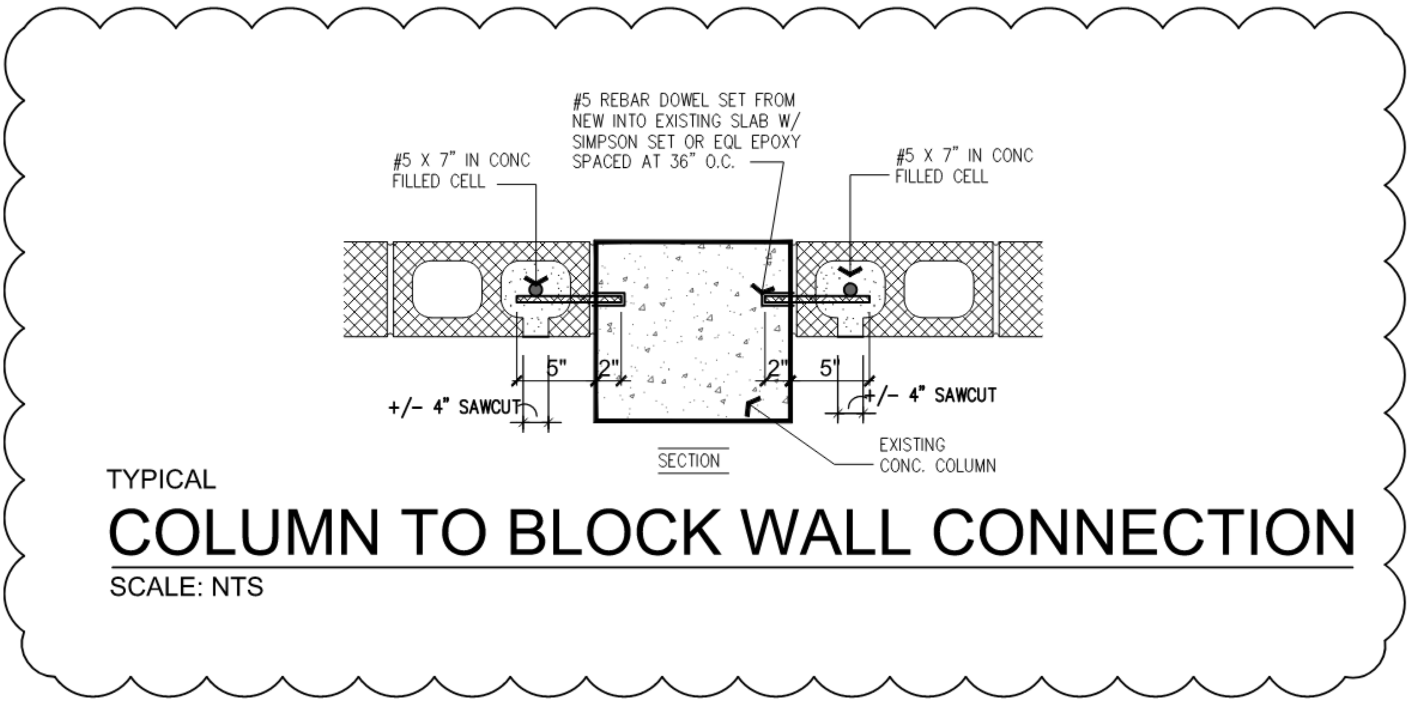


Figure 2 – CMU to Column Connection

PAI Comment – Based on Scanning of the structure the exterior columns appear to be tied into the exterior walls by horizontal rebar on 16-inch centers. The rebar is estimated to extend 6 to 8 inches into the wall columns.

3.0 FLOOD ZONE CONSIDERATIONS

At the time of original construction in 2020, the city hall building was located in FEMA Special Flood Hazard Area (SFHA) Zone AE10 in a coastal floodplain seaward of the Limit of Moderate Wave Action according to the FIRM map dated 08-18-2009. The design flood elevation after adding required + 2' freeboard was 12'. A flood elevation certificate dated 12-15-2021 was provided to the client but this is no longer valid records these values. The 2021 flood elevation certificate is in **Exhibit B**.

According to 2023, Florida Building code and latest FEMA maps, the subject building now located in a FEMA Special Flood Hazard Area Zone **AE11** in a coastal floodplain seaward of the Limit of Moderate Wave Action according to FIRM map dated 01-23-2025. The design flood elevation in Madeira, after adding the required freeboard of BFE + 4', is **15'**. It is recommended that an updated flood elevation certificate is obtained prior to proceeding with repair drawings to confirm current requirements. The current FEMA flood map is in **Exhibit C**.

Based on information received from the local Madeira Beach building official, the proposed repairs would be required to meet the original design codes referenced in the original construction. This would allow us to design the repairs for the 2017 Florida Building Code (FBC). This is the code requirement as long as the value of repairs and upgrades is less than 50% the current value of the building.

Figure 3 – Enlarged Area of Current FEMA Map

4.0 STRUCTURAL ANALYSIS

A. Analysis as Designed (2017 FBC):

The first analysis conducted was to determine if the structure, as designed in the permit drawings provided dated 11/22/2019, met the requirements of the original code (including wind and flood). The original design criteria are listed below as well as the loading used for this analysis (**Exhibit D**). The design flood elevation for this design is 12' and the building also needs to be designed for breaking waves up to 1.5' above base flood elevation. Codes Referenced for this analysis 6th Edition Florida Building Code (2017), ASCE 7-16, & ASCE 24-14. The as designed slab on grade system is a 4" concrete slab with no reinforcing of any type. The walls analyzed are constructed of 8" nominal CMU block with #5 Vertical reinforcement at 48" maximum, the wall height is 8'-9". The information for these structural members were provided in the build out set provided to Pennoni.

<u>Original Design Criteria</u>
Wind Speed = 150 mph
Wind Exposure Category: C
Risk Category: II
Soil Bearing Capacity = 3000 psf
Flood Zone = AE10 (Undefined A)
Flood Design Class = 3
Base Flood Elevation = 10'-0"
Design Floor Elevation = 12'-0"
<u>Loading</u>
Dead Load = Self weight + 5 psf
Live Load = 100 psf for lobby and corridor, 50 psf for offices
Components and Cladding Wall Pressure = -58.0 psf, Zone 4; -64.0 psf, Zone 5
Maximum combined wave pressure = 622 psf
Net breaking wave force (Ft) = 2,071 lb/ft at 2.49' above top of slab
Buoyant Force = 155 psf

<u>Assumptions</u>
CMU block f'm = 2000 psi
Slab on grade f'c = 3000 psi
Soil unit weight = 110 pcf

The results of this analysis determined that the 8" Nominal CMU wall **failed** in bending and deflection for flood loading. The bending stress is at **438%** of the wall's capacity. The deflection limit for an exterior load bearing wall with stucco finish is L/360 = 0.29" where L is the length (in this case height) of the wall. The loading on the wall gives a deflection of L/63 = 1.68", which is well outside required limit. The results show that the wall does **NOT** meet structural design code requirements for when the project was originally designed.

The 6" slab with wire mesh reinforcing failed for the buoyant force acting upward on the underside of the slab. The slab failed for bending as well as for displacement when accounting for flood loading. The mesh reinforcing failed throughout the slab with reinforcing needing to be 2.40 in^2/ft in critical areas of the slab. The wire mesh reinforcing shown on the drawings gives us a reinforcing area of 0.028 in^2/ft. The displacement from the upward buoyant force on the slab was 11.7" at midspan which is well beyond the allowable slab displacement limit of L/360. L/360 for this slab would be 2.76". For gravity loading only, without flood loading, the slab passes the design requirements. The 6x6-W1.4xW1.4 wire mesh reinforcing provided on the drawing is sufficient. 0.022 in2/ft are required in each direction, the 0.028 in2/ft of the wire mesh is sufficient for this. The slab also has insufficient displacement due to this loading. The slab would be an acceptable frangible slab, but as a structural slab it fails and would not resist flood loading as required by the 2017 FBC.

B. Analysis as Constructed (2017 FBC):

This analysis of the structure based on the build-out drawing set dated 10/22/2020. This design was confirmed based on the finding of the GPR investigation completed by GeoView. The drawing set followed the same design criteria as the set from 2019 that was used in the as designed analysis. The main difference in this analysis to the earlier analysis is the slab on grade. In the constructed building the slab is 4" thick with no reinforcement present. This was confirmed in the GeoView report.

The result of this study showed that the 4" unreinforced concrete slab failed for the buoyant force acting upward on the underside of the slab. The slab fails in bending stress. The maximum bending stress acting on the slab is 36.2 kip-ft/ft, the tensile capacity of the unreinforced slab is 0.077 kip-ft/ft. The deflection on the slab due to the buoyant pressure is 36.4", which is extensively beyond the allowable limit of 2.76". The slab as constructed would fail from buckling due to the buoyant force acting on the slab. It is suspected that the flooding of the 2024 hurricanes entered the building though both exterior doors and crack in the slabs. This type of water intrusion would be consist with a Frangible Slab.

The constructed exterior wall matches what was shown in the design set from 2019. However, as constructed this would meet the 2017 code wind loads, but not the flood code requirements.

C. Conceptual Repair Recommendations to Meet Original Design 2017 FBC Code Flood Loads:

This analysis was intended to determine a repair option to meet the code requirements of the existing structure for when the building was designed. The codes referenced for this design were the 6th Edition Florida Building Code (2017), ASCE 7-16, & ASCE 24-14. Additional design criteria and loading used for this analysis can be found in Section A, analysis as designed. This design would be dry floodproofed.

For the exterior walls to meet the existing code requirements for flood loading from the original design a new 2nd 8" CMU walls would need to be constructed and placed behind the face of the existing 8" CMU wall. The new wall would act as 16" CMU wall against the breaking wave force acting on the building. The new wall would satisfy requirements for bending and for deflection. The new wall would need to be reinforced with (1) #5 vertical bar at 24" on center. The rebar would be centered within a filled cell in the wall. For bending stress, the new wall is at 94% capacity. The wall deflection would be 0.06" which is within the required deflection limit of L/360.

The 4" non reinforced slab would need to be removed and replaced with a 9" thick, 2-way mat slab. This new slab would be made from 4000 psi concrete with #5 rebar at 8 inches on center in each direction, for both top and bottom portions of the slab. The slab would be required to be supported by 16" diameter helical piles to resist the uplift forces from buoyance when at flood stage. The piles would be located no more than 12'-0" apart in each direction. A site-specific geotechnical testing, including Standard Penetration Testing (SPT) borings, would be required to determine the type, depth and size of piles to be installed below the new structural slab.

The conceptual structural hardening details have been included in the below **Figure 4**. The new CMU walls would need to be pinned together with rebar so they can function uniformly under flood loading.

All window and door openings would also need to have new flood panels installed as well. The original flood panels do not appear to have a NOA associated with them and may have been site built without engineering.

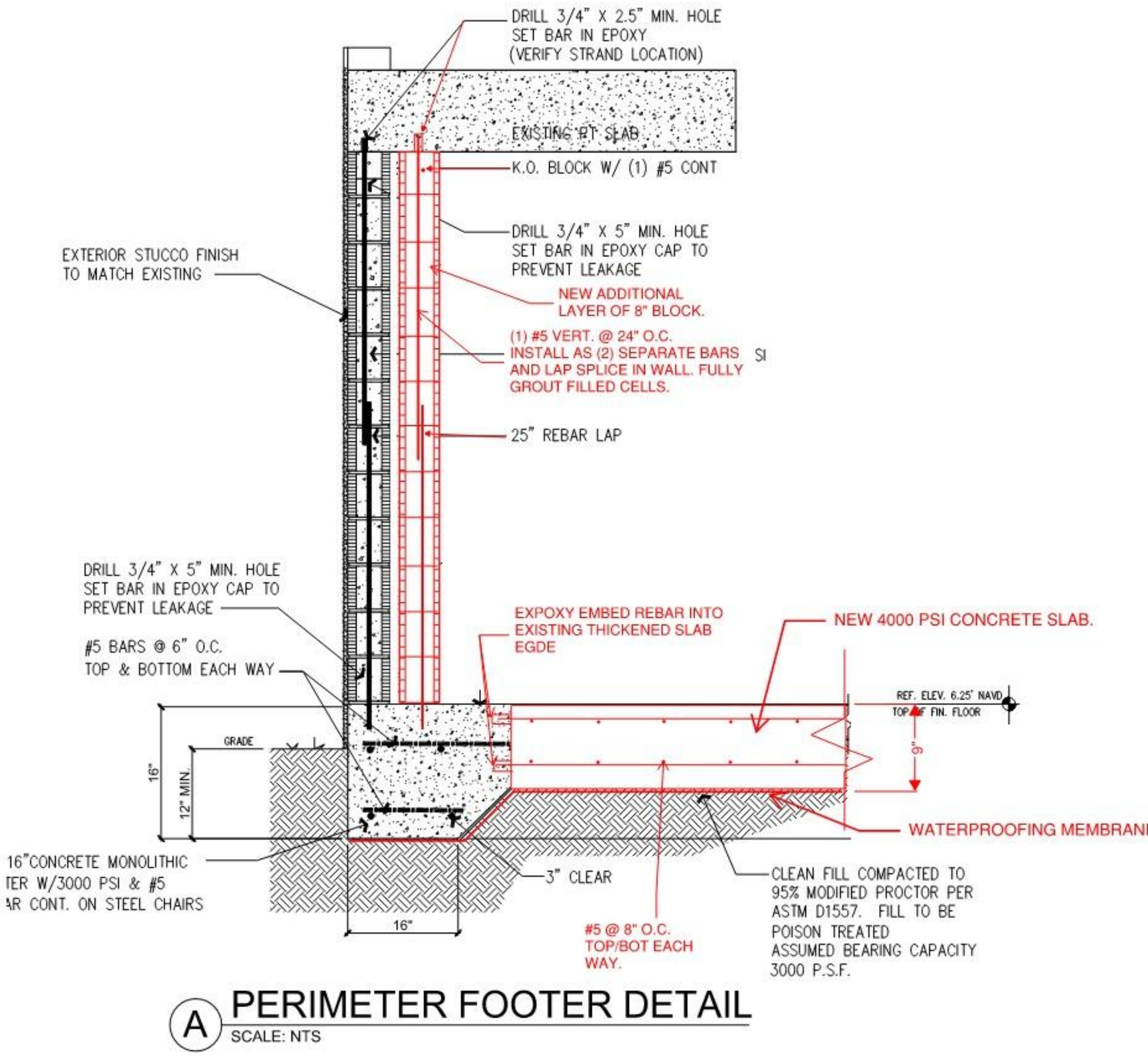


Figure 4 – Sketch of Recommended Repair to Meet Original Code

D. Recommendations to Meet Current FBC 2023 Code:

According to Current FEMA flood maps the City Hall building lies in a Coastal A Zone, see **Exhibit C**. According to the 8th Edition (2023) Florida Building Code, section 1612.4.1 Modification of ASCE 24, dry floodproofing is permitted in Coastal A Zones for non-residentials and mixed-use structures. Pennoni completed an analysis of what upgrades and repairs would be required to meet the dry floodproofing requirements for the current building code.

<u>Design Criteria</u>
Wind Speed = 147 mph
Wind Exposure Category: D
Risk Category: II
Soil Bearing Capacity = 3000 psf
Flood Zone = AE11 (Coastal A)
Flood Design Class = 3
Base Flood Elevation = 11’-0”
Design Floor Elevation = 15’-0”

Loading
Dead Load = Self weight + 5 psf
Live Load = 100 psf for lobby and corridor, 50 psf for offices.
Maximum combined wave pressure = 832 psf
Net breaking wave force (Ft) = 3704 lb/ft
Buoyant Force = 208 psf.

Recommendation
To get the structure to meet code requirements for flood loading the 8" CMU walls would need to be replaced with a new 12" CMU block wall with (2) #5 vertical reinforcing bars per block. The reinforcement would be (1) #5 on each face of the wall. The wall would need to be fully grouted. This wall design meets bending stress and deflection requirements. For bending stress, the wall is at 98% capacity. The wall deflection would be 0.13", which is within the required deflection limit of L/360.

The 4" non reinforced slab on grade would need to be removed and replaced with a 12" thick, 2-way mat slab. This new slab would be made from 4000 psi concrete with #5 rebar at 6 inches on center in each direction, for both top and bottom portions of the slab. The slab would be required to be supported by 16" diameter helical piles. Located no more than 12'-0" apart in each direction.

5.0 RECOMMENDED REPAIR COST ESTIMATE

Based on information Pennoni received from the city of Madeira Beach during the development of this assessment, repairs on the structure would need to be designed for the code that the building was originally constructed for in 2020 (the 2017 FBC). This requires us to use the 6th Edition of the Florida Building Code (2017).

With this information, a cost estimate was developed by the 3rd Party Cost Estimator CC&A. This repair concept included the removal and replacement of the interior slab on grade with a new structural slab supported by helical piles. This repair also includes the addition of a 2nd layer of 8" CMU block placed behind the current existing layer of CMU for added support. The cost estimate for **total construction cost including new interior renovations is $2,494,596**. The full cost estimate can be found in **Exhibit E**.

6.0 CLOSURE

Pennoni is available to provide detailed design drawings of repair or replacement as part of a separate scope of services if requested.

It shall be noted that the above-listed issues do not unknown hidden damages. The sign and seal on this letter indicate professional engineering responsibility for the review of structural portion only. General architecture, life safety, accessibility, electrical, mechanical, etc. are the responsibility of others.

If you have any questions or need additional information, please feel free to contact us.

Sincerely,
PENNONI

James Vincent Barnes III, PE #77754, SI-Limited
Forensic Division Manager

See Attached: **Exhibit A** – GeoView Report
Exhibit B – 2021 Flood Elevation Certificate
Exhibit C – Current FEMA Flood Hazard Map
Exhibit D – Original FEMA Flood Hazard Map
Exhibit E – Madeira Beach City Hall Repair Cost Estimate

EXHIBIT A
GEOVIEW REPORT

FINAL REPORT
CONCRETE STRUCTURE EVALUATION
MADEIRA BEACH CITY HALL COMPLEX SITE
MADEIRA BEACH, FLORIDA

Prepared for Pennoni
Clearwater, FL

Prepared by GeoView, Inc.
St. Petersburg, FL

June 05, 2025

Mr. Vince Barnes, P.E.
Pennoni
5755 Rio Vista Drive
Clearwater, FL 33760

Subject: Transmittal of Final Report for Concrete Structure Evaluation
Madeira Beach City Hall Complex Site
Madeira Beach, Florida
GeoView Project Number 43362
Pennoni Project Number: MDBCH25002P

Mr. Barnes,

GeoView, Inc. is pleased to submit the final report that summarizes and presents the results of the geophysical investigation carried out at the above referenced site. Non-destructive geophysical testing methods were used to determine the design and reinforcement of various concrete structures at the site. GeoView appreciates the opportunity to have assisted you on this project. If you have any questions or comments about the report, please contact us.

Sincerely,

GEOVIEW, INC.

Michael J. Wightman, P.G.
President
Florida Professional Geologist Number 1423

4610 Central Avenue
St. Petersburg, FL 33711
Tel.: (727) 209-2334
Fax: (727) 328-2477

1.0 Introduction

A geophysical investigation was completed on May 14 and 15, 2025 at the Madeira Beach City Hall Complex which is located at 300 Municipal Drive in Madeira Beach, Florida. The purpose of the investigation was to help determine:

- Floor slab thickness
- Design of floor slab foundation and associated reinforcing.
- Location and vertical continuity of rebar-reinforced concrete-filled cells for the external concrete masonry unit (CMU) walls.

2.0 Site Description

The investigation was completed inside and around the exterior of the building. The location of the study areas are provided on Figures 1-3 (Appendix 1).

3.0 Description of Geophysical Investigation

The geophysical investigation was conducted using ground penetrating radar (GPR), electromagnetics (EM) and impact echo (IE). The GPR survey was performed using a GSSI NX Flex GPR system with a 2.5 giga-hertz antenna. The GPR was used to determine the design of the concrete slab and any associated reinforcing. The EM survey was performed using the Proceq 650 AI. The EM survey was done to confirm the presence of rebar. The thickness of the concrete slab was determined using the Olson Impact Echo (IE) system and confirmed using GPR.

4.0 Survey Results

Results from the geophysical investigation are presented on Figures 1-3 and are described as follows:

<u>Column Reinforcement:</u> The exterior columns appear to be tied into the exterior walls by horizontal rebar on 16-inch centers. The rebar is estimated to extend 6 to 8 inches into the walls (Figure 1)

<u>Exterior Wall Footer Reinforcement:</u> There is a longitudinal piece of rebar near the top of the thickened edge foundation at a depth of 6 to 7 inches. Short pieces of rebar are present which extend from the wall to this piece of longitudinal rebar. This rebar is spaced 3 to 4 inches on center with a cover depth of approximately 6 inches. (Figure 1). It was not possible to confirm the presence of the reinforcement in the bottom of the thickened slab foundation that is shown in the site drawings.

<u>Floor Slab:</u> The floor slab is 4 to 5 inches thick. No wire mesh or rebar mat reinforcement was observed in the slab (Figure 2).

<u>Interior Grade Beams:</u> No interior grade beams were observed (Figure 2).

Interior Column Foundations: The interior columns of the structure are independent of the slab. No rebar reinforcement or thickening of the slab was observed near the columns. No indication of an underlying spread footer that would have supported the columns was observed (Figure 2). It is suspected that the columns are driven piles.

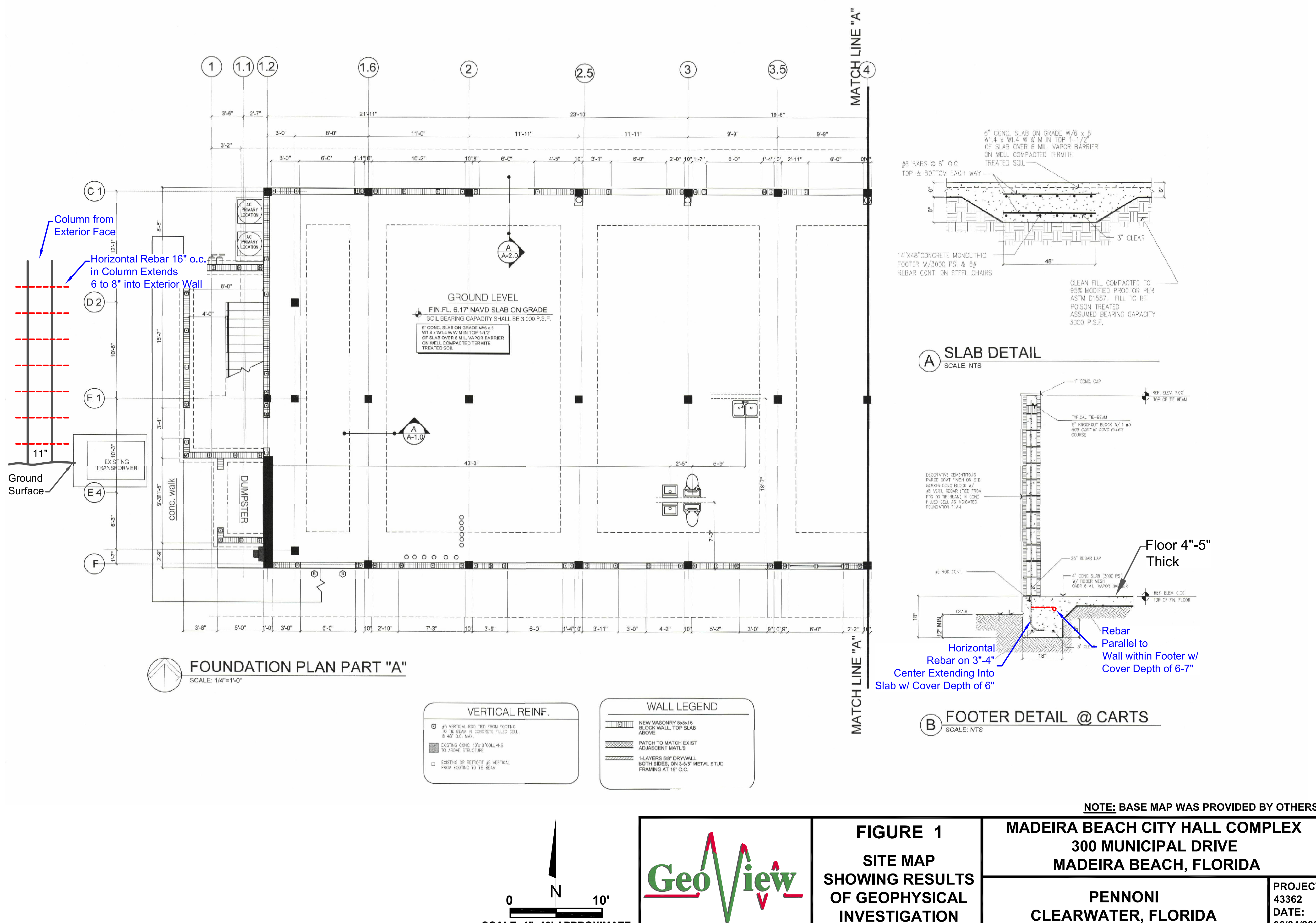
Exterior CMU Wall Reinforcement: Concrete filled cells with rebar reinforcement were observed within the exterior walls. The location the reinforced filled cells corresponds very well with the existing building plans including in the areas around the windows and doors (Figure 3)

Interior CMU Wall Reinforcement: Concrete filled cells with rebar reinforcement were observed within the interior CMU walls. The reinforced cells were 32 to 48 inches on-center. One gap in the vertical filled cells was observed in the eastern portion of the building. This gap extended from the floor to a height of 62 to 64 inches above the floor. Concrete was present in the column above this elevation. No other gaps were observed in the scanned interior CMU walls of the building. The location the reinforced filled cells corresponded reasonably well with the existing building plans (Figure 3).

CMU Exterior Walls in Eastern Portion of the Building: Rebar reinforced filled cells were observed on 32 to 48 inches on center (Figure 3).

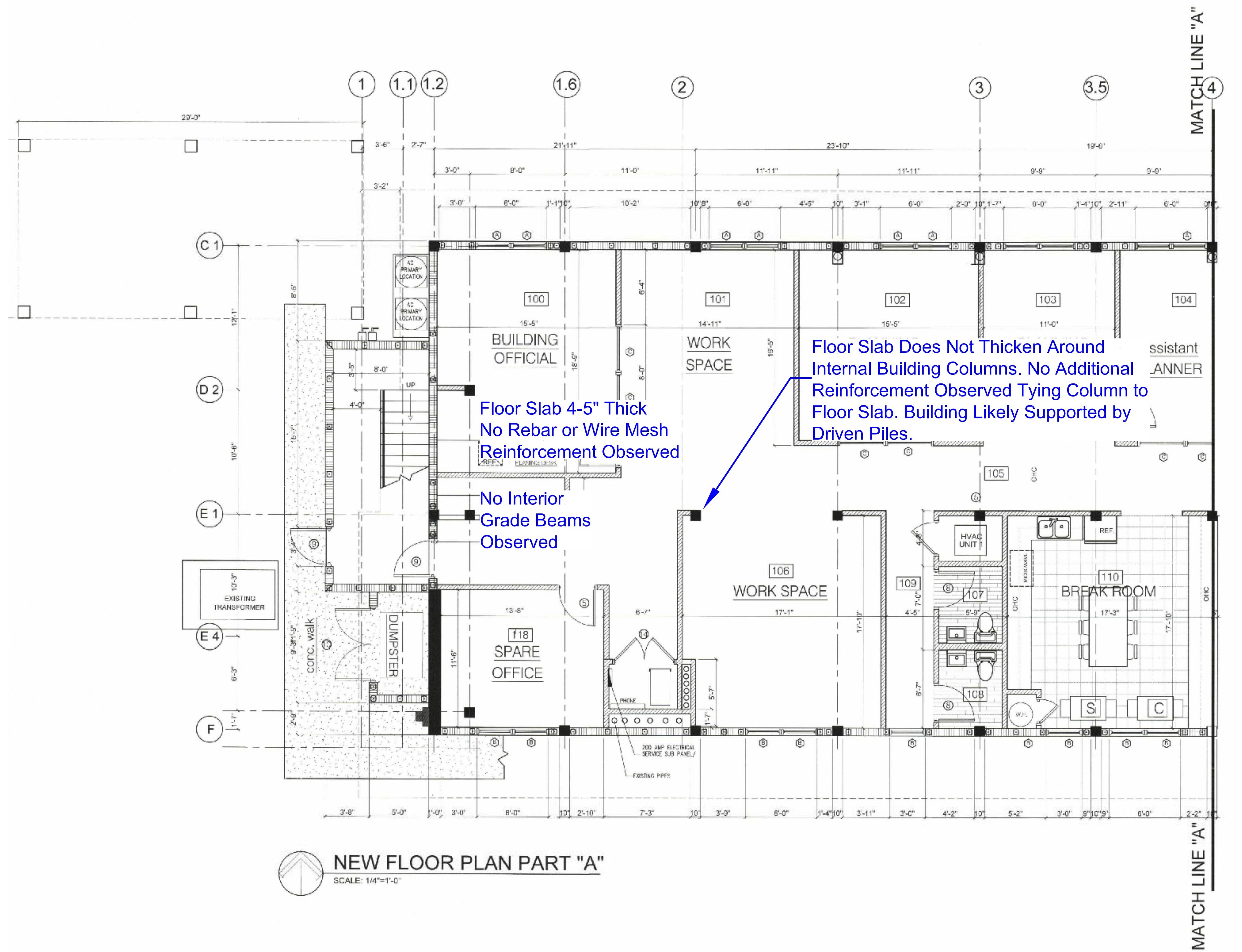
A discussion of the various geophysical testing methods and their associated limitations are provided in Appendix 2.

APPENDIX 1
FIGURES



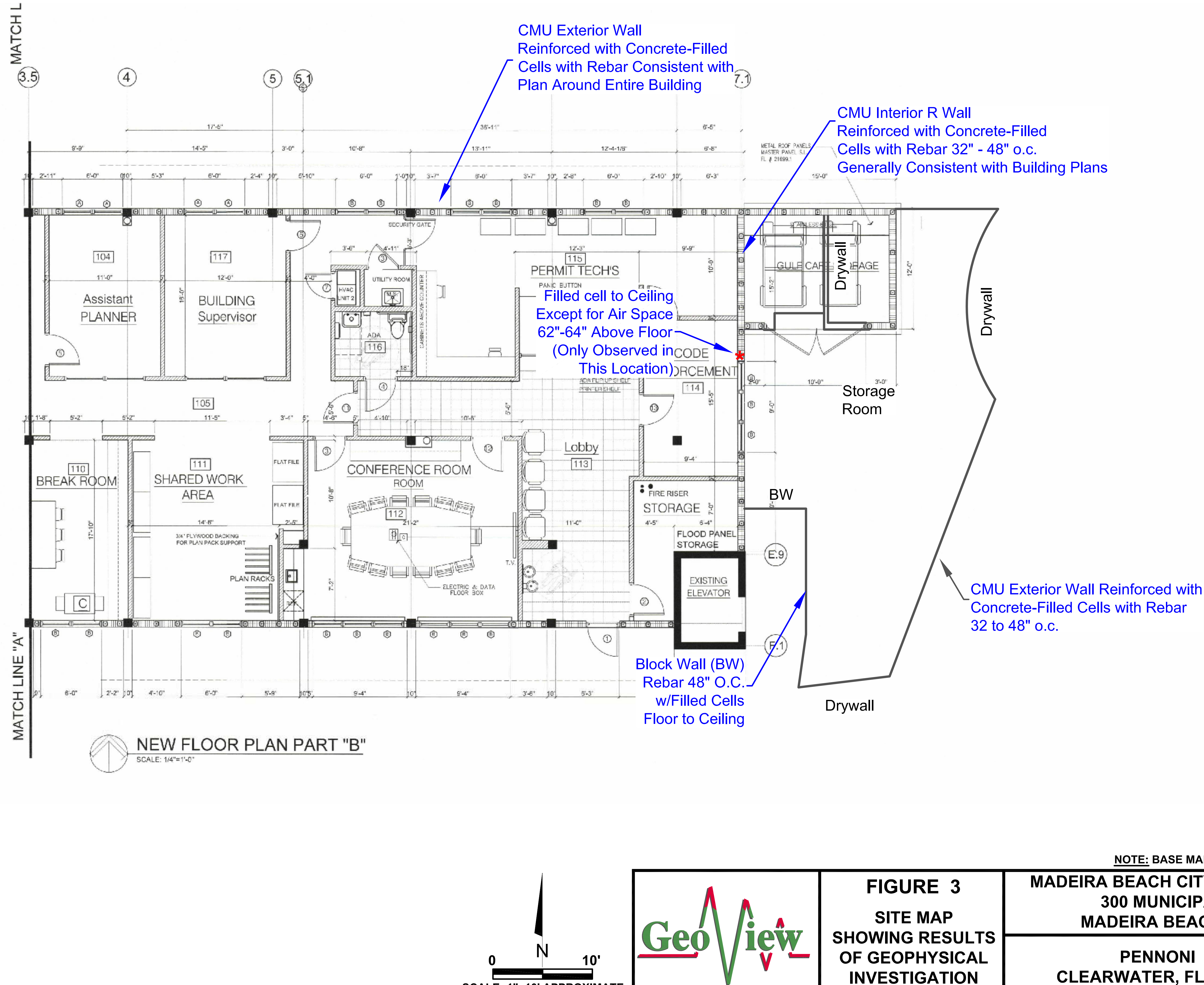
NOTE: BASE MAP WAS PROVIDED BY OTHERS

GeoView	FIGURE 1 SITE MAP SHOWING RESULTS OF GEOPHYSICAL INVESTIGATION	MADEIRA BEACH CITY HALL COMPLEX 300 MUNICIPAL DRIVE MADEIRA BEACH, FLORIDA	
		PENNONI CLEARWATER, FLORIDA	PROJECT: 43362 DATE: 06/04/2025



NOTE: BASE MAP WAS PROVIDED BY OTHERS

GeoView	**FIGURE 2** SITE MAP SHOWING RESULTS OF GEOPHYSICAL INVESTIGATION	MADEIRA BEACH CITY HALL COMPLEX 300 MUNICIPAL DRIVE MADEIRA BEACH, FLORIDA
		PENNONI CLEARWATER, FLORIDA
		PROJECT: 43362 DATE: 06/04/2025



NOTE: BASE MAP WAS PROVIDED BY OTHERS

GeoView

FIGURE 3

SITE MAP SHOWING RESULTS OF GEOPHYSICAL INVESTIGATION

MADEIRA BEACH CITY HALL COMPLEX
300 MUNICIPAL DRIVE
MADEIRA BEACH, FLORIDA

PENNONI
CLEARWATER, FLORIDA

PROJECT: 43362
DATE: 06/04/2025

APPENDIX 2
DESCRIPTION OF GEOPHYSICAL METHODS, SURVEY METHODOLOGIES AND LIMITATIONS

A2.1 Ground Penetrating Radar

GeoView uses a GSSI Mini Structure Scan system. Ground Penetrating Radar (GPR) consists of a set of integrated electronic components which transmits high frequency (2.6 or 1.6 giga-Hertz) electromagnetic waves and records the energy reflected back to the concrete surface. The GPR system consists of an antenna, which serves as both a transmitter and receiver, and a profiling recorder that both processes the incoming signal and provides a graphic display of the data. The GPR data can be reviewed both real time or recorded on the profiling recorder's hard drive for later review.

A GPR survey provides a graphic cross-sectional view of subsurface conditions. This cross-sectional view is created from the reflections of repetitive short-duration electromagnetic (EM) waves which are generated as the antenna is pulled across the ground surface. The reflections occur at the subsurface contacts between materials with differing electrical properties. The electrical property contrast that causes the reflections is the dielectric permittivity which is directly related to conductivity of a material. The GPR method is commonly used to identify such targets as voids, rebar or post-tension cables.

A GPR survey is conducted along survey lines (transects) which are measured paths along which the GPR antenna is moved. Electronic marks are placed in the data by the operator at designated points along the GPR transects. These marks, and a calibrated survey wheel attached to the GPR equipment, allow for a correlation between the GPR data and the position of the GPR antenna on the concrete surface.

A2.2 Electromagnetics

The Profometer 650 AI consists of a set of integrated electronic components that can detect the presence of metallic objects within concrete. The system operates on the principle of pulse induction where a primary electromagnetic (EM) field is created by the equipment. Any metallic objects within the equipment's sensitivity range will have created within them a secondary EM field that is sensed by the equipment.

The Profometer 650 AI is operated by moving a probe across the concrete surface. The strongest secondary field response is created when the long-axis of the probe is moved perpendicularly across the long axis of the rebar. The strength of the resultant secondary EM field is represented by the equipment as both an audible tone and as a graphic display. The position of the rebar is determined at the location where the secondary field strength is at a maximum.

The depth range of the Profometer 650 AI is controlled by the diameter of the rebar; the greater the diameter of the rebar the greater the depth that rebar can be identified. For example, the maximum depth range that #3 rebar can be detected is approximately 4.5 inches while the maximum depth range that #10 rebar can be detected is 7 inches. Regardless of rebar diameter, the maximum depth range of the equipment is approximately 7 inches.

The ability to resolve the location of rebar is also controlled by the spacing between rebar. As a general rule, the spacing between rebars must roughly be equal to the depth of concrete cover. For example, rebar with 3 inches of concrete cover must have a minimum spacing of 3 inches between the individual rebars to be resolved by the equipment. The equipment is also capable of estimating the diameter of rebar and depth of concrete cover.

A2.3 Impact Echo (IE)

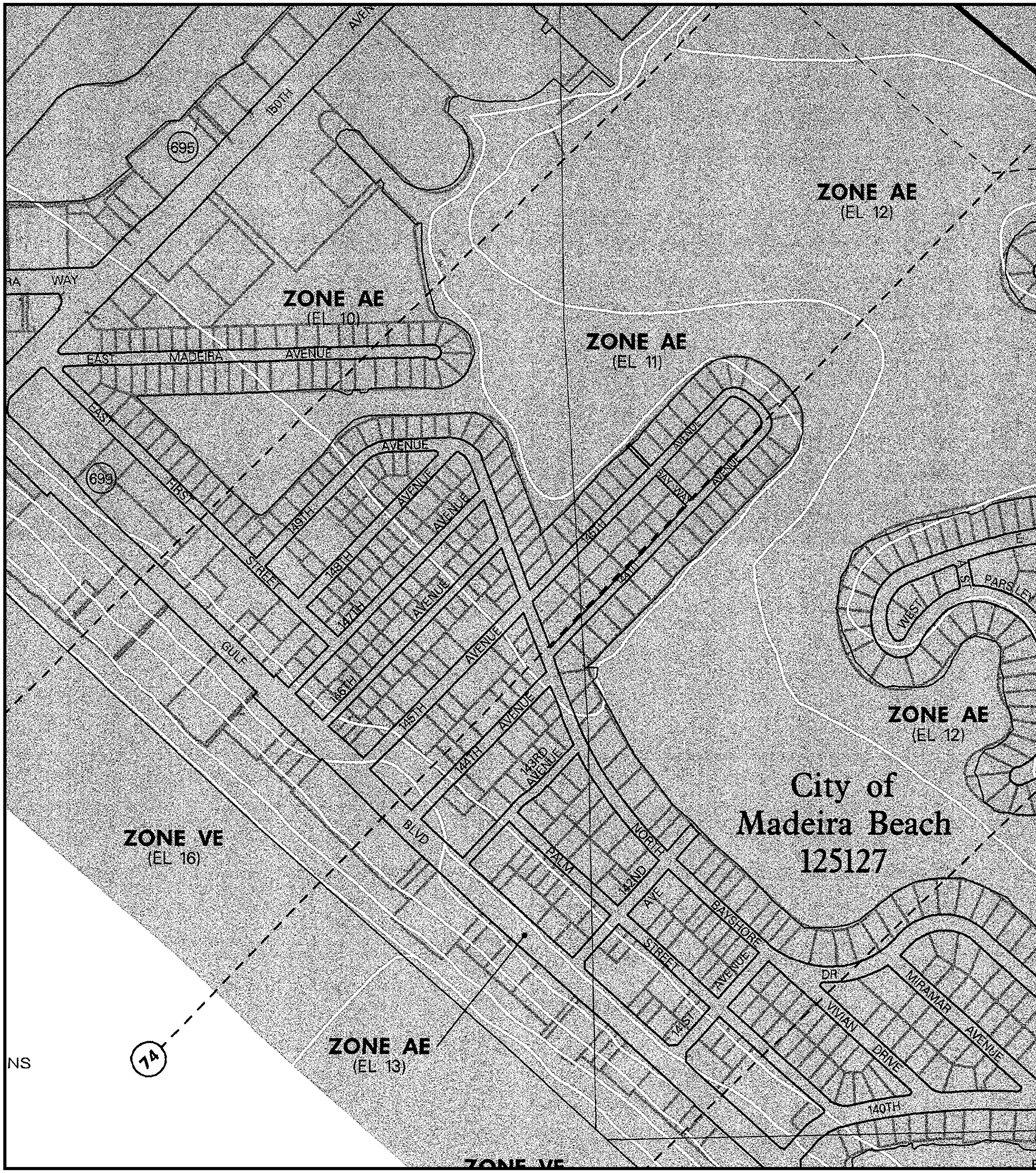
The IE method is used to determine the thickness of concrete structure by sending a high-frequency pulse through the concrete and recording the reflected return from opposite side of the structure. Any horizontal or diagonal cracks will create a discontinuity in the concrete structure, in which the reflection will occur at the crack interface rather than the back side of the structure. This will be recorded as a localized decrease in structure thickness.The impact echo testing is performed using the Olson Impact Echo concrete test system (Impact Echo) in accordance with ASTM C-1383.

A2.4 Limitations

The analysis and collection of geophysical data is both a technical and interpretative skill. The technical aspects of the work are learned from both training and experience. Having the opportunity to compare data collected in numerous settings to the results from concrete studies performed at the same locations develops interpretative skills for concrete characterization studies.

GeoView can make no warranties or representations of concrete conditions that may be present beyond the depth of investigation or resolving capability of the geophysical methods or in areas that were not accessible to the geophysical investigation.

EXHIBIT B
2021 FLOOD ELEVATION CERTIFICATE



APPROXIMATE SCALE

500 0

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

PINELLAS COUNTY,
FLORIDA
AND INCORPORATED AREAS

PANEL 191 OF 327

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MADEIRA BEACH, CITY OF	125127	0191	G
PINELLAS COUNTY	125139	0191	G
REDINGTON BEACH, TOWN OF	125140	0191	G
TREASURE ISLAND, CITY OF	125153	0191	G

Notice to User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown above should be used on insurance applications for the subject community.

MAP NUMBER
12103C0191G

EFFECTIVE DATE:
SEPTEMBER 3, 2003

Federal Emergency Management Agency

This is an official FIRMette showing a portion of the above-referenced flood map created from the MSC FIRMette Web tool. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For additional information about how to make sure the map is current, please see the Flood Hazard Mapping Updates Overview Fact Sheet available on the FEMA Flood Map Service Center home page at https://msc.fema.gov.

EXHIBIT C
CURRENT FEMA FLOOD HAZARD MAP

National Flood Hazard Layer FIRMette

FEMA

82°48'26"W 27°48'33"N

0 250 500 1,000 1,500 2,000 Feet

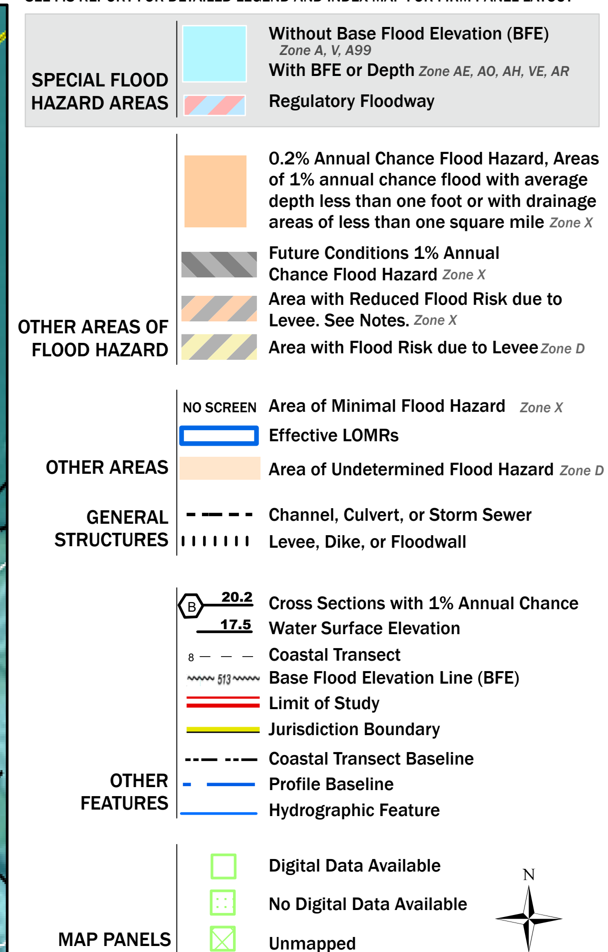
1:6,000

82°47'48"W 27°48'1"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/23/2025 at 4:13 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

EXHIBIT D
ORIGINAL FEMA FLOOD HAZARD MAP

REVISED 01/25/22

DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
National Flood Insurance Program

OMB No.: 1660-0008
Expiration: 11/30/2022

FLOODPROOFING CERTIFICATE FOR NON-RESIDENTIAL STRUCTURES

Paperwork Burden Disclosure Notice

Public reporting burden for this data collection is estimated to average 3.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and submitting this form. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street SW, Washington, DC 20742, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.**

General: This information is provided pursuant to Public Law 96-511 (the Paperwork Reduction Act of 1980, as amended), dated December 11, 1980, to allow the public to participate more fully and meaningfully in the Federal paperwork review process.

Authority: Public Law 96-511, amended; 44 U.S.C. 3507; and 5 CFR 1320.

Privacy Act Statement

Authority: Title 44 CFR § 61.7 and 61.8.

Principal Purpose(s): This information is being collected for the primary purpose of estimating the risk premium rates necessary to provide flood insurance for new or substantially improved structures in designated Special Flood Hazard Areas.

Routine Use(s): The information on this form may be disclosed as generally permitted under 5 U.S.C. § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA-003 – National Flood Insurance Program Files System or Records Notice 73 Fed. Reg. 77747 (December 19, 2008); DHS/FEMA/NFIP/LOMA-1 – National Flood Insurance Program (NFIP) Letter of Map Amendment (LOMA) System of Records Notice 71 Fed. Reg. 7990 (February 15, 2006); and upon written request, written consent, by agreement, or as required by law.

Disclosure: The disclosure of information on this form is voluntary; however, failure to provide the information requested may result in the inability to obtain flood insurance through the National Flood Insurance Program or being subject to higher premium rates for flood insurance. Information will only be released as permitted by law.

Purpose of the Floodproofing Certificate for Non-Residential Structures

Under the National Flood Insurance Program (NFIP), the floodproofing of non-residential buildings may be permitted as an alternative to elevating to or above the Base Flood Elevation (BFE). A floodproofing design certification is required for non-residential structures that are floodproofed. This form is to be used for that certification.

A floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. Before a floodproofed building is designed, numerous planning considerations, including flood warning time, uses of the building, mode of entry to and exit from the building and the site in general, floodwater velocities, flood depths, debris impact potential, and flood frequency, must be addressed to ensure that dry floodproofing will be a viable floodplain management measure.

The minimum NFIP requirement is to floodproof a building to the BFE. However, when it is rated for flood insurance one-foot is subtracted from the floodproofed elevation. Therefore, a building has to be floodproofed to one foot above the BFE to receive the same favorable flood insurance rates as a building elevated to the BFE.

Additional guidance can be found in FEMA Publication 936, Floodproofing Non-Residential Buildings (2013), available on FEMA's website at https://www.fema.gov/media-library/assets/documents/34270.

DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
National Flood Insurance Program

OMB No.: 1660-0008
Expiration: 11/30/2022

FLOODPROOFING CERTIFICATE FOR NON-RESIDENTIAL STRUCTURES

The floodproofing of non-residential buildings may be permitted as an alternative to elevating to or above the Base Flood Elevation; however, a floodproofing design certification is required. This form is to be used for that certification. Floodproofing of a residential building does not alter a community's floodplain management elevation requirements or affect the insurance rating unless the community has been issued an exception by FEMA to allow floodproofed residential basements. The permitting of a floodproofed residential basement requires a separate certification specifying that the design complies with the local floodplain management ordinance.

BUILDING OWNER'S NAME

City of Madeira Beach

STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. Number) OR P.O. ROUTE AND BOX NUMBER

300 Municipal Dr

OTHER DESCRIPTION (Lot and Block Numbers, etc.) CITY HALL COMPLEX DESC AS PT GOVT LOT 1, FROM SW COR OF MADEIRA BCH YACHT CLUB CONDO & E R/W OF MUNICIPAL DR TH N 118.45FT FOR POB TH CONT N CITY SEAWALL 1710 FT(S) TO N COR OF CONDO TH SW'LY ALG CONDO 1671.13FT TO POB & ADJ SUBM LAND ON NW CONT 19.87 AC (C)

CITY	STATE	Zip Code
Madeira Beach	FL	33708

FOR INSURANCE COMPANY USE

POLICY NUMBER

COMPANY NAIC NUMBER

SECTION I – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

Provide the following from the proper FIRM:

COMMUNITY NUMBER	PANEL NUMBER	SUFFIX	DATE OF FIRM INDEX	FIRM ZONE	BASE FLOOD ELEVATION (in AO Zones, Use Depth)
25127	0191	G	08-18-2009	AE	11.0

Indicate elevation datum used for Base Flood Elevation shown above: ☐ NGVD 1929 ☒ NAVD 1988 ☐ Other/Source: ____________

SECTION II – FLOODPROOFED ELEVATION CERTIFICATION (By a Registered Professional Land Surveyor, Engineer, or Architect)

All elevations must be based on finished construction.

Floodproofing Elevation Information:

Building is floodproofed to an elevation of 12.0 feet (In Puerto Rico only: ____________ (meters).

☐ NGVD 1929 ☒ NAVD 1988 ☐ Other/Source: ____________

(Elevation datum used must be the same as that used for the Base Flood Elevation.)

Height of floodproofing on the building above the lowest adjacent grade is 6.0 feet (In Puerto Rico only: ________ meters).

For Unnumbered A Zones Only:

Highest adjacent (finished) grade next to the building (HAG) 6.0 feet (In Puerto Rico only: ____________ meters).

☐ NGVD 1929 ☒ NAVD 1988 ☐ Other/Source: ________

(NOTE: For insurance rating purposes, the building's floodproofed design elevation must be at least 1 foot above the Base Flood Elevation to receive rating credit. If the building is floodproofed only to the Base Flood Elevation, then the building's insurance rating will result in a higher premium. See the Instructions section for information on documentation that must accompany this certificate if being submitted for flood insurance rating purposes.)

OMB No.: 1660-0008
Expiration: 11/30/2022

FLOODPROOFING CERTIFICATE FOR NON-RESIDENTIAL STRUCTURES

Non-Residential Floodproofed Elevation Information Certification:

Section II certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information

I certify that the information in Section II on this Certificate represents a true and accurate interpretation and determination by the undersigned using the available information and data. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME	LICENSE NUMBER (or Affix Seal)			
John A. Bodziak, Architect	FLA REG. #AR0005065			STATE OF FLORIDA JOHN A. BODZIAK AR0005065 REGISTERED ARCHITECT
TITLE: Architect / President	COMPANY NAME: John A. Bodziak, Architect, AIA, PA			
ADDRESS: 743 49th Street N	CITY: St. Petersburg	STATE: FL	ZIP CODE: 33710	
SIGNATURE: [signature]	DATE: 12-15-2021	PHONE: 727.327.1966		

SECTION III – FLOODPROOFED CERTIFICATION (By a Registered Professional Engineer or Architect)

Non-Residential Floodproofed Construction Certification:

I certify the structure, based upon development and/or review of the design, specifications, as-built drawings for construction and physical inspection, has been designed and constructed in accordance with the accepted standards of practice (ASCE 24-05, ASCE 24-14 or their equivalent) and any alterations also meet those standards and the following provisions.

The structure, together with attendant utilities and sanitary facilities is watertight to the floodproofed design elevation indicated above, is substantially impermeable to the passage of water, and shall perform in accordance with the 44 Code of Federal Regulations (44 CFR 60.3(c)(3).

All structural components are capable of resisting hydrostatic and hydrodynamic flood forces, including the effects of buoyancy, and anticipated debris impact forces.

I certify that the information in Section III on this certificate represents a true and accurate determination by the undersigned using the available information and data. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME	LICENSE NUMBER (or Affix Seal)			
John A. Bodziak, Architect	FLA REG. #AR0005065			STATE OF FLORIDA JOHN A. BODZIAK AR0005065 REGISTERED ARCHITECT
TITLE: Architect / President	COMPANY NAME: John A. Bodziak, Architect, AIA, PA			
ADDRESS: 743 49th Street N	CITY: St. Petersburg	STATE: FL	ZIP CODE: 33710	
SIGNATURE: [signature]	DATE: 12-15-2021	PHONE: 727.327.1966		

Copy all pages of this Floodproofing Certificate and all attachments for 1) community official, 2) insurance agent/company, and 3) building owner.

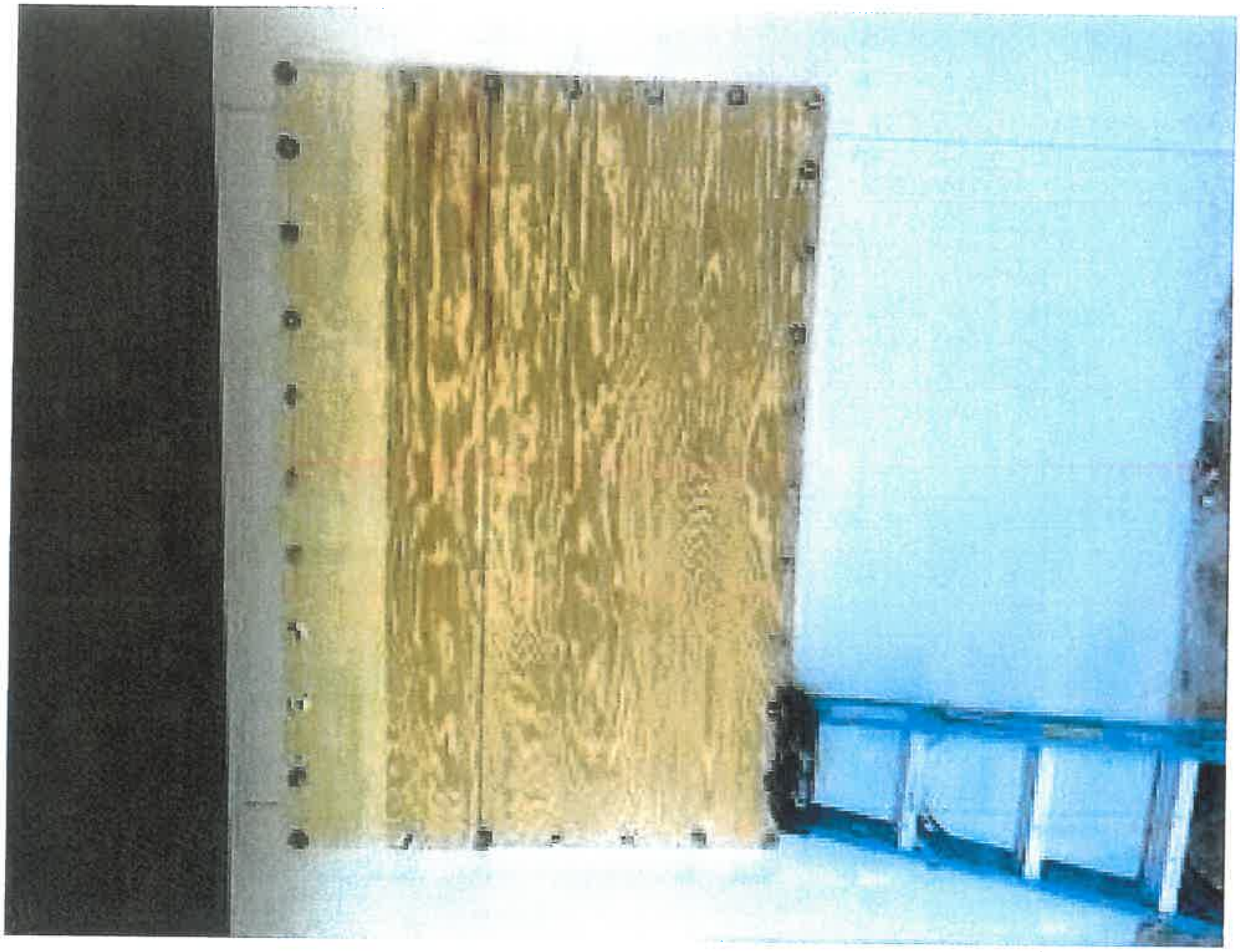
FLOODPROOFING CERTIFICATE FOR NON-RESIDENTIAL STRUCTURES

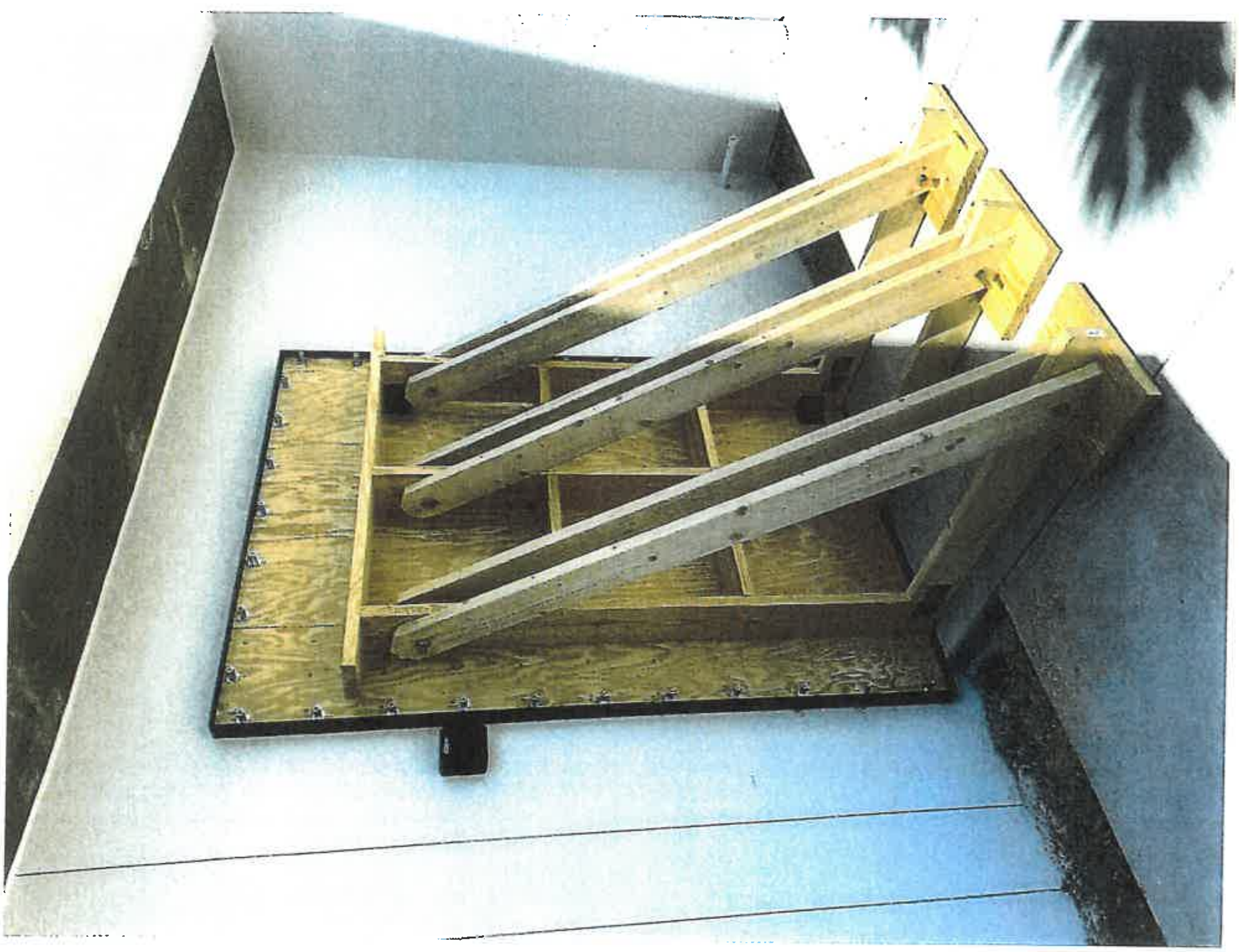
Instructions for Completing the Floodproofing Certificate for Non-Residential Structures

To receive credit for floodproofing, a completed Floodproofing Certificate for Non-Residential Structures is required for non-residential and business buildings in the Regular Program communities, located in zones A1–A30, AE, AR, AR Dual, AO, AH, and A with BFE.

In order to ensure compliance and provide reasonable assurance that due diligence had been applied in designing and constructing floodproofing measures, the following information must be provided with the completed Floodproofing Certificate:

- Photographs of shields, gates, barriers, or components designed to provide floodproofing protection to the structure.
- Written certification that all portions of the structure below the BFE that will render it watertight or substantially impermeable to the passage of water and must perform in accordance with Title 44 Code of Federal Regulations (44 CFR 60.3 (c)(3)).
- A comprehensive Maintenance Plan for the entire structure to include but not limited to:
    - Exterior envelope of the structure
    - All penetrations to the exterior of the structure
    - All shields, gates, barriers, or components designed to provide floodproofing protection to the structure
    - All seals or gaskets for shields, gates, barriers, or components
    - Location of all shields, gates, barriers, and components as well as all associated hardware, and any materials or specialized tools necessary to seal the structure.





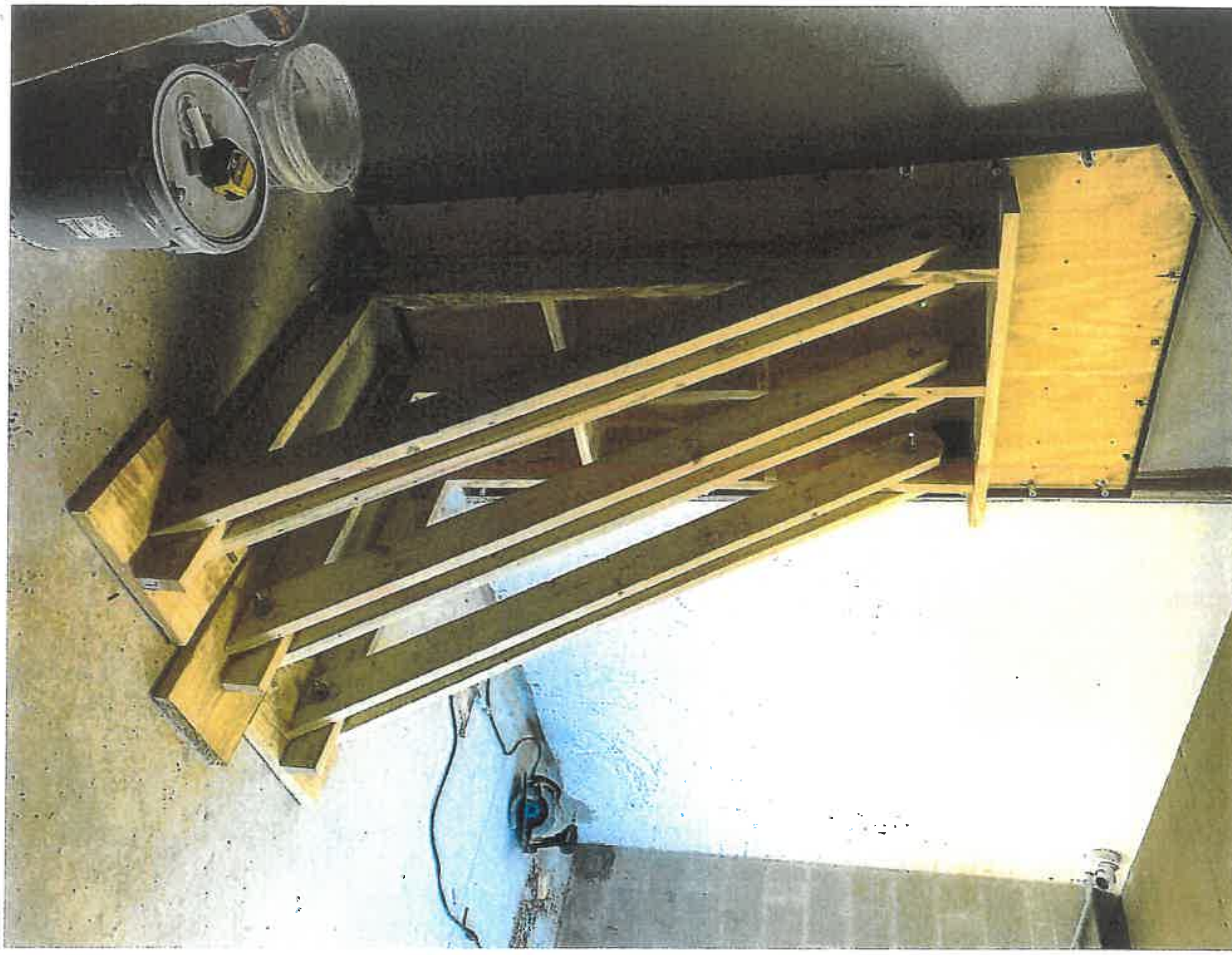


EXHIBIT E
MADEIRA BEACH CITY HALL
REPAIR COST ESTIMATE by CC&A

C C & A

CONSTRUCTION CONSULTANTS & ASSOCIATES, INC.

PROJECT : **Maderia Beach CH Renovations**
LOCATION : **Maderia Beach, Fl**
FILE NAME : **Maderia Bch CH**

DATE : 07/17/25
PROJ # : 2025.128

DESCRIPTION	QTY.	UNIT	UNIT COST	TOTAL	REMARKS
PRELIMINARY CONSTRUCTION BUDGET					
Selective Demolition					
Interior Demolition 1st fl	4,920	sf	10.00	49,200	
Sawcut SOG 4"	320	lf	7.50	2,400	
Remove SOG 4"	76	cy	200.00	15,185	
Thickened SOG Remains as is					
Foundations					
Helical Piles - 25ft depth	33	ea	3,500.00	115,500	
Concrete Work					
SOG 9" w/rebars 8"oc ea T&B	159	cy	1,050.00	166,619	
SOG waterproofing membrane	5,658	sf	2.50	14,145	
Epoxy rebars into ex SOG	960	ea	125.00	120,000	
Masonry Work					
Int CMU wall 8" block	3,680	blk	22.50	82,800	
Vert FC 24"oc	17	cy	1,250.00	21,296	
Metals					
None					
Moisture Protection					
Flood Panels at Doors	140	sf	200.00	28,000	
Flood Panels at Windows	260	sf	150.00	39,000	
Openings					
Remain as is					
Finishes					
New Interior Drs/Finishes	4,920	sf	65.00	319,800	
Specialties					
Toilet Acc/Rm Signage	4,920	sf	2.00	9,840	

PROJECT : **Maderia Beach CH Renovations** DATE : 07/17/25
LOCATION : **Maderia Beach, Fl** PROJ # : 2025.128
FILE NAME : **Maderia Bch CH** PAGE : 2 OF 2

DESCRIPTION	QTY.	UNIT	UNIT COST	TOTAL	REMARKS
PRELIMINARY CONSTRUCTION BUDGET					
Equipment					
By Owner					
Mechanical					
Fire Sprinkler System	4,920	sf	6.50	31,980	
Plumbing System	4,920	sf	20.00	98,400	
HVAC System	4,920	sf	45.00	221,400	
Electrical					
Existing Service - Remains as is					
New MDP, Power, Lighting	4,920	sf	50.00	246,000	
Technology - Allowance	4,920	sf	5.00	24,600	
SUBTOTAL				$1,606,166	
Contractor General Conditions	15.0%			$240,925	
Contractor Insurance & Bonds	3.0%			$55,413	
Estimate Contingency	15.0%			$285,376	
Escalation	6.0%			$131,273	
Permits - Allowance	1.0%			$23,192	
Contractor OH&P	6.5%			$152,252	
CONSTRUCTION BUDGET TOTAL				$2,494,596	