# The Moorings Condominiums
## Building 10

357-371 Moorings Cove Drive
Tarpon Springs, FL 34689
B.A.S.I.C. File No.: B2020-018

February 23rd, 2021

# FINAL REPORT

BASIC ENGINEERING

**Bay Area Sinkhole Investigation & Civil Engineering**
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BAY AREA SINKHOLE INVESTIGATION & CIVIL ENGINEERING

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To: The Moorings Condominiums Association
Attn: Karen Cleary, President
450 Moorings Cove Drive
Tarpon Springs, FL 34689

Date: 02/23/2021
Project # B2020-018

Subject: Injection Pin Pile, Compaction and Chemical Grouting
The Moorings Condominiums | Building 10
357-371 Moorings Cove Drive, Tarpon Springs, FL 34689

Dear Ms. Cleary,

We have reviewed a Subsidence Investigation report by SDII Global, (SDII), dated January 12th, 2018, a Structural Damage Evaluation (Partial Structural Only) by SDII Global, (SDII), dated June 19th, 2018, a Geologic/Geotechnical Testing and Evaluation report by Applied Engineering & Geosciences (AEG), dated September 24th, 2018, a Sinkhole Loss Determination report by Structural Engineering and Inspections, Inc, (SEI), dated November 28th, 2018, a Peer Review report by SDII Global, (SDII), dated January 11th, 2019, a Neutral Evaluation report by Andreyev Engineering, Inc., (AEI), dated March 16th, 2020 and field work and engineering design performed by B.A.S.I.C. Engineering.

Based on the aforementioned reports, you have asked us to recommend and monitor a remediation program. B.A.S.I.C. Engineering recommended utilizing a combination of injection pin piles, compaction grouting and chemical grouting points. We have provided you with a Site Plan indicating the location of the injection pin piles, compaction grout and chemical grouting points and their estimated depths of installation. However, we were unable to accurately predict the amount of grout that would be required prior to actual field installation.

Injection Pin Piles are recommended in similar situations whereby the property requires lifting or other foundation support in addition to sealing off the limestone interface to prevent future sinkhole activity from occurring. The installation of the Injection Pin Piles is a process whereby high carbon steel pilings are hydraulically driven into the ground until a predetermined pressure reading is attained or refusal occurs where lifting of the structure takes place. The Injection Pin Piles are then grouted through a patented process allowing grout to be pumped directly at the limestone interface (Figure 10a).

In addition to the installation of the Injection Pin Piles, a high slump pressure grouting program is recommended as a means of sealing deep openings into underlying cavernous zones, fill in void zones, consolidate/densify the loose soils, prevent downward migration of soil particles and also to provide greater lateral stability to the steel piling. A 4-6 inch slump grout is recommended by B.A.S.I.C. Engineering so that it may be accurately placed below the structure and it may flow through the grout holes and densify soil voids with greatest efficiency.

Compaction grouting is the injection of grout into the soil to improve bearing capacity. This is accomplished by using a very viscous (low-mobility), aggregate under high pressure to form grout bulbs, which displace and densify the surrounding soils in a controlled manner through an injection pipe. The upward component of force causing heaving at the surface during compaction grouting usually limits the degree which soil can be compacted, making compaction grouting ineffective for stabilizing upper level soils (approximately the top 15 feet). Therefore, in order to stabilize the uppermost subsurface soils, chemical grouting has also been recommended.

Chemical grouting is a process whereupon a polyurethane grout is injected to fill void spaces and improve the strength of granular soils. Chemical grout behaves like a fluid but reacts with an agent and water and within usually a few seconds forms a solid, expanding to compact the soils similarly to standard compaction grouting but in a more controlled manner.

**MONITORING**

As requested, we have completed the monitoring of the subsurface injection pin piles, compaction grouting and chemical grouting operations as conducted by Helicon Foundation Repair Systems, Inc., (Helicon). This work was completed utilizing the TMG Injection Pier System, Compaction Grouting and Chemical Grouting. The remediation was started on November 18th, 2020 and completed on February 8th, 2021. A technician from our firm was present during the remediation operations to monitor operations and perform applicable grout slump tests.

Helicon installed a total of 63 injection pin piles around the property as per our site plan recommendations, as shown in figure 11a. Due to the site conditions, six (6) points were omitted from our original recommendations. (Injection Pin Pile Numbers 3, 5, 41, 42, 43 and 57). The depths of installation ranged from a low of 15 feet to a high of 60 feet below grade. Each pin pile was hydraulically driven into the soil until enough pressure was reached for refusal. The hydraulic gauge reading (psi) was recorded for each injection pin pile along with the installed depth (Figure 10b). The contractor then accepted delivery of a 1500-psi pressure grout from Preferred Materials, Inc and Pasco Ready Mix. The grout was a high slump 4-6 inch pressure grout. A grout gun was connected to each of the 63 injection pin piles pumped by Helicon, utilizing a TK-40 pump. The grout was pumped until a pressure gauge reading of up to 400-psi was reached on the in-line gauge. The amount of grout pumped for each injection pin pile was recorded (Figure 10b). A total of 155.0 cubic yards of grout was pumped in various quantities through 63 injection pin piles points.

Helicon then staked the compaction grout point locations as shown in Figure 10d in accordance with B.A.S.I.C. Engineering's recommendations. Angled compaction grout points were installed to refusal (hard limestone bedrock) at depths ranging from 37 to 63 feet below existing grade. A total of 322 feet of grout casing was installed at the 7 compaction grout points. After the grout casing was installed, a TK-40 pump was used to inject a mixture of cement, fly ash, sand, water, and other admixtures into the loose soils and voids in the limestone and overlying sand strata. Pumping continued until a grout pressure of 200 to 400 psi was achieved (over that required to initiate grout take) or lifting of the structure was observed (via a surveyor's level). The grout casing was then extracted upward four to five feet and pumping resumed. A total of 109.1 cubic yards of grout was pumped in various quantities through 7 compaction grout points on the subject property, ranging from a minimum of 4.15 cubic yards on point #7 to a maximum of 30.65 cubic yards on point #1.

Lastly, a total of 4,501.4 lbs. of chemical grout was injected through 104 chemical grout points by Helicon as shown in Figure 10e. Vertical points were pumped at depth ranges between 8', 6', 4' and 2 feet below ground surface until lift of the slab/ground refusal was achieved. Angled points were pumped at depth ranges between 12', 10', 8', 6', 4' and 2 feet below ground surface until lift of the slab/ground refusal was achieved.

It is our opinion that the injection pin piles, compaction grout and chemical grout were installed in accordance with industry standards and are an effective method to fill voids, cracks, fractures and cavities and to stabilize granular material, thus improving the physical properties of soil and rock at The Moorings Condominiums | Building #10. The proven technology utilized by the pier manufacturer and the ability to solve foundation settlement problems using a combination of injection pin piles, compaction grout and chemical grout, has demonstrated success without additional settlement. This report is not a guarantee that sinkhole activity will not continue to exist at the subject property but rather a summary and certification of the work completed by Helicon Foundation Repair Systems, Inc.

We thank you for the opportunity to provide the services to you on this project. We trust that the information provided in this letter is satisfactory. Should you have any questions, or require additional assistance, please do not hesitate to call.

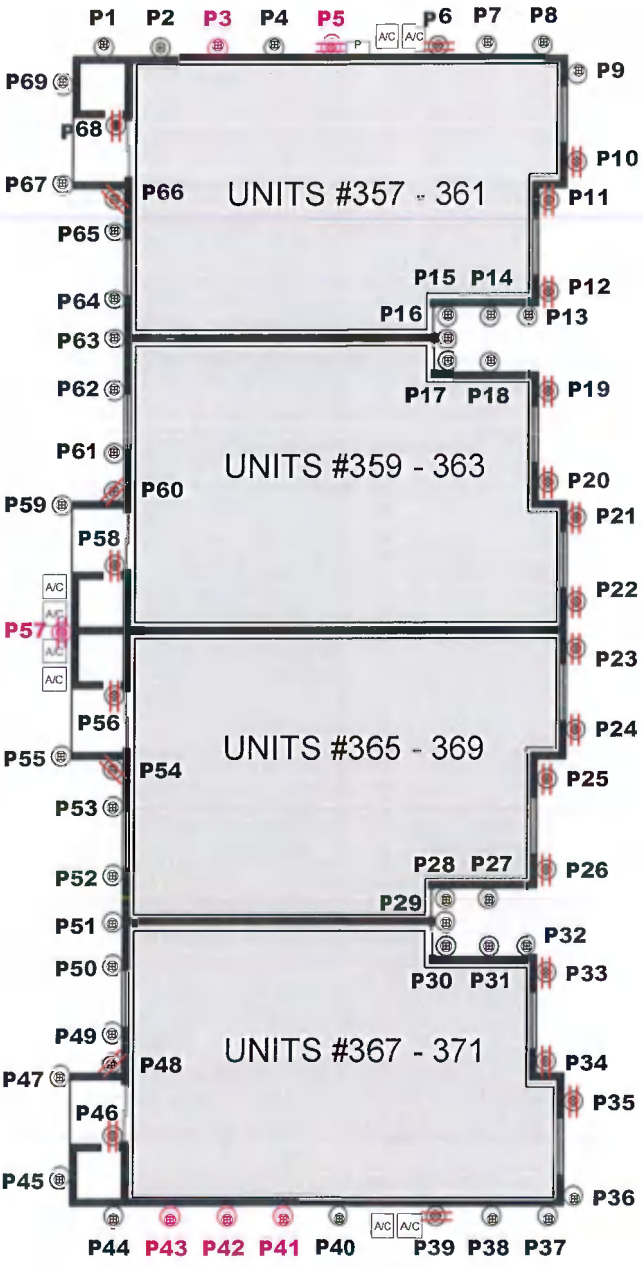
Sincerely,

2/22/2021

Justin D. James, P.E.
Florida P.E. # 60886
C.O.A. # 25869
Attachments

## TECHNICAL NOTES:

- INJECTION PIN PILE
- SPREADER BEAM
- OMMITED POINTS
- SEE FIGURE 10c FOR PIN PILE DETAIL
- NOT FOR PERMITTING




TWO STORY
WOOD FRAME
BUILDING #10

Approximate Scale
1" = 20'

0 10 20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357-371 MOORINGS COVE DRIVE, TARPON SPRINGS, FL 34689
PINELLAS COUNTY

CONSTRUCTION INJECTION PLAN

FIGURE NO.: 10a
FILE NO.: B2020-018
DATE: 02/23/2021
CHECKED BY: JJ

## TECHNICAL NOTES:

- INJECTION PIN PILE SUMMARY POINTS

| Points # | PSI | Depth (ft) | Strokes | Actual Grout (cy) |
|---|---|---|---|---|
| 1 | 1200 | 20.0 | 26 | 0.49 |
| 2 | 2600 | 54.0 | 601 | 11.78 |
| 3 | - | - | - | - |
| 4 | 2700 | 30.0 | 15 | 0.30 |
| 5 | - | - | - | - |
| 6 | 2500 | 33.0 | 231 | 4.92 |
| 7 | 2500 | 39.0 | 187 | 4.05 |
| 8 | 2500 | 50.0 | 588 | 11.64 |
| 9 | 2700 | 53.0 | 57 | 1.12 |
| 10 | 2500 | 20.0 | 8 | 0.16 |
| 11 | 2800 | 43.0 | 14 | 0.27 |
| 12 | 2700 | 37.0 | 98 | 1.91 |
| 13 | 2400 | 54.0 | 9 | 0.17 |
| 14 | 2400 | 54.0 | 134 | 2.62 |
| 15 | 2800 | 29.0 | 27 | 0.53 |
| 16 | 2700 | 51.0 | 96 | 1.87 |
| 17 | 2800 | 37.0 | 71 | 1.39 |
| 18 | 2600 | 52.0 | 413 | 7.69 |
| 19 | 2500 | 39.0 | 288 | 5.36 |
| 20 | 2700 | 34.0 | 135 | 3.46 |
| 21 | 2600 | 41.0 | 123 | 2.3 |
| 22 | 1800 | 35.0 | 191 | 3.63 |
| 23 | 1800 | 41.0 | 77 | 1.47 |
| 24 | 1800 | 28.0 | 115 | 2.20 |
| 25 | 1800 | 24.0 | 25 | 0.48 |
| 26 | 1800 | 27.0 | 105 | 2.00 |
| 27 | 1900 | 33.0 | 2 | 0.04 |
| 28 | 1900 | 33.0 | 22 | 0.42 |
| 29 | 2000 | 24.0 | 3 | 0.06 |
| 30 | 2000 | 24.0 | 18 | 0.34 |
| 31 | 1900 | 33.0 | 36 | 0.69 |
| 32 | 1800 | 34.0 | 116 | 2.44 |
| 33 | 1800 | 28.0 | 29 | 0.61 |
| 34 | 1800 | 33.0 | 213 | 4.48 |
| 35 | 1800 | 45.0 | 4 | 0.09 |

| Points # | PSI | Depth (ft) | Strokes | Actual Grout (cy) |
|---|---|---|---|---|
| 36 | 1800 | 44.0 | 79 | 1.66 |
| 37 | 2800 | 31.0 | 296 | 6.29 |
| 38 | 2800 | 26.0 | 35 | 0.74 |
| 39 | 2700 | 45.0 | 4 | 0.09 |
| 40 | 2600 | 32.0 | 362 | 7.52 |
| 41 | - | - | - | - |
| 42 | - | - | - | - |
| 43 | - | - | - | - |
| 44 | 1200 | 15.0 | 5 | 0.10 |
| 45 | 1800 | 31.0 | 39 | 0.79 |
| 46 | 2600 | 37.0 | 214 | 4.35 |
| 47 | 1600 | 33.0 | 22 | 0.45 |
| 48 | 2400 | 31.0 | 2 | 0.04 |
| 49 | 2400 | 32.0 | 14 | 0.29 |
| 50 | 2400 | 41.0 | 478 | 10.02 |
| 51 | 2600 | 53.0 | 2 | 0.04 |
| 52 | 2400 | 53.0 | 244 | 5.22 |
| 53 | 2400 | 42.0 | 128 | 2.74 |
| 54 | 2600 | 38.0 | 490 | 10.70 |
| 55 | 1800 | 19.0 | 11 | 0.24 |
| 56 | 2800 | 28.0 | 50 | 1.10 |
| 57 | - | - | - | - |
| 58 | 2700 | 33.0 | 48 | 0.96 |
| 59 | 1800 | 27.0 | 9 | 0.18 |
| 60 | 2400 | 32.0 | 3 | 0.06 |
| 61 | 2600 | 42.0 | 168 | 3.37 |
| 62 | 2400 | 32.0 | 2 | 0.04 |
| 63 | 2600 | 30.0 | 14 | 0.28 |
| 64 | 2600 | 34.0 | 121 | 2.37 |
| 65 | 2600 | 53.0 | 115 | 2.26 |
| 66 | 2600 | 60.0 | 600 | 11.57 |
| 67 | 1200 | 20.0 | 10 | 0.19 |
| 68 | 2700 | 55.0 | 5 | 0.10 |
| 69 | 1200 | 20.0 | 13 | 0.25 |
| | **TOTALS:** | **2281.0** | **7660** | **155.0** |

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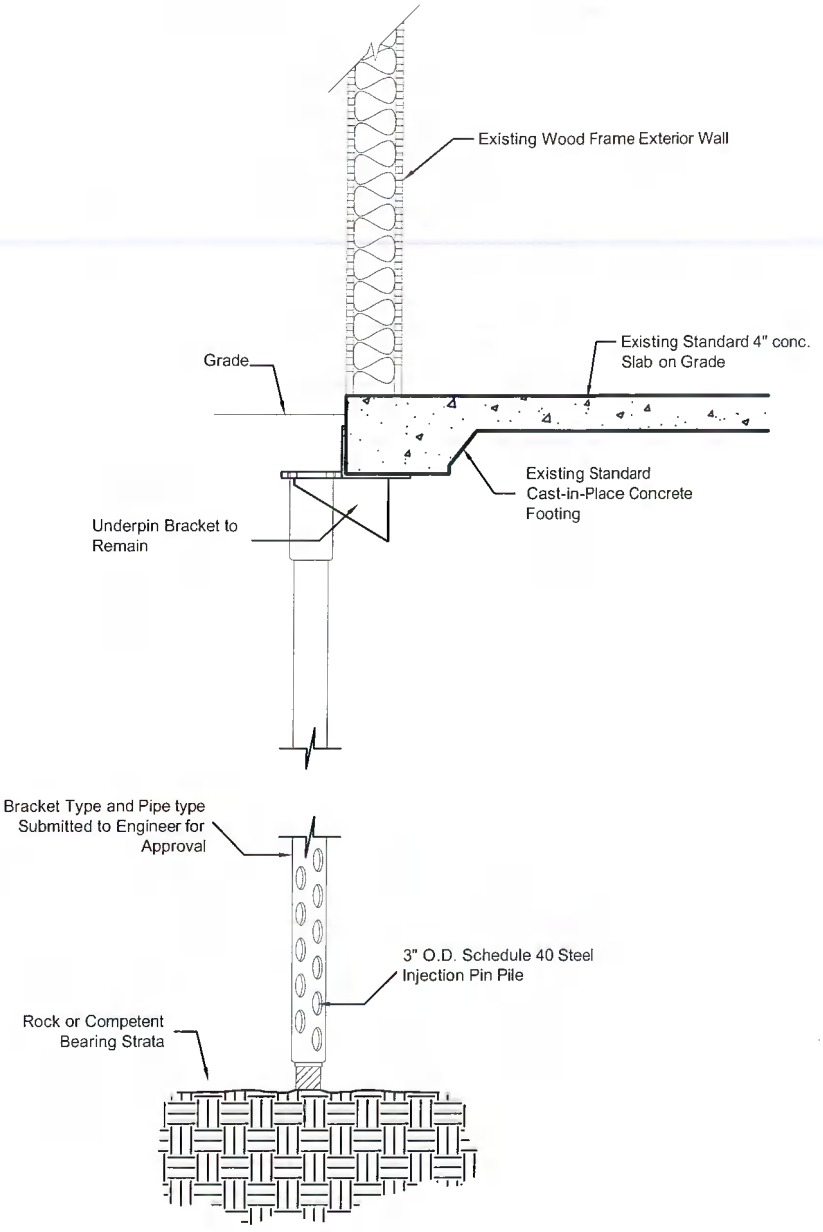
INJECTION PIN PILE SUMMARY POINTS

FIGURE NO.: 10b
FILE NO.: B2020-018
DATE: 02/23/2021
CHECKED BY: JJ

# Wood Frame on Spread Footer:

Injection Pin Pile Detail
(NOT FOR PERMITTING)

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INJECTION PIN PILE DETAIL PLAN

FIGURE NO.: 10c
FILE NO.: B2020-018
DATE: 02/23/2021
CHECKED BY: JJ

## TECHNICAL NOTES:

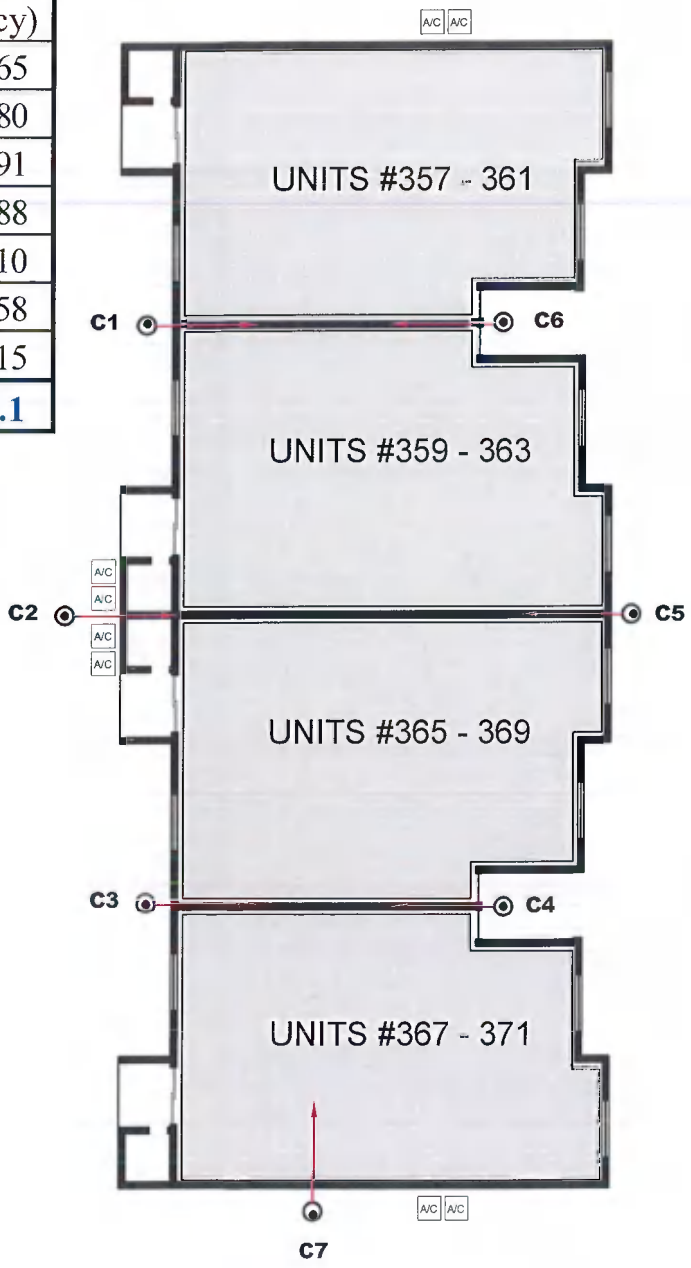
- INSTALLED POINTS DEPTH: 37' - 63'

- ANGLED COMPACTION GROUT POINTS

- NOT FOR PERMITTING

| Points # | Depth (ft) | Strokes | Actual Grout (cy) |
|---|---|---|---|
| 1 | 63 | 1,569 | 30.65 |
| 2 | 53 | 910 | 16.80 |
| 3 | 41 | 867 | 16.91 |
| 4 | 39 | 372 | 6.88 |
| 5 | 50 | 1,194 | 23.10 |
| 6 | 37 | 57 | 10.58 |
| 7 | 39 | 213 | 4.15 |
| **Total:** | **322** | **Total:** | **109.1** |

TWO STORY
WOOD FRAME
BUILDING #10




Approximate Scale
1" = 20'
0 10 20

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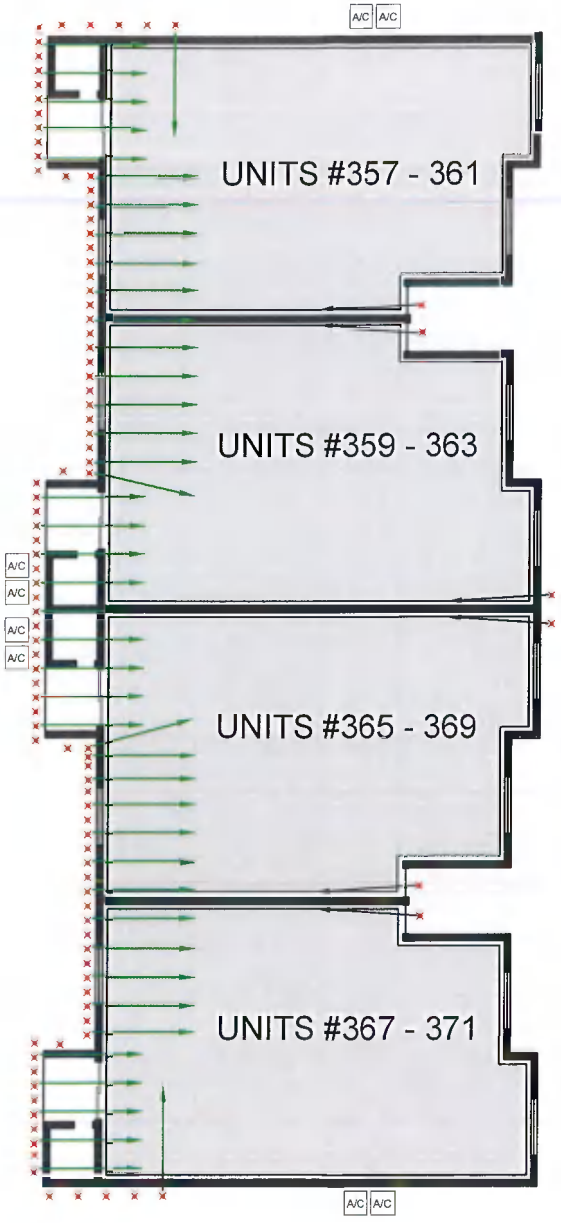
COMPACTION GROUT PLAN

FIGURE NO.: 10d
FILE NO.: B2020-018
DATE: 02/23/2021
CHECKED BY: JJ

## TECHNICAL NOTES:

- INSTALLED DEPTH:
- VERTICAL POINTS: 8', 6', 4' & 2' BGS
- ANGLED POINTS: 12', 10', 8', 6', 4' & 2' BGS
- INSTALLED EXTERIOR CHEMICAL GROUT POINTS = 104
- INSTALLED EXTERIOR CHEMICAL GROUT QUANTITY = 4,501.4 LBS
- NOT FOR PERMITTING

TWO STORY
WOOD FRAME
BUILDING #10




Approximate Scale
1" = 20'

0 10 20

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CHEMICAL GROUT PLAN

FIGURE NO.: 10e
FILE NO.: B2020-018
DATE: 02/23/2021
CHECKED BY: JJ

## TECHNICAL NOTES:

- CHEMICAL GROUT SUMMARY POINTS

| Point #s | Depth (ft) | PSI | Lbs. |
|---|---|---|---|
| 1 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 2 | 8 | 1200 | 20.4 |
| | 6 | - | - |
| | 4 | 1200 | 2.8 |
| | 2 | - | - |
| 3 | 8 | 1200 | 29.9 |
| | 6 | 1200 | 20.1 |
| | 4 | 1200 | 1.8 |
| | 2 | - | - |
| 4 | 8 | 1300 | 29.9 |
| | 6 | 1300 | 20.1 |
| | 4 | 1200 | 4.2 |
| | 2 | - | - |
| 5 | 8 | - | - |
| | 6 | - | - |
| | 4 | 1300 | 16.2 |
| | 2 | - | - |
| 6 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1300 | 2.1 |
| 7 | 8 | 1200 | 29.9 |
| | 6 | 1300 | 20.1 |
| | 4 | 1200 | 9.8 |
| | 2 | 1200 | 2.5 |
| 8 | 12 | 1200 | 20.1 |
| | 10 | 1100 | 11.3 |
| | 8 | - | - |
| | 6 | 1200 | 6.0 |
| | 4 | 1100 | 3.2 |
| | 2 | 1100 | 2.1 |
| 9 | 8 | 1200 | 29.9 |
| | 6 | 1200 | 20.1 |
| | 4 | 1100 | 9.9 |
| | 2 | 1000 | 2.5 |
| 10 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 4.9 |
| | 8 | - | - |
| | 6 | 1150 | 6.0 |
| | 4 | 1100 | 3.2 |
| | 2 | 1100 | 2.1 |

| Point #s | Depth (ft) | PSI | Lbs. |
|---|---|---|---|
| 11 | 8 | 1200 | 29.9 |
| | 6 | 1200 | 5.6 |
| | 4 | 1100 | 9.9 |
| | 2 | 1100 | 2.5 |
| 12 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1100 | 6.0 |
| | 4 | 1100 | 3.2 |
| | 2 | 1050 | 2.1 |
| 13 | 8 | 1100 | 29.9 |
| | 6 | 1000 | 20.1 |
| | 4 | 1200 | 9.9 |
| | 2 | 1100 | 0.7 |
| 14 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 5.3 |
| | 6 | 1100 | 6.0 |
| | 4 | 1100 | 3.2 |
| | 2 | 1000 | 2.1 |
| 15 | 8 | 1200 | 29.9 |
| | 6 | 1200 | 1.4 |
| | 4 | 1200 | 9.9 |
| | 2 | 1100 | 1.4 |
| 16 | 8 | 1100 | 29.9 |
| | 6 | 1100 | 6.0 |
| | 4 | 1050 | 9.9 |
| | 2 | 1000 | 2.5 |
| 17 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1150 | 6.0 |
| | 4 | 1100 | 3.2 |
| | 2 | 1100 | 2.1 |
| 18 | 8 | 1100 | 29.9 |
| | 6 | 1100 | 20.1 |
| | 4 | 1100 | 6.0 |
| | 2 | - | - |
| 19 | 12 | 1100 | 20.1 |
| | 10 | 1100 | 18.0 |
| | 8 | 1100 | 12.0 |
| | 6 | 1100 | 6.0 |
| | 4 | 1100 | 3.2 |
| | 2 | 1100 | 2.1 |
| 20 | 8 | 1100 | 14.1 |
| | 6 | - | - |
| | 4 | 1200 | 3.2 |
| | 2 | - | - |

| Point #s | Depth (ft) | PSI | Lbs. |
|---|---|---|---|
| 21 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1100 | 0.7 |
| | 4 | 1100 | - |
| | 2 | 1100 | - |
| 22 | 8 | 1200 | 29.9 |
| | 6 | 1000 | 20.1 |
| | 4 | 1100 | 9.9 |
| | 2 | 1100 | 2.5 |
| 23 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1100 | 6.0 |
| | 4 | 1100 | 3.2 |
| | 2 | 1100 | 2.1 |
| 24 | 8 | 1200 | 5.6 |
| | 6 | - | - |
| | 4 | 1200 | 9.9 |
| | 2 | 1100 | 2.5 |
| 25 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | - | - |
| | 2 | - | - |
| 26 | 8 | 1000 | 29.9 |
| | 6 | 1000 | 12.0 |
| | 4 | 1000 | 3.9 |
| | 2 | - | - |
| 27 | 12 | 1000 | 20.1 |
| | 10 | 1000 | 18.0 |
| | 8 | 1000 | 12.0 |
| | 6 | 1000 | 6.0 |
| | 4 | 1000 | 3.2 |
| | 2 | 1000 | 2.1 |
| 28 | 8 | 1200 | 29.9 |
| | 6 | 1200 | 20.1 |
| | 4 | 1200 | 9.9 |
| | 2 | - | - |
| 29 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1150 | 6.0 |
| | 4 | 1100 | 3.2 |
| | 2 | 1100 | 2.1 |
| 30 | 8 | 1200 | 20.1 |
| | 6 | - | - |

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CHEMICAL GROUT SUMMARY POINTS

FIGURE NO.: 10f
FILE NO.: B2020-018
DATE: 02/23/2021
CHECKED BY: JJ

# TECHNICAL NOTES:

- CHEMICAL GROUT SUMMARY POINTS

| Point #s | Depth (ft) | PSI | Lbs. |
|---|---|---|---|
| 30 | 4 | 1200 | 9.9 |
| | 2 | 1100 | 2.5 |
| 31 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1100 | 2.1 |
| 32 | 8 | 1200 | 29.9 |
| | 6 | 1200 | 20.1 |
| | 4 | 1150 | 4.2 |
| | 2 | - | - |
| 33 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1150 | 6.0 |
| | 4 | 1150 | 3.2 |
| | 2 | 1100 | 2.1 |
| 34 | 8 | 1200 | 19.0 |
| | 6 | - | - |
| | 4 | 1200 | 6.0 |
| | 2 | - | - |
| 35 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1100 | 6.0 |
| | 4 | 1100 | 3.2 |
| | 2 | 1100 | 2.1 |
| 36 | 8 | 1100 | 11.3 |
| | 6 | - | - |
| | 4 | 1100 | 7.7 |
| | 2 | - | - |
| 37 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 38 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1100 | 6.0 |
| | 4 | 1100 | 3.2 |
| | 2 | 1100 | 2.1 |
| 39 | 8 | 1200 | 29.9 |
| | 6 | 1200 | 20.1 |
| | 4 | 1200 | 9.9 |
| | 2 | 1200 | 2.5 |

| Point #s | Depth (ft) | PSI | Lbs. |
|---|---|---|---|
| 40 | 8 | 1200 | 16.2 |
| | 6 | - | - |
| | 4 | 1200 | 10.9 |
| | 2 | - | - |
| 41 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 15.8 |
| | 8 | - | - |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1150 | 2.1 |
| 42 | 8 | 1200 | 16.4 |
| | 6 | - | - |
| | 4 | 1200 | 9.9 |
| | 2 | 1150 | 2.5 |
| 43 | 12 | 1200 | 16.2 |
| | 10 | - | - |
| | 8 | - | - |
| | 6 | 1200 | 6.7 |
| | 4 | - | - |
| | 2 | - | - |
| 44 | 8 | 1200 | 9.2 |
| | 6 | - | - |
| | 4 | 1200 | 8.4 |
| | 2 | - | - |
| 45 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 11.6 |
| | 8 | - | - |
| | 6 | 1200 | 6.0 |
| | 4 | 1100 | 0.7 |
| | 2 | - | - |
| 46 | 8 | 1200 | 29.9 |
| | 6 | 1100 | 20.1 |
| | 4 | 1100 | 9.9 |
| | 2 | 1050 | 2.5 |
| 47 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 4.9 |
| | 8 | - | - |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1150 | 2.1 |
| 48 | 8 | 1200 | 16.2 |
| | 6 | - | - |
| | 4 | 1200 | 8.8 |
| | 2 | - | - |
| 49 | 12 | 1200 | 14.1 |
| | 10 | - | - |
| | 8 | - | - |
| | 6 | 1200 | 6.0 |

| Point #s | Depth (ft) | PSI | Lbs. |
|---|---|---|---|
| 49 | 4 | 1200 | 3.2 |
| | 2 | 1150 | 2.1 |
| 50 | 8 | 1100 | 12.0 |
| | 6 | - | - |
| | 4 | 1100 | 9.9 |
| | 2 | 1100 | 2.5 |
| 51 | 12 | 1100 | 20.1 |
| | 10 | 1100 | 18.0 |
| | 8 | 1100 | 12.0 |
| | 6 | 1100 | 6.0 |
| | 4 | 1100 | 3.2 |
| | 2 | 1100 | 2.1 |
| 52 | 8 | 1200 | 29.9 |
| | 6 | 1200 | 3.2 |
| | 4 | 1200 | 9.9 |
| | 2 | 1200 | 2.5 |
| 53 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 54 | 8 | 1200 | 29.9 |
| | 6 | - | - |
| | 4 | 1200 | 11.3 |
| | 2 | - | - |
| 55 | 12 | 1200 | 11.3 |
| | 10 | - | - |
| | 8 | - | - |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1100 | 2.1 |
| 56 | 8 | 1200 | 29.9 |
| | 6 | 1200 | 0.7 |
| | 4 | 1200 | 8.4 |
| | 2 | - | - |
| 57 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 58 | 8 | 1200 | 29.9 |
| | 6 | 1200 | 13.7 |
| | 4 | 1200 | 7.7 |
| | 2 | - | - |
| 59 | 8 | 1200 | 9.2 |
| | 6 | - | - |

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**THE MOORINGS CONDO ASSOC. | BLDG #10**
357-371 MOORINGS COVE DRIVE, TARPON SPRINGS, FL 34689
PINELLAS COUNTY

CHEMICAL GROUT SUMMARY POINTS

FIGURE NO.: 10g
FILE NO.: B2020-018
DATE: 02/23/2021
CHECKED BY: JJ

# TECHNICAL NOTES:

- CHEMICAL GROUT SUMMARY POINTS

| Point #s | Depth (ft) | PSI | Lbs. |
|---|---|---|---|
| 59 | 4 | 1200 | 5.3 |
| | 2 | - | - |
| 60 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 8.4 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 61 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 11.3 |
| | 8 | - | - |
| | 6 | 1100 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 62 | 8 | 1200 | 19.7 |
| | 6 | - | - |
| | 4 | 1200 | 9.9 |
| | 2 | 1200 | 2.1 |
| 63 | 12 | 1200 | 10.9 |
| | 10 | - | - |
| | 8 | - | - |
| | 6 | 1200 | 5.6 |
| | 4 | - | - |
| | 2 | - | - |
| 64 | 8 | 1200 | 19.4 |
| | 6 | - | - |
| | 4 | 1200 | 6.7 |
| | 2 | - | - |
| 65 | 12 | 1200 | 7.4 |
| | 10 | - | - |
| | 8 | - | - |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 66 | 8 | 1200 | 15.8 |
| | 6 | - | - |
| | 4 | 1200 | 6.3 |
| | 2 | - | - |
| 67 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 1.4 |
| | 2 | - | - |
| 68 | 8 | 1200 | 19.4 |
| | 6 | - | - |
| | 4 | 1200 | 9.9 |
| | 2 | 1200 | 2.5 |

| Point #s | Depth (ft) | PSI | Lbs. |
|---|---|---|---|
| 69 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 9.9 |
| | 8 | - | - |
| | 6 | 1200 | 1.1 |
| | 4 | - | - |
| | 2 | - | - |
| 70 | 8 | 1200 | 19.0 |
| | 6 | - | - |
| | 4 | 1200 | 2.8 |
| | 2 | - | - |
| 71 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1150 | 2.1 |
| 72 | 8 | 1200 | 18.0 |
| | 6 | - | - |
| | 4 | 1200 | 9.9 |
| | 2 | 1150 | 0.7 |
| 73 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1150 | 3.2 |
| | 2 | 1150 | 2.1 |
| 74 | 8 | 1200 | 29.9 |
| | 6 | 1200 | 15.5 |
| | 4 | 1200 | 4.9 |
| | 2 | - | - |
| 75 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 2.1 |
| | 8 | - | - |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 76 | 8 | 1200 | 29.9 |
| | 6 | - | - |
| | 4 | 1200 | 2.1 |
| | 2 | - | - |
| 77 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 2.1 |
| | 8 | - | - |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1150 | 2.1 |
| 78 | 8 | 1200 | 20.1 |
| | 6 | - | - |

| Point #s | Depth (ft) | PSI | Lbs. |
|---|---|---|---|
| 78 | 4 | 1200 | 9.9 |
| | 2 | 1200 | 2.5 |
| 79 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1100 | 2.1 |
| 80 | 8 | 1200 | 29.9 |
| | 6 | 1200 | 10.9 |
| | 4 | 1200 | 9.9 |
| | 2 | 1100 | 2.5 |
| 81 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 82 | 8 | 1200 | 9.5 |
| | 6 | - | - |
| | 4 | 1200 | 9.9 |
| | 2 | 1200 | 2.5 |
| 83 | 8 | 1200 | 14.1 |
| | 6 | - | - |
| | 4 | 1200 | 5.3 |
| | 2 | - | - |
| 84 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 85 | 8 | 1200 | 23.9 |
| | 6 | - | - |
| | 4 | 1200 | 7.7 |
| | 2 | - | - |
| 86 | 12 | 1200 | 14.1 |
| | 10 | - | - |
| | 8 | - | - |
| | 6 | 1200 | 6.0 |
| | 4 | 1100 | 2.5 |
| | 2 | - | - |
| 87 | 8 | 1200 | 29.9 |
| | 6 | - | - |
| | 4 | 1200 | 6.0 |
| | 2 | - | - |
| 88 | 12 | 1200 | 19.4 |
| | 10 | - | - |

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357-371 MOORINGS COVE DRIVE, TARPON SPRINGS, FL 34689
PINELLAS COUNTY

CHEMICAL GROUT SUMMARY POINTS

FIGURE NO.: 10h
FILE NO.: B2020-018
DATE: 02/23/2021
CHECKED BY: JJ

## TECHNICAL NOTES:

- CHEMICAL GROUT SUMMARY POINTS

| Point #s | Depth (ft) | PSI | Lbs. |
|---|---|---|---|
| 88 | 8 | - | - |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1150 | 0.7 |
| 89 | 8 | 1200 | 28.9 |
| | 6 | - | - |
| | 4 | 1200 | 7.7 |
| | 2 | - | - |
| 90 | 12 | 1200 | 19.0 |
| | 10 | - | - |
| | 8 | - | - |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 91 | 8 | 1200 | 21.1 |
| | 6 | - | - |
| | 4 | 1200 | 2.8 |
| | 2 | - | - |
| 92 | 12 | 1200 | 11.3 |
| | 10 | - | - |
| | 8 | - | - |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 93 | 8 | 1200 | 29.9 |
| | 6 | 1200 | 16.9 |
| | 4 | 1200 | 10.9 |
| | 2 | - | - |
| 94 | 8 | 1200 | 17.2 |
| | 6 | - | - |
| | 4 | 1200 | 9.2 |
| | 2 | - | - |
| 95 | 8 | 1200 | 21.1 |
| | 6 | - | - |
| | 4 | 1200 | 4.9 |
| | 2 | - | - |
| 96 | 8 | 1200 | 16.2 |
| | 6 | - | - |
| | 4 | 1200 | 9.9 |
| | 2 | 1200 | 2.5 |
| 97 | 8 | 2500 | 29.9 |
| | 6 | 2500 | 20.1 |
| | 4 | 2500 | 9.9 |
| | 2 | 2500 | 2.5 |
| 98 | 12 | 1200 | 8.8 |
| | 10 | - | - |
| | 8 | - | - |
| | 6 | 1200 | 6.0 |

| Point #s | Depth (ft) | PSI | Lbs. |
|---|---|---|---|
| 98 | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 99 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 100 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 101 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 102 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 103 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | 1200 | 3.2 |
| | 2 | 1200 | 2.1 |
| 104 | 12 | 1200 | 20.1 |
| | 10 | 1200 | 18.0 |
| | 8 | 1200 | 12.0 |
| | 6 | 1200 | 6.0 |
| | 4 | - | - |
| | 2 | - | - |
| | | **Total:** | **4501.4** |

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PINELLAS COUNTY

CHEMICAL GROUT SUMMARY POINTS

FIGURE NO.: 10i
FILE NO.: B2020-018
DATE: 02/23/2021
CHECKED BY: JJ