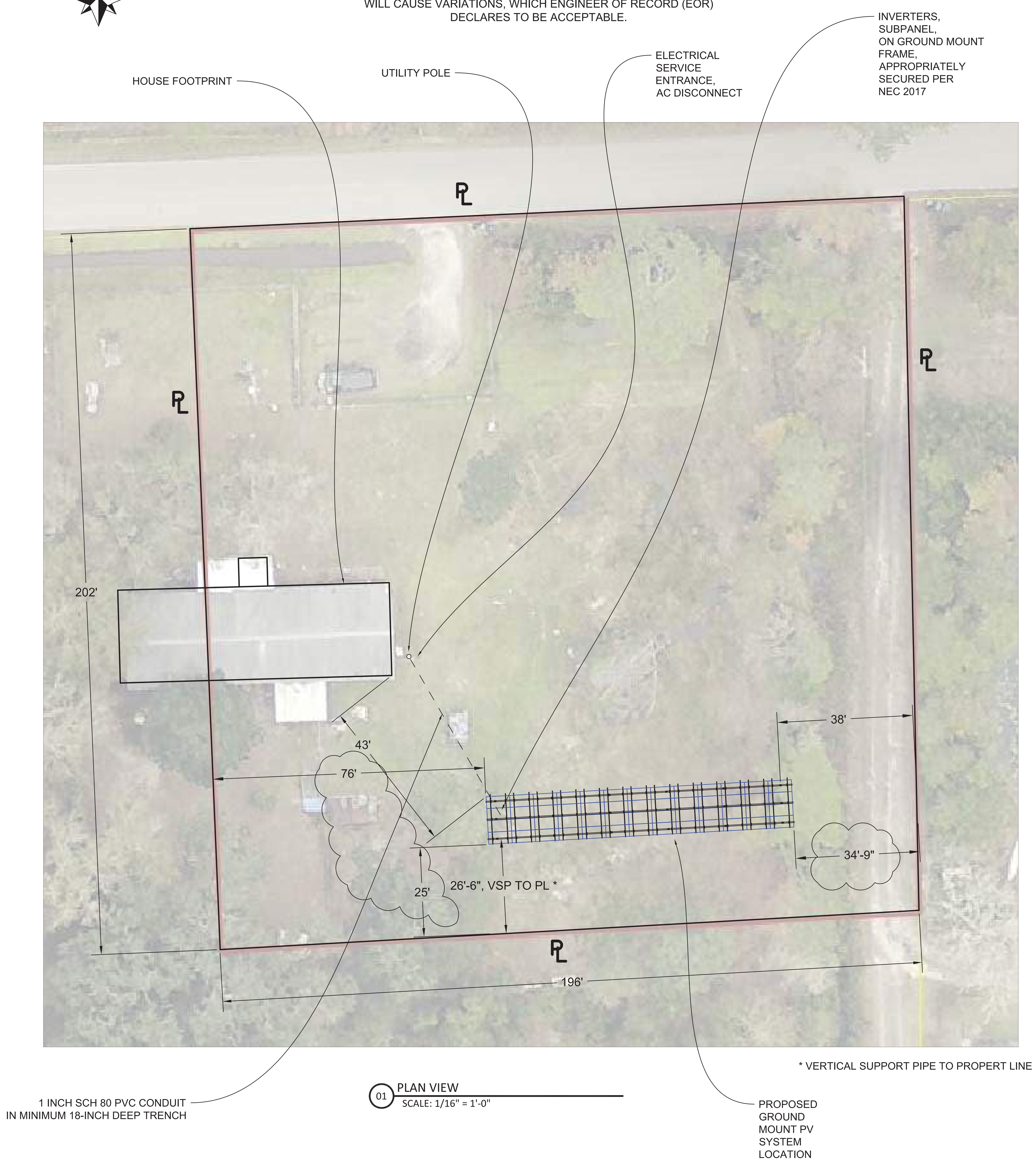
MEASUREMENTS CALLED OUT ARE NOT INTENDED TO BE EXACT.
AHJ, CONTRACTOR, & OWNER ARE NOTIFIED THAT SITE CONDITONS WILL CAUSE VARIATIONS, WHICH ENGINEER OF RECORD (EOR) DECLARES TO BE ACCEPTABLE.



* VERTICAL SUPPORT PIPE TO PROPERT LINE

01 PLAN VIEW
SCALE: 1/16" = 1'-0"

ATC Hazards by Location

Search Information

Address: 1322 Ebenezer Rd, Lake City, FL 32025, USA
Coordinates: 30.0950067, -82.5542964
Elevation: 143 ft
Timestamp: 2021-05-02T21:03:51.041Z
Hazard Type: Wind

ASCE 7-16

MRI 10-Year .... 74 mph
MRI 25-Year .... 83 mph
MRI 50-Year .... 89 mph
MRI 100-Year .... 97 mph
Risk Category I .... 109 mph
Risk Category II .... 119 mph
Risk Category III .... 129 mph

If the structure under consideration is a healthcare facility and you are also within 1 mile of the coastal mean high water line, you are in a wind-borne debris region. If other occupancy, use the Risk Category II basic wind speed contours to determine if you are in a wind-borne debris region.

Risk Category IV .... 134 mph

You are in a wind-borne debris region if you are also within 1 mile of the coastal mean high water line.

ASCE 7-10

MRI 10-Year .... 76 mph
MRI 25-Year .... 84 mph
MRI 50-Year .... 91 mph
MRI 100-Year .... 98 mph
Risk Category I .... 110 mph
Risk Category II .... 119 mph
Risk Category III-IV .... 129 mph

If the structure under consideration is a healthcare facility and you are also within 1 mile of the coastal mean high water line, you are in a wind-borne debris region. If other occupancy, use the Risk Category II basic wind speed contours to determine if you are in a wind-borne debris region.

ASCE 7-05

ASCE 7-05 Wind Speed .... 100 mph

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region

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Ground Mounting System – Structural Analysis – 4 Module (XR1000)

July 1, 2019
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Table 2B - MAXIMUM PIER SPACING (in)											
3" Unbraced Pipe Frame	Snow	Slope (deg)									
Wind Speed & Exposure Category	psf	0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	0	212	217	188	181	171	165	139	117	100	85
	10	191	194	178	174	170	163	139	117	100	85
	20	165	167	155	154	153	153	139	117	100	85
	30	155	156	147	146	146	147	139	117	100	85
	40	142	143	136	135	137	139	139	117	100	85
	50	131	131	127	127	129	131	134	117	100	85
	60	121	121	120	119	122	125	129	117	100	85
105 mph Exposure C	0	204	179	162	148	137	134	128	107	91	77
	10	188	178	162	148	137	134	128	107	91	77
	20	162	164	152	148	137	134	128	107	91	77
	30	152	154	144	143	137	134	128	107	91	77
	40	140	141	134	133	134	134	128	107	91	77
	50	130	131	125	125	128	129	128	107	91	77
	60	121	121	118	118	120	123	128	107	91	77
110 mph Exposure C	0	198	202	171	168	157	150	116	97	83	70
	10	182	186	167	164	157	150	116	97	83	70
	20	159	161	149	147	148	145	116	97	83	70
	30	150	152	141	140	139	140	116	97	83	70
	40	138	139	131	130	131	132	116	97	83	70
	50	128	130	123	123	124	128	116	97	83	70
120 mph Exposure C	0	183	188	159	154	145	132	97	82	69	59
	10	174	177	158	154	145	132	97	82	69	59
	20	153	155	142	140	138	132	97	82	69	59
	30	145	147	136	134	133	132	97	82	69	59
	40	134	136	127	128	128	128	97	82	69	59
	50	125	127	119	119	120	121	97	82	69	59
130 mph Exposure C	0	171	175	145	143	135	112	82	70	59	50
	10	168	169	145	143	135	112	82	70	59	50
	20	147	150	139	134	131	112	82	70	59	50
	30	140	142	130	129	127	112	82	70	59	50
	40	130	132	122	121	121	112	82	70	59	50
	50	122	124	118	118	118	112	82	70	59	50
140 mph Exposure C	0	160	165	138	134	128	97	71	60	51	43
	10	158	162	138	134	128	97	71	60	51	43
	20	142	145	130	128	125	97	71	60	51	43
	30	135	138	125	123	121	97	71	60	51	43
	40	127	128	118	117	116	97	71	60	51	43
	50	119	121	112	111	111	97	71	60	51	43
150 mph Exposure C	0	150	158	130	128	118	84	62	52	44	38
	10	150	154	130	128	118	84	62	52	44	38
	20	137	140	125	123	118	84	62	52	44	38
	30	131	133	120	118	116	84	62	52	44	38
	40	123	125	114	113	111	84	62	52	44	38
160 mph Exposure C	0	142	146	122	118	107	74	54	46	39	33
	10	142	146	122	118	107	74	54	46	39	33
	20	132	135	120	117	107	74	54	46	39	33
	30	127	129	118	114	107	74	54	46	39	33
	40	119	121	110	108	107	74	54	46	39	33

Notes: see page 14

Starling Madison Lofquist, Inc. Consulting Structural and Forensic Engineers

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IronRidge
Mr. Corey Geiger
Ground Mounting System – Structural Analysis – 4 Module (XR1000)

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Notes for Tables 3 & 4:

1. Concrete Weight = 145 pcf / f'c = 2500 psi
2. Provide Air Entraining Admixture for freeze and thaw cycles as required for colder climates.
3. Skin Friction per 2020 FBC 1810.3.3.1.4 & 5
4. Top 1'-0" of soil neglected for Skin Friction
5. Snow Load = 0 psf – tabulated values are conservative for Snow Loads > 0 psf
6. * indicates special foundation required. Contact IronRidge
7. Resistance to corrosion and/or sulfate attack, along with possible adverse effects due to expansive soils has not been considered in these foundation recommendations. SML Engineers assumes no liability with regard to these items.
8. Soil classification is to be determined and verified by the end user of this certification letter.

The analysis assumes that the array, including the connections and associated hardware, are installed in a workmanlike manner in accordance with the IronRidge Ground Mount Installation Manual and generally accepted standards of construction practice. Verification of PV Module capacity to support the loads associated with the given array shall be the responsibility of the Contractor or Owner and not IronRidge or Starling Madison Lofquist.

Please feel free to contact me at your convenience if you have any questions.

Respectfully yours,

Tres Warner, P.E.
Design Division Manager

Tres J Warner
Digitally signed by Tres J Warner
DN: c=US, o=Starling Madison Lofquist Inc, ou=A01410C00000174 6F7B422200003388, cn=Tres J Warner
Date: 2021.02.25 13:06:03 -07'00'

TRES J. WARNER LICENSE No 72547 STATE OF FLORIDA PROFESSIONAL ENGINEER
2.25.21
EXP 2.28.23

Starling Madison Lofquist, Inc. Consulting Structural and Forensic Engineers

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SML Starling Madison Lofquist, Inc.
Consulting Structural and Forensic Engineers
5224 South 39th Street, Phoenix, Arizona 85040
tel: (602) 438-2500 fax: (602) 438-2505 ROC#291316 www.smleng.com

IronRidge
28357 Industrial Boulevard
Hayward, CA 94545

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Attn: Mr. Corey Geiger, VP New Markets, IronRidge Inc.

Subject: Ground Mounting System – Structural Analysis – 4 Module (XR1000)

Dear Sir:

We have analyzed the subject ground mounted structure and determined that it is in compliance with the applicable sections of the following Reference Documents:

Codes: ASCE/SEI 7-16 Min. Design Loads for Buildings & Other Structures
Florida Building Code, 2020 Edition
Other: AC428, Acceptance Criteria for Modular Framing Systems Used to Support PV Modules, dated Effective November 1, 2012 by ICC-ES
Aluminum Design Manual, 2015 Edition
IronRidge Exhibit EX-0001

The structure is a simple column (pier) and beam (cross pipe) system. The piers & cross pipes are ASTM A53 Grade B standard weight (schedule 40) steel pipes or Allied Mechanical Tubing. Please refer to Exhibit EX-0001 for approved pipe geometry and material properties. The tops of the piers are connected in the E-W direction by the cross pipes which cantilever over and extend past the end piers. The cross pipes are connected by proprietary IronRidge XR1000 Rails spanning up and down the slope which cantilever over and extend past the top and bottom cross pipes. There are typically two rails per column of modules. The modules are clamped to the rails by the IronRidge Module Mounting Clamps as shown in the attached Exhibit.

Gravity loads are transferred to the piers and foundations by the rails and cross pipes acting as simple beams. For lateral loads the system is either a cantilever structure or, when diagonal braces are provided, a braced frame. The effect of seismic loads (for all design categories A-F) have been determined to be less than the effect due to wind loads in all load conditions and combinations.

The pier spacing in the N-S direction is 7'-6". The pier spacing in the E-W direction is selected from load tables determined by the structural design for the specified slope, wind load, and snow load. The governing criteria for the pier spacing is either the spanning capacity of the cross pipes or the cantilever capacity of the pier. Simplified Load Tables 1A-F & 2A-F are included herein for reference.

More comprehensive information covering all load combinations is available at the IronRidge website, IronRidge.com.

Starling Madison Lofquist, Inc. Consulting Structural and Forensic Engineers

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IronRidge
Mr. Corey Geiger
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Soil Class 4											
Table 4B - MINIMUM FOUNDATION DEPTHS (in)											
3" Pipe Frame Unbraced	Pier Dia (in)	Slope (deg)									
Wind Speed & Exposure Category		0	5	10	15	20	25	30	35	40	45
100 mph Exposure C	12	42	48	54	60	72	84	90	90	90	90
	16	36	36	42	54	66	72	78	78	78	78
	20	36	36	42	48	60	66	72	72	72	72
	24	36	36	36	48	54	60	66	66	66	66
105 mph Exposure C	12	42	48	48	60	66	78	90	90	90	90
	16	36	36	42	54	60	72	78	78	78	78
	20	36	36	42	48	54	66	72	72	72	72
	24	36	36	36	42	54	60	66	66	66	66
110 mph Exposure C	12	48	54	54	66	78	84	90	90	90	90
	16	36	42	48	54	66	78	78	78	78	78
	20	36	36	42	54	60	72	72	72	72	72
	24	36	36	36	48	54	66	66	66	66	66
120 mph Exposure C	12	54	60	60	72	78	90	90	90	90	90
	16	42	48	48	60	72	78	78	78	78	78
	20	36	36	42	54	66	72	72	72	72	72
	24	36	36	42	48	60	66	66	66	66	66
130 mph Exposure C	12	54	66	66	78	84	90	90	90	90	90
	16	42	48	54	60	72	78	78	78	78	78
	20	36	42	42	54	66	72	72	72	72	72
	24	36	36	42	54	60	66	66	66	66	66
140 mph Exposure C	12	60	72	72	84	84	90	90	90	90	90
	16	48	54	54	66	72	78	78	78	78	78
	20	36	42	48	60	66	72	72	72	72	72
	24	36	36	42	54	66	66	66	66	66	*
150 mph Exposure C	12	66	78	78	90	90	90	90	90	90	90
	16	48	60	60	66	78	78	78	78	78	78
	20	42	48	48	60	72	72	72	72	72	*
	24	36	42	42	54	66	66	66	66	*	*
160 mph Exposure C	12	72	84	84	96	96	90	90	90	90	90
	16	54	60	60	72	78	78	78	78	78	78
	20	42	48	48	60	72	72	72	72	*	*
	24	36	42	48	54	66	66	66	*	*	*

Notes: see page 52

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http://files.ironridge.com/groundmounting/certification/XR1000SGA4/IronRidge_XR1000SGA4_Certification_UFO_FL.pdf

ULTIMATE WIND SPEED: 110 MPH
EXPOSURE CATEGORY: C
RISK CATEGORY: 1

SOIL CLASSIFICATION 4
(SECTION1806 PRESUMPTIVE LOAD-BEARING VALUES OF SOILS, FBC 7TH EDITION, 2020.)

SLOPE: 6°

PIER PILE DIAMETER PROVIDED: 12 INCHES.

PIER DEPTH REQUIRED PER MANUFACTURER'S RECOMMENDATION: 54 INCHES (FOR 2 ROWS OF VERTICAL SUPPORT PIPES (VSP)).
PIER DEPTH PROVIDED : 48 INCHES (3 ROWS OF VSP'S PROVIDED).

CONCRETE COMPRESSIVE STRENGTH REQUIRED PER MANUFACTURER'S RECOMMENDATION : 2500 PSI
CONCRETE PROVIDED: 4000 PSI, WET-TAMPED

MAXIMUM EAST-WEST PIER SPACING REQUIRED PER MANUFACTURER'S RECOMMENDATION: 202 INCHES.
EAST-WEST PIER SPACING PROVIDED : 192 INCHES.

02 WIND LOAD, PIER(PIPE) SPACING & PIER DEPTH
SCALE: N/A

ENGINEER
ALPER ICELI
FL 90469
3753 LOCKRIDGE DR.
LAND O LAKES, FL 34638
(813) 406-7060
alper@iceli-pe.com

ALPER ICELI LICENSE No. 90469 STATE OF FLORIDA PROFESSIONAL ENGINEER

This item has been digitally signed and sealed by Alper Iceli, PE, on date shown above.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Alper Iceli
2021.05.13 15:05:38-04'00'

NAME OF OWNER:FRANKLIN ANITA DAWN CABRERA
ADDRESS:1322 SE EBENEZER RD LAKE CITY, FL 32025
PROPERTY ID#:31-4S-18-10519-004 (38586)

CONTRACTOR:

Dave's Home Helper Service, Inc.
36549 Laurel Oaks Dr.
Dade City, FL 33525
813-991-7596
EC13007006

DHHS-CABRERA
STRUCTURAL
REV.01-SHEET 2
MAY.13-21