Department of Veterans Affairs

Viera VA Multi-Specialty Clinic

Address Viera Site Deficiencies

675-23-151

100% Construction Document Narrative

Contract Number:
36C24819D0022 36C24823N0237

November 3rd, 2023

Table of Contents

Viera VAMC Site Deficiencies
VA Project #: 675-23-151
Engineer: Blake L. Gude

Civil Design Narrative

Design References

The project will be designed and constructed in accordance with VA program guides, directives, design manuals, and specifications in conjunction with industry standard criteria.

Building Codes and Design References

1. U.S. Department of Veterans Affairs, Master Specifications PG-18-1
2. U.S. Department of Veterans Affairs, VHA Program Guide PG-18-3, July 2021
3. U.S. Department of Veterans Affairs, National CAD Standards and Details PG-18-4
4. U.S. Department of Veterans Affairs, Construction Standards H-18-3
5. U.S. Department of Veterans Affairs, Design Manuals PG-18-10
6. U.S. Department of Veterans Affairs, Design Submission Requirements PG-18-15C
7. ACI 360R-10, Specifications Guide to Design of Slabs-On-Ground

Existing Conditions:

The Viera VA Medical Center campus is a suite of buildings surrounded by parking lots to the north, south, east, and west. Calibre is being tasked with fixing drainage and flooding problems in the northeast landscape area near Breslay Dr. as well as pavement repair in various locations around the site.

Currently, water is ponding in the landscape area and not flowing to the existing storm infrastructure. The water should flow to the south and enter a drainage swale, where it is then directed off site, however it is currently ponding in a low spot and being eventually percolating through the soil. In some cases, this water sits for a week before completely drying up.

The pavement is currently in good condition throughout the complex but some areas are in need of repairs in the approximate locations indicated on the plans. These areas are identified and located on the site plan and will be repaired as part of the pavement improvements.

Site Demolition:

Site preparation for the re-grading area is limited to the excavation and grading of necessary soil to restore the correct drainage patterns. Removal of topsoil will be required to adjust grades to proper elevations to allow drainage as originally intended.

Site preparation required for the pavement repairs is the sawcut and removal of full depth asphalt top layer in the areas where repairs are required.

Site Improvements:

In the landscape area near Bresley Dr., once the grading has been corrected, re-sodding of removed grass will be required.

In the areas where pavement repairs are necessary the pavement will be sawcut, removed and filled with new asphaltic concrete to match the existing pavement section and material.

Once repairs are completed, the entire parking lot and access drive area will be seal coated with an asphaltic seal coat conforming to VA specifications. Work for seal coat will be accomplished on weekends when visitor vehicles are not occupying the site. Paint restriping will be done after seal coat application has cured sufficiently to apply paint. Striping will match existing parking spaces, accessible spaces and no parking striping.

Figure 1: Landscape area low spot.

Figure 2: Pavement repair area near entrance

Figure 3: Pavement repair area

Figure 4: Pavement repair area

Figure 5: Asphalt-Conc transition repair area

Introduction

This project addresses a variety of site deficiencies located at the Viera VA Multi-Specialty Clinic at 2900 Veterans Way, Melbourne, Florida 32940

The scope of work includes the following items and as noted in the SOW. The AE shall provide professional design services to develop and furnish Construction Documents and perform Construction Period Service as it relates to the following items.

The project specific items will include the installation of new epoxy flooring, creating a new bathroom and office, upgrading physical security, provide a safety eye wash system, replacing the existing marquee signage and controller at the Clinic Main Entrance, enclosing an existing concrete pad area for secure storage adjacent to loading dock, repair damaged and/or cracked asphalt throughout the clinic parking and roadway areas, and address storm water storage at the Northeast corner of the property.

This scope of work will include but not be limited to Architectural, Civil, Structural, Mechanical, Plumbing, and Electrical Engineering services.

General Design Criteria

All aspects of the design shall be in full compliance with VA design criteria as listed in VA design guides and manuals which can be found on the web at the VA Office of Facilities Management technical information library – site address: http://www.cfm.va.gov/TIL/.

The following codes and design criteria shall be utilized to the extent applicable:

- VA Directives, Design Manuals, Master Specifications, VA National CAD Standard Application Guide, and other Guidance on the Technical Information Library (TIL) http://www.cfm.va.gov/til/.
- International Building Code (IBC) (Only when specifically referenced in VA Design Documents, see notes below)
- NFPA 101 Life Safety Code
- NFPA 99 (2021)
- NFPA 13 (2022)
- NFPA National Fire Codes with the exception of NFPA 5000 and NFPA 900
- Occupational, Safety and Health Administration (OSHA) Standards.
- VA Seismic Design Requirements, H-18-8
- National Electrical Code (NEC)
- International Plumbing Code (IPC)
- Safety Code for Elevators and Escalators, American Society of Mechanical Engineers (ASME) A 17.1.

- ASME Boiler and Pressure Vessel Code
- ASME Code for Pressure Piping
- Architectural Barriers Act Accessibility Standards (ABAAS) including VA supplement, Barrier Free Design Guide (PG-18-13)
- Building Code Requirements for Reinforced Concrete, American Concrete Institute and Commentary (ACI 318)
- Manual of Steel Construction, Load and Resistance Factor Design Specifications for Structural Steel Buildings, American Institute of Steel Construction (AISC)
- Energy policy Act of 2005 (EPAct)
- DOE Interim Final Rule: Energy Conservation Standards for New Federal, Commercial and Multi-Family High-Rise Residential Buildings and New Low-Rise Residential Buildings, 10 CFR Parts 433, 434 and 435.
- Federal Leadership in High Performance and Sustainable Buildings: Memorandum of Understanding (MOU)
- Executive Order 13423: Strengthening Federal Environmental, Energy, and Transportation Management.
- The Provisions for Construction and Safety Signs. Stated in the General Requirements Section 01010 of the VA Master Construction Specification.
- Ventilation for Acceptable Indoor Air Quality – ASHRAE Standard 62.1-2004.
- Safety Standard for Refrigeration Systems – ASHRAE Standard 15 – 2007.
- VA OI&T Infrastructure Standard for Telecommunication Spaces

100% Design Intent:

Install Epoxy Flooring: The design intent is to acid wash the existing concrete floor in the chiller plant to remove stains and then provide approximately 5000 sf of new epoxy flooring. The new flooring shall resistant against chemical and mechanical damage. The epoxy floor shall be non-slip and installed over the entire chiller floor area.

Office / Bathroom: The design intent is to provide an office area of approximately 150-sf inside the Viera Chiller Plant with windows and a new door. Although the framing will go to the deck above, the drywall will stop at roughly 9’0” AFF to allow the existing louver to function properly. An acoustical ceiling system will be installed at 8’-0” with sound attenuation blanks on top to mask the sound of the chiller plant equipment. In addition, the design will include a 100-sf bathroom which will utilize the existing roughed in plumbing. The bathroom will have a gypsum board ceiling, exhaust fan, and lights.

Security: Upgrade Viera Chiller Plant Physical Security Systems as per VA Design Guides and regulations, including all required camera surveillance, access control and intrusion alarm systems.

Monument Signage: Replace the existing electronic Marquee sign and controller at the Clinic Main Entrance with a multi-color networked system capable of displaying a variety of large computer-generated images and alpha-numeric dynamic messages generated from remote locations.

Concrete Enclosure: Fully enclose an existing concreate pad and wall area of approximately 250 sf adjacent to the loading dock. The design intent will add a roof structure, metal deck, and TPO roof system. The design will also include a double locking gate and miscellaneous concrete work.

Roadways and Parking: The project includes repairing damaged asphalt roadways and parking areas. The damaged asphalt will be removed, repaired, or replaced as required per this contract and budget.

Stormwater Drainage: Address poor stormwater drainage at the Northeast area of Clinic property to minimize flooding.

Project Phasing

Although this project will not permanently affect life safety and/or egress, the GC will need to have an in-depth discussion and provide a phasing plan regarding the designed upgrades. This project will include phasing plans to minimally impact patient care and existing facility. This work shall include but not be limited to architectural, structural, civil, mechanical, plumbing, and electrical. All fire life safety systems will remain as is but will be considered and designed per the NFPA 99 and 101.

The contractor shall be required to perform construction operations during time frames approved by the hospital. Ultimately, the precise sequence will be determined after a building contractor has been selected and consultations among the hospital staff, facilities personnel, contractor, and architect can be arranged.

The VA will need to provide feedback regarding hospital operations. Knowing these items early in the construction phase will foster a better understanding of the project and phasing. The following items shall be considered for this project prior to the start of construction:

· Staging for construction materials and access information for contractor.
· In-depth site walks with COR
· Phasing and safety plans
· Coordination drawing
· Utilities/Outages

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Viera VAMC Correct Site Deficiencies
VA Project #: 675-23-151
Engineer: J Travis Benjamin II

Structural Design Narrative

Design References

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2. U.S. Department of Veterans Affairs, VHA Program Guide PG-18-3, July 2021
3. U.S. Department of Veterans Affairs, National CAD Standards and Details PG-18-4
4. U.S. Department of Veterans Affairs, Construction Standards H-18-3
5. U.S. Department of Veterans Affairs, H-18-8 Seismic Design Requirements, 1 November 2019, revised May 1, 2020
6. U.S. Department of Veterans Affairs, VA Directive 7512, 3 August 2017
7. U.S. Department of Veterans Affairs, Design Manuals PG-18-10
8. U.S. Department of Veterans Affairs, Design Submission Requirements PG-18-15C
9. 2021 IBC, International Building Code
10. ACI 318-19, Building Code Requirements for Reinforced Concrete
11. ACI 360R-10, Specifications Guide to Design of Slabs-On-Ground
12. ASCE 7-16 Minimum Design Loads for Building and Other Structures
13. AWC NDS 2018, American Wood Council National Design Specification for Wood Construction

Structural System

Enclosed Storage Structure

A storage area near the existing loading dock will be enclosed. This will be a single-story structure, enclosed on 3 sides, constructed using the existing tilt-up concrete panels for bearing walls and a new roof. The roof structure will be constructed using steel w-shape beams and metal roof deck. A large existing equipment pad will be removed and the concrete slab to remain will be repaired as required.

Monument Signage

The existing monument sign near the northwest corner of the main entrance to the Viera VAMC will be demolished and a new monument sign will be constructed in the same location. The new signage is expected to be the same size and will re-use the existing concrete foundations.

Site Design Criteria

Dead Loads

- Storage Superimposed DL: 8 PSF
- Structure Self-weight: Actual Weight

Live Loads

- Roof Live Load: 20 PSF

Seismic Design Data

- Building Risk Category = I
- Importance Factor = 1.0
- Soil Site Class = D (assumed)
- SS = 0.057g, S1 = 0.032g, SDS = 0.061g, SD1 = 0.051g
- Seismic Design Category = A
- Building Frame System: Ordinary Precast Shear Walls

Wind Design Data

- Basic Wind Speed = 165 MPH (ASCE 7)
- Roughness Category = C
- Exposure Category = C

Climate Data

- Rainfall Intensity = 10.32” per hour

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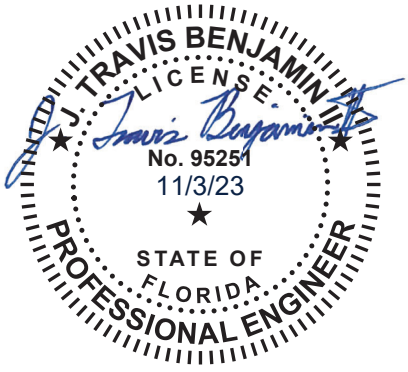
VIERA ADDRESS SITE DEFICIENCIES

VIERA VAMC, FLORIDA

Project #: 675-23-151

Structural Calculations Package
Bid Documents

November 3, 2023



DESIGN PREPARED UNDER THE SUPERVISION OF ED SABIA, PE

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CALIBRE-ENGINEERING.COM

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Part 1

Loading & Design Criteria

Calibre Engineering
9090 S. Ridgeline Blvd, Suite 105
Highlands Ranch, CO 80129
303-730-0434

JOB TITLE Viera Site Deficiencies
Design Criteria

CALCULATED BY JTB **SHEET NO.** **DATE** 3/21/23

CODE SUMMARY

Code: International Building Code 2021

Live Loads:

Roof	0 to 200 sf:	20 psf
	200 to 600 sf:	24 - 0.02Area, but not less than 12 psf
	over 600 sf:	12 psf

Typical Floor	0 psf
Partitions	N/A
Storage areas above ceilings	20 psf

Dead Loads:

Floor	0.0 psf
Roof	16.0 psf

Roof Snow Loads:

Design Uniform Roof Snow load		=	0.0 psf
Flat Roof Snow Load	Pf	=	0.0 psf
Balanced Snow Load	Ps	=	0.0 psf
Ground Snow Load	Pg	=	0.0 psf
Importance Factor	I	=	0.80
Snow Exposure Factor	Ce	=	1.00
Thermal Factor	Ct	=	1.20
Sloped-roof Factor	Cs	=	1.00
Drift Surcharge load	Pd	=	
Width of Snow Drift	w	=	

Earthquake Design Data:

Risk Category		=	I
Importance Factor	I	=	1.00
Mapped spectral response accelerati	Ss	=	5.70
	S1	=	3.20
Site Class		=	ode default
Spectral Response Coef.	Sds	=	0.061
	Sd1	=	0.051
Seismic Design Category		=	A
Basic Structural System		=	Bearing Wall Systems
Seismic Resisting System		=	Ordinary precast shear walls
Seismic Response Coef.	Cs	=	0.020
Response Modification Factor	R	=	3
Analysis Procedure		=	Equivalent Lateral-Force Analysis

Rain Design Data:

Rain intensity	*i*	=	10.32 in/hr
Rain Load	R	=	0.0 psf

Wind Design Data:

Ultimate Design Wind Speed	165 mph
Nominal Design Wind Speed	127.81 mph
Risk Category	I
Mean Roof Ht (h)	10.5 ft
Exposure Category	C
Enclosure Classif.	Partially Enclosed
Internal pressure Coef.	+/-0.55
Directionality (Kd)	0.85

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Component and Cladding Ultimate Wind Pressures

Roof	Surface Pressure (psf)							
Area	10 sf	20 sf	50 sf	100 sf	200 sf	350 sf	500 sf	1000 sf
Negative Zone 1	-113.2	-106.9	-98.7	-92.4	-86.2	-81.2	-77.9	-77.9
Negative Zone 1'	-72.9	-72.9	-72.9	-72.9	-65.4	-59.2	-55.3	-47.8
Negative Zone 2	-143.3	-135.3	-124.7	-116.7	-108.7	-102.2	-98.1	-98.1
Negative Zone 3	-188.6	-172.5	-151.3	-135.3	-119.3	-106.3	-98.1	-98.1
Positive All Zones	42.7	41.2	39.2	37.7	37.7	37.7	37.7	37.7
Overhang Zone 1&1'	-85.5	-84.0	-82.0	-80.5	-67.5	-57.0	-50.3	-50.3
Overhang Zone 2	-115.7	-105.0	-90.8	-80.1	-69.5	-60.8	-55.3	-55.3
Overhang Zone 3	-160.9	-142.2	-117.5	-98.8	-80.1	-65.0	-55.3	-55.3

Overhang soffit pressure equals adj wall pressure (which includes internal pressure of 27.7 psf)

	Parapet	Solid Parapet Pressure (psf)					
	Area	10 sf	20 sf	50 sf	100 sf	200 sf	500 sf
CASE A:	Zone 2 :	0.0	0.0	0.0	0.0	0.0	0.0
	Zone 3 :	0.0	0.0	0.0	0.0	0.0	0.0
CASE B :	Interior zone :	0.0	0.0	0.0	0.0	0.0	0.0
	Corner zone :	0.0	0.0	0.0	0.0	0.0	0.0

Wall	Surface Pressure (psf)			
Area	10 sf	100 sf	200 sf	500 sf
Negative Zone 4	-77.4	-69.5	-67.0	-63.9
Negative Zone 5	-91.0	-75.0	-70.2	-63.9
Positive Zone 4 & 5	72.9	64.9	62.5	59.3

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Wind Loads - MWFRS all h (Except for Open Buildings)

Kh (case 2) =	0.85			GCpi =	+/-0.55
Base pressure (q_h) =	**50.3 psf**	Bldg dim parallel to ridge =	20.0 ft	G =	0.85
Roof Angle (θ) =	1.2 deg	Bldg dim normal to ridge =	16.5 ft	z for qi :	10.5 ft
Roof tributary area:		h =	10.5 ft	qi =	50.3 psf for positive internal pressures
Wind normal to ridge =(h/2)*L:	105 sf	ridge ht =	10.7 ft		
Wind parallel to ridge =(h/2)*L:	87 sf				

Ultimate Wind Surface Pressures (psf)

	Wind Normal to Ridge L/B = 0.83		h/L = 0.64		Wind Parallel to Ridge L/B = 1.21		h/L = 0.53	
Surface	Cp	q_hGC_p	w/+q_iGC_{pi}	w/-q_hGC_{pi}	Dist.*	Cp	q_hGC_p	w/ +q_iGC_{pi}	w/ -q_hGC_{pi}
Windward Wall (WW)	0.80	34.2	see table below			0.80	34.2	see table below	
Leeward Wall (LW)	-0.50	-21.4	-49.0	6.3		-0.46	-19.6	-47.2	8.1
Side Wall (SW)	-0.70	-29.9	-57.6	-2.3		-0.70	-29.9	-57.6	-2.3
Leeward Roof (LR)		**				Included in windward roof			
Neg Windward Roof: 0 to h/2*	-1.01	-43.1	-70.7	-15.4	0 to h/2*	-0.92	-39.3	-67.0	-11.7
h/2 to h*	-0.85	-36.1	-63.8	-8.5	h/2 to h*	-0.89	-38.0	-65.7	-10.4
h to 2h*	-0.55	-23.7	-51.4	4.0	h to 2h*	-0.51	-21.8	-49.5	5.9
Pos/min windward roof press.	-0.18	-7.7	-35.4	20.0	Min press.	-0.18	-7.7	-35.4	20.0

**Roof angle < 10 degrees. Therefore, leeward roof is included in windward roof pressure zones.

*Horizontal distance from windward edge

For monoslope roofs, entire roof surface is either windward or leeward surface.

Parapet

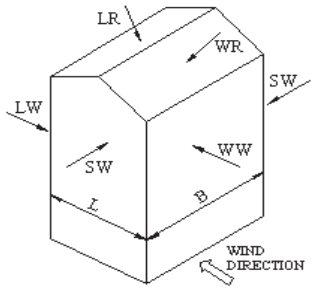
z	Kz	Kzt	qp (psf)
10.5 ft	0.85	1.00	50.3

Windward parapet: 75.4 psf (GCpn = +1.5)
Leeward parapet: -50.3 psf (GCpn = -1.0)

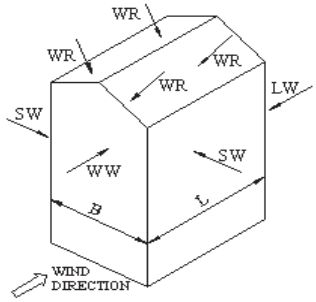
Windward roof overhangs : 34.2 psf (upward - add to windward roof pressure)

Windward Wall Pressures at "z" (psf)

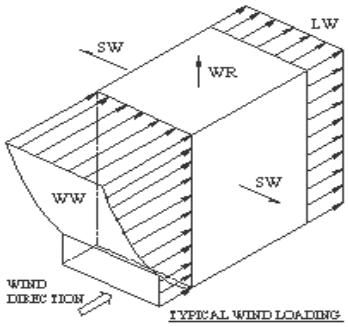
	z	Kz	Kzt	Windward Wall q_zGC_p	Windward Wall w/+q_iGC_{pi}	Windward Wall w/-q_hGC_{pi}	Combined WW + LW Wind Normal to Ridge	Combined WW + LW Wind Parallel to Ridge
h=	0 to 15'	0.85	1.00	34.2	6.5	61.9	55.6	53.8



WIND NORMAL TO RIDGE

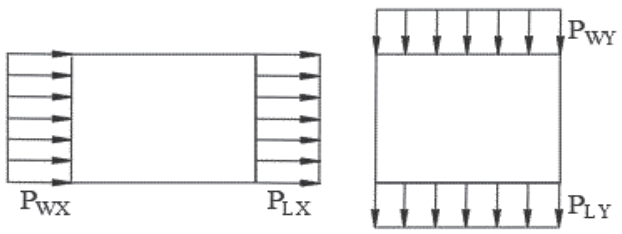


WIND PARALLEL TO RIDGE

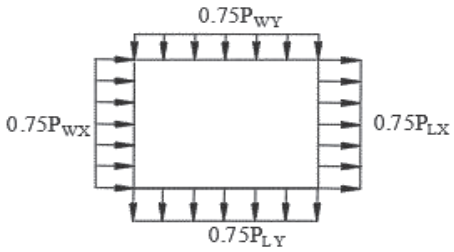


TYPICAL WIND LOADING

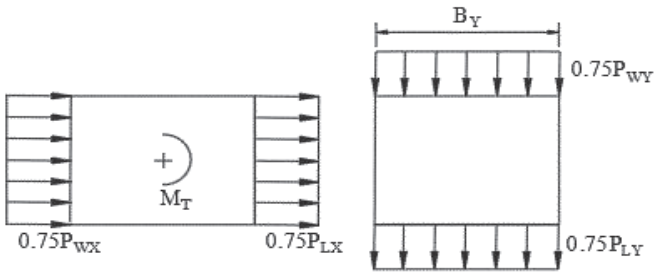
NOTE: ASCE 7 requires the application of full and partial loading of the wind pressures per the 4 cases below.



CASE 1



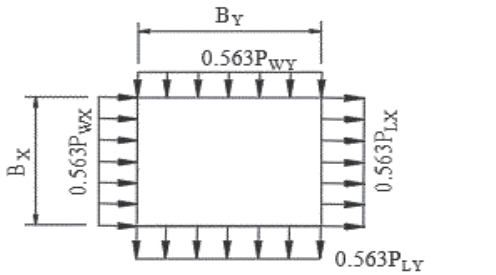
CASE 3



$M_T = 0.75(P_{WX}+P_{LX})B_X e_X$
$e_X = \pm 0.15\ B_X$

$M_T = 0.75(P_{WY}+P_{LY})B_Y e_Y$
$e_Y = \pm 0.15\ B_Y$

CASE 2



$M_T = 0.563(P_{WX}+P_{LX})B_X e_X + 0.563(P_{WY}+P_{LY})B_Y e_Y$
$e_X = \pm 0.15\ B_X$ $e_Y = \pm 0.15\ B_Y$

CASE 4

Wind Forces at Floors

Building dimension (parallel with ridge) = 20.0 ft e = 3.00 ft
Total Floors = 1 Building dimension (normal to ridge) = 16.5 ft e = 2.48 ft
T/Fdn (dist below grade) = 2.0 ft L is the building dimension parallel to the wind direction

	Elevation	Height of	Wind Normal to Ridge						Wind Parallel to Ridge			
Level	Above Grade (ft)	Centroid to Fdn (ft)	L	B	Area (sf)	Applied Force (k)	Story Shear (k)	Overturning Moment ('k)	Area	Applied Force (k)	Story Shear (k)	Overturning Moment ('k)
Equip,etc		0.00	wind on equip, screenwalls, etc =					0.0				
Parapet	10.50	0.00				0.0		0.0		0.0		
T/Ridge		0.00			0.0	0.0		0.0	0.0	0.0		0.0
Roof	15.00	17.00	16.5	20.0	123.8	6.9	6.9	0.0	150.0	8.1	8.1	0.0
1	0.00	2.00	16.5	20.0	123.8	6.9	13.8	103.2	150.0	8.1	16.1	121.0
FDN		0.00						130.7				153.2

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Seismic Loads: IBC 2021 Strength Level Forces

Risk Category : I
Importance Factor (Ie) : 1.00
Site Class : D - code default

Ss (0.2 sec) = 5.70 %g
S1 (1.0 sec) = 3.20 %g

Site specific ground motion analysis performed:

Fa =	1.600		Sms =	0.091	S_{DS} =	0.061	Design Category =	A
Fv =	2.400		Sm1 =	0.077	S_{D1} =	0.051	Design Category =	A

Seismic Design Category = **A** ASCE7 Section 11.4.1 Exception Applies
Redundancy Coefficient ρ = 1.00
Number of Stories: 1
Structure Type: All other building systems
Horizontal Struct Irregularities: No plan Irregularity
Vertical Structural Irregularities: No vertical Irregularity
Flexible Diaphragms: No
Building System: **Bearing Wall Systems**
Seismic resisting system: **Ordinary precast shear walls**
System Structural Height Limit: **Height not limited**
Actual Structural Height (hn) = 10.5 ft

DESIGN COEFFICIENTS AND FACTORS

Response Modification Coefficient (R) = 3
Over-Strength Factor (Ωo) = 2.5
Deflection Amplification Factor (Cd) = 3
S_{DS} = 0.061
S_{D1} = 0.051

Seismic Load Effect (E) = Eh +/-Ev = ρ Q_E +/- 0.2S_{DS} D = Qe +/- 0.000D Q_E = horizontal seismic force
Special Seismic Load Effect (Em) = Emh +/- Ev = Ωo Q_E +/- 0.2S_{DS} D = 2.5Qe +/- 0.012D D = dead load

PERMITTED ANALYTICAL PROCEDURES

Index Force Minimum lateral force Fx = 0.01Wx at each floor level

Simplified Analysis - Use Equivalent Lateral Force Analysis

Equivalent Lateral-Force Analysis - Permitted

Building period coef. (C_T) = 0.020 Cu = 1.70
Approx fundamental period (Ta) = $C_T h_n^x$ = 0.117 sec x= 0.75 Tmax = CuTa = 0.198 sec
User calculated fundamental period = T = 0.117 sec
Long Period Transition Period (TL) = ASCE7 map = 8 sec
Seismic response coef. (Cs) = SdsI/R = 0.020
need not exceed Cs = Sd1 I /RT = 0.146
but not less than Cs = 0.010
USE Cs = 0.020

Design Base Shear V = 0.020W

Model & Seismic Response Analysis - Permitted (see code for procedure)

ALLOWABLE STORY DRIFT

Structure Type: All other structures

Allowable story drift Δa = 0.020hsx where hsx is the story height below level x

Part 2

Roof Design

Roof Deck

SDL:

INSULATION:	3 PSF	(2" AVG, SLOPED INSUL)
MEMBRANE:	2 PSF	(TPO MEMBRANE)
L/E/FP:	3 PSF	(ASSUMED)
TOTAL:	8 PSF	

LL_R: 20 PSF (ASCE 7)
WL+: 38 PSF (12/3, C&C STANDARDS)
WL-: -141 PSF "

$+TL_A = D + .75L_R + .75(.6W) = 40$ PSF
$-TL_A = .6D + .6W = -80$ PSF

$W_N/JZ = 93$ PSF (VULCRAFT: 2-SPAN, 1.5B20)

Roof Framing

SDL: 8 PSF
DL: 3 PSF (DECK)
LL_R: 20 PSF
WL+: 38 PSF
WL-: -141 PSF

$t_w = 7'-0"$
$l = 15.25$ ft

$w_a = t_w \times (.6D + .6W) = 7 \times (-78) = -546$ PLF

$M_a = w_a l^2/8 = -16$ k-ft
$V_a = w_a l/2 = 4$ k

$M_N/JZ = 20$ k-ft (AISC TABLE 3-10, W8×18, $L_b = 16.5$ ft)
$V_N/JZ = 37$ k (AISC TABLE 3-6, W8×18)

Project	Date	Page
VILLA CSD		
Subject	Job No.	Initials
ROOF CONNECTIONS		

PROFIS INPUTS

CONC THICKNESS = 6.25" (AS-BUILT)
"
f'_c = 3000 PSI, CRACKED
ℓ = 15.25'
W_a = .6D + .6W
t_w = 7'-0"
SDL: 8 PSF × 7 = 56 PLF
DL_{DUCT}: 3 PSF × 7 = 21 PLF
DL_{3KMM}: 18 PLF
DL_{TOT} = 95 PLF

WL = -141 PSF × 7 = -987 PLF

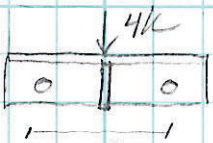
w_a = -535 PLF
$V_a = w_a \ell/2$ = -4081 #

SEE HILTI PRINTOUT

ANGLE CHECKS

M_a = 4k × 4" = 16k-in

$M_n/\Omega \le M_a$ ∴ 16k-in = $\frac{F_y b d^2/6}{1.67}$ = $\frac{36(4d^2/6)}{1.67}$ = 1.06in ∴ ANGLE PER'S STIFF PL



M_y = 4 × (4/12)²/8 = 56 #-FT

$M_n/\Omega = 1.5 M_y/1.67 = \frac{1.5(36(2))}{1.67} = \frac{1.5(36(5.97))}{1.67}$

= 190.5k-in
= 16k-FT > M_a ∴ OK

Company:	Calibre Engineering, Inc	Page:	1
Address:	9090 S Ridgeline Blvd, Suite 105 Highlands Ranch,	Specifier:	Travis Benjamin
Phone I Fax:	303-730-0434 |	E-Mail:	
Design:	ROOF BEAM CONNECTION	Date:	6/1/2023
Fastening point:			

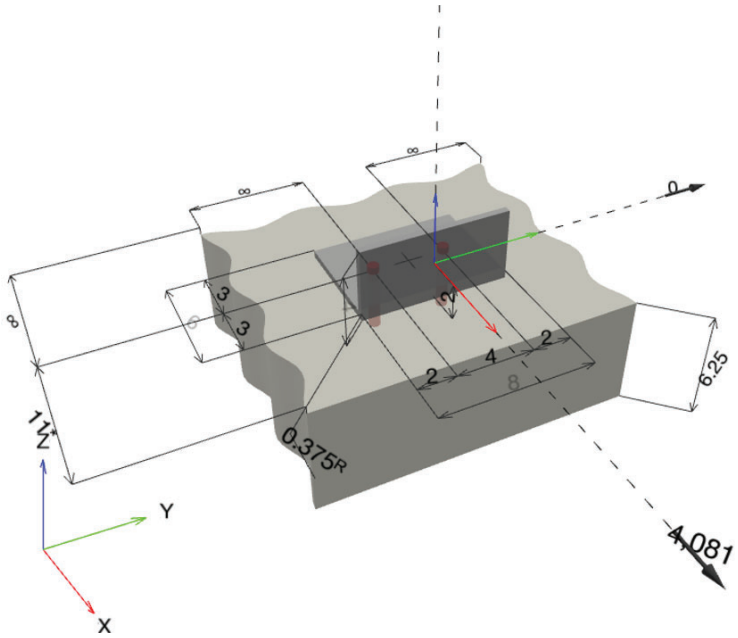
Specifier's comments:

1 Input data

Anchor type and diameter:	**KWIK HUS-EZ (KH-EZ) 5/8 (4)**
Item number:	418080 KH-EZ 5/8"x5 1/2"
Effective embedment depth:	$h_{ef,act}$ = 3.030 in., h_{nom} = 4.000 in.
Material:	Carbon Steel
Evaluation Service Report:	ESR-3027
Issued I Valid:	4/1/2022 | 12/1/2023
Proof:	Design Method ACI 318-19 / Mech
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.375 in.
Ledger Angle[R] :	L_1 x L_2 x t_{L1} x t_{L2} x l = 4.000 in. x 6.000 in. x 0.375 in. x 0.375 in. x 8.000 in.;
Load Point Height:	h_{pl} = 2.000 in.
Base material:	cracked concrete, 3000, f_c' = 3,000 psi; h = 6.250 in.
Installation:	**hammer drilled hole, Installation condition: Dry**
Reinforcement:	tension: not present, shear: not present; no supplemental splitting reinforcement present edge reinforcement: > No. 4 bar

[R] - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, in.lb]

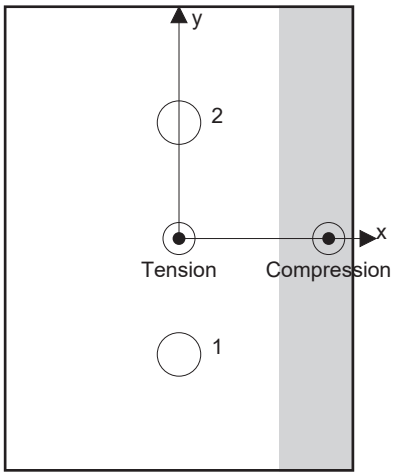


Company:	Calibre Engineering, Inc	Page:	2
Address:	9090 S Ridgeline Blvd, Suite 105 Highlands Ranch,	Specifier:	Travis Benjamin
Phone I Fax:	303-730-0434 |	E-Mail:	
Design:	ROOF BEAM CONNECTION	Date:	6/1/2023
Fastening point:			

1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 0; V_x = 4,081; V_y = 0; M_x = 0; M_y = 0; M_z = 0;	no	82

2 Load case/Resulting anchor forces



Anchor reactions [lb]
Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	1,580	2,040	2,040	0
2	1,580	2,040	2,040	0

max. concrete compressive strain:	0.15 [‰]
max. concrete compressive stress:	632 [psi]
resulting tension force in (x/y)=(0.000/-0.000):	3,160 [lb]
resulting compression force in (x/y)=(2.583/-0.000):	3,160 [lb]

Anchor forces are calculated based on the assumption of a rigid anchor plate.

3 Tension load

	Load N_{ua} [lb]	Capacity ϕ N_n [lb]	Utilization $\beta_N = N_{ua}/\phi$ N_n	Status
Steel Strength*	1,580	15,736	11	OK
Pullout Strength*	N/A	N/A	N/A	N/A
Concrete Breakout Failure**	3,160	4,597	69	OK

* highest loaded anchor **anchor group (anchors in tension)

Project	Date	Page
VIEGA CSD	5/31/23	
Subject: ROOF CONNECTIONS	Job No.	Initials: JJB

FLANGE BENDING

t_f = .33in (AISC TABLE 1-1)

b = 3.5" (BEARING ON ANGLE)

b_f = 5.25"

$M_a = \frac{4k \cdot 5.25}{4} = 5.25 k\text{-in}$

$M_n/\Omega \leq M_a \therefore 5.25 k\text{-in} = f_y Z/1.67 = \frac{36(35d^3/6)}{1.67}$ d_{min} = .65in

$d_{min} > t_f \therefore$ STIFF. REQ'D

Roof Pack

1.5B20 GA

DL RFT: 14# PSF

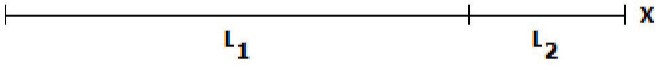
SEE HILTI REPORT

Company:	CALIBRE ENGINEERING, INC	**Page:**	2 / 5
Address:	8822 S RIDGELINE BLVD STE 310, HIGHLANDS	**Project Number:**	
Phone | Fax:	303-730-0434	**Project Title:**	VIERA CSD
e-Mail:	TBENJAMIN@CALIBRE-ENGINEERING.COM		
Contact:		**Date:**	6/1/2023

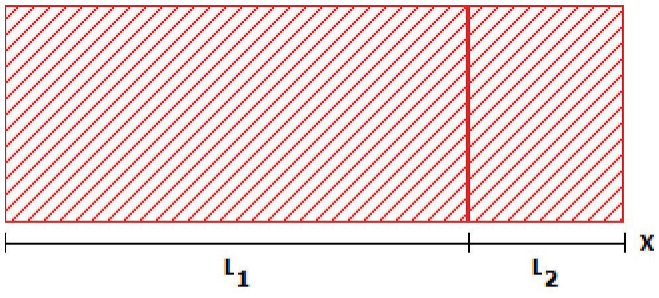
Area A

Length L:	200.00 ft	**Zone Orientation:**	X - Direction
Width B:	100.00 ft		
Deck Type:	Steel Roof Deck		
Support Construction:	Beams	**Sidelap Connector Spacing from:**	3 in.
Joist / Beam Spacing:	6.25 ft	**Sidelap Connector Spacing to:**	36 in.
Joist / Beam Thickness:	0.3300 in.	**Sidelap Connector Spacing incr.:**	3 in.
Deck Panel:	1-1/2" B-Deck - Fy = 40 ksi - Wide Rib or WR	**Panel Moment of Inertia (16 ga):**	0.383 $in.^4/ft$
		Panel Moment of Inertia (18 ga):	0.313 $in.^4/ft$
f_u / f_y	55 ksi / 40 ksi	**Panel Moment of Inertia (20 ga):**	0.240 $in.^4/ft$
Panel Type:	Nestable	**Panel Moment of Inertia (22 ga):**	0.200 $in.^4/ft$
Panel Width:	36.000 in.		

Lateral Load



Uplift Load



Company:	CALIBRE ENGINEERING, INC	**Page:**	3 / 5
Address:	8822 S RIDGELINE BLVD STE 310, HIGHLANDS	**Project Number:**	
Phone | Fax:	303-730-0434	**Project Title:**	VIERA CSD
e-Mail:	TBENJAMIN@CALIBRE-ENGINEERING.COM		
Contact:		**Date:**	6/1/2023

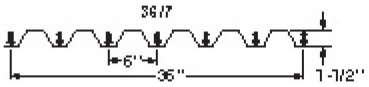
Zone A - 1

Length L: 150 ft

Required Input Loads

Diaphragm Shear Q:	**0 plf**	**Net Uplift T (W):**	**141 psf**
Req. Shear Stiffness G'_{req}:	**0.0 kip/in.**		

Proposed Diaphragm System

Frame Fastener:	5/8 Inch Diameter Puddle Weld	**Deck Thickness:**	20 ga (0.0358 in.)
		Pattern:	36/7
Sidelap Connector:	#10 Drill Screw	**Pattern Drawing:**	
Sidelap Connector Spacing:	36 in.		
Edge Fastener Spacing:	36 in.		
Ω_{Wind}:	2.15		
Ω_{Uplift}:	2.50		
$\Omega_{PB,Buckling}$:	2.00		

Proposed System Diaphragm Shear and Stiffness/Flexibility

Design Shear:	**473 plf**	**Design Uplift:**	**213 psf**
Shear Stiffness G':	78.1 kip/in.	**Flexibility Factor F:**	12.8 micro-in./lb

Design Checks

Design Shear	= 473 plf >= Q = 0 plf **=> OK**
Design Uplift	= 213 psf >= T = 141 psf **=> OK**
Shear Stiffness G'	= 78.1 kip/in. >= G'_{req} = 0.0 kip/in. **=> OK**

Design OK

www.hilti.com

Company:	CALIBRE ENGINEERING, INC	**Page:**	4 / 5
Address:	8822 S RIDGELINE BLVD STE 310, HIGHLANDS	**Project Number:**	
Phone | Fax:	303-730-0434	**Project Title:**	VIERA CSD
e-Mail:	TBENJAMIN@CALIBRE-ENGINEERING.COM		
Contact:		**Date:**	6/1/2023

Zone A - 2

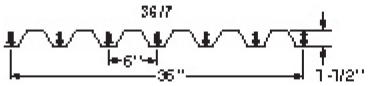
Length L: 50 ft

Required Input Loads

Diaphragm Shear Q:	**0 plf**	**Net Uplift T (W):**	**141 psf**
Req. Shear Stiffness G'_{req}:	**0.0 kip/in.**		

Proposed Diaphragm System

Frame Fastener:	Hilti X-HSN 24	**Deck Thickness:**	20 ga (0.0358 in.)
		Pattern:	36/7
Sidelap Connector:	#10 Drill Screw	**Pattern Drawing:**	
Sidelap Connector Spacing:	36 in.		
Edge Fastener Spacing:	36 in.		
Ω_{Wind}:	2.00		
Ω_{Uplift}:	3.00		
$\Omega_{PB,Buckling}$:	2.00		



Proposed System Diaphragm Shear and Stiffness/Flexibility

Design Shear:	**391 plf**	**Design Uplift:**	**179 psf**
Shear Stiffness G':	76.3 kip/in.	**Flexibility Factor F:**	13.1 micro-in./lb

Design Checks

Design Shear	= 391 plf >= Q = 0 plf **=> OK**
Design Uplift	= 179 psf >= T = 141 psf **=> OK**
Shear Stiffness G'	= 76.3 kip/in. >= G'_{req} = 0.0 kip/in. **=> OK**

Design OK

Calibre

Project	Date	Page
VIERA CSD	6/1/23	
Subject	Job No.	Initials
ROOF CONNECTIONS - PULL TO CORE		JTB

SIMPSON ST: TITEN SCREW SS

$\phi T_u = 1,040$

$W_u = t_w (.9D + W)$

$t_w = 15.25/2 = 7.625$ ft

SDL: 8 PSF

DL_{DECK}: 3 PSF

DL_{BM}: 18 PLF / 7 ft = 3 PSF

DL = 14 PSF

$-WL = -141$ PSF

$W_u = 7.625 (.9(14) - 141)$

$= -979$ PLF

$W_u S \leq \phi T_u$

$-979S = 1040$

$S = 12"$ OC

Titen® Stainless Steel Concrete and Masonry Screw

Stainless-Steel Titen Allowable Tension and Shear Loads in Normal-Weight Concrete

Dia. in. (mm)	Drill Bit Dia. in.	Embed. Depth in. (mm)	Critical Spacing in. (mm)	Critical Edge Dist. in. (mm)	Tension Load				Shear Load	
					$f'_c \geq 2{,}000$ psi (13.8 MPa) Concrete		$f'_c \geq 4{,}000$ psi (27.6 MPa) Concrete		$f'_c \geq 2{,}000$ psi (13.8 MPa) Concrete	
					Ultimate lb. (kN)	Allow. lb. (kN)	Ultimate lb. (kN)	Allow. lb. (kN)	Ultimate lb. (kN)	Allow. lb. (kN)
¼ (6.4)	3/16	1 (25.4)	3 (76.2)	1 ½ (38.1)	600 (2.7)	150 (0.7)	935 (4.2)	235 (1.0)	760 (3.4)	190 (0.8)
¼ (6.4)	3/16	1 ½ (38.1)	3 (76.2)	1 ½ (38.1)	1,040 (4.6)	260 (1.2)	1,760 (7.8)	440 (2.0)	810 (3.6)	200 (0.9)

1. Maximum anchor embedment is 1 ½" (38.1 mm).
2. Minimum concrete thickness is 1.5 x embedment.

Stainless-Steel Titen Allowable Tensionand Shear Loads in Face Shell of Hollow and Grout-Filled CMU

Dia. in. (mm)	Drill Bit Dia. in.	Embed. Depth in. (mm)	Critical Spacing in. (mm)	Critical Edge Dist. in. (mm)	Values for 6" or 8" Lightweight, Medium-Weight or Normal-Weight CMU			
					Tension Load		Shear Load	
					Ultimate lb. (kN)	Allow. lb. (kN)	Ultimate lb. (kN)	Allow. lb. (kN)
¼ (6.4)	3/16	1 (25.4)	4 (101.6)	1 ½ (38.1)	550 (2.4)	110 (0.5)	495 (2.2)	100 (0.4)

1. The tabulated allowable loads are based on a safety factor of 5.0.
2. Maximum anchor embedment is 1 ½" (38.1 mm).

Length Identification Head Marks on Stainless-Steel Titen Screw Anchors (corresponds to anchor length in inches)

Length ID Marking on Head		—	A	B	C	D	E	F	G	H	I	J
Length of Anchor (in.)	From	1	1½	2	2½	3	3½	4	4½	5	5½	6
	Up To But Not Including	1½	2	2½	3	3½	4	4½	5	5½	6	6½

For SI: 1 inch = 25.4 mm.

** See p. 12 for an explanation of the load table icons.*

Part 3

Lateral Design

LATERAL LOADS, WIND

WL	56	PSF	(MWFRS, STRUWARE)
h	11	FT	(MAX, AS-BUILT)
l	20	FT	(AS-BUILT)
d	16.5	FT	(AS-BUILT)
w	308	PLF	
V_{E-W}	3080	LBS	
V_{N-S}	2541	LBS	

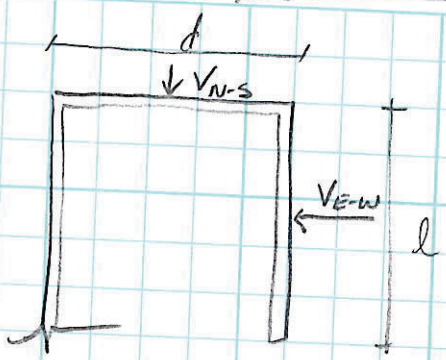
LATERAL LOADS, SEISMIC

DL_{ROOF}	16	PSF	(SEE ROOF CALCS)
DL_{WALL}	91	PSF	(7.25" CONC WALL, AS-BUILT)
h	11	FT	(MAX, AS-BUILT)
l	20	FT	(AS-BUILT)
d	16.5	FT	(AS-BUILT)
W_{ROOF}	5280	LBS	
W_{WALL}	28162	LBS	
W_{TOT}	33442	LBS	
$V_{SEISMIC}$	669	LBS	(INDEX FORCE ANALYSIS)

WIND CONTROLS IN BOTH DIRECTIONS

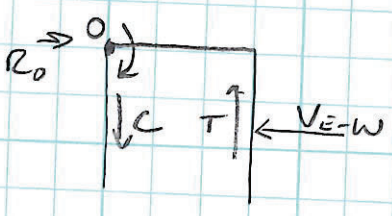
Calibre

Project		Date	Page
Subject VIERA SITE DEFICIENCIES		5/31/23	
LATERAL ANALYSIS		Job No.	Initials JTS



$l = 20\,ft$
$d = 16.5\,ft$
$V_{N-S} = 2.5k$
$V_{E-W} = 3.1k$

WIND: E-W



$T = C$

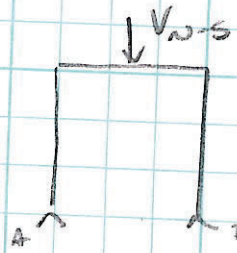
$\Sigma M_O = V_{E-W} \times 1.05(l/2) - T \times d = 0$

$= 3.1 \times 1.05(10) - 3.8 \times 16.5$

$T = 2k$

$R_0 = V = 3.1k$

WIND: N-S



$R_A = R_B = V_{N-S}/2 = 2.5/2 = 1.25k$

$T_{E-W} > R_A$ ∴ USE 2k

Project	Date	Page
VILLA SITE DEFICIENCIES	5/31/23	
Subject	Job No.	Initials
LATERAL ANALYSIS		JTB

EXISTING WALL

$V_{max} = 3.1k$

$V_u = .9D + 1.0W = 0 + 3.1k = 3.1k$

$P_u = 1.2D + 1.0W + .5L_R$

$t_w = 15.25/2 = 7.625$ ft

$DL = 16$ PSF (SEE ROOF CALCS)

$LL_R = 20$ PSF (ASCE 7)

$WL = 35$ PSF (MINERS, STEWARDS)

$P_u = 7.625\,(1.2(16) + 1.0(35) + .5(20))$

$= 490\#$

$M_u = V_u \times \ell/2 \times 1.05 = 3.1 \times (20/2)(1.05)$

$= 32.55$ k-ft

$h = 14'-0"$ (MAX, AS-BUILT)

$\ell = 20'-0"$ "

$w = 16'-6"$ "

$t = 7.25"$ "

$f'_c = 3000$ PSI "

VERT: #4@16" "

HORIZ: #4@12" "

See S-CONC

$\phi M_n = 6317$ k-ft $> M_u$ ∴ OK

$\phi V_n = 425k$ $> V_u$ ∴ OK

S-CONCRETE 2022.2.0 © 1995-2022 Altair Engineering Canada, Ltd. www.altair.com/s-frame

File Name: J:\ ... STRUCTURAL\CALCULATIONS\S-CONC WALLS.SC

Summary

Status	Reviewed-OK
Maximum	1.000
V & T Util	0.471
N vs M Util	0.505

Section Name	Consultant
Concrete Section	Calibre Engineering

American Building Standards

ACI 318-11, "Building Code Requirements for Structural Concrete"
ACI 318R-11, "Commentary for ACI 318-11"

Design Aids, Manuals, and Handbooks (For Reference Only)

The Reinforced Concrete Design Manual in Accordance with ACI 318-11
"ACI Detailing Manual - 1994", ACI Committee 315, American Concrete Institute, 1994
"Manual of Standard Practice", Concrete Reinforcing Steel Institute, 2003

Section Dimensions

C-Shape
L1 = 198.0 in
T1 = 7.25 in
L2 = 240.0 in
T2 = 7.25 in
Offset = 0.0 in

Quantities (approx.)

Concrete = 5002 lb/ft
Steel = 68.5 lb/ft
Primary = 29.9 lb/ft
Secondary = 38.6 lb/ft

Material Properties

fc' = 3000 psi
fy (panel vert) = 60.0 ksi
fy (panel horz) = 60.0 ksi
fy (zone vert) = 60.0 ksi
fy (zone horz) = 60.0 ksi
Wc = 150 pcf
Ws = 500 pcf
Poisson's Ratio = 0.2
hagg = 0.75 in
Es = 29000 ksi
Ec = 3321 ksi
Gc = 1384 ksi
fr = 411 psi

Gross Properties

Zbar = 152.2 in
Ybar = 0.0 in
Ag = 4810.4 sq.in.
Ig (y-y) = 29744xE3 in4
Ig (z-z) = 35404xE3 in4
Ashear (Y) = 1435.5 sq.in.
Ashear (Z) = 3480.0 sq.in.
Jg = 82541 in4

Effective Properties

Ae = 4810.4 sq.in.
Ie (y-y) = 29744xE3 in4
Ie (z-z) = 35404xE3 in4
Ase (Y) = 1435.5 sq.in.
Ase (Z) = 3480.0 sq.in.
Je = 82541 in4

Panel 1

11-#4 @ 16.0" Vert
#4 @ 12.0" Horz

Panel 2 & Panel 3

16-#4 @ 16.0" Vert
#4 @ 12.0" Horz

Slenderness Effects

k (y-y) = 1.0
k (z-z) = 1.0
Lu (y-y) = 120.0 in
Lu (z-z) = 120.0 in

kLu (y-y) = 120.0 in
kLu (z-z) = 120.0 in
EI = 0.25 x Eclg

Ncr (y-y) = -12692700.0 kips
Ncr (z-z) = -15107730.0 kips

Factored Input Sectional Loads

Load Case/Combo	N (kips)	T (k*ft)	Vz (kips)	My (k*ft)	Vy (kips)	Mz (k*ft)	Load Type	Comment
1	0.5	32.6	0.0	0.0	3.1	0.0	Wind	
2	0.5	32.6	0.0	0.0	3.1	0.0	Wind	** Alt. LC # 1

Factored Design Loads (with Magnified Moments)

Load Case/Combo	Vz (kips)	My (k*ft)	Cm (y-y)	Vy (kips)	Mz (k*ft)	Cm (z-z)	Mres (k*ft)	Theta
1	0.0	0.1	1.0	3.1	0.1	1.0	0.1	135°
2	0.0	-0.1	1.0	3.1	0.1	1.0	0.1	45°

Factored Panel Loads - Panel 1

Load Case/Combo	N1 (kips)	V1 (kips)	M1 (k*ft)	Load Type	Comment
1	-1000.0	200.0	2000.0	Wind	

Factored Panel Loads - Panel 2

Load Case/Combo	N2 (kips)	V2 (kips)	M2 (k*ft)	Load Type	Comment
1	-1000.0	200.0	-2400.0	Wind	

Factored Panel Loads - Panel 3

Load Case/Combo	N3 (kips)	V3 (kips)	M3 (k*ft)	Load Type	Comment
1	-1000.0	200.0	-2400.0	Wind	

N vs M Results

GLC	1 (Panel Loading)
Status	Acceptable
Utilization	0.505
Maximum	1.000
Panel	1

Governing Load Case Utilizations

Nu = -1000.0 kips	Mu = 2000.0 k*ft	Mn = 6731.4 k*ft
ØNn(max) = -1981.1 kips	ØMn = 6317.7 k*ft	Mp = 6878.7 k*ft
Axial Util. = 0.505	Moment Util. = 0.317	

Shear and Torsion Utilization

GLC	1 (Panel Loading)
Panel	1
Status	Acceptable
Utilization	0.471
Maximum	1.000

Shear in Panel 1	Shear in Panel 2	Shear in Panel 3
Nu = -1000.0 kips	Nu = -1000.0 kips	Nu = -1000.0 kips
Mu = 2000.0 k*ft	Mu = -2400.0 k*ft	Mu = -2400.0 k*ft
Vu = 200.0 kips	Vu = 200.0 kips	Vu = 200.0 kips
Tu = 0.0 k*ft	Tu = 0.0 k*ft	Tu = 0.0 k*ft
bw = 7.25 in	bw = 7.25 in	bw = 7.25 in
d = 158.4 in	d = 192.0 in	d = 192.0 in
As (Tens) = 1.29 sq.in.	As (Tens) = 1.84 sq.in.	As (Tens) = 1.84 sq.in.
Av = 0.2 sq.in.	Av = 0.2 sq.in.	Av = 0.2 sq.in.
Lambda = 1.00	Lambda = 1.00	Lambda = 1.00
ØVs = 118.8 kips	ØVs = 144.0 kips	ØVs = 144.0 kips
ØVc = 305.7 kips	ØVc = 338.7 kips	ØVc = 338.7 kips
ØVn = 424.5 kips	ØVn = 482.7 kips	ØVn = 482.7 kips
Util = 0.471	Util = 0.414	Util = 0.414

Panel 1 Reinforcing

#4 @ 16.0" Vert

Vert Steel Ratio	Vert Bar Spacing	Number of Curtains
Rho = 0.00172	S = 16.00 in	Curtains Specified = 1
Rho (min) = 0.00250	S (min) = 2.50 in	Curtains Required = 1
Rho (max) = 0.01000	S (max) = 18.00 in	Acceptable
Reviewed-OK Message 47	Acceptable	

#4 @ 12.0" Horz	Horz Steel Ratio	Horz Bar Spacing
	Rho = 0.00230	S = 12.00 in
	Rho (min) = 0.00250	S (min) = 2.00 in
	Reviewed-OK Message 49	S (max) = 18.00 in
		Acceptable

Panel 2 Reinforcing

#4 @ 16.0" Vert	Vert Steel Ratio	Vert Bar Spacing	Number of Curtains
	Rho = 0.00172	S = 16.00 in	Curtains Specified = 1
	Rho (min) = 0.00250	S (min) = 2.50 in	Curtains Required = 1
	Rho (max) = 0.01000	S (max) = 18.00 in	Acceptable
	Reviewed-OK Message 47	Acceptable	

#4 @ 12.0" Horz	Horz Steel Ratio	Horz Bar Spacing
	Rho = 0.00230	S = 12.00 in
	Rho (min) = 0.00250	S (min) = 2.00 in
	Reviewed-OK Message 49	S (max) = 18.00 in
		Acceptable

Panel 3 Reinforcing

#4 @ 16.0" Vert	Vert Steel Ratio	Vert Bar Spacing	Number of Curtains
	Rho = 0.00172	S = 16.00 in	Curtains Specified = 1
	Rho (min) = 0.00250	S (min) = 2.50 in	Curtains Required = 1
	Rho (max) = 0.01000	S (max) = 18.00 in	Acceptable
	Reviewed-OK Message 47	Acceptable	

#4 @ 12.0" Horz	Horz Steel Ratio	Horz Bar Spacing
	Rho = 0.00230	S = 12.00 in
	Rho (min) = 0.00250	S (min) = 2.00 in
	Reviewed-OK Message 49	S (max) = 18.00 in
		Acceptable

Panel Vertical Reinf.

fy (min)	40.0 ksi
fy (vert)	60.0 ksi
fy (max)	80.0 ksi
Status	Acceptable

Panel Horizontal Reinf.

fy (min)	40.0 ksi
fy (horz)	60.0 ksi
fy (max)	60.0 ksi
Status	Acceptable

Zone Vertical Reinf.

fy (min)	40.0 ksi
fy (vert)	60.0 ksi
fy (max)	80.0 ksi
Status	Acceptable

Concrete Strength

fc' (min)	2500.0 psi
fc'	3000.0 psi
fc' (max)	10000.0 psi
Status	Acceptable

Concrete Density

Wc (min)	90.0 pcf
Wc	150.0 pcf
Wc (max)	160.0 pcf
Status	Acceptable

Zone Horizontal Reinf.

fy (min)	40.0 ksi
fy (horz)	60.0 ksi
fy (max)	100.0 ksi
Status	Acceptable

American Reinforcing Bars

Index	Bar Designation	Diameter (in)	Area (sq.in.)
1	#2	0.25	0.05
2	#3	0.375	0.11
3	#4	0.50	0.20
4	#5	0.625	0.31

5	#6	0.75	0.44
6	#7	0.875	0.60
7	#8	1.00	0.79
8	#9	1.128	1.00
9	#10	1.27	1.27
10	#11	1.41	1.56
11	#14	1.693	2.25
12	#18	2.257	4.00

Wall Dimensions Lu (y-y) = 120.0 in, Lu (z-z) = 120.0 in, hw = 168.0 in

Panel 1 Thickness	Panels 2 & 3 Thicknesses
T = 7.25 in	T = 7.25 in
T (min) = 4.8 in	T (min) = 4.8 in
Acceptable	Acceptable

List of Messages Reviewed by Professional Engineer and considered OK

Message 47	Reviewed-OK	Panel Vertical Steel Ratio does not meet the minimum. Clauses 14.3.2 and 11.9.9.4 of ACI 318
Message 49	Reviewed-OK	Panel Horizontal Steel Ratio does not meet the minimum Clauses 14.3.3 and 11.9.9.2 of ACI 318

Part 4

Miscellaneous

Calibre

Project	Date	Page
VICMA CSD	4/1/23	
Subject	Job No.	Initials
FOUNDATIONS CHECK		VB

DL: 14 PSF (ROOF LOADS)
LL_R: 20 PSF
WL+: 38 PSF
WL-: -141 PSF
t_w: 15.25/2 = 7.625 FT

DL_{WALL} = 7.25/12 × 150 = 91 PSF
DL_{PTG} = 4 × 2 × 150 = 900 PLF

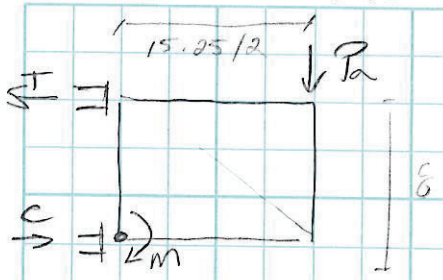
$+W_A = D + .75L_R + .75(.6W)$
$= (900 + 7.625(91+14)) + .75(7.625 \cdot 20) + .75(.6(7.625 \cdot 38))$
$= 1700 + 114 + 130$
$= 1944$ PLF

$-W_A = .6D + .6W = .6(1700) + .6(7.625 \cdot -141)$
$= 375$ PLF > 0 ∴ NO UPLIFT

BEARING PRESSURE:

1500 PSF (ASSUMED, PRESCRIPTIVE)
W_{PTG} = 4'-0" (AS-BUILT)

$W = 6000$ PLF $> +W_A$ ∴ OK



ASSUME:

CORRUGATED METAL ON STEEL FRAME

DL = 8 PSF

A = 15.25/2 × 8 = 61 SF PER LEAF

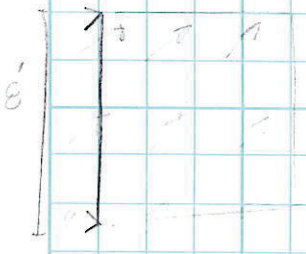
P_a = 8 × 61 = .5K PER LEAF

$\Sigma M_0 = 0 = P_a \times 7.625 - J8$

$J_a = \frac{3.8125}{8} = .48K$

OOP WIND

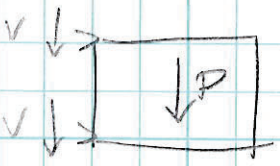
$WL_U = \pm 91$ PSF, $WL_A = 55$ PSF



$w_{al} = 55 \times 15.25/2 = 419$ PLF

$V_{al} = wl/2 = 1.7K$

I-P SHEARS



$V = P/2 = .25K$

Introduction

This project will address a variety of site deficiencies at the Viera VA Clinic, to include the installation of new epoxy flooring, creating a new bathroom and office, upgrading physical security and safety eye wash systems as required for the chiller plant, replacing the marquee signage and controller at the Clinic Main Entrance, enclosing an existing concrete pad area for secure storage adjacent to loading dock, repair damaged and cracked asphalt throughout the clinic parking and roadway areas, and address poor storm water storage at the Northeast corner of the property.

Design Criteria

All aspects of the design shall be in full compliance with VA design criteria as listed in VA design guides and manuals which can be found on the web at the VA Office of Facilities Management technical information library – site address: http://www.cfm.va.gov/TIL/.

The following codes and design criteria shall be utilized to the extent applicable:

- VA Directives, Design Manuals, Master Specifications, VA National CAD Standard Application Guide, and other Guidance on the Technical Information Library (TIL) http://www.cfm.va.gov/til/.
- International Building Code (IBC) (Only when specifically referenced in VA Design Documents, see notes below)
- NFPA 101 Life Safety Code
- NFPA National Fire Codes with the exception of NFPA 5000 and NFPA 900
- Occupational, Safety and Health Administration (OSHA) Standards.
- VA Seismic Design Requirements, H-18-8
- National Electrical Code (NEC)
- International Plumbing Code (IPC)
- Safety Code for Elevators and Escalators, American Society of Mechanical Engineers (ASME) A 17.1.
- ASME Boiler and Pressure Vessel Code
- ASME Code for Pressure Piping
- Architectural Barriers Act Accessibility Standards (ABAAS) including VA supplement, Barrier Free Design Guide (PG-18-13)
- Building Code Requirements for Reinforced Concrete, American Concrete Institute and Commentary (ACI 318)
- Manual of Steel Construction, Load and Resistance Factor Design Specifications for Structural Steel Buildings, American Institute of Steel Construction (AISC)
- Energy policy Act of 2005 (EPAct)
- DOE Interim Final Rule: Energy Conservation Standards for New Federal, Commercial and Multi-Family High-Rise Residential Buildings and New Low-Rise Residential Buildings, 10 CFR Parts 433, 434 and 435.
- Federal Leadership in High Performance and Sustainable Buildings: Memorandum of Understanding (MOU)
- Executive Order 13423: Strengthening Federal Environmental, Energy, and Transportation Management.

- The Provisions for Construction and Safety Signs. Stated in the General Requirements Section 01010 of the VA Master Construction Specification.
- Ventilation for Acceptable Indoor Air Quality – ASHRAE Standard 62.1- 2004.
- Safety Standard for Refrigeration Systems – ASHRAE Standard 15 – 2007.

Mechanical and Plumbing

Weather

The weather information for Orlando, FL is as follows:

- Latitude: 28.43N
- Elevation: 105 ft
- Summer (0.4% Dry Bulb): 93.7 F-Db, 76.5 F-Wb
- Summer (Extreme Dry Bulb): 99.4 F-Db
- Summer (0.4% Dehumidification): 81.9 F-Db, 143.9 gr/lb, 78.6 F-Wb
- Winter (0.4% Dry Bulb): 37.7 F-Db
- Winter (0.4% Humidification): 47 F-Db, 16.1 gr/lb, 36.8 F-Wb
- Winter (Extreme Dry Bulb): 19.8 F-Db

Mechanical Scope (Refer to plans for clarification):

- Provide cooling from existing AHU to:
  - New Office – Provide VAV with electric heat to control temperature of office (1 KW).
  - New Restroom
- Upsize coil in existing Chilled Water Plant. The coil has been replaced with a 30-ton coil (more rows/fins than previous cooling coil), per the request of the owner.
  - The previous coil provided approximately 19 tons of cooling.
  - The new coil will provide sufficient cooling during normal operations.
- Add automatic damper to existing refrigerant monitoring relief louver. This shall remain closed during normal operation. In the event there is a refrigerant leak and the exhaust fan initiates the damper will open to provide relief. In the event of a power loss, the damper will automatically open.

Plumbing Scope:

- New toilet for new restroom
- New Lav for new restroom
- New water heater for new restroom

Fire Protection Scope (Refer to plans for clarification):

- Add new heads to new rooms.

Mechanical Calculations

Room Name	ACH	Area	Ceiling Height	Cubic Feet	Calculated CFM	Actual CFM
Office	4	142	8	1,136	76	100
Restroom	10	44	8	352	59	60

Appendix A (Mechanical Cutsheets):

TRANE

Job Name: AESUS Design - VA Vierra Coil Replacement
Prepared For:
Unit Tag: CLCL-1
Quantity: 1

Cooling Coil

Equipment Details	
Coil utilization	Use in Performance (CSAA)

Coil Construction	
Model Number	D3UB32061G0FB122*AKA00B*******
System type	Chilled Water 3/8" Unit Optimized, High Water Flow(3U)
Rows	8
Tube matl/wall thickness	.012" (0.305 mm) copper tubes
Nominal fin spacing	122 fins per foot
Fin material	Aluminum
Fin type	Omega flo H
Actual coil face area	13.44
Nominal coil height	32" (813 mm)
Finned length	61" (1549 mm)
Casing option	Galvanized
Turbulators	No
Rigging weight	238.1 lb
Installed weight	310.2 lb
Tube matl/wall thickness	.012" (0.305 mm) copper tubes

Coil Performance

Capacity	
Total capacity	370.00 MBh
Sensible Capacity	204.31 MBh
Air	
Elevation	0.00 ft
Actual airflow	6800 cfm
Entering dry bulb	80.00 F
Entering wet bulb	70.00 F
Leaving dry bulb	52.85 F
Leaving wet bulb	52.75 F
APD	1.141 in H2O
Face velocity	506 ft/min

Fluid	
Standard fluid flow rate	52.67 gpm
Entering fluid temp	42.00 F
Leaving water temperature	56.00 F
Fluid PD	3.79 ft fluid
Fluid velocity	2.55 ft/sec
Fluid type	Water
Fouling factor	0.00000 hr-sq ft-deg F/Btu
Volume	8.62 gal
Reynolds number	5543.39 Each
AHRI 410 Classification	
AHRI 410 classification	AHRI ACHC certified
Data generation date	8/7/2023
Trane Select Assist update number	2710.00

Note: Certified in accordance with the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program which is based on AHRI Standard 410 within the Range of Standard Rating Conditions listed in Table 1 of the Standard. Certified units may be found in the AHRI Directory at www.ahridirectory.org.

AHRI CERTIFIED

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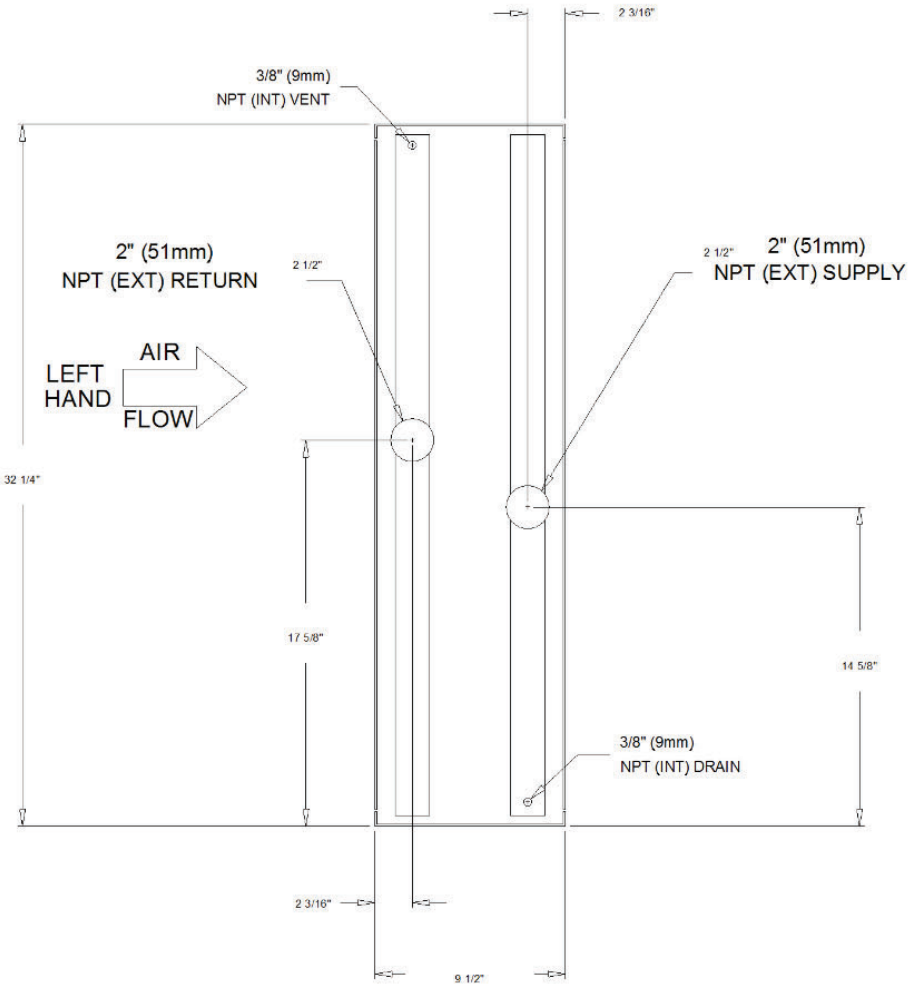
TRANE

Job Name: AESUS Design - VA Vierra Coil Replacement
Prepared For:
Unit Tag: CLCL-1
Quantity: 1



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TRANE

Job Name: AESUS Design - VA Vierra Coil Replacement
Prepared For:
Unit Tag: CLCL-1
Quantity: 1

GENERAL

A double-row serpentine coil, with 3/8" (9.5mm) OD tubes. Coils have a supply header to ensure distribution of chilled water to each tube of coil. Coil is proof tested as standard at 300 psig (2068kPa) and leak tested to 200 psig (1379kPa), air pressure under water. Working pressure is 200 psig (1379kPa) at 220F (104C).

Tubes are 3/8" [9.5 mm] OD 0.012" [0.305 mm] thick copper.

Refrigerant coil tubes are 3/8" [9.5 mm] OD .0132" [0.335 mm] thick, internally enhanced copper.

COIL CASING

Coil casing is manufactured with galvanized steel.

COIL SUPPLY CONNECTION

Coil supply connection is on left side of coil (facing airflow).

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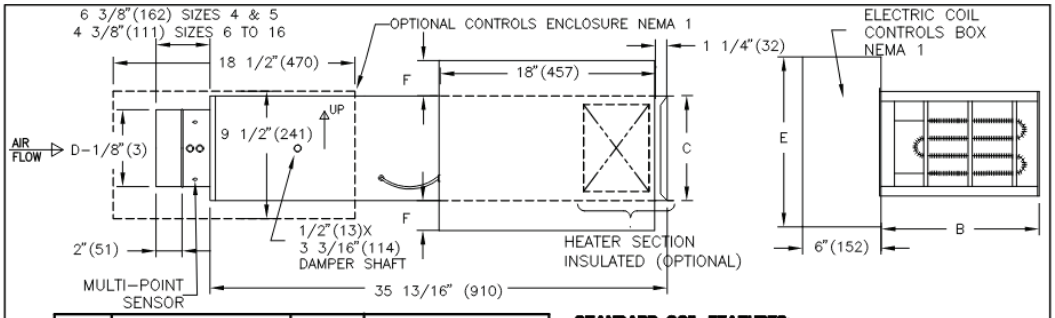
price®

Submittal Sheet



UNIT SIZE	OUTLET		INLET	CONTROL BOX	
	B	C	D	E	F
4	12 (305)	8 (203)	4(102)**	12(305)	2(51)
5			5(127)**	12(305)	2(51)
6			6(152)	12(305)	2(51)
7		10 (254)	7(178)	12(305)	1(25)
8			8(203)	12(305)	1(25)
9	14 (356)	12½ (318)	9(229)	12(305)	*
10			10(254)	12(305)	*
12	16 (406)	15 (381)	12(305)	17(432)	1(25)
14	20 (508)	17½ (445)	14(356)	17(432)	*
16	24(610)	18 (457)	16(406)	17(432)	*

SEE CATALOGUE FOR DETAILED CFM RANGE AND HEATING CAPACITY.
* CONTROL BOX WITHIN THE HEIGHT OF THE TERMINAL UNIT.
** 6" DIAMETER DUCT WITH 4" OR 5" REDUCER.

NOTES:

- INTERNAL INSULATION – FIBERGLASS ½" (13)THICK, MIN. 1.5# DENSITY, WHICH MEETS REQUIREMENTS OF NFPA 90A AND UL181.
- ZINC COATED STEEL 22GA. TERMINAL & 20 GA. HEATER, MECHANICALLY SEALED AND GASKETED, LEAK RESISTANT CONSTRUCTION .
- RECTANGULAR DISCHARGE OPENINGS HAVE SLIP & DRIVE CLEAT DUCT CONNECTIONS.
- CONTROL ASSEMBLY WILL BE SUPPLIED AS ILLUSTRATED ON RIGHT HAND SIDE UNLESS SPECIFIED OTHERWISE.
- DIGITAL CONTROLS SUPPLIED BY CONTROLS CONTRACTOR.
- FOR ACCESSORIES SEE SUBMITTAL DRAWINGS.
- SCR CONTROLS OVER 25 AMPS 3ø USE 19"(483) CONTROL BOX.
- ASSEMBLY ETL CERTIFIED TO UL1995 & CSA236.

OPTIONS: ☐ CONTROLS ENCLOSURE ☐ 20ga OUTER CASING ☐ RS – BOTTOM REMOVABLE SENSOR

STANDARD COIL FEATURES:

- AUTOMATIC RESET THERMAL CUTOUT
- MANUAL RESET THERMAL CUTOUT
- LOW WATT DENSITY ELEMENTS, HIGH GRADE NICKEL–CHROME ALLOY
- MAGNETIC CONTACTORS
- AIR FLOW SWITCH
- 24VAC/50VAC CLASS 2 TRANSFORMER
- HINGED ACCESS DOOR
- SINGLE POINT ELECTRICAL CONNECTION
- REFER TO SUBMITTED CONTROL DIAGRAMS FOR STANDARD CONTROL COMPONENTS TO BE SUPPLIED.

OPTIONAL COIL FEATURES:

☐ CONTROL CIRCUIT FUSES
☐ DOOR INTERLOCK DISCONNECT SWITCH
☐ MERCURY CONTACTORS
☐ MAIN SUPPLY FUSES
☐ HEATER SECTION INSULATED (FF NOT AVAILABLE)
☐ SCR CONTROLS ☐ SCR–DAT CONTROLS
☐ 0 to 10 Vdc CONTROL SIGNAL
☐ 4 to 20 mA CONTROL SIGNAL

OPTIONAL DUCT LINERS AND CONSTRUCTION:

☐ FG75 ☐ FG1
☐ SM ☐ SM1 ☐ AFPM ☐ AFPM1 ☐ CRWF ☐ CRAF ☐ CRAF1 ☐ PM ☐ PM1
☐ FF ☐ FF1 ☐ FF50 ☐ FB ☐ FB1 ☐ WFPM

SUPPLY VOLTAGE:

☐ 120/1ø
☐ 208/1ø (2 WIRE)
☐ 208/3ø (3 WIRE)
☐ 240/1ø
☐ 277/1ø
☐ 347/1ø
☐ 480/1ø
☐ 480/3ø (3 WIRE)
☐ 600/3ø (3 OR 4 WIRE)

AHRI CERTIFIED www.ahridirectory.org VAV Terminals AHRI Standard 880

ETL LISTED c US Intertek

ALL METRIC DIMENSIONS ( ) ARE SOFT CONVERTED. IMPERIAL DIMENSIONS ARE CONVERTED TO METRIC AND ROUNDED TO THE NEAREST MILLIMETER.

PROJECT:	price®	
ENGINEER:	GF	**SDV5000** INTEGRAL ELECTRIC REHEAT SIZE 4 TO 16 ASSEMBLY DIGITAL CONTROLS
CUSTOMER:	237030	
SUBMITTAL DATE: / **SPEC. SYMBOL:**	2015/10/06	

SHEET 1 OF 2 REV T

Appendix B: Plumbing Cutsheets

KwickShot® Tankless Electric Water Heaters

Single Point Flow Controlled, Non-Thermostatic Models (Single Phase Only)

Model Number	kW Rating	Voltage (Volts)	AMPS	TURN ON (GPM)	TURN ON (LPM)	Temperature Rise °F						Temperature Rise °C						Recommended Wire Size (75° C/CU)
						0.35 GPM	0.5 GPM	0.75 GPM	1.0 GPM	1.5 GPM	2.0 GPM	1.3 LPM	1.9 LPM	2.8 LPM	3.8 LPM	5.7 LPM	7.6 LPM	
TEF024V120	2.4	120	20	0.25	0.95	55	33	22	16	11	8	31	18	12	9	6	4	14 AWG
TEF030V120	3.0	120	25	0.25	0.95	68	41	27	20	14	10	38	23	15	11	8	6	12 AWG
TEF030V208	3.0	208	15	0.25	0.95	68	41	27	20	14	10	38	23	15	11	8	6	14 AWG
TEF030V277	3.0	277	11	0.25	0.95	68	41	27	20	14	10	38	23	15	11	8	6	14 AWG
TEF035V120	3.5	120	29	0.30	1.14	80	48	32	24	16	12	44	27	18	13	9	7	10 AWG
TEF035V240	3.5	240	15	0.30	1.14	80	48	32	24	16	12	44	27	18	13	9	7	14 AWG
TEF035V240*	2.6	208	13	0.30	1.14	59	36	24	18	12	9	33	20	13	10	7	5	14 AWG
TEF041V208	4.1	208	20	0.40	1.52	—	56	37	28	19	14	—	31	21	16	11	8	14 AWG
TEF041V277	4.1	277	15	0.40	1.52	—	56	37	28	19	14	—	31	21	16	11	8	14 AWG
TEF048V240	4.8	240	20	0.40	1.52	—	66	44	33	22	16	—	37	24	18	12	9	14 AWG
TEF048V240*	3.6	208	17	0.40	1.52	—	49	33	25	16	12	—	27	18	14	9	7	14 AWG
TEF055V240	5.5	240	23	0.50	1.90	—	75	50	38	25	19	—	42	28	21	14	11	12 AWG
TEF055V240*	4.1	208	20	0.50	1.90	—	56	37	28	19	14	—	31	21	16	11	8	12 AWG
TEF060V277	6.0	277	22	0.70	2.65	—	—	55	41	27	20	—	—	31	23	15	11	12 AWG
TEF065V240	6.5	240	27	0.70	2.65	—	—	59	44	30	22	—	—	33	24	17	12	10 AWG
TEF065V240*	4.8	208	23	0.70	2.65	—	—	44	33	22	16	—	—	24	18	12	9	10 AWG
TEF075V240	7.5	240	32	0.70	2.65	—	—	68	51	34	26	—	—	38	28	19	14	10 AWG
TEF075V240*	5.6	208	27	0.70	2.65	—	—	51	38	25	19	—	—	28	21	14	11	10 AWG
TEF080V277	8.0	277	29	0.70	2.65	—	—	73	55	36	27	—	—	41	31	20	15	10 AWG
TEF083V208	8.3	208	40	0.70	2.65	—	—	76	57	38	28	—	—	42	32	21	16	8 AWG
TEF090V277	9.0	277	33	0.70	2.65	—	—	82	61	41	31	—	—	46	34	23	17	10 AWG
TEF095V240	9.5	240	40	0.80	3.03	—	—	—	65	43	32	—	—	—	36	24	18	8 AWG
TEF095V240*	7.1	208	34	0.80	3.03	—	—	—	38	25	19	—	—	—	21	14	11	8 AWG
TEF100V277	10.0	277	36	0.80	3.03	—	—	—	68	46	34	—	—	—	38	26	19	8 AWG

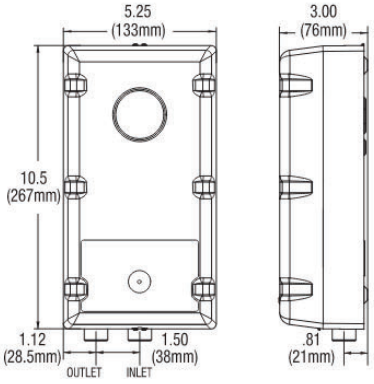
* 240V units can be used on 208V single phase with 25% reduced temperature output. Please note per UL standards the rating plate and installation instructions will all be according to a 240V applied voltage. Check with local officials prior to derating the electrical infrastructure.

System Specifications

Dimensions:	10.5" H x 5.25" W x 3" D	266mm H x 133.4mm W x 76mm D
Product Weight:	(model dependent) 2.75 lb/3 lb	(model dependent) 1.25kg/1.36kg
Cover:	ABS-UL 94 5VA	
Color:	White	
Minimum Operating Pressure:	30 PSI	207 kPa
Maximum Operating Pressure:	150 PSI	1034 kPa
Element:	Replaceable nichrome cartridge insert	
Fittings:	3/8" compression fittings	10mm compression fittings

U.S. Patent Pending Technology.

Note: For optimum performance, mounting location should be located within 2 feet (.61m) of fixture.



Dimensions and specifications subject to change without notice in accordance with our policy of continuous product improvement.

Introduction

This project will address a variety of site deficiencies at the Viera VA Clinic, to include the installation of new epoxy flooring, creating a new bathroom and office, upgrading physical security and safety eye wash systems as required for the chiller plant, replacing the marquee signage and controller at the Clinic Main Entrance, enclosing an existing concrete pad area for secure storage adjacent to loading dock, repair damaged and cracked asphalt throughout the clinic parking and roadway areas, and address poor storm water storage at the Northeast corner of the property.

General Design Guidelines

The following guidelines shall establish the basic standards of construction for the work associated with this project:

- All work described herein shall conform to the National Electric Code (NEC) – NFPA 70, The International Building Code, The Health Care Facilities Code, NFPA 99, The Life Safety Code, NFPA 101, The International Energy Conservation Code, and VA design guidelines.

Project Scope

Electrically, the scope of work for this project will involve:

- Providing the following for the new office:
  - New receptacles, fed from the nearest 120/208V normal branch panelboard.
  - New recessed LED lighting (Lithonia VTL Series), fed from nearest normal/emergency branch panelboard.
  - Power to new mechanical/plumbing equipment as required, fed from the nearest equipment branch panelboard.
- Providing the following for the new restroom:
  - New receptacles, fed from the nearest 120/208V normal branch panelboard.
  - New downlighting (Lithonia LDN6 Series) fed from nearest normal/emergency branch panelboard.
  - Power to new mechanical/plumbing equipment as required, fed from the nearest equipment branch panelboard.
- Providing lighting for storage enclosure around generator pad
  - New surface mounted strip lighting with associated occupancy sensor and dimming switch
- Reconnect power to monument sign
  - Power for the monument sign will be disconnect, the same circuit will then be re-used to feed the new monument sign.

Furthermore, the following applies to the areas in scope:

Electrical Service and Distribution:

- All existing electrical service and distribution are to remain “as-is” unless noted otherwise. Additions or modification to any panel or service will be documented.
- No additional backup, standby or emergency power will be required. Existing egress or emergency lighting will be reconnected or modified as needed.

Branch Wiring:

- Branch wiring system will be installed in accordance with the latest edition of the NEC. Each branch circuit will utilize a dedicated neutral conductor. All branch circuits shall utilize an equipment grounding conductor in each conduit. The conduit will not be allowed to be used as the sole grounding path.
- All branch circuiting will be copper conductors in conduit. Minimum conduit size will be 3/4".
- Typical branch circuit wiring will be minimum #12 AWG CU, installed in EMT conduit for power and lighting systems. Rigid conduits shall be used for all exposed conduit runs where EMT would be subject to physical damage as defined by the National Electrical Code (NEC). Conduits to be installed concealed, except where installed in electrical rooms, mechanical rooms or other unfinished areas.
- All empty conduits shall have a pull-string installed in them.

Power for Mechanical Equipment:

- Power for Mechanical Equipment wiring systems will be installed in accordance with the latest edition of the NEC. Each branch circuit will utilize a dedicated neutral conductor as needed. All branch circuits shall utilize an equipment grounding conductor in each conduit. The conduit will not be allowed to be used as the sole grounding path.
- All branch circuiting will be copper conductors in conduit. Minimum conduit size will be 3/4".

Wiring Devices:

- Wiring Devices shall be hospital-grade, tamper-resistant duplex receptacles rated for 120V with 5-20 NEMA configuration, nylon type, with finishes determined by architect. Device faceplates shall be stainless steel.
- Interior receptacles located within 6 feet of a water source shall be provided with GFCI.
- Wiring devices to be mounted in 4" square x 2-1/8" deep minimum boxes with appropriate gang mud ring.
- Where wiring devices are surface mounted or in unfinished areas, devices to be mounted in a 4" square outlet box with matching industrial raised cover plates.
- Device wall plates to have extra strength laminated adhesive tape labels indicating the source panel and circuit number. Labels to be white with black letters for "normal" power and red with black letters for "emergency" power.
- Receptacles shall have the following finish:
  - Normal = White
  - Life Safety / Emergency = Red
- Receptacle cover plate to be stainless steel.
- Receptacles to be installed in accordance with the electrical drawings.

Lighting and Lighting Control Systems:

- LED lighting will be utilized to reduce energy and maintenance costs.
- Provide new exit signs as required along path of egress.
- Local control of the lights will be provided in each room.
- Emergency egress lighting will also be controlled but will incorporate a UL 924 listed transfer relay to override any lighting controls in the event of a power outage.
- Local emergency power shall be utilized as necessary to maintain egress lighting in the event of a power outage.

(VA-PG-18-10) Lighting Design Manual – Applicable Guidelines:

5.9 PUBLIC TOILET

DESIGN PARAMETERS:

1. Average Maintained Illumination - Ambient: 200 lx (20 FC) at finished floor.

2. Average Maintained Illumination - Task: Vanity: 300 lx (30 FC) at vanity surface.
3. Uniformity Ratio (avg / min): Ambient: 2:1.
4. Color Temperature (CCT): 3,500 degrees.
5. Color Rendering (CRI): Minimum of 80
6. Power Source:
    - Normal
    - Critical branch of the EES.

DESIGN APPROACH:
Vertical illumination should be considered at hand washing sinks and mirrors.
Decorative sconces may be used at sink areas.

RECOMMENDED LUMINAIRES:
1. Recessed ceiling-mounted LED lensed luminaire.
2. Recessed ceiling-mounted LED downlight or wall washer.
3. Recessed ceiling-mounted LED cove or perimeter light.
4. Wall-mounted LED mirror or vanity luminaire.
5. Decorative LED wall-mounted sconce.

CONTROL APPROACH:
1. Occupancy sensors.
2. Refer to the ASHRAE 90.1 – Chapter 9 - Section 9.4.1.1 Interior Lighting Controls – for additional controls.

SPECIFIC COORDINATION ISSUES:
1. Coordinate lighting with toilet stall partitions, and ensure that all stalls are properly illuminated.
2. Sconces must be ADA compliant.

6.1 OFFICE

DESIGN PARAMETERS:
1. Average Maintained Illumination - Ambient: 300 lx (30 FC) at 3’-0” AFF.
2. Average Maintained Illumination - Task: Reading: 500 lx (50 FC) at desktop or countertop.
3. Uniformity Ratio (avg / min): Ambient: 2:1.
4. Color Temperature (CCT): 3,500 degrees.
5. Color Rendering (CRI): Minimum of 80.
6. Power Source: Normal.

DESIGN APPROACH:
Lighting in the office spaces should be a combination of indirect general lighting and direct lighting on the task surface. Task lighting should be provided at each workstation.

RECOMMENDED LUMINAIRES:
1. Recessed ceiling-mounted LED lensed luminaire.
2. Linear suspended LED indirect/direct luminaire.
3. Linear wall-mounted LED indirect/direct luminaire.
4. Surface-mounted LED under-cabinet task light (if not provided with prefabricated furniture system).

CONTROL APPROACH:
1. Dimming controls for LED luminaires, or vacancy sensors.
2. Under-cabinet task lights and desk lights shall be controlled with integral switches.
3. Refer to the ASHRAE 90.1 – Chapter 9 - Section 9.4.1.1 Interior Lighting Controls – for additional controls.

SPECIFIC COORDINATION ISSUES:

1. In open office areas, coordinate location of occupancy sensors in ceiling with space plan.

100% Physical Security System Narrative

Introduction

This narrative discusses the existing conditions verified at the Viera, Melbourne VA Medical Center, and the design approach to correct noted deficiencies and bring the chiller building up to the current standard as outlined in the VA Physical Security and Resiliency Design Manual. Scope of work for this project includes upgrades to the Chiller Building physical security systems as outlined in the SOW, which includes camera surveillance, access control, intrusion alarm and telecommunication enclosure (TE).

General Design Guidelines

The following guidelines shall establish the basic standards of construction for the work associated with this project.

- ASHRAE 90.1 2013 Edition as applicable.
- Department of Energy (DOE) Regulations
- Energy Efficiency & Renewable Energy (EERE)
- IEEE STD 143-1992-Grounding of Industrial and Commercial Power Systems
- International Building Code (IBC – 2021 Edition)
- International Fire Code (IFC – 2021 Edition)
- National Energy Conservation Policy Act (95-619)
- National Fire Protection Association Standards (Latest Editions)
- NFPA 13 – Standard for Installation of Sprinkler Systems
- NFPA 70 – National Electric Code
- NFPA 72 – National Fire Alarm Code
- NFPA 75 – Standard for the Fire Protection of Information Technology Equipment
- NFPA 101 – Life Safety Code
- Underwriters' Laboratories (UL)
- U.S. Department of Veterans Affairs PG-18-10 Electrical Design Manual 2019
- U.S. Department of Veterans Affairs PG-18-10 Physical Security and Resiliency Design Manual 2020
- U.S. Department of Veterans Affairs OI&T Infrastructure Standards for Telecommunications Spaces, Version 3.1, July 1, 2021 – Solution Delivery-Data Center and Infrastructure Engineering
- U.S. Department of Veterans Affairs Infrastructure Standard for Telecommunications Spaces 2021 (driving document)
- All applicable federal, state, and local codes, regulations and standards adopted by the authority having jurisdiction

Existing Conditions

The Chiller Building is a separate structure from the main building and currently does not have any physical security hardware associated with the existing structure. However, it was observed and noted that the existing Chiller Building does contain an existing data rack. This existing data rack is located in the southwest corner of the Chiller Building and is being fed with (2) 2" conduits with (6) multi-mode fibers and (3) OSP CAT-6 cables terminating in room D601. Ongoing EHRM upgrades within the main building have room D601 to be decommissioned and converted to an engineering support space; all new fiber to be terminated in room A406.

The Chiller Building's electrical service and power distribution contains its own service separate from the main building and is not to be disturbed under this SOW. However, any power required to serve the new physical security system and hardware shall be fed from the existing 208/120V, 3 Phase panelboard PP-1 within the Chiller Building.

Project Scope

The scope of this project is to create a new 150 sq/ft office area inside the Viera Chiller Building along with a 100 sq/ft bathroom facility. In addition, upgrade the Viera's Chiller Building physical security systems to meet the criteria's as identified in the provided SOW attachments. The EOR will compare the SOW with VA Physical Security and Resiliency Design Manual, and compare them to the existing conditions. Additional scope noted below:

- Existing physical security distribution will be evaluated to study if existing system can support additional equipment would be required.
- Provide new security cameras throughout Chiller Building structure in coordination with the VA police.
- Provide access control/intrusion detection devices and hardware as needed to support the Chiller Building updates.
- Coordinate with site existing elements and access point to provide connectivity to the new devices.
- Provide new Telecommunication Enclosure to support new equipment/devices.

Security and Access Control:

- New physical security system which includes physical access control systems (PACS), motion intrusion detection, and security surveillance television (SSTV) will be installed in accordance with VA standards.
- PACS such as card readers will be installed at all exterior entrances of the Chiller Building to properly verify, identify and grant or deny access to individuals entering the space. These entry control devices-card readers are dual authentication card readers (card and pin).
- Intrusion detection system (IDS) such as door contacts, VMD and BMS will be installed at each accessible and man-passable opening of the Chiller Building to detect and annunciate potential unauthorized entry into the protected space.
- Video motion detection (VMD) cameras will be installed/utilized around the exterior perimeter of building structure to provide an automated alert, assessment, and response to the. SSTV as described below will have built in VMD capability.
- As part of the IDS, gates and double doors will be fitted with a balanced magnetic switch (BMS). Roll up doors wider than 80 inches will have two BMS mounted on both sides.
- Security surveillance television (SSTV) such as cameras will be installed around the exterior perimeter of the building in a configuration to provide visual identification and surveillance of persons, vehicles, assets, and incidents. Cameras shall be in accordance with Physical Security & Resiliency Design Manual, Section 10.6.3.1. Cameras shall be dual technology with motion sensors. All new cameras shall be coordinated with VA police.
- Duress/Panic alarms will be included with the new OIT computers that have a keyboard panic system built in. Upon activation, a silent alarm will be sent to a centralized monitoring location in the main building as defined by the VA and shall function as described in the Physical Security & Resiliency Design Manual, Section 10.7.3.
- A phone shall be installed outside the newly created office that will dial out directly to the campus's police/security room.

Image #1 Room D601 – Existing Physical Security System

Image #2 Chiller Building – Existing Electrical Gear

Image #3 Overall Campus – D601 and Chiller Building

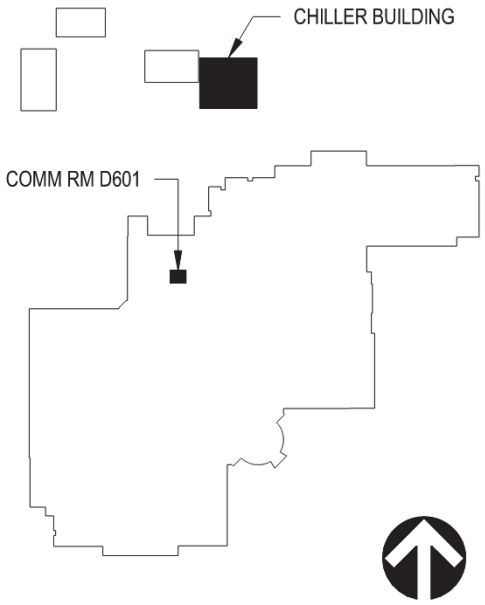


Image #4 – Security Door Opening Matrix

October 1, 2020

Appendix A3
Security Door Opening Matrix
Department of Veterans Affairs

Facility Type/Door Location	PG18-9/VA SEPS References			Door Types	SDO Hardware	Facility Classification	Access Control			Monitoring				Notes
	Chapter	Room Name	Room Code				Fail Safe	Fail Secure	ANSI/BMHA Function	Door Contact	IDS with Audible and Remote Alarm	Force or Hold-open Alarm	Audit Trail Capability	
Ambulatory Care Clinic/Outpatient Clinic														
Loading Dock (Swinging)	265	Receiving/Shipping Dock	DOCK1	A, C	107	Exist			F07 Store-room	X	X			
Staff				A, B, C, D	103	New/Exist	X		F04 Entry	X				2, 3, 4
Main Mechanical and Electrical Rooms from Corridor				A, C	228	New/Exist		X	F07 Store-room	X				8, 18

Notes

1. Magnetic lock or electric strike
2. Alarmed exit
3. Magnetic lock, electric strike or ANSI F04 Entrance lock
4. Intercom to reception, information or guard desk
5. Manual operation during power outage
6. Intercom to guard station
7. Card reader or ANSI F07 Storeroom lock
8. No glazing
9. Not used
10. One-way glass
11. Not used
12. 15 minute forced entry
13. FEBR (15 minutes/Level III)
14. ANSI F07 Storeroom lock and magnetic lock or electric strike
15. Elevator door control
16. Glazed door, monitor door at Nurses' Station
17. Padlock from the inside
18. All locks shall be field selectable Fail Safe/Fail Secure. The term Fail Secure indicates the lock will remain secure when in fail mode. Fail Secure shall always permit emergency egress functions of the lock. In these circumstances an bypass feature; such as, conventional key and lock, shall be provided to allow access from the unsecure side. Magnetic locks shall not fail secure.

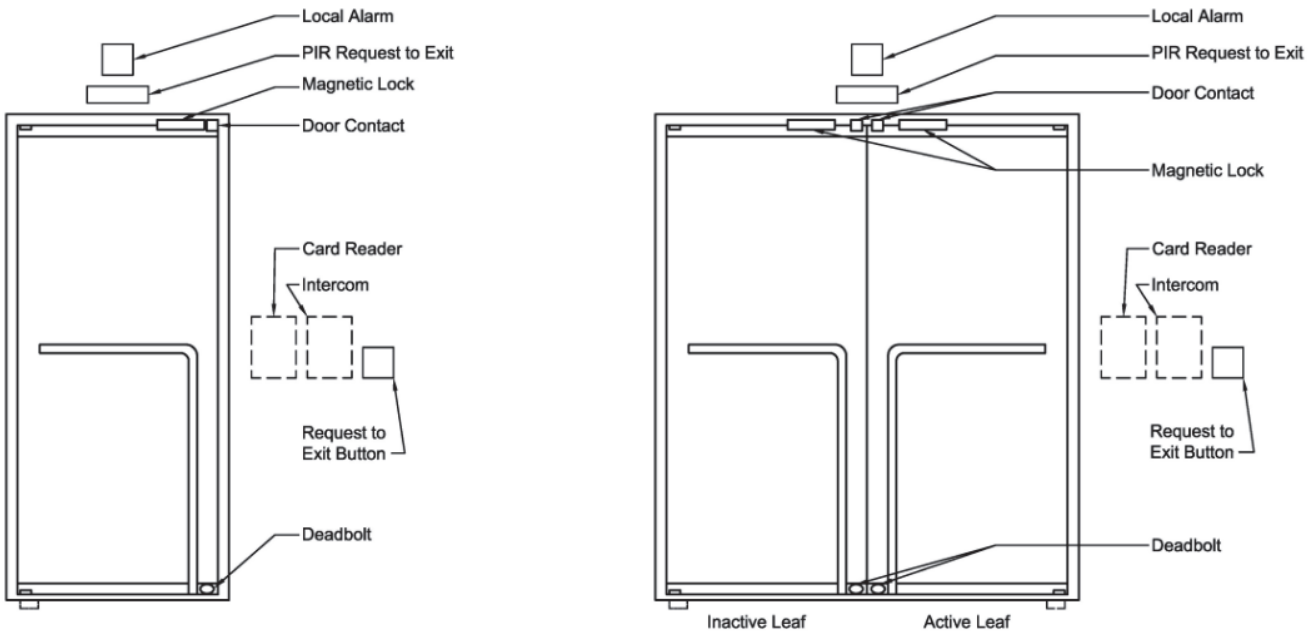
Image #5 – Security System Matrix

Department of Veterans Affairs	Appendix B - Security System Application Matrix																																
10/1/2020 rev 4/1/2021	(1)	(2)			(3)	(4)			(5)	Stand-Alone Network				(6)	Stand-Alone Network			Stand-Alone Network (7), (8)					Stand-Alone Network (7), (8)					Stand-Alone Equipment Optional (9)				
Area of Coverage	Dual Authentication Card Reader (card and pin)	Biometrics	Motion Detection (Microwave, Passive Infrared or VMD) - Dual Technology	Glass Break	Door/Window Contact	Interstitial Motion Detector	Seismic/Movement Sensor	Underfloor Motion/Water/Heat Sensor	Fixed Camera, Pan/Tilt/Zoom, Passive Infrared Camera - Dual Technology	Intercom	Duress/Panic Alarm/Money Clip	Emergency Phone/Call-Box	Public Address/Mass Notification System	SCC/IOC/EOC Monitoring (Local or Regional) of PACS, IDS, SSTV, DSPI	RFID (PIV, Bracelet, Pen, etc.)	Wi-Fi Antenna	Control Console	Card Reader/Key Access	Speaker/Microphone	Fixed, Pan-Tilt-Zoom or VMD Camera	Video Monitor (2 Min)	Duress/Panic Alarm	Card Reader and PIN Pad	Fixed, Pan-Tilt-Zoom or VMD Camera	Video Monitor (2 Min)	Emergency Phone/Call-Box	X-Ray Machine	WTMD	HHMD	Itemizer	Equipment RFID
	10.4 PACS		10.5 IDS						10.6 SSTV	10.7 DSPI			10.8 PA/MNS	10.9 SCC/IOC/EOC	10.10 PAL			10.11 BHA					10.12 NSAS				10.13 DSS				
BUILDING EXTERIOR																																	
UTILITY BUILDINGS																																	
ELECTRICAL	X		O		X				X	O	O	X	X	X																		
MECHANICAL	X		O		X				X	O	O	X	X	X																		

X = Required - any deviations must be coordinated with VA Office of Operations, Security, and Preparedness, Office of Security and Law Enforcement, Police Service (07B)
O = Optional - the local Director, Facility and Security staff determine if needed/desired as a back-up or for redundancy (primarily relates to dual-use technology and installed legacy systems)

Footnotes:
1 Refer to SDO Matrix for PACS configurations. The card credential will be the primary security identity for access control applications.
2 Biometric security devices shall only be used as a secondary means of identity authentication for an access control application.
3 Refer to SDO Matrix for specific door configurations.
4 Pan-Tilt-Zoom, Passive Infrared and Video Motion Detection cameras may be deployed to monitor site, building interior and exterior areas. They will supplement the use of fixed cameras if they can be programmed to monitor multiple areas with minimal human interface required.
5 Forensic Grade cameras may be used in high-value/high-risk areas
6 For Credit Union, Child Care and CBOC functions, the IDS and SSTV must be monitored in the SCC and the IOC by Law Enforcement only. For VBA facilities in leased space/multi-tenants or CBOCS, they follow DHS ISC guidelines (typically monitored by a FPS Megacenter or contract guard services).
7 A dedicated SSTV monitor may be required to provide staff with the ability to monitor access to these controlled areas.
8 Recording systems must match the camera quality of the resolution and image capture; Forensics grade cameras require Forensic Grade storage
9 The use of DSS equipment is indicated as an optional means to screen persons, items, and materials carried into or delivered to a facility. Each facility shall be addressed on a case-by-case basis as to DSS equipment requirements.

Image #6 – Door Details



100% Fire Protection Narrative

Existing Conditions

The existing enclosure is adjacent to the main building and is comprised of three masonry walls. The enclosure does not presently have a roof. No fire protection system is installed in the enclosure.

Project Scope

The scope of this project includes building a roof above the existing walled enclosure and installing a chain link gate on the open side. Fire sprinklers will be added to the enclosure to meet the VA PSDRM criteria and VA Design Manuals as this will now be an enclosed space. The sprinkler piping will be connected to the existing wet pipe fire protection system in the adjacent building.

The piping will be routed below grade from the main building to the enclosure and will be exposed within the enclosure. Sprinkler heads shall be of the upright type and shall be caged to prevent damage.