SOLUTIONS 4 STRUCTURES Inc.

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Date: 2026 01 21
Design by: TLC

Structural Calculations for Vertical and Lateral Design of Trash Enclosure Structure

PRCNC20260043

Project & Location:

Structural Calculations

Bradley Heights Apartments

(Lat 47.1652, Long -122.2921)
202 27th Avenue SE, Puyallup, WA

Client:

Timberlane Partners
Attn: Dave Enslow
dave@timberlanepartners.com

Professional Engineer:

Solutions 4 Structures, Inc
11605 135th St Ct E
Puyallup, WA 98374
Attn: Tom Chase, PE
tom@solutions4structures.com
(253) 314 - 9822

Project Number: 23.007

Code / Location: 2021 IBC

Loads:

1. Vertical Loads

	Dead	Live
Roof	22 PSF	25 PSF (Snow)

City of Puyallup
Building
REVIEWED
FOR
COMPLIANCE
SKinnear
02/10/2026
11:25:24 AM

2. Lateral Loads
   Wind Criteria
      Basic Wind Speed = 97 MPH
      Exposure B
      Iw = 1.0, Kzt = 1.0
   Seismic Criteria
      Seismic Design Category "D"
      Site Class C
      I_E= 1.0, Ss = 1.263, S1 = 0.435
      SDS = 1.010, SD1 = 0.435

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning
Engineering | Public Works
Fire | Traffic

3. Soils Data (per GeoResources Inc. dated 02/10/2022)
      Bearing Capacity = 2,000 PSF

Calculations required to be provided by the Permittee on site for all Inspections

CMU ENCLOSURE WALLS

Project Bradley Heights
S4S Job# 23.007
Date 8/14/2024

SOIL PROPERTIES

Wind Pressure (ASD)	W =	**10.0**	psf
Seismic Pressure (ASD)	E =	23.8	psf
Allowable Bearing	ASBP =	**2,000**	psf
Allowable 1/3 Increase		**yes**	
Seismic Sds		**1.010**	

WALL DESIGN

Base Design Shear	Vu =	0.32	k	
Shear Strength	ϕVm =	3.19	k	OK!
Base Design Moment	Mu =	1.48	kft	
Bending Strength	**ϕMn =**	**1.78**	**kft**	**OK!**
Bar A	#	**5**		
Spacing A	s =	**32**	in o.c.	

WALL & FOOTING DIMENSIONS

Concrete Strength	f'c =	**2,500**	psi
Wall thickness	t =	**7.625**	in
Wall Height	H =	**9.33**	ft
Footing Width	W_{ftg} =	**2.83**	ft
Footing thickness	T_{ftg} =	**1.00**	ft

FOOTING REINF

				As	
Longitudinal Bars	**(3)**	**#5**	=	0.93	in2
Min Reinforcing			=	0.73	in2

STABILITY CHECKS

Wall wt	W_w =	784	lbs	
Footing wt	W_f =	425	lbs	
Total wt	W =	1209	lbs	
Overturning M	OTM =	1,256	kft	
Resisting M	RM =	1,713	lbft	
	X =	0.38	ft	
	e =	1.04	ft	> L/6
Soil Pressure	SP =	2,135	psf	**OK!**

CMU ENCLOSURE WALLS

Project Bradley Heights
S4S Job# 23.007
Date 8/14/2024

SOIL PROPERTIES

Wind Pressure (ASD)	W =	**10.0**	psf
Seismic Pressure (ASD)	E =	23.8	psf
Allowable Bearing	ASBP =	**2,000**	psf
Allowable 1/3 Increase		**yes**	
Seismic Sds		**1.010**	

WALL DESIGN

Base Design Shear	Vu =	0.25	k	
Shear Strength	ϕVm =	3.19	k	OK!
Base Design Moment	Mu =	0.91	kft	
Bending Strength	**ϕMn =**	**1.44**	**kft**	**OK!**
Bar A	#	**5**		
Spacing A	s =	**40**	in o.c.	

WALL & FOOTING DIMENSIONS

Concrete Strength	f'c =	**2,500**	psi
Wall thickness	t =	**7.625**	in
Wall Height	H =	**7.33**	ft
Footing Width	W_{ftg} =	**2.33**	ft
Footing thickness	T_{ftg} =	**0.83**	ft

FOOTING REINF

				As	
Longitudinal Bars	**(3)**	**#4**	=	0.60	in2
Min Reinforcing			=	0.50	in2

STABILITY CHECKS

Wall wt	W_w =	616	lbs	
Footing wt	W_f =	292	lbs	
Total wt	W =	908	lbs	
Overturning M	OTM =	784	kft	
Resisting M	RM =	1,059	lbft	
	X =	0.30	ft	
	e =	0.86	ft	> L/6
Soil Pressure	SP =	1,998	psf	**OK!**

CMU ENCLOSURE WALLS

Project Bradley Heights
S4S Job# 23.007
Date 8/14/2024

SOIL PROPERTIES

Wind Pressure (ASD)	W =	**10.0**	psf
Seismic Pressure (ASD)	E =	23.8	psf
Allowable Bearing	ASBP =	**2,000**	psf
Allowable 1/3 Increase		**yes**	
Seismic Sds		**1.010**	

WALL DESIGN

Base Design Shear	Vu =	0.18	k	
Shear Strength	ϕVm =	3.19	k	OK!
Base Design Moment	Mu =	0.48	kft	
Bending Strength	**ϕMn =**	**1.18**	**kft**	**OK!**
Bar A	#	**4**		
Spacing A	s =	**32**	in o.c.	

WALL & FOOTING DIMENSIONS

Concrete Strength	f'c =	**2,500**	psi
Wall thickness	t =	**7.625**	in
Wall Height	H =	**5.33**	ft
Footing Width	W_{ftg} =	**1.83**	ft
Footing thickness	T_{ftg} =	**0.83**	ft

FOOTING REINF

				As	
Longitudinal Bars	**(2)**	**#4**	=	0.40	in2
Min Reinforcing			=	0.40	in2

STABILITY CHECKS

Wall wt	W_w =	448	lbs	
Footing wt	W_f =	229	lbs	
Total wt	W =	677	lbs	
Overturning M	OTM =	443	kft	
Resisting M	RM =	621	lbft	
	X =	0.26	ft	
	e =	0.65	ft	> L/6
Soil Pressure	SP =	1,724	psf	**OK!**

SOLUTIONS 4 STRUCTURES Inc.

JOB # 23.007

DESIGNED MRO DATE 8-15-24

PROJECT: BRADLEY HEIGHTS APTS

CMU ENCLOSURE WALLS

EXAMPLE HT = 7'-4"

$w_o = 0.4 S_{DS} W$

$= 0.4 (1.010)(84)$

$= 33.9$ PSF

$w_{ABD} = 0.7 w_o$

$= 0.7(33.9)$

$= 23.8$ PSF

$V_o = 0.0339(7.33) = 0.25k$

$M_o = 0.25(7.33)/2 = 0.91$ kft

$\phi V_c = 0.80(2.25)\sqrt{1500}(12)(3.81) = 3.19k$ ✓

$A_{s\,dowels} = V_o/\phi F_y = 0.25/0.9 \times 60 = 0.0046$ in²/ft

$A_{s\,eff} = \#5@40" - A_{s\,dowels} = 0.0884$ in²/ft

$a = \frac{.0884(60)}{0.8(1.5)(12)} = 0.368$ in

$\phi M_n = 0.9(.0884)(60)\left(3.81 - \frac{.368}{2}\right)/12 = 1.44$ kft ✓

SOLUTIONS 4 STRUCTURES Inc.

JOB # 23.007

DESIGNED MRO DATE 8-15-24

PROJECT: BRADLEY HEIGHTS APTS

HT = 7'-4" cont.

$$OTM = 23.8\,(7.33)(7.33/2 + 0.833) = 785 \text{ lb ft}$$

$$W_{wall} = 84\,(7.33) = 616$$

$$W_{FTG} = 150\,(2.33 \times 0.83) = 292$$

$$908 \text{ lbs}$$

$$RM = 908\,(2.33)/2 = 1{,}059 \text{ lb ft}$$

$$\bar{X} = \frac{RM - OTM}{\Sigma W} = \frac{1059 - 785}{908} = 0.30 \text{ ft}$$

$$e = 2.33/2 - 0.30 = 0.87 \text{ ft} \; (> \ell/6)$$

$$SP = \frac{2}{3}\,\frac{\Sigma W}{\bar{X}} = \frac{2}{3}\,\frac{908}{0.30} = 1{,}998 \text{ PSF}$$