

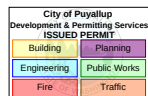
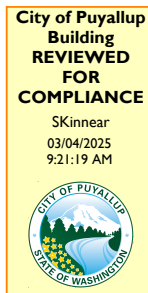
# STRUCTURAL CALCULATIONS

For

## New Construction for McDonald's in Puyallup, WA

PRCNC20241917

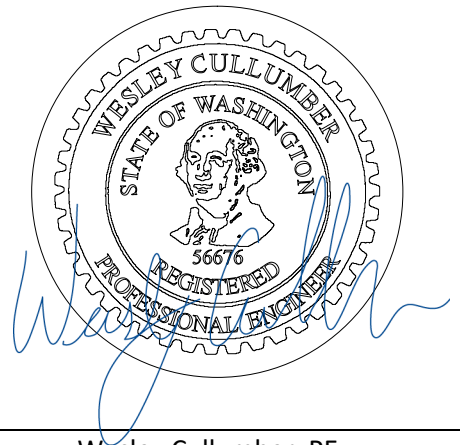
Calculations required to be provided by  
the Permittee on site for all Inspections



& ASSOCIATES

Client: PM Design Group  
Project Address: 2902 Pioneer E.  
Puyallup, WA 98372  
Project Number: CN112124  
Purpose: Structural Engineering  
for New Construction  
Date: 12/10/2024  
Revisions: 3/20/2025  
Engineer: Emma Brown, EIT  
EOR: Wesley Cullumber, PE

The design calculations contained herein have been  
prepared by or under the direction of the following  
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916-251-9798



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

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## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### 1. DESIGN CRITERIA

#### PROJECT APPROACH

Typical design approach for gravity and lateral analysis. Seismic and Wind loading applied for lateral analysis. Gravity loading applied as specified in the calculations. Diaphragms are treated as flexible and simple span theory is utilized. Design utilized using ASD load combinations.

#### DESIGN VALUES

##### 1. CRITERIA

Risk Category = II

##### 2. ROOF LOADS

Roof Material = Single Ply Roofing  
Roof Dead Load (DL) = 20 psf  
Roof Live Load (RLL) = 20 psf  
Deflection Live Load (LL) = L/360  
Deflection Total Load (TL) = L/240

##### 3. FLOOR LOADS

Floor Dead Load (DL) = Slab on Grade  
Floor Live Load (LL) = 100 psf

##### 4. SEISMIC LOADS

MCER ground motion (period=0.2s)  $S_s$  = 1.254g  
MCER ground motion (period=1.0s)  $S_1$  = 0.432g  
Design Spectral Acc. for Short Periods  $SDS$  = 1.003g  
Design Spectral Acc. for 1-sec. Periods  $SD_1$  = 0.538g  
Overstrength Factor  $\Omega_o$  = 2.5  
Deflection Amplification Factor  $C_d$  = 4.0  
Soil Site Class = D  
Seismic Design Category = D  
Response Modification Factor  $R$  = 6.50  
Seismic Response Coefficient  $C_s$  = 0.1538g

Basic Seismic Force Resisting System:

Bearing Wall Systems – Light frame walls sheathed w/wood structural panels rated for shear resistance.

##### 5. WIND LOADS

Ultimate Wind Speed (3-Second Gust) = 98 mph  
Wind Exposure = C  
Topographic Factor  $K_{zt}$  = 1.0

##### 6. GEOTECHNICAL

Building = 2,500 psf  
Geotech: Krazen & Associates  
Job No: 062-24019



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

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### CODE REFERENCES

ASCE 7-16 Minimum Design Loads for Buildings and Other Structures

ACI 318-19 Building Code Requirements for Structural Concrete and Commentary

IBC 2021 International Building Code 2021

AISC Steel Construction Manual 15<sup>th</sup> Edition

NDS 2018 National Design Specification 2018

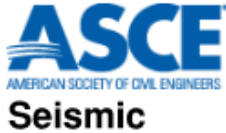




## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

## 2. SEISMIC ANALYSIS



**Site Soil Class:** D - Default (see Section 11.4.3)  
**Results:**

|            |       |                    |       |
|------------|-------|--------------------|-------|
| $S_S$ :    | 1.254 | $S_{D1}$ :         | N/A   |
| $S_1$ :    | 0.432 | $T_L$ :            | 6     |
| $F_a$ :    | 1.2   | PGA :              | 0.5   |
| $F_v$ :    | N/A   | PGA <sub>M</sub> : | 0.6   |
| $S_{MS}$ : | 1.505 | $F_{PGA}$ :        | 1.2   |
| $S_{M1}$ : | N/A   | $I_e$ :            | 1     |
| $S_{DS}$ : | 1.003 | $C_v$ :            | 1.351 |

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

**Data Accessed:** Fri Dec 06 2024

**Date Source:** [USGS Seismic Design Maps](#)



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### ASCE 7-16 Seismic Base Shear

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

**DESCRIPTION:** Seismic Base Shear Analysis

Specific Description: New Build

#### Risk Category

Calculations per ASCE 7-16

Risk Category of Building or Other Structure: "II": All Buildings and other structures except those listed as Category I, III, and IV *ASCE 7-16, Page 4, Table 1.5-1*

Seismic Importance Factor = 1 *ASCE 7-16, Page 5, Table 1.5-2*

#### USER DEFINED Ground Motion

ASCE 7-16 11.4.2

Max. Ground Motions, 5% Damping

$S_S = 1.254$  g, 0.2 sec response

$S_1 = 0.4320$  g, 1.0 sec response

For the closest datapoint grid location . . .

Latitude = 0.000 deg North

Longitude = 0.000 deg West

Conforms to ASCE 7 Section 12.8.1.3: Regular structure with period of 0.5 s or less, SDS limited to max of  $0.7 \cdot S_{DS}$  or 1.0 for calculation

#### Site Class, Site Coeff. and Design Category

Classification: "D": Shear Wave Velocity 600 to 1,200 ft/sec = **D** (By Default per 11.4.3) *ASCE 7-16 Table 20.3-1*

Site Coefficients  $F_a$  &  $F_v$   $F_a = 1.20$  *ASCE 7-16 Table 11.4-1 & 11.4-2*  
(using straight-line interpolation from table values)  $F_v = 1.87$

Maximum Considered Earthquake Acceleration  $S_{MS} = F_a \cdot S_s = 1.505$  *ASCE 7-16 Eq. 11.4-1*

$S_{M1} = F_v \cdot S_1 = 0.807$  *ASCE 7-16 Eq. 11.4-2*

Design Spectral Acceleration  $S_{DS} = S_{MS}^{2/3} = 1.003$  *ASCE 7-16 Eq. 11.4-3*

$S_{D1} = S_{M1}^{2/3} = 0.538$  *ASCE 7-16 Eq. 11.4-4*

Seismic Design Category = **D** *ASCE 7-16 Table 11.6-1 & -2*

#### Resisting System

ASCE 7-16 Table 12.2-1

Basic Seismic Force Resisting System . . .

**Bearing Wall Systems**

**15. Light-frame (wood) walls sheathed w/wood structural panels rated for shear resistance.**

Response Modification Coefficient "R" = 6.50

System Overstrength Factor "Wo" = 2.50

Deflection Amplification Factor "Cd" = 4.00

*NOTE! See ASCE 7-16 for all applicable footnotes*

**Building height Limits:**

Category "A & B" Limit: No Limit

Category "C" Limit: No Limit

Category "D" Limit: Limit = 65

Category "E" Limit: Limit = 65

Category "F" Limit: Limit = 65

#### Lateral Force Procedure

ASCE 7-16 Section 12.8.2

Equivalent Lateral Force Procedure

The "Equivalent Lateral Force Procedure" is being used according to the provisions of ASCE 7-16 12.8

#### Determine Building Period

Use ASCE 12.8-7

Structure Type for Building Period Calculation: All Other Structural Systems

"Ct" value = 0.020 "hn": Height from base to highest level = 15.0 ft

"x" value = 0.75

"Ta" Approximate fundamental period using Eq. 12.8-7:  $T_a = C_t \cdot (h_n^x) = 0.152$  sec

"TL": Long-period transition period per ASCE 7-16 Maps 22-14 to 22-17 = 16.000 sec

Building Period "Ta" Calculated from Approximate Method set = 0.152



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### ASCE 7-16 Seismic Base Shear

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

#### DESCRIPTION: Seismic Base Shear Analysis

#### "Cs" Response Coefficient

ASCE 7-16 Section 12.8.1.1

|                                                  |   |       |                                                  |   |       |
|--------------------------------------------------|---|-------|--------------------------------------------------|---|-------|
| $S_{DS}$ : Short Period Design Spectral Response | = | 1.003 | From Eq. 12.8-2, Preliminary $C_s$               | = | 0.154 |
| "R" : Response Modification Factor               | = | 6.50  | From Eq. 12.8-3 & 12.8-4, $C_s$ need not exceed  | = | 0.543 |
| "I" : Seismic Importance Factor                  | = | 1     | From Eq. 12.8-5 & 12.8-6, $C_s$ not be less than | = | 0.044 |

User has selected ASCE 12.8.1.3 : Regular structure, **Cs : Seismic Response Coefficient = 0.1538**  
 Less than 5 Stories and with  $T \leq 0.5$  sec, SO  $S_s \leq 1.5$  for  $C_s$  calcul

#### Seismic Base Shear

ASCE 7-16 Section 12.8.1

|                          |                      |                               |         |
|--------------------------|----------------------|-------------------------------|---------|
| $C_s$ =                  | 0.1538 from 12.8.1.1 | $W$ ( see Sum $W_i$ below ) = | 67.35 k |
| Seismic Base Shear $V$ = | $C_s * W$ =          |                               | 10.36 k |

#### Vertical Distribution of Seismic Forces

ASCE 7-16 Section 12.8.3

"k" : hx exponent based on  $T_a$  = 1.00

Table of building Weights by Floor Level...

| Level #     | $W_i$ : Weight | $H_i$ : Height    | $(W_i * H_i^k)$ | $C_{vx}$           | $F_x = C_{vx} * V$ | Sum Story Shear | Sum Story Moment |
|-------------|----------------|-------------------|-----------------|--------------------|--------------------|-----------------|------------------|
| 1           | 67.35          | 15.00             | 1,010.25        | 1.0000             | 10.36              | 10.36           | 0.00             |
| Sum $W_i$ = | 67.35 k        | Sum $W_i * H_i$ = | 1,010.25 k-ft   | Total Base Shear = | 10.36 k            | Base Moment =   | 155.4 k-ft       |

#### Diaphragm Forces : Seismic Design Category "B" to "F"

ASCE 7-16 12.10.1.1

| Level # | $W_i$ | $F_i$ | Sum $F_i$ | Sum $W_i$ | $F_{px}$ : Calcd | $F_{px}$ : Min | $F_{px}$ : Max | $F_{px}$ | Dsgn. Force |
|---------|-------|-------|-----------|-----------|------------------|----------------|----------------|----------|-------------|
| 1       | 67.35 | 10.36 | 10.36     | 67.35     | 10.36            | 13.51          | 27.03          | 13.51    | 13.51       |

$W_{px}$  : Weight at level of diaphragm and other structure elements attached to it.

$F_i$  : Design Lateral Force applied at the level.

Sum  $F_i$  : Sum of "Lat. Force" of current level plus all levels above

MIN Req'd Force @ Level :  $0.20 * S_{DS} * I * W_{px}$

MAX Req'd Force @ Level :  $0.40 * S_{DS} * I * W_{px}$

$F_{px}$  : Design Force @ Level :  $W_{px} * \text{SUM}(x \rightarrow n) F_i / \text{SUM}(x \rightarrow n) w_i$ ,  $x$  = Current level,  $n$  = Top Level

### 3. WIND ANALYSIS

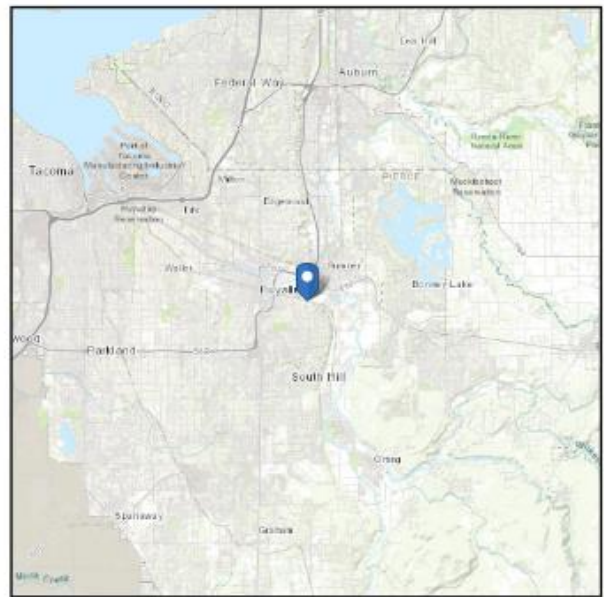
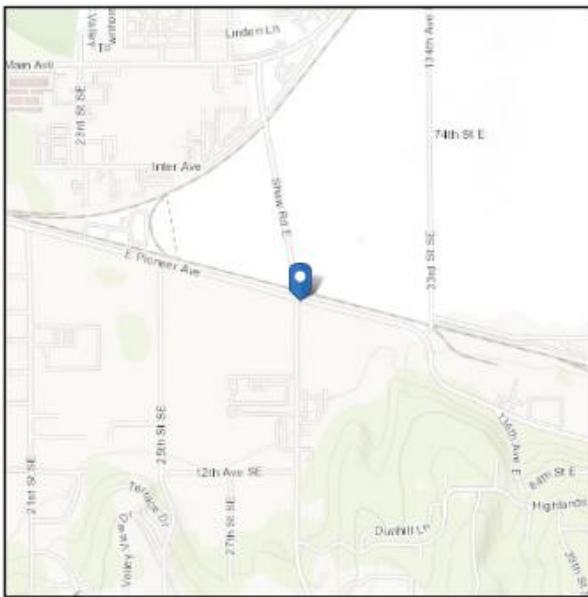


**Address:**  
 2902 E Pioneer  
 Puyallup, Washington  
 98372

### ASCE Hazards Report

**Standard:** ASCE/SEI 7-16  
**Risk Category:** II  
**Soil Class:** D - Default (see Section 11.4.3)

**Latitude:** 47.185406  
**Longitude:** -122.256073  
**Elevation:** 69.16267886674896 ft (NAVD 88)



### Wind

#### Results:

|              |         |
|--------------|---------|
| Wind Speed   | 98 Vmph |
| 10-year MRI  | 67 Vmph |
| 25-year MRI  | 74 Vmph |
| 50-year MRI  | 78 Vmph |
| 100-year MRI | 83 Vmph |

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2  
 Date Accessed: Fri Dec 06 2024

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### ASCE 7-16 Wind Forces Chpt 28, Pt2 & Chpt 30, Pt2

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

#### DESCRIPTION: BUILDING

#### General Design Values

Calculations per ASCE 7-16

V : Basic Wind Speed per Sect 26.5-1 or 2 **98.0 mph**  
User specified minimum design pressure **16.0 psf**  
Occupancy per Table 1.5-1 **II All Buildings and other structures except those listed**  
Exposure Category per 26.7 **Exposure B**  
Topographic Factor Kzt per 26.8 **1.00**

"Lambda" is interpolated between height tabular values.

#### Main Force Resisting System Value

MRH : Mean Roof Height **15.0 ft**  
Roof Slope Angle **0 to 5 degrees**

#### Component & Cladding Values

Effective Wind Area of Component & Clad **10.0 ft^2**  
Roof pitch for cladding pressure **Flat/Hip/Gable Roof**  
LHD : Least Horizontal Dimension **44.50 ft**  
a = max (0.04 \* LHD, 3, min(0.10 \* LHD, 0.4\*MRH)) **4.45 ft**

Lambda MWFRS: per Figure 26. **1.00**

Lambda Component & Cladding : per Figure **0.82**

#### Design Wind Pressures

##### Horizontal Pressures . . .

Zone: A = **16.00 psf** Zone: C = **16.00 psf**  
Zone: B = **-16.00 psf** Zone: D = **-16.00 psf**

##### Vertical Pressures . . .

Zone: E = **-18.34 psf** Zone: G = **-16.00 psf**  
Zone: F = **-16.00 psf** Zone: H = **-16.00 psf**

##### Overhangs . . .

Zone: Eoh = **-25.66 psf** Zone: Goh = **-20.06 psf**

ASCE 7-16 Section 28.5.4 Minimum Design Wind Loads requires that the load effects of the design wind pressures from Section 28.5.3 shall not be less than a minimum load defined by assuming the pressures, ps, for zones A and C equal to +16 psf, Zones B and D equal to +8 psf, while assuming ps for Zones E, F, G, and H are equal to 0 psf.

#### Component & Cladding Design Wind Pressures

Design Wind Pressure = Lambda \* Kzt \* Ps30 ps

| Roof Pressures |          |             | Overhang Pressures |             |
|----------------|----------|-------------|--------------------|-------------|
|                | Positive | Negative    |                    | Negative    |
| Zone 1         | 16.000   | -22.616 psf | Zone 1             | -20.418 psf |
| Zone 1'        | 16.000   | -16.000 psf | Zone 1'            | -20.418 psf |
| Zone 2         | 16.000   | -29.782 psf | Zone 2             | -27.634 psf |
| Zone 2e        | ***      | *** psf     | Zone 2e            | *** psf     |
| Zone 2n        | ***      | *** psf     | Zone 2n            | *** psf     |
| Zone 2r        | ***      | *** psf     | Zone 2r            | *** psf     |
| Zone 3         | 16.000   | -40.590 psf | Zone 3             | -38.442 psf |
| Zone 3e        | ***      | *** psf     | Zone 3e            | *** psf     |
| Zone 3r        | ***      | *** psf     | Zone 3r            | *** psf     |

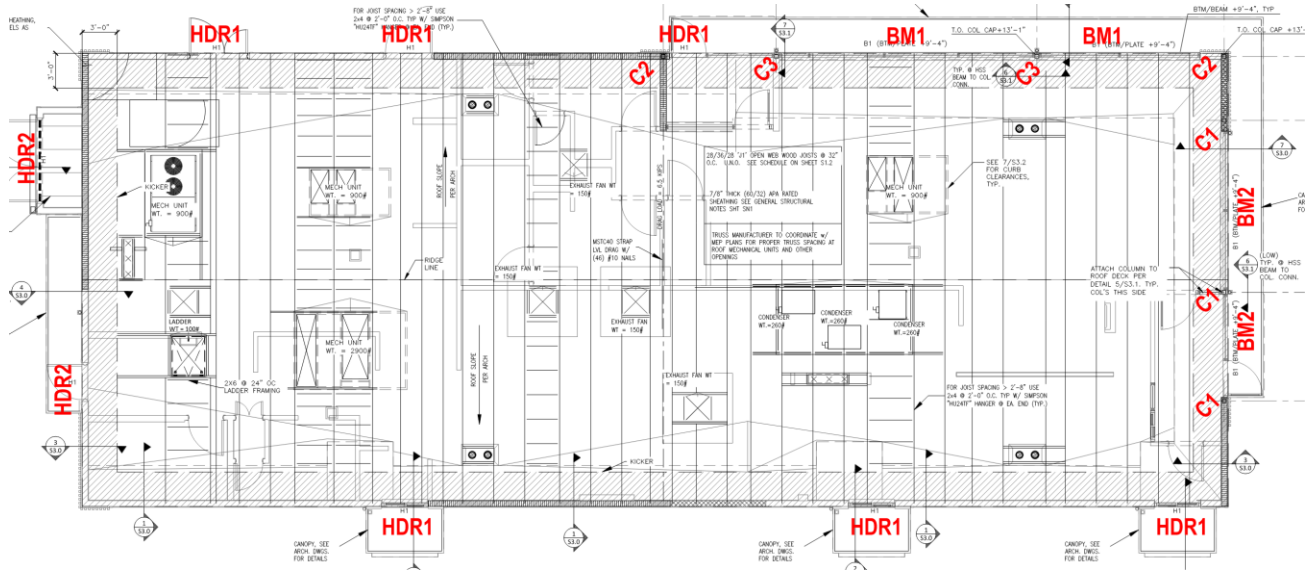
#### Wall Pressures

Wall Zone 4 : **16.000 -16.000 psf**  
Wall Zone 5 : **16.000 -18.975 psf**

\*\*\*\* : There is no value in Figure 30.4-1 Tabular Values

### 4. STRUCTURAL CALCULATIONS

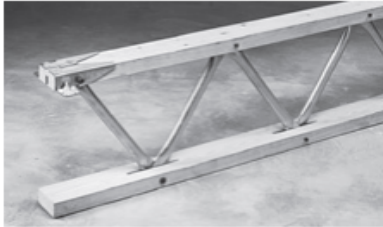
#### GRAVITY ANALYSIS



See Appendix A for software printouts



### OPEN-WEB TRUSS DESCRIPTIONS



#### Red-L™ and Red-W™ Trusses

##### Chords:

- Red-L™ trusses: 1½" x 3½" MSR lumber\*
- Red-W™ trusses: 1½" x 4¾" MSR lumber

##### Webs:

1" and 1½" diameter tubular steel members varying in gauge and diameter according to requirements.

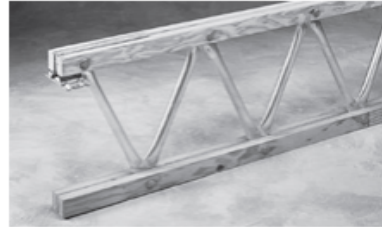
##### Weight:

- Red-L™ trusses: 3.75 to 4.25 lbs/ft
- Red-W™ trusses: 4.5 to 5.25 lbs/ft

##### Depths:

Minimum depth at wall .....14"  
 Maximum depth at wall .....50"  
 Maximum pitched ridge depth.....50"

Any depth between minimum and maximum is available.



#### Red-S™ Trusses

##### Chords:

Double 1½" x 2.3" RedLam™ LVL

##### Webs:

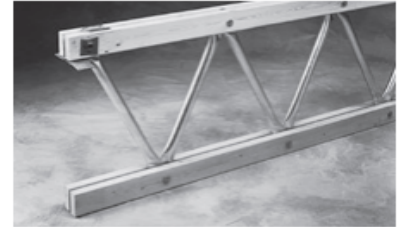
1", 1¼", and 1½" diameter tubular steel members varying in gauge and diameter according to requirements.

##### Weight:

4.75 to 5.75 lbs/ft

##### Depths:

Minimum depth at wall .....16"  
 Maximum depth at wall .....60"  
 Maximum pitched ridge depth.....84"  
 Any depth between minimum and maximum is available.



#### Red-M™ and Red-H™ Trusses

##### Chords:

- Red-M™ trusses: Double 1½" x 3½" MSR lumber\*
- Red-H™ trusses: Double 1½" x 5½" MSR lumber\*

##### Webs:

Up to 2" diameter tubular steel members varying in gauge and diameter according to requirements.

##### Weight:

- Red-M™ trusses: 8 to 9 lbs/ft
- Red-H™ trusses: 10 to 12 lbs/ft

##### Depths:

**Red-M™    Red-H™**  
 Minimum depth at wall ..... 20" ..... 24"  
 Maximum depth at wall ..... 60" ..... 72"  
 Maximum pitched ridge depth..... 72" .....114"  
 Any depth between minimum and maximum is available.

*Open-web trusses are intended for dry use, untreated applications.*

\* RedLam™ LVL chords may be available for Red-L™, Red-M™, and Red-H™ truss series. Consult your technical representative for availability and limitations.

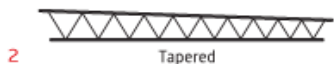
**Building Codes and Product Acceptance:** See ICC-ES ESR-1774, L.A. City RR #22614

### Truss Profiles



1

Parallel Chord



2

Tapered



3

Pitched



4

Radius Pitched



5

Bow String



6

Barrel



7

Pitched Top Chord/Radius Bottom Chord



8

Scissor



9

Compound Barrel



10

Lenticular

### Tightest Curvature Available:

Red-L™ and Red-W™ trusses ..... 52' radius  
 Red-S™ trusses ..... 200' radius  
 Red-M™ trusses ..... Camber only  
 Red-H™ trusses ..... Camber only

| Truss Series | Profiles Available |   |   |   |   |   |   |   |   |    |
|--------------|--------------------|---|---|---|---|---|---|---|---|----|
|              | 1                  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Red-L™       | ■                  | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■  |
| Red-W™       | ■                  | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■  |
| Red-S™       | ■                  | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■  |
| Red-M™       | ■                  | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■  |
| Red-H™       | ■                  | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■  |

■ Indicates that the profile is available.

In radius truss applications (Profiles 5, 6, 7, 9, and 10), allowable loads are reduced due to radial stresses. Contact your RedBuilt technical representative for job-specific possibilities.

Maximum top chord slope for Profile 4 (Radius Pitched) is ½:12 for Red-L™ and Red-W™ truss series, and ¾:12 for Red-S™ truss series.



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

Load Tables

### RED-M™ TRUSS ALLOWABLE UNIFORM LOAD TABLE (PLF) / PARALLEL CHORD

SEE PAGE 4 FOR ECONOMICAL TRUSS DESIGN

| Span | Depth           |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|      | 20"             | 22"             | 24"             | 26"             | 28"             | 30"             | 32"             | 34"             | 36"             | 38"             | 40"             | 42"             | 44"             | 46"             |                 |                 |
|      | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL | 100% TL 115% TL |
| 24'  | 292 327         | 330 369         | 368 406         | 393 449         | 412 449         | 409 457         | 401 455         | 406 455         | 370 455         | 386 456         | 366 434         | 367 456         | 347 437         | 356 436         |                 |                 |
|      | 183 348         | 226 390         | 266 433         | 311 461         | 357 476         | 396 479         | 486             | 480             | 480             | 468             | 475             | 470             | 467             | 464             |                 |                 |
| 26'  | 251 278         | 277 313         | 315 345         | 347 383         | 366 419         | 386 424         | 388 433         | 384 431         | 377 424         | 384 423         | 368 417         | 347 432         | 340 417         | 332 414         |                 |                 |
|      | 147 294         | 181 328         | 218 365         | 251 403         | 290 437         | 329 436         | 371 447         | 448             | 437             | 452             | 440             | 439             | 428             | 438             |                 |                 |
| 28'  | 215 235         | 239 271         | 269 301         | 299 330         | 322 362         | 351 391         | 369 402         | 368 412         | 365 404         | 352 400         | 349 400         | 363 391         | 339 391         | 363 392         |                 |                 |
|      | 119 255         | 148 286         | 177 316         | 209 350         | 239 383         | 272 400         | 305 402         | 344 409         | 420             | 416             |                 | 420             | 413             | 407             |                 |                 |
| 30'  | 186 206         | 208 231         | 235 260         | 261 285         | 283 312         | 303 341         | 331 367         | 349 381         | 348 381         | 348 380         | 346 379         | 336 377         | 330 374         | 309 372         |                 |                 |
|      | 99 224          | 121 245         | 146 277         | 172 303         | 198 333         | 227 360         | 255 381         | 285 386         | 315 387         | 343 386         | 392             | 379             | 379             | 382             |                 |                 |
| 32'  | 166 185         | 185 206         | 203 229         | 226 251         | 250 274         | 271 299         | 290 319         | 311 344         | 329 355         | 335 356         | 331 364         | 329 364         | 324 360         | 313 348         |                 |                 |
|      | 82 195          | 101 220         | 121 244         | 144 267         | 166 293         | 190 317         | 215 342         | 238 361         | 263 364         | 288 360         | 318 361         | 364             | 360             | 357             |                 |                 |
| 34'  | 148 164         | 164 181         | 183 202         | 200 223         | 218 247         | 240 263         | 253 281         | 270 305         | 295 324         | 314 331         | 303 340         | 319 344         | 314 334         | 303 329         |                 |                 |
|      | 68 173          | 85 196          | 102 216         | 122 237         | 141 259         | 161 279         | 182 299         | 204 324         | 225 340         | 247 342         | 272 346         | 297 339         | 340             | 334             |                 |                 |
| 36'  | 133 146         | 148 162         | 160 178         | 176 199         | 196 216         | 211 233         | 226 255         | 244 272         | 261 290         | 277 304         | 291 316         | 305 322         | 311 319         | 310 313         |                 |                 |
|      | 58 155          | 72 173          | 86 192          | 103 211         | 119 229         | 137 250         | 155 270         | 174 289         | 193 301         | 212 322         | 235 325         | 255 320         | 279 319         | 301 311         |                 |                 |
| 38'  | 118 131         | 133 148         | 147 161         | 162 176         | 178 190         | 188 210         | 199 226         | 220 242         | 234 257         | 249 277         | 259 289         | 278 305         | 293 296         | 298 293         |                 |                 |
|      | 49 141          | 61 155          | 74 175          | 88 191          | 103 206         | 118 218         | 134 241         | 150 259         | 166 273         | 184 293         | 202 305         | 217 301         | 239 295         | 262 295         |                 |                 |
| 40'  | 105 119         | 118 133         | 131 147         | 144 159         | 158 173         | 167 193         | 183 201         | 196 215         | 209 235         | 224 249         | 237 264         | 249 278         | 262 284         | 275 277         |                 |                 |
|      | 42 127          | 52 141          | 64 157          | 76 172          | 89 189          | 103 205         | 116 219         | 130 230         | 144 249         | 159 264         | 175 279         | 188 284         | 204 283         | 225 279         |                 |                 |
| 42'  | 91 110          | 109 121         | 121 135         | 132 145         | 143 159         | 155 170         | 167 183         | 180 202         | 189 209         | 200 226         | 215 239         | 229 249         | 239 261         | 253 267         |                 |                 |
|      | 36 115          | 45 129          | 55 142          | 66 155          | 77 170          | 89 178          | 102 200         | 114 211         | 127 226         | 140 234         | 154 253         | 166 264         | 180 266         | 195 261         |                 |                 |
| 44'  | 79 99           | 99 110          | 110 122         | 122 135         | 130 144         | 141 158         | 153 170         | 162 179         | 174 190         | 181 204         | 196 218         | 206 230         | 216 241         | 227 247         |                 |                 |
|      | 32 103          | 39 116          | 48 128          | 58 142          | 67 153          | 78 169          | 89 181          | 100 186         | 111 205         | 123 218         | 134 223         | 145 244         | 160 253         | 172 249         |                 |                 |
| 46'  | 90 96           | 101 111         | 111 122         | 121 133         | 129 140         | 140 153         | 148 161         | 161 171         | 170 188         | 180 199         | 189 210         | 198 221         | 208 231         |                 |                 |                 |
|      | 90 34           | 107 42          | 120 50          | 129 59          | 142 68          | 153 78          | 159 88          | 176 99          | 188 109         | 199 120         | 206 132         | 222 140         | 234 154         | 237             |                 |                 |
| 48'  | 80 76           | 93 93           | 102 102         | 111 111         | 122 121         | 132 127         | 141 136         | 153 146         | 163 157         | 173 166         | 183 176         | 192 183         | 199 191         | 213             |                 |                 |
|      | 80 30           | 98 37           | 110 44          | 118 52          | 132 61          | 141 69          | 153 78          | 160 87          | 171 97          | 184 107         | 191 116         | 204 125         | 214 137         | 222             |                 |                 |
| 50'  | 70 70           | 86 82           | 95 94           | 104 102         | 112 111         | 123 119         | 130 129         | 139 137         | 150 144         | 159 154         | 169 160         | 179 170         | 186 180         | 196             |                 |                 |
|      | 70 33           | 88 39           | 101 39          | 111 46          | 118 54          | 129 61          | 138 69          | 144 77          | 161 86          | 162 95          | 181 104         | 189 113         | 193 123         | 208             |                 |                 |
| 52'  | 63 63           | 78 78           | 89 87           | 96 95           | 104 102         | 111 111         | 120 118         | 132 125         | 138 135         | 141 140         | 158 149         | 164 156         | 174 165         | 181             |                 |                 |
|      | 63 35           | 78 41           | 89 41           | 96 41           | 104 41          | 109 48          | 118 55          | 130 62          | 136 69          | 147 77          | 157 85          | 163 94          | 174 102         | 185 110         | 194             |                 |
| 54'  | 56 56           | 70 70           | 82 78           | 89 88           | 96 95           | 103 101         | 115 109         | 119 118         | 130 125         | 138 132         | 145 138         | 152 148         | 161 153         | 167             |                 |                 |
|      | 56 31           | 70 36           | 86 37           | 96 43           | 104 43          | 113 49          | 118 56          | 130 62          | 136 69          | 143 77          | 152 84          | 161 91          | 169 100         | 177             |                 |                 |
| 56'  | 51 51           | 63 63           | 76 76           | 83 83           | 90 89           | 94 86           | 103 102         | 114 109         | 117 116         | 129 122         | 136 129         | 141 135         | 148 143         | 158             |                 |                 |
|      | 51 33           | 63 37           | 76 39           | 83 39           | 90 35           | 97 44           | 105 44          | 113 50          | 120 56          | 125 63          | 135 69          | 144 76          | 145 83          | 158 89          | 165             |                 |
| 58'  | 46 46           | 57 57           | 69 68           | 75 75           | 85 83           | 91 90           | 98 95           | 106 102         | 113 108         | 118 114         | 126 121         | 133 126         | 139 133         | 146             |                 |                 |
|      | 46 30           | 57 35           | 68 38           | 75 38           | 85 38           | 91 40           | 98 45           | 106 51          | 113 57          | 123 63          | 131 69          | 139 75          | 150 81          | 153             |                 |                 |
| 60'  | 41 41           | 52 52           | 63 63           | 73 73           | 79 77           | 85 83           | 90 90           | 99 95           | 102 101         | 111 107         | 118 113         | 125 119         | 129 124         | 138             |                 |                 |
|      | 41 32           | 52 36           | 63 40           | 73 43           | 79 43           | 85 43           | 90 41           | 99 46           | 102 51          | 111 57          | 118 63          | 125 69          | 138 75          | 146             |                 |                 |
| 62'  | 37 37           | 47 47           | 57 57           | 68 68           | 75 79           | 80 84           | 85 83           | 92 89           | 97 94           | 106 100         | 110 106         | 116 111         | 122 117         | 127             |                 |                 |
|      | 37 33           | 47 39           | 57 43           | 68 43           | 75 43           | 80 43           | 85 43           | 92 43           | 97 43           | 106 47          | 110 52          | 116 57          | 122 62          | 129 68          | 137             |                 |
| 64'  | 34 34           | 43 43           | 52 52           | 62 62           | 67 73           | 75 80           | 81 85           | 88 91           | 93 88           | 100 94          | 105 98          | 110 104         | 116 110         | 122             |                 |                 |
|      | 34 30           | 43 34           | 52 38           | 62 43           | 67 43           | 75 43           | 81 43           | 88 43           | 93 43           | 100 47          | 105 52          | 110 57          | 116 62          | 122 62          | 126             |                 |
| 66'  | 31 31           | 39 39           | 47 47           | 57 57           | 65 67           | 70 75           | 77 81           | 83 83           | 87 84           | 93 89           | 96 94           | 103 99          | 109 104         | 113             |                 |                 |
|      | 31 31           | 39 39           | 47 47           | 57 57           | 65 67           | 70 75           | 77 81           | 83 83           | 87 84           | 93 89           | 96 94           | 103 99          | 109 104         | 113             |                 |                 |
| 68'  |                 | 36 36           | 43 43           | 50 50           | 61 61           | 67 70           | 73 76           | 77 83           | 83 83           | 87 84           | 93 89           | 97 93           | 102 97          | 108             |                 |                 |
|      |                 | 36 36           | 43 43           | 50 50           | 61 61           | 67 70           | 73 76           | 77 83           | 83 83           | 87 84           | 93 89           | 97 93           | 102 97          | 108             |                 |                 |
| 70'  |                 | 33 33           | 40 40           | 45 45           | 56 56           | 64 64           | 67 71           | 72 76           | 78 82           | 84 84           | 90 86           | 94 90           | 99 94           | 104 104         |                 |                 |
|      |                 | 33 33           | 40 40           | 45 45           | 56 56           | 64 64           | 67 71           | 72 76           | 78 82           | 84 84           | 90 86           | 94 90           | 99 94           | 104 104         |                 |                 |

- See page 5 for available depths and profiles. For depths and profiles not shown, contact your RedBilt technical representative for assistance.
- For spans over 70 feet, see page 32 or contact your RedBilt technical representative.
- Red numbers refer to 115% Total Load (TL).





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Wood Column

Project File: Enercalc NW6thSt.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

**DESCRIPTION:** Wall Studs - Typ. @ 16" o.c.

### Code References

Calculations per NDS 2018, IBC 2021, ASCE 7-16  
Load Combinations Used : ASCE 7-16

### General Information

|                                              |                         |             |            |                     |               |                                   |
|----------------------------------------------|-------------------------|-------------|------------|---------------------|---------------|-----------------------------------|
| Analysis Method                              | Allowable Stress Design |             |            | Wood Section Name   | 2x6           |                                   |
| End Fixities                                 | Top & Bottom Pinned     |             |            | Wood Grading/Manuf. | Graded Lumber |                                   |
| Overall Column Height                        | 14.5 ft                 |             |            | Wood Member Type    | Sawn          |                                   |
| ( Used for non-slender calculations )        |                         |             |            |                     |               |                                   |
| Wood Species                                 | Douglas Fir-Larch       |             |            | Exact Width         | 1.50 in       | Allow Stress Modification Factors |
| Wood Grade                                   | No.2                    |             |            | Exact Depth         | 5.50 in       | Cf or Cv for Bending 1.30         |
| Fb +                                         | 900.0 psi               | Fv          | 180.0 psi  | Area                | 8.250 in^2    | Cf or Cv for Compression 1.10     |
| Fb -                                         | 900.0 psi               | Ft          | 575.0 psi  | Ix                  | 20.797 in^4   | Cf or Cv for Tension 1.30         |
| Fc - Prll                                    | 1,350.0 psi             | Density     | 31.210 pcf | Iy                  | 1.547 in^4    | Cm : Wet Use Factor 1.0           |
| Fc - Perp                                    | 625.0 psi               |             |            |                     |               | Ct : Temperature Fact 1.0         |
| E : Modulus of Elasticity . . .              | x-x Bending             | y-y Bending | Axial      |                     |               | Cfu : Flat Use Factor 1.0         |
|                                              | Basic                   | 1,600.0     | 1,600.0    | 1,600.0 ksi         |               | Kf : Built-up columns 1.0         |
|                                              | Minimum                 | 580.0       | 580.0      |                     |               | Use Cr : Repetitive ? Yes         |
| Column Buckling Condition:                   |                         |             |            |                     |               |                                   |
| ABOUT X-X Axis: Lux = 12.5 ft, Kx = 1.0      |                         |             |            |                     |               |                                   |
| Fully braced against buckling ABOUT Y-Y Axis |                         |             |            |                     |               |                                   |

### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 25.927 lbs \* Dead Load Factor

AXIAL LOADS . . .

Tributary 1.33': Axial Load at 14.50 ft, D = 0.520, Lr = 0.520, S = 0.650, W = 0.590 k

BENDING LOADS . . .

Lat. Uniform Load creating Mx-x, W = 0.0240 k/ft

### DESIGN SUMMARY

#### Bending & Shear Check Results

**PASS** Max. Axial+Bending Stress Ratio = **0.9013 : 1**  
Load Combination +D+0.60W  
Governing NDS Formula Comp + Mxx, NDS Eq. 3.9-3  
Location of max.above base 7.201 ft  
At maximum location values are .  
Applied Axial 0.8999 k  
Applied Mx 0.3784 k-ft  
Applied My 0.0 k-ft  
Fc : Allowable 600.38 psi

#### Maximum SERVICE Lateral Load Reactions . .

|               |          |                  |          |
|---------------|----------|------------------|----------|
| Top along Y-Y | 0.1740 k | Bottom along Y-Y | 0.1740 k |
| Top along X-X | 0.0 k    | Bottom along X-X | 0.0 k    |

#### Maximum SERVICE Load Lateral Deflections . . .

|                                 |           |    |          |            |
|---------------------------------|-----------|----|----------|------------|
| Along Y-Y                       | 0.4351 in | at | 7.299 ft | above base |
| for load combination : +D+0.60W |           |    |          |            |
| Along X-X                       | 0.0 in    | at | 0.0 ft   | above base |
| for load combination : n/a      |           |    |          |            |

#### Other Factors used to calculate allowable stresses . . .

|         |             |         |
|---------|-------------|---------|
| Bending | Compression | Tension |
|---------|-------------|---------|

**PASS** Maximum Shear Stress Ratio = **0.06591 : 1**  
Load Combination +D+0.60W  
Location of max.above base 0.0 ft  
Applied Design Shear 28.473 psi  
Allowable Shear 288.0 psi

### Load Combination Results

| Load Combination  | C <sub>D</sub> | C <sub>P</sub> | Maximum Axial + Bending Stress Ratios |        |          | Maximum Shear Ratios |        |          |
|-------------------|----------------|----------------|---------------------------------------|--------|----------|----------------------|--------|----------|
|                   |                |                | Stress Ratio                          | Status | Location | Stress Ratio         | Status | Location |
| D Only            | 0.900          | 0.419          | 0.1181                                | PASS   | 0.0 ft   | 0.0                  | PASS   | 14.50 ft |
| +D+Lr             | 1.250          | 0.316          | 0.2202                                | PASS   | 0.0 ft   | 0.0                  | PASS   | 14.50 ft |
| +D+S              | 1.150          | 0.340          | 0.2495                                | PASS   | 0.0 ft   | 0.0                  | PASS   | 14.50 ft |
| +D+0.750Lr        | 1.250          | 0.316          | 0.1933                                | PASS   | 0.0 ft   | 0.0                  | PASS   | 14.50 ft |
| +D+0.750S         | 1.150          | 0.340          | 0.2156                                | PASS   | 0.0 ft   | 0.0                  | PASS   | 14.50 ft |
| +D+0.60W          | 1.600          | 0.253          | 0.9013                                | PASS   | 7.201 ft | 0.06591              | PASS   | 0.0 ft   |
| +D+0.750Lr+0.450W | 1.600          | 0.253          | 0.7581                                | PASS   | 7.201 ft | 0.04943              | PASS   | 0.0 ft   |
| +D+0.750S+0.450W  | 1.600          | 0.253          | 0.7852                                | PASS   | 7.201 ft | 0.04943              | PASS   | 0.0 ft   |
| +0.60D+0.60W      | 1.600          | 0.253          | 0.8461                                | PASS   | 7.201 ft | 0.06591              | PASS   | 0.0 ft   |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Wood Column

Project File: Enercalc NW6thSt.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

**DESCRIPTION:** Wall Studs - Typ. @ 16" o.c.

### Load Combination Results

| Load Combination | C <sub>D</sub> | C <sub>P</sub> | Maximum Axial + Bending Stress Ratios |        |          | Maximum Shear Ratios |        |          |
|------------------|----------------|----------------|---------------------------------------|--------|----------|----------------------|--------|----------|
|                  |                |                | Stress Ratio                          | Status | Location | Stress Ratio         | Status | Location |
| +0.60D           | 1.600          | 0.253          | 0.06613                               | PASS   | 0.0 ft   | 0.0                  | PASS   | 14.50 ft |

### Maximum Reactions

Note: Only non-zero reactions are listed.

| Load Combination  | X-X Axis Reaction |       | k | Y-Y Axis Reaction |       | Axial Reaction | My - End Moments |       | Mx - End Moments |       |
|-------------------|-------------------|-------|---|-------------------|-------|----------------|------------------|-------|------------------|-------|
|                   | @ Base            | @ Top |   | @ Base            | @ Top | @ Base         | @ Base           | @ Top | @ Base           | @ Top |
| D Only            |                   |       |   |                   |       | 0.546          |                  |       |                  |       |
| +D+Lr             |                   |       |   |                   |       | 1.066          |                  |       |                  |       |
| +D+S              |                   |       |   |                   |       | 1.196          |                  |       |                  |       |
| +D+0.750Lr        |                   |       |   |                   |       | 0.936          |                  |       |                  |       |
| +D+0.750S         |                   |       |   |                   |       | 1.033          |                  |       |                  |       |
| +D+0.60W          |                   |       |   | 0.104             | 0.104 | 0.900          |                  |       |                  |       |
| +D+0.750Lr+0.450W |                   |       |   | 0.078             | 0.078 | 1.201          |                  |       |                  |       |
| +D+0.750S+0.450W  |                   |       |   | 0.078             | 0.078 | 1.299          |                  |       |                  |       |
| +0.60D+0.60W      |                   |       |   | 0.104             | 0.104 | 0.682          |                  |       |                  |       |
| +0.60D            |                   |       |   |                   |       | 0.328          |                  |       |                  |       |
| Lr Only           |                   |       |   |                   |       | 0.520          |                  |       |                  |       |
| S Only            |                   |       |   |                   |       | 0.650          |                  |       |                  |       |
| W Only            |                   |       |   | 0.174             | 0.174 | 0.590          |                  |       |                  |       |

### Maximum Deflections for Load Combinations

| Load Combination  | Max. X-X Deflection |         | Distance | Max. Y-Y Deflection |         | Distance |
|-------------------|---------------------|---------|----------|---------------------|---------|----------|
|                   |                     |         |          |                     |         |          |
| D Only            | 0.0000 in           | 0.000ft |          | 0.000 in            | 0.000ft |          |
| +D+Lr             | 0.0000 in           | 0.000ft |          | 0.000 in            | 0.000ft |          |
| +D+S              | 0.0000 in           | 0.000ft |          | 0.000 in            | 0.000ft |          |
| +D+0.750Lr        | 0.0000 in           | 0.000ft |          | 0.000 in            | 0.000ft |          |
| +D+0.750S         | 0.0000 in           | 0.000ft |          | 0.000 in            | 0.000ft |          |
| +D+0.60W          | 0.0000 in           | 0.000ft |          | 0.435 in            | 7.299ft |          |
| +D+0.750Lr+0.450W | 0.0000 in           | 0.000ft |          | 0.326 in            | 7.299ft |          |
| +D+0.750S+0.450W  | 0.0000 in           | 0.000ft |          | 0.326 in            | 7.299ft |          |
| +0.60D+0.60W      | 0.0000 in           | 0.000ft |          | 0.435 in            | 7.299ft |          |
| +0.60D            | 0.0000 in           | 0.000ft |          | 0.000 in            | 0.000ft |          |
| Lr Only           | 0.0000 in           | 0.000ft |          | 0.000 in            | 0.000ft |          |
| S Only            | 0.0000 in           | 0.000ft |          | 0.000 in            | 0.000ft |          |
| +0.60W            | 0.0000 in           | 0.000ft |          | 0.435 in            | 7.299ft |          |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Wood Column

Project File: Enercalc NW6thSt.ec6

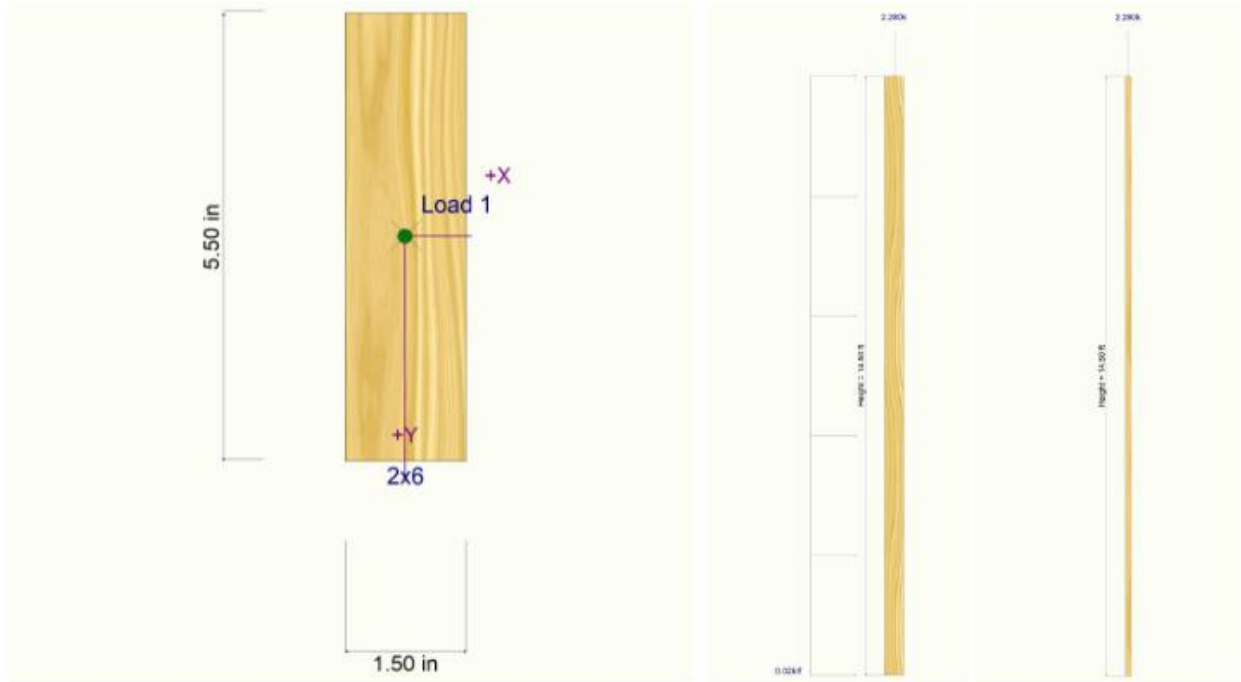
LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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**DESCRIPTION:** Wall Studs - Typ. @ 16" o.c.

### Sketches





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Steel Beam

Project File: enercalc nw6thst\_backup\_1.ec6

LIC#: KW-06014798, Build 20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: BM1

### CODE REFERENCES

Calculations per AISC 360-16, IBC 2021, ASCE 7-16

Load Combination Set: ASCE 7-16

### Material Properties

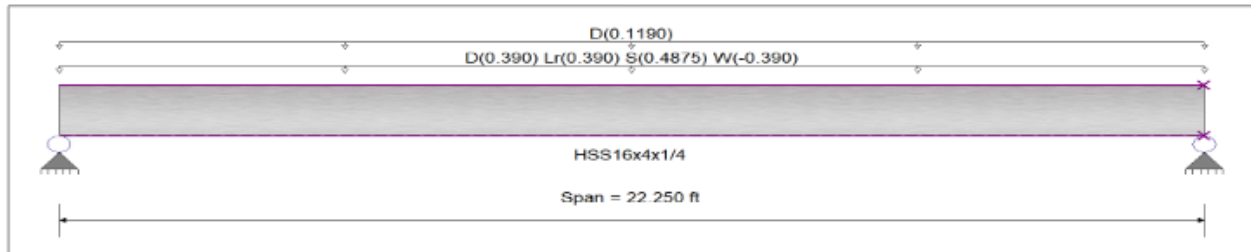
Analysis Method: Allowable Strength Design

Fy: Steel Yield: 46.0 ksi

Beam Bracing: Beam is Fully Braced against lateral-torsional buckling

E: Modulus: 29,000.0 ksi

Bending Axis: Major Axis Bending



### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading

Uniform Load: D = 0.020, Lr = 0.020, S = 0.0250, W = -0.020 ksf, Tributary Width = 19.50 ft, (Roof Load)

Uniform Load: D = 0.0170 ksf, Tributary Width = 7.0 ft, (Parapet Wall Load)

### DESIGN SUMMARY

Design OK

|                                   |  |             |                              |     |             |
|-----------------------------------|--|-------------|------------------------------|-----|-------------|
| Maximum Bending Stress Ratio =    |  | 0.675 : 1   | Maximum Shear Stress Ratio = |     | 0.103 : 1   |
| Section used for this span        |  | HSS16x4x1/4 | Section used for this span   |     | HSS16x4x1/4 |
| Ma : Applied                      |  | 63.685 k-ft | Va : Applied                 |     | 11.449 k    |
| Mn / Omega : Allowable            |  | 94.334 k-ft | Vn/Omega : Allowable         |     | 110.824 k   |
| Load Combination                  |  | +D+S        | Load Combination             |     | +D+S        |
| Span # where maximum occurs       |  | Span # 1    | Location of maximum on span  |     | 0.000 ft    |
| Span # where maximum occurs       |  | Span # 1    | Span # where maximum occurs  |     | Span # 1    |
| Maximum Deflection                |  |             |                              |     |             |
| Max Downward Transient Deflection |  | 0.368 in    | Ratio =                      | 725 | >=360       |
| Max Upward Transient Deflection   |  | -0.294 in   | Ratio =                      | 906 | >=360       |
| Max Downward Total Deflection     |  | 0.777 in    | Ratio =                      | 344 | >=180       |
| Max Upward Total Deflection       |  | 0 in        | Ratio =                      | 0   | <180        |
|                                   |  |             | Span: 1 : S Only             |     |             |
|                                   |  |             | Span: 1 : W Only             |     |             |
|                                   |  |             | Span: 1 : +D+S               |     |             |
|                                   |  |             | n/a                          |     |             |

### Maximum Forces & Stresses for Load Combinations

| Load Combination  | Segment Length | Span # | Max Stress Ratios |       | Summary of Moment Values |        |        |        |           |      |      | Summary of Shear Values |               |        |
|-------------------|----------------|--------|-------------------|-------|--------------------------|--------|--------|--------|-----------|------|------|-------------------------|---------------|--------|
|                   |                |        | M                 | V     | Mmax +                   | Mmax - | Ma Max | Mnx    | Mnx/Omega | Cb   | Rm   | Va Max                  | Vnx/Vnx/Omega |        |
| D Only            |                |        |                   |       |                          |        |        |        |           |      |      |                         |               |        |
| Dsgn. L =         | 22.25 ft       | 1      | 0.355             | 0.054 | 33.52                    |        | 33.52  | 157.54 | 94.33     | 1.00 | 1.00 | 6.03                    | 185.08        | 110.82 |
| +D+Lr             |                |        |                   |       |                          |        |        |        |           |      |      |                         |               |        |
| Dsgn. L =         | 22.25 ft       | 1      | 0.611             | 0.094 | 57.65                    |        | 57.65  | 157.54 | 94.33     | 1.00 | 1.00 | 10.36                   | 185.08        | 110.82 |
| +D+S              |                |        |                   |       |                          |        |        |        |           |      |      |                         |               |        |
| Dsgn. L =         | 22.25 ft       | 1      | 0.675             | 0.103 | 63.69                    |        | 63.69  | 157.54 | 94.33     | 1.00 | 1.00 | 11.45                   | 185.08        | 110.82 |
| +D+0.750Lr        |                |        |                   |       |                          |        |        |        |           |      |      |                         |               |        |
| Dsgn. L =         | 22.25 ft       | 1      | 0.547             | 0.084 | 51.62                    |        | 51.62  | 157.54 | 94.33     | 1.00 | 1.00 | 9.28                    | 185.08        | 110.82 |
| +D+0.750S         |                |        |                   |       |                          |        |        |        |           |      |      |                         |               |        |
| Dsgn. L =         | 22.25 ft       | 1      | 0.595             | 0.091 | 56.14                    |        | 56.14  | 157.54 | 94.33     | 1.00 | 1.00 | 10.09                   | 185.08        | 110.82 |
| +D+0.60W          |                |        |                   |       |                          |        |        |        |           |      |      |                         |               |        |
| Dsgn. L =         | 22.25 ft       | 1      | 0.202             | 0.031 | 19.04                    |        | 19.04  | 157.54 | 94.33     | 1.00 | 1.00 | 3.42                    | 185.08        | 110.82 |
| +D+0.750Lr+0.450W |                |        |                   |       |                          |        |        |        |           |      |      |                         |               |        |
| Dsgn. L =         | 22.25 ft       | 1      | 0.432             | 0.066 | 40.76                    |        | 40.76  | 157.54 | 94.33     | 1.00 | 1.00 | 7.33                    | 185.08        | 110.82 |
| +D+0.750S+0.450W  |                |        |                   |       |                          |        |        |        |           |      |      |                         |               |        |
| Dsgn. L =         | 22.25 ft       | 1      | 0.480             | 0.073 | 45.28                    |        | 45.28  | 157.54 | 94.33     | 1.00 | 1.00 | 8.14                    | 185.08        | 110.82 |
| +0.60D+0.60W      |                |        |                   |       |                          |        |        |        |           |      |      |                         |               |        |
| Dsgn. L =         | 22.25 ft       | 1      | 0.060             | 0.009 | 5.63                     |        | 5.63   | 157.54 | 94.33     | 1.00 | 1.00 | 1.01                    | 185.08        | 110.82 |
| +0.60D            |                |        |                   |       |                          |        |        |        |           |      |      |                         |               |        |
| Dsgn. L =         | 22.25 ft       | 1      | 0.213             | 0.033 | 20.11                    |        | 20.11  | 157.54 | 94.33     | 1.00 | 1.00 | 3.62                    | 185.08        | 110.82 |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Steel Beam

Project File: enercalc nw6thst\_backup\_1.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: BM1

### Overall Maximum Deflections

| Load Combination | Span | Max. "-" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|------------------|------|---------------|------------------|------------------|---------------|------------------|
| +D+S             | 1    | 0.7770        | 11.189           |                  | 0.0000        | 0.000            |

### Vertical Reactions

Support notation : Far left is #

Values in KIPS

| Load Combination                                         | Support 1 | Support 2 |
|----------------------------------------------------------|-----------|-----------|
| Max Upward from all Load Conditions                      | 11.449    | 11.449    |
| Max Upward from Load Combinations                        | 11.449    | 11.449    |
| Max Upward from Load Cases                               | 6.026     | 6.026     |
| Max Downward from all Load Conditions (Resist)           | -4.339    | -4.339    |
| Max Downward from Load Cases (Resisting U <sub>f</sub> ) | -4.339    | -4.339    |
| D Only                                                   | 6.026     | 6.026     |
| +D+Lr                                                    | 10.364    | 10.364    |
| +D+S                                                     | 11.449    | 11.449    |
| +D+0.750Lr                                               | 9.280     | 9.280     |
| +D+0.750S                                                | 10.093    | 10.093    |
| +D+0.60W                                                 | 3.422     | 3.422     |
| +D+0.750Lr+0.450W                                        | 7.327     | 7.327     |
| +D+0.750S+0.450W                                         | 8.141     | 8.141     |
| +0.60D+0.60W                                             | 1.012     | 1.012     |
| +0.60D                                                   | 3.615     | 3.615     |
| Lr Only                                                  | 4.339     | 4.339     |
| S Only                                                   | 5.423     | 5.423     |
| W Only                                                   | -4.339    | -4.339    |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Steel Beam

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

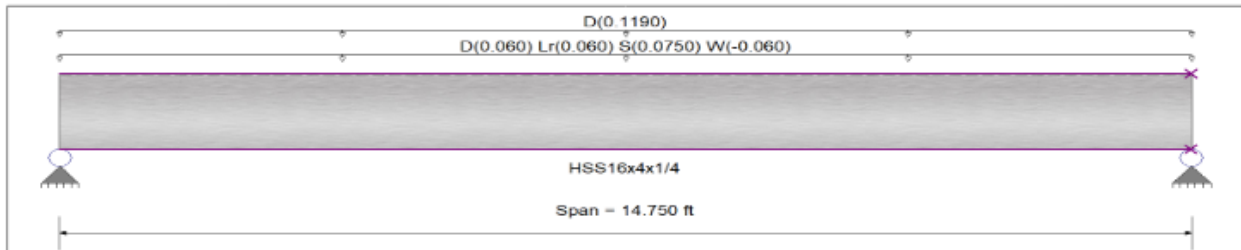
DESCRIPTION: BM2

### CODE REFERENCES

Calculations per AISC 360-16, IBC 2021, ASCE 7-16  
Load Combination Set : ASCE 7-16

### Material Properties

Analysis Method : Allowable Strength Design  
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling  
Bending Axis : Major Axis Bending  
Fy : Steel Yield : 46.0 ksi  
E : Modulus : 29,000.0 ksi



### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading

Uniform Load : D = 0.020, Lr = 0.020, S = 0.0250, W = -0.020 ksf, Tributary Width = 3.0 ft, (Roof Load)

Uniform Load : D = 0.0170 ksf, Tributary Width = 7.0 ft, (Parapet Wall Load)

### DESIGN SUMMARY

Design OK

|                                   |                          |                              |                  |
|-----------------------------------|--------------------------|------------------------------|------------------|
| Maximum Bending Stress Ratio =    | 0.083 : 1                | Maximum Shear Stress Ratio = | 0.019 : 1        |
| Section used for this span        | HSS16x4x1/4              | Section used for this span   | HSS16x4x1/4      |
| Ma : Applied                      | 7.795 k-ft               | Va : Applied                 | 2.114 k          |
| Mn / Omega : Allowable            | 94.334 k-ft              | Vn/Omega : Allowable         | 110.824 k        |
| Load Combination                  | +D+S                     | Load Combination             | +D+S             |
| Span # where maximum occurs       | Span # 1                 | Location of maximum on span  | 0.000 ft         |
| Span # where maximum occurs       | Span # 1                 | Span # where maximum occurs  | Span # 1         |
| Maximum Deflection                |                          |                              |                  |
| Max Downward Transient Deflection | 0.011 in Ratio = 16,184  | >=360                        | Span: 1 : S Only |
| Max Upward Transient Deflection   | -0.009 in Ratio = 20,230 | >=360                        | Span: 1 : W Only |
| Max Downward Total Deflection     | 0.042 in Ratio = 4235    | >=180                        | Span: 1 : +D+S   |
| Max Upward Total Deflection       | 0 in Ratio = 0           | <180                         | n/a              |

### Maximum Forces & Stresses for Load Combinations

| Load Combination   | Segment Length | Span # | Max Stress Ratios |       | Summary of Moment Values |        |        |        |           |      | Summary of Shear Values |        |               |
|--------------------|----------------|--------|-------------------|-------|--------------------------|--------|--------|--------|-----------|------|-------------------------|--------|---------------|
|                    |                |        | M                 | V     | Mmax +                   | Mmax - | Ma Max | Mnx    | Mnx/Omega | Cb   | Rm                      | Va Max | Vnx/Vnx/Omega |
| D Only             |                |        |                   |       |                          |        |        |        |           |      |                         |        |               |
| Dsgn. L = 14.75 ft | 1              |        | 0.061             | 0.014 | 5.76                     |        | 5.76   | 157.54 | 94.33     | 1.00 | 1.00                    | 1.56   | 185.08        |
| +D+Lr              |                |        |                   |       |                          |        |        |        |           |      |                         |        |               |
| Dsgn. L = 14.75 ft | 1              |        | 0.078             | 0.018 | 7.39                     |        | 7.39   | 157.54 | 94.33     | 1.00 | 1.00                    | 2.00   | 185.08        |
| +D+S               |                |        |                   |       |                          |        |        |        |           |      |                         |        |               |
| Dsgn. L = 14.75 ft | 1              |        | 0.083             | 0.019 | 7.79                     |        | 7.79   | 157.54 | 94.33     | 1.00 | 1.00                    | 2.11   | 185.08        |
| +D+0.750Lr         |                |        |                   |       |                          |        |        |        |           |      |                         |        |               |
| Dsgn. L = 14.75 ft | 1              |        | 0.074             | 0.017 | 6.98                     |        | 6.98   | 157.54 | 94.33     | 1.00 | 1.00                    | 1.89   | 185.08        |
| +D+0.750S          |                |        |                   |       |                          |        |        |        |           |      |                         |        |               |
| Dsgn. L = 14.75 ft | 1              |        | 0.077             | 0.018 | 7.29                     |        | 7.29   | 157.54 | 94.33     | 1.00 | 1.00                    | 1.98   | 185.08        |
| +D+0.60W           |                |        |                   |       |                          |        |        |        |           |      |                         |        |               |
| Dsgn. L = 14.75 ft | 1              |        | 0.051             | 0.012 | 4.78                     |        | 4.78   | 157.54 | 94.33     | 1.00 | 1.00                    | 1.30   | 185.08        |
| +D+0.750Lr+0.450W  |                |        |                   |       |                          |        |        |        |           |      |                         |        |               |
| Dsgn. L = 14.75 ft | 1              |        | 0.066             | 0.015 | 6.24                     |        | 6.24   | 157.54 | 94.33     | 1.00 | 1.00                    | 1.69   | 185.08        |
| +D+0.750S+0.450W   |                |        |                   |       |                          |        |        |        |           |      |                         |        |               |
| Dsgn. L = 14.75 ft | 1              |        | 0.069             | 0.016 | 6.55                     |        | 6.55   | 157.54 | 94.33     | 1.00 | 1.00                    | 1.78   | 185.08        |
| +0.60D+0.60W       |                |        |                   |       |                          |        |        |        |           |      |                         |        |               |
| Dsgn. L = 14.75 ft | 1              |        | 0.026             | 0.006 | 2.47                     |        | 2.47   | 157.54 | 94.33     | 1.00 | 1.00                    | 0.67   | 185.08        |
| +0.60D             |                |        |                   |       |                          |        |        |        |           |      |                         |        |               |
| Dsgn. L = 14.75 ft | 1              |        | 0.037             | 0.008 | 3.45                     |        | 3.45   | 157.54 | 94.33     | 1.00 | 1.00                    | 0.94   | 185.08        |





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Steel Beam

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

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**DESCRIPTION: BM2**

### Overall Maximum Deflections

| Load Combination | Span | Max. "-" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|------------------|------|---------------|------------------|------------------|---------------|------------------|
| +D+S             | 1    | 0.0418        | 7.417            |                  | 0.0000        | 0.000            |

### Vertical Reactions

| Load Combination                                       | Support 1 | Support 2 |
|--------------------------------------------------------|-----------|-----------|
| Max Upward from all Load Conditions                    | 2.114     | 2.114     |
| Max Upward from Load Combinations                      | 2.114     | 2.114     |
| Max Upward from Load Cases                             | 1.561     | 1.561     |
| Max Downward from all Load Conditions (Resi            | -0.443    | -0.443    |
| Max Downward from Load Cases (Resisting U <sub>f</sub> | -0.443    | -0.443    |
| D Only                                                 | 1.561     | 1.561     |
| +D+Lr                                                  | 2.003     | 2.003     |
| +D+S                                                   | 2.114     | 2.114     |
| +D+0.750Lr                                             | 1.893     | 1.893     |
| +D+0.750S                                              | 1.976     | 1.976     |
| +D+0.60W                                               | 1.295     | 1.295     |
| +D+0.750Lr+0.450W                                      | 1.694     | 1.694     |
| +D+0.750S+0.450W                                       | 1.776     | 1.776     |
| +0.60D+0.60W                                           | 0.671     | 0.671     |
| +0.60D                                                 | 0.936     | 0.936     |
| Lr Only                                                | 0.443     | 0.443     |
| S Only                                                 | 0.553     | 0.553     |
| W Only                                                 | -0.443    | -0.443    |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Wood Beam

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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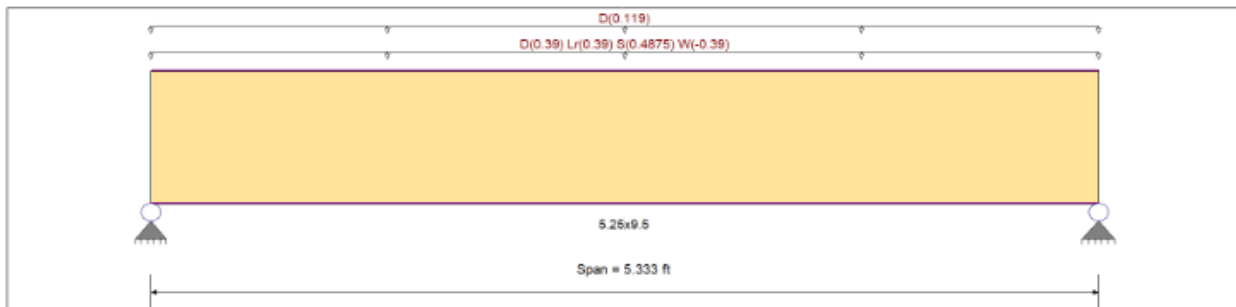
DESCRIPTION: HDR1

### CODE REFERENCES

Calculations per NDS 2018, IBC 2021, ASCE 7-16  
Load Combination Set : ASCE 7-16

### Material Properties

|                    |                                                         |           |             |                           |             |
|--------------------|---------------------------------------------------------|-----------|-------------|---------------------------|-------------|
| Analysis Method :  | Allowable Stress Design                                 | Fb +      | 2,900.0 psi | E : Modulus of Elasticity |             |
| Load Combination : | ASCE 7-16                                               | Fb -      | 2,900.0 psi | Ebend- xx                 | 2,000.0ksi  |
|                    |                                                         | Fc - Prll | 2,635.0 psi | Eminbend - xx             | 1,036.83ksi |
| Wood Species :     | RedBuilt                                                | Fc - Perp | 750.0 psi   |                           |             |
| Wood Grade :       | RedLam LVL Beam/Joist                                   | Fv        | 285.0 psi   |                           |             |
|                    |                                                         | Ft        | 1,660.0 psi | Density                   | 42.010pcf   |
| Beam Bracing :     | Beam is Fully Braced against lateral-torsional buckling |           |             |                           |             |



### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading

Uniform Load : D = 0.020, Lr = 0.020, S = 0.0250, W = -0.020 ksf, Tributary Width = 19.50 ft, (Roof Load)

Uniform Load : D = 0.0170 ksf, Tributary Width = 7.0 ft, (Parapet Load)

### DESIGN SUMMARY

|                                   |           |             |             | Design OK                   |   |            |   |
|-----------------------------------|-----------|-------------|-------------|-----------------------------|---|------------|---|
| Maximum Bending Stress Ratio      | =         | 0.160       | 1           | Maximum Shear Stress Ratio  | = | 0.175      | 1 |
| Section used for this span        |           | 5.25x9.5    |             | Section used for this span  |   | 5.25x9.5   |   |
| fb: Actual                        | =         | 546.20psi   |             | fv: Actual                  | = | 57.41 psi  |   |
| F'b                               | =         | 3,422.61psi |             | F'v                         | = | 327.75 psi |   |
| Load Combination                  |           | +D+S        |             | Load Combination            |   | +D+S       |   |
| Location of maximum on span       | =         | 2.667ft     |             | Location of maximum on span | = | 4.554 ft   |   |
| Span # where maximum occurs       | =         | Span # 1    |             | Span # where maximum occurs | = | Span # 1   |   |
| Maximum Deflection                |           |             |             |                             |   |            |   |
| Max Downward Transient Deflection | 0.012 in  | Ratio =     | 5379 >= 360 | Span: 1 : S Only            |   |            |   |
| Max Upward Transient Deflection   | -0.010 in | Ratio =     | 6724 >= 360 | Span: 1 : W Only            |   |            |   |
| Max Downward Total Deflection     | 0.025 in  | Ratio =     | 2593 >= 180 | Span: 1 : +D+S              |   |            |   |
| Max Upward Total Deflection       | 0 in      | Ratio =     | 0 < 180     | n/a                         |   |            |   |

### Maximum Forces & Stresses for Load Combinations

| Load Combination  |        | Max Stress Ratios |       |      |      |                |      |                |                 |                |                | Moment Values |       |         | Shear Values |      |       |
|-------------------|--------|-------------------|-------|------|------|----------------|------|----------------|-----------------|----------------|----------------|---------------|-------|---------|--------------|------|-------|
| Segment Length    | Span # | M                 | V     | CD   | CM   | C <sub>t</sub> | CLx  | C <sub>F</sub> | C <sub>fu</sub> | C <sub>i</sub> | C <sub>r</sub> | M             | fb    | Fb      | V            | fv   | F'v   |
| D Only            |        |                   |       |      |      |                |      |                |                 |                |                |               |       | 0.0     | 0.00         | 0.0  | 0.0   |
| Length = 5.333 ft | 1      | 0.106             | 0.116 | 0.90 | 1.00 | 1.00           | 1.00 | 1.026          | 1.00            | 1.00           | 1.00           | 1.86          | 282.8 | 2,678.6 | 0.99         | 29.7 | 256.5 |
| +D+Lr             |        |                   |       |      |      |                |      |                |                 |                |                |               |       | 0.0     | 0.00         | 0.0  | 0.0   |
| Length = 5.333 ft | 1      | 0.133             | 0.146 | 1.25 | 1.00 | 1.00           | 1.00 | 1.026          | 1.00            | 1.00           | 1.00           | 3.25          | 493.5 | 3,720.2 | 1.72         | 51.9 | 356.3 |
| +D+S              |        |                   |       |      |      |                |      |                |                 |                |                |               |       | 0.0     | 0.00         | 0.0  | 0.0   |
| Length = 5.333 ft | 1      | 0.160             | 0.175 | 1.15 | 1.00 | 1.00           | 1.00 | 1.026          | 1.00            | 1.00           | 1.00           | 3.59          | 546.2 | 3,422.6 | 1.91         | 57.4 | 327.8 |
| +D+0.750Lr        |        |                   |       |      |      |                |      |                |                 |                |                |               |       | 0.0     | 0.00         | 0.0  | 0.0   |
| Length = 5.333 ft | 1      | 0.119             | 0.130 | 1.25 | 1.00 | 1.00           | 1.00 | 1.026          | 1.00            | 1.00           | 1.00           | 2.90          | 440.9 | 3,720.2 | 1.54         | 46.3 | 356.3 |
| +D+0.750S         |        |                   |       |      |      |                |      |                |                 |                |                |               |       | 0.0     | 0.00         | 0.0  | 0.0   |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### Wood Beam

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: HDR1

### Maximum Forces & Stresses for Load Combinations

| Load Combination  | Segment Length | Span # | Max Stress Ratios |      |      |      |                |       |                |                 |                |                | Moment Values |                |                | Shear Values |                |                |
|-------------------|----------------|--------|-------------------|------|------|------|----------------|-------|----------------|-----------------|----------------|----------------|---------------|----------------|----------------|--------------|----------------|----------------|
|                   |                |        | M                 | V    | CD   | CM   | C <sub>t</sub> | CLx   | C <sub>F</sub> | C <sub>fu</sub> | C <sub>i</sub> | C <sub>r</sub> | M             | f <sub>b</sub> | F <sub>b</sub> | V            | f <sub>v</sub> | F <sub>v</sub> |
| Length = 5.333 ft | 1              | 0.140  | 0.154             | 1.15 | 1.00 | 1.00 | 1.00           | 1.026 | 1.00           | 1.00            | 1.00           | 1.00           | 3.16          | 480.4          | 3,422.6        | 1.68         | 50.5           | 327.8          |
| +D+0.60W          |                |        |                   |      |      | 1.00 | 1.00           | 1.00  | 1.026          | 1.00            | 1.00           | 1.00           |               |                | 0.0            | 0.00         | 0.0            | 0.0            |
| Length = 5.333 ft | 1              | 0.033  | 0.036             | 1.60 | 1.00 | 1.00 | 1.00           | 1.026 | 1.00           | 1.00            | 1.00           | 1.00           | 1.03          | 156.4          | 4,761.9        | 0.55         | 16.4           | 456.0          |
| +D+0.750Lr+0.450W |                |        |                   |      |      | 1.00 | 1.00           | 1.00  | 1.026          | 1.00            | 1.00           | 1.00           |               |                | 0.0            | 0.00         | 0.0            | 0.0            |
| Length = 5.333 ft | 1              | 0.073  | 0.080             | 1.60 | 1.00 | 1.00 | 1.00           | 1.026 | 1.00           | 1.00            | 1.00           | 1.00           | 2.28          | 346.0          | 4,761.9        | 1.21         | 36.4           | 456.0          |
| +D+0.750S+0.450W  |                |        |                   |      |      | 1.00 | 1.00           | 1.00  | 1.026          | 1.00            | 1.00           | 1.00           |               |                | 0.0            | 0.00         | 0.0            | 0.0            |
| Length = 5.333 ft | 1              | 0.081  | 0.089             | 1.60 | 1.00 | 1.00 | 1.00           | 1.026 | 1.00           | 1.00            | 1.00           | 1.00           | 2.54          | 385.5          | 4,761.9        | 1.35         | 40.5           | 456.0          |
| +0.60D+0.60W      |                |        |                   |      |      | 1.00 | 1.00           | 1.00  | 1.026          | 1.00            | 1.00           | 1.00           |               |                | 0.0            | 0.00         | 0.0            | 0.0            |
| Length = 5.333 ft | 1              | 0.009  | 0.010             | 1.60 | 1.00 | 1.00 | 1.00           | 1.026 | 1.00           | 1.00            | 1.00           | 1.00           | 0.28          | 43.3           | 4,761.9        | 0.15         | 4.5            | 456.0          |
| +0.60D            |                |        |                   |      |      | 1.00 | 1.00           | 1.00  | 1.026          | 1.00            | 1.00           | 1.00           |               |                | 0.0            | 0.00         | 0.0            | 0.0            |
| Length = 5.333 ft | 1              | 0.036  | 0.039             | 1.60 | 1.00 | 1.00 | 1.00           | 1.026 | 1.00           | 1.00            | 1.00           | 1.00           | 1.12          | 169.7          | 4,761.9        | 0.59         | 17.8           | 456.0          |

### Overall Maximum Deflections

| Load Combination | Span | Max. "-" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|------------------|------|---------------|------------------|------------------|---------------|------------------|
| +D+S             | 1    | 0.0247        | 2.686            |                  | 0.0000        | 0.000            |

### Vertical Reactions

Support notation : Far left is #1

Values in KIPS

| Load Combination                      | Support 1 | Support 2 |
|---------------------------------------|-----------|-----------|
| Max Upward from all Load Conditions   | 2.696     | 2.696     |
| Max Upward from Load Combinations     | 2.696     | 2.696     |
| Max Upward from Load Cases            | 1.396     | 1.396     |
| Max Downward from all Load Conditions | -1.040    | -1.040    |
| Max Downward from Load Cases (Resis)  | -1.040    | -1.040    |
| D Only                                | 1.396     | 1.396     |
| +D+Lr                                 | 2.436     | 2.436     |
| +D+S                                  | 2.696     | 2.696     |
| +D+0.750Lr                            | 2.176     | 2.176     |
| +D+0.750S                             | 2.371     | 2.371     |
| +D+0.60W                              | 0.772     | 0.772     |
| +D+0.750Lr+0.450W                     | 1.708     | 1.708     |
| +D+0.750S+0.450W                      | 1.903     | 1.903     |
| +0.60D+0.60W                          | 0.214     | 0.214     |
| +0.60D                                | 0.838     | 0.838     |
| Lr Only                               | 1.040     | 1.040     |
| S Only                                | 1.300     | 1.300     |
| W Only                                | -1.040    | -1.040    |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Wood Beam

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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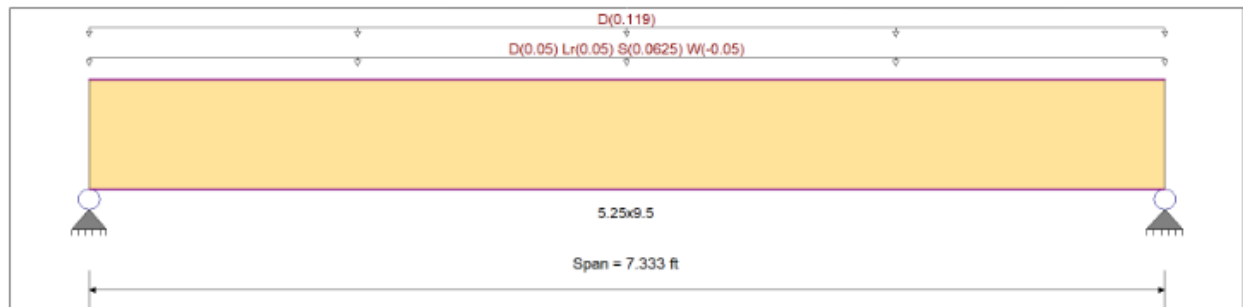
DESCRIPTION: HDR2

### CODE REFERENCES

Calculations per NDS 2018, IBC 2021, ASCE 7-16  
Load Combination Set : ASCE 7-16

### Material Properties

|                    |                                                         |           |             |                           |             |
|--------------------|---------------------------------------------------------|-----------|-------------|---------------------------|-------------|
| Analysis Method :  | Allowable Stress Design                                 | Fb +      | 2,900.0 psi | E : Modulus of Elasticity |             |
| Load Combination : | ASCE 7-16                                               | Fb -      | 2,900.0 psi | Ebend- xx                 | 2,000.0ksi  |
|                    |                                                         | Fc - Prll | 2,635.0 psi | Eminbend - xx             | 1,036.83ksi |
| Wood Species :     | RedBuilt                                                | Fc - Perp | 750.0 psi   |                           |             |
| Wood Grade :       | RedLam LVL Beam/Joist                                   | Fv        | 285.0 psi   |                           |             |
|                    |                                                         | Ft        | 1,660.0 psi | Density                   | 42.010pcf   |
| Beam Bracing :     | Beam is Fully Braced against lateral-torsional buckling |           |             |                           |             |



### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading  
Uniform Load : D = 0.020, Lr = 0.020, S = 0.0250, W = -0.020 ksf, Tributary Width = 2.50 ft, (Roof Load)  
Uniform Load : D = 0.0170 ksf, Tributary Width = 7.0 ft, (Parapet Load)

### DESIGN SUMMARY

Design OK

|                                   |   |              |               |                             |                  |            |     |
|-----------------------------------|---|--------------|---------------|-----------------------------|------------------|------------|-----|
| Maximum Bending Stress Ratio      | = | 0.073        | 1             | Maximum Shear Stress Ratio  | =                | 0.065      | : 1 |
| Section used for this span        |   | 5.25x9.5     |               | Section used for this span  |                  | 5.25x9.5   |     |
| fb: Actual                        | = | 251.32 psi   |               | fv: Actual                  | =                | 21.39 psi  |     |
| F'b                               | = | 3,422.61 psi |               | F'v                         | =                | 327.75 psi |     |
| Load Combination                  |   | +D+S         |               | Load Combination            |                  | +D+S       |     |
| Location of maximum on span       | = | 3.667 ft     |               | Location of maximum on span | =                | 6.557 ft   |     |
| Span # where maximum occurs       | = | Span # 1     |               | Span # where maximum occurs | =                | Span # 1   |     |
| Maximum Deflection                |   |              |               |                             |                  |            |     |
| Max Downward Transient Deflection |   | 0.005 in     | Ratio = 16140 | >=360                       | Span: 1 : S Only |            |     |
| Max Upward Transient Deflection   |   | -0.004 in    | Ratio = 20175 | >=360                       | Span: 1 : W Only |            |     |
| Max Downward Total Deflection     |   | 0.021 in     | Ratio = 4099  | >=180                       | Span: 1 : +D+S   |            |     |
| Max Upward Total Deflection       |   | 0 in         | Ratio = 0     | <180                        | n/a              |            |     |

### Maximum Forces & Stresses for Load Combinations

| Load Combination  | Segment Length | Span # | Max Stress Ratios |       |      |      |      |      |       |      |      |      | Moment Values |       |         | Shear Values |      |       |
|-------------------|----------------|--------|-------------------|-------|------|------|------|------|-------|------|------|------|---------------|-------|---------|--------------|------|-------|
|                   |                |        | M                 | V     | CD   | CM   | Ct   | CLx  | Cp    | Cfu  | Ci   | Cr   | M             | fb    | Fb      | V            | fv   | Fv    |
| D Only            |                |        |                   |       |      |      |      |      |       |      |      |      |               |       | 0.0     | 0.00         | 0.0  | 0.0   |
| Length = 7.333 ft | 1              |        | 0.070             | 0.062 | 0.90 | 1.00 | 1.00 | 1.00 | 1.026 | 1.00 | 1.00 | 1.00 | 1.23          | 187.5 | 2,678.6 | 0.53         | 16.0 | 256.5 |
| +D+Lr             |                |        |                   |       |      |      |      |      |       |      |      |      |               |       | 0.0     | 0.00         | 0.0  | 0.0   |
| Length = 7.333 ft | 1              |        | 0.064             | 0.057 | 1.25 | 1.00 | 1.00 | 1.00 | 1.026 | 1.00 | 1.00 | 1.00 | 1.57          | 238.6 | 3,720.2 | 0.68         | 20.3 | 356.3 |
| +D+S              |                |        |                   |       |      |      |      |      |       |      |      |      |               |       | 0.0     | 0.00         | 0.0  | 0.0   |
| Length = 7.333 ft | 1              |        | 0.073             | 0.065 | 1.15 | 1.00 | 1.00 | 1.00 | 1.026 | 1.00 | 1.00 | 1.00 | 1.65          | 251.3 | 3,422.6 | 0.71         | 21.4 | 327.8 |
| +D+0.750Lr        |                |        |                   |       |      |      |      |      |       |      |      |      |               |       | 0.0     | 0.00         | 0.0  | 0.0   |
| Length = 7.333 ft | 1              |        | 0.061             | 0.054 | 1.25 | 1.00 | 1.00 | 1.00 | 1.026 | 1.00 | 1.00 | 1.00 | 1.49          | 225.8 | 3,720.2 | 0.64         | 19.2 | 356.3 |
| +D+0.750S         |                |        |                   |       |      |      |      |      |       |      |      |      |               |       | 0.0     | 0.00         | 0.0  | 0.0   |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Wood Beam

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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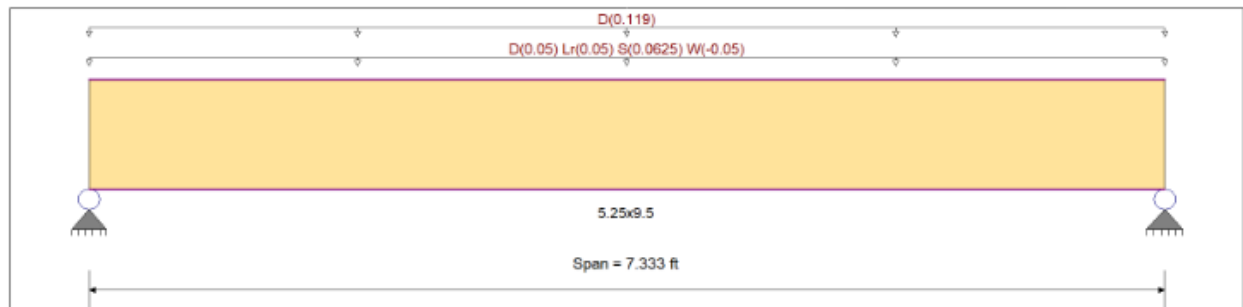
DESCRIPTION: HDR2

### CODE REFERENCES

Calculations per NDS 2018, IBC 2021, ASCE 7-16  
Load Combination Set : ASCE 7-16

### Material Properties

|                    |                                                         |           |             |                           |             |
|--------------------|---------------------------------------------------------|-----------|-------------|---------------------------|-------------|
| Analysis Method :  | Allowable Stress Design                                 | Fb +      | 2,900.0 psi | E : Modulus of Elasticity |             |
| Load Combination : | ASCE 7-16                                               | Fb -      | 2,900.0 psi | Ebend- xx                 | 2,000.0ksi  |
|                    |                                                         | Fc - Prll | 2,635.0 psi | Eminbend - xx             | 1,036.83ksi |
| Wood Species :     | RedBuilt                                                | Fc - Perp | 750.0 psi   |                           |             |
| Wood Grade :       | RedLam LVL Beam/Joist                                   | Fv        | 285.0 psi   |                           |             |
|                    |                                                         | Ft        | 1,660.0 psi | Density                   | 42.010pcf   |
| Beam Bracing :     | Beam is Fully Braced against lateral-torsional buckling |           |             |                           |             |



### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading  
Uniform Load : D = 0.020, Lr = 0.020, S = 0.0250, W = -0.020 ksf, Tributary Width = 2.50 ft, (Roof Load)  
Uniform Load : D = 0.0170 ksf, Tributary Width = 7.0 ft, (Parapet Load)

### DESIGN SUMMARY

Design OK

|                                   |   |              |               |                             |                  |            |     |
|-----------------------------------|---|--------------|---------------|-----------------------------|------------------|------------|-----|
| Maximum Bending Stress Ratio      | = | 0.073        | 1             | Maximum Shear Stress Ratio  | =                | 0.065      | : 1 |
| Section used for this span        |   | 5.25x9.5     |               | Section used for this span  |                  | 5.25x9.5   |     |
| fb: Actual                        | = | 251.32 psi   |               | fv: Actual                  | =                | 21.39 psi  |     |
| F'b                               | = | 3,422.61 psi |               | F'v                         | =                | 327.75 psi |     |
| Load Combination                  |   | +D+S         |               | Load Combination            |                  | +D+S       |     |
| Location of maximum on span       | = | 3.667 ft     |               | Location of maximum on span | =                | 6.557 ft   |     |
| Span # where maximum occurs       | = | Span # 1     |               | Span # where maximum occurs | =                | Span # 1   |     |
| Maximum Deflection                |   |              |               |                             |                  |            |     |
| Max Downward Transient Deflection |   | 0.005 in     | Ratio = 16140 | >=360                       | Span: 1 : S Only |            |     |
| Max Upward Transient Deflection   |   | -0.004 in    | Ratio = 20175 | >=360                       | Span: 1 : W Only |            |     |
| Max Downward Total Deflection     |   | 0.021 in     | Ratio = 4099  | >=180                       | Span: 1 : +D+S   |            |     |
| Max Upward Total Deflection       |   | 0 in         | Ratio = 0     | <180                        | n/a              |            |     |

### Maximum Forces & Stresses for Load Combinations

| Load Combination  |        | Max Stress Ratios |       |      |      |      |                |       |                |                 |                | Moment Values  |       |         | Shear Values |      |       |     |
|-------------------|--------|-------------------|-------|------|------|------|----------------|-------|----------------|-----------------|----------------|----------------|-------|---------|--------------|------|-------|-----|
| Segment           | Length | Span #            | M     | V    | CD   | CM   | C <sub>t</sub> | CLx   | C <sub>F</sub> | C <sub>fu</sub> | C <sub>i</sub> | C <sub>r</sub> | M     | fb      | F'b          | V    | fv    | F'v |
| D Only            |        |                   |       |      |      |      |                |       |                |                 |                |                |       |         |              |      |       |     |
| Length = 7.333 ft | 1      | 0.070             | 0.062 | 0.90 | 1.00 | 1.00 | 1.00           | 1.026 | 1.00           | 1.00            | 1.00           | 1.23           | 187.5 | 2,678.6 | 0.53         | 16.0 | 256.5 |     |
| +D+Lr             |        |                   |       |      |      |      |                |       |                |                 |                |                |       |         |              |      |       |     |
| Length = 7.333 ft | 1      | 0.064             | 0.057 | 1.25 | 1.00 | 1.00 | 1.00           | 1.026 | 1.00           | 1.00            | 1.00           | 1.57           | 238.6 | 3,720.2 | 0.68         | 20.3 | 356.3 |     |
| +D+S              |        |                   |       |      |      |      |                |       |                |                 |                |                |       |         |              |      |       |     |
| Length = 7.333 ft | 1      | 0.073             | 0.065 | 1.15 | 1.00 | 1.00 | 1.00           | 1.026 | 1.00           | 1.00            | 1.00           | 1.65           | 251.3 | 3,422.6 | 0.71         | 21.4 | 327.8 |     |
| +D+0.750Lr        |        |                   |       |      |      |      |                |       |                |                 |                |                |       |         |              |      |       |     |
| Length = 7.333 ft | 1      | 0.061             | 0.054 | 1.25 | 1.00 | 1.00 | 1.00           | 1.026 | 1.00           | 1.00            | 1.00           | 1.49           | 225.8 | 3,720.2 | 0.64         | 19.2 | 356.3 |     |
| +D+0.750S         |        |                   |       |      |      |      |                |       |                |                 |                |                |       |         |              |      |       |     |

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### Wood Beam

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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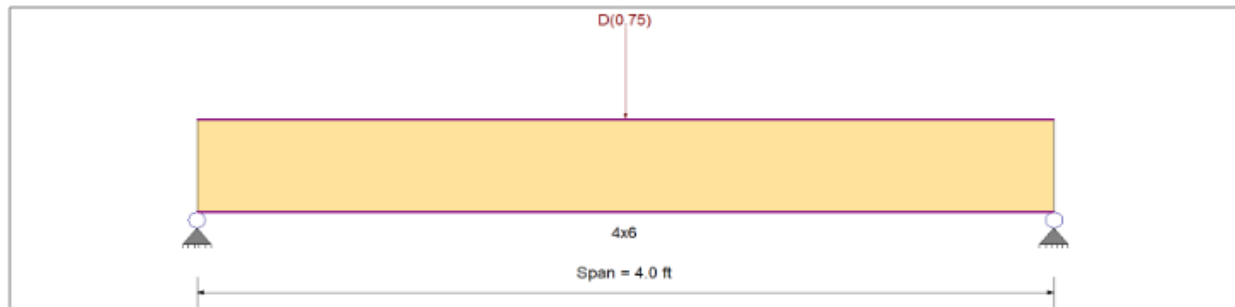
### DESCRIPTION: RTU BLOCKING

### CODE REFERENCES

Calculations per NDS 2018, IBC 2021, ASCE 7-16  
 Load Combination Set : ASCE 7-16

### Material Properties

|                    |                                                         |           |             |                           |            |
|--------------------|---------------------------------------------------------|-----------|-------------|---------------------------|------------|
| Analysis Method :  | Allowable Stress Design                                 | Fb +      | 900.0 psi   | E : Modulus of Elasticity |            |
| Load Combination : | ASCE 7-16                                               | Fb -      | 900.0 psi   | Ebend- xx                 | 1,600.0ksi |
|                    |                                                         | Fc - Prll | 1,350.0 psi | Eminbend - xx             | 580.0ksi   |
| Wood Species :     | Douglas Fir-Larch                                       | Fc - Perp | 625.0 psi   |                           |            |
| Wood Grade :       | No.2                                                    | Fv        | 180.0 psi   |                           |            |
|                    |                                                         | Ft        | 575.0 psi   | Density                   | 31.210pcf  |
| Beam Bracing :     | Beam is Fully Braced against lateral-torsional buckling |           |             |                           |            |



### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added  
 Point Load : D = 0.750 k @ 2.0 ft, (approx. 3K RTU / 4 corners = 0.75K)

### DESIGN SUMMARY

|                                   |          |             |             | Design OK                   |   |            |   |
|-----------------------------------|----------|-------------|-------------|-----------------------------|---|------------|---|
| Maximum Bending Stress Ratio      | =        | 0.484       | 1           | Maximum Shear Stress Ratio  | = | 0.180      | 1 |
| Section used for this span        |          | 4x6         |             | Section used for this span  |   | 4x6        |   |
| fb: Actual                        | =        | 510.04psi   |             | fv: Actual                  | = | 29.22 psi  |   |
| F'b                               | =        | 1,053.00psi |             | F'v                         | = | 162.00 psi |   |
| Load Combination                  |          | D Only      |             | Load Combination            |   | D Only     |   |
| Location of maximum on span       | =        | 2.000ft     |             | Location of maximum on span | = | 0.000ft    |   |
| Span # where maximum occurs       | =        | Span # 1    |             | Span # where maximum occurs | = | Span # 1   |   |
| <b>Maximum Deflection</b>         |          |             |             |                             |   |            |   |
| Max Downward Transient Deflection | 0 in     | Ratio =     | 0 < 360     | n/a                         |   |            |   |
| Max Upward Transient Deflection   | 0 in     | Ratio =     | 0 < 360     | n/a                         |   |            |   |
| Max Downward Total Deflection     | 0.022 in | Ratio =     | 2144 >= 180 | Span: 1 : D Only            |   |            |   |
| Max Upward Total Deflection       | 0 in     | Ratio =     | 0 < 180     | n/a                         |   |            |   |

### Maximum Forces & Stresses for Load Combinations

| Load Combination |        | Max Stress Ratios |       |      |      |                |      |                |                 |                |                | Moment Values |       |         | Shear Values |      |       |
|------------------|--------|-------------------|-------|------|------|----------------|------|----------------|-----------------|----------------|----------------|---------------|-------|---------|--------------|------|-------|
| Segment Length   | Span # | M                 | V     | CD   | CM   | C <sub>t</sub> | CLx  | C <sub>F</sub> | C <sub>fu</sub> | C <sub>i</sub> | C <sub>r</sub> | M             | fb    | F'b     | V            | fv   | F'v   |
| D Only           |        |                   |       |      |      |                |      |                |                 |                |                |               |       | 0.0     | 0.00         | 0.0  | 0.0   |
| Length = 4.0 ft  | 1      | 0.484             | 0.180 | 0.90 | 1.00 | 1.00           | 1.00 | 1.300          | 1.00            | 1.00           | 1.00           | 0.75          | 510.0 | 1,053.0 | 0.38         | 29.2 | 162.0 |
| +0.60D           |        |                   |       |      |      |                |      |                |                 |                |                |               |       | 0.0     | 0.00         | 0.0  | 0.0   |
| Length = 4.0 ft  | 1      | 0.163             | 0.061 | 1.60 | 1.00 | 1.00           | 1.00 | 1.300          | 1.00            | 1.00           | 1.00           | 0.45          | 306.0 | 1,872.0 | 0.23         | 17.5 | 288.0 |

### Overall Maximum Deflections

| Load Combination | Span | Max. "-" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|------------------|------|---------------|------------------|------------------|---------------|------------------|
| D Only           | 1    | 0.0224        | 2.000            |                  | 0.0000        | 0.000            |

### Vertical Reactions

Support notation : Far left is #1

Values in KIPS

| Load Combination                    | Support 1 | Support 2 |
|-------------------------------------|-----------|-----------|
| Max Upward from all Load Conditions | 0.375     | 0.375     |





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Wood Beam

Project File: Enercalc NW6thSt.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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**DESCRIPTION:** RTU BLOCKING

### Vertical Reactions

Support notation : Far left is #1

Values in KIPS

| Load Combination                  | Support 1 | Support 2 |
|-----------------------------------|-----------|-----------|
| Max Upward from Load Combinations | 0.225     | 0.225     |
| Max Upward from Load Cases        | 0.375     | 0.375     |
| D Only                            | 0.375     | 0.375     |
| +0.60D                            | 0.225     | 0.225     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### Steel Column

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: Column C1

### Code References

Calculations per AISC 360-16, IBC 2021, ASCE 7-16  
 Load Combinations Used : IBC 2021

### General Information

Steel Section Name : HSS4x4x1/4  
 Analysis Method : Allowable Strength  
 Steel Stress Grade  
 Fy : Steel Yield 46.0 ksi  
 E : Elastic Bending Modulus 29,000.0 ksi  
 Overall Column Height 13.330 ft  
 Top & Bottom Fixity Top & Bottom Pinned  
 Brace condition :  
 Unbraced Length for buckling ABOUT X-X Axis = 13.330 ft, K = 1.0  
 Unbraced Length for buckling ABOUT Y-Y Axis = 10 ft, K = 1.0

### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 162.759 lbs \* Dead Load Factor  
 AXIAL LOADS ...  
 Axial Load at 13.330 ft, Xecc = 4.0 in, D = 3.120, LR = 0.880, S = 1.10, W = 0.880 k  
 BENDING LOADS ...  
 Lat. Uniform Load creating Mx-x, W = 0.1250 k/ft

### DESIGN SUMMARY

#### Bending & Shear Check Results

**PASS** Max. Axial+Bending Stress Ratio = **0.2596** : 1  
 Load Combination +D+0.60W  
 Location of max.above base 7.873 ft  
 At maximum location values are ...  
 Pa : Axial 3.811 k  
 Pn / Omega : Allowable 44.069 k  
 Ma-x : Applied 1.611 k-ft  
 Mn-x / Omega : Allowable 10.765 k-ft  
 Ma-y : Applied -0.7182 k-ft  
 Mn-y / Omega : Allowable 10.765 k-ft

**Maximum Load Reactions** . .  
 Top along X-X 0.1086 k  
 Bottom along X-X 0.1086 k  
 Top along Y-Y 0.8331 k  
 Bottom along Y-Y 0.8331 k

**Maximum Load Deflections** . . .  
 Along Y-Y 0.3968 in at 6.710 ft above base  
 for load combination : W Only  
 Along X-X -0.1271 in at 7.783 ft above base  
 for load combination : +D+0.750S+0.450W

**PASS** Maximum Shear Stress Ratio = **0.01966** : 1  
 Load Combination +D+0.60W  
 Location of max.above base 0.0 ft  
 At maximum location values are ...  
 Va : Applied 0.4999 k  
 Vn / Omega : Allowable 25.423 k

### Load Combination Results

| Load Combination  | Maximum Axial + Bending Stress Ratios |        |          |      | Maximum Shear Ratios |         |         |              |        |          |
|-------------------|---------------------------------------|--------|----------|------|----------------------|---------|---------|--------------|--------|----------|
|                   | Stress Ratio                          | Status | Location | Cbx  | Cby                  | KxLx/Rx | KyLy/Ry | Stress Ratio | Status | Location |
| D Only            | 0.133                                 | PASS   | 13.24 ft | 1.14 | 1.66                 | 105.24  | 78.95   | 0.003        | PASS   | 0.00 ft  |
| +D+Lr             | 0.170                                 | PASS   | 13.24 ft | 1.14 | 1.66                 | 105.24  | 78.95   | 0.004        | PASS   | 0.00 ft  |
| +D+S              | 0.180                                 | PASS   | 13.24 ft | 1.14 | 1.66                 | 105.24  | 78.95   | 0.004        | PASS   | 0.00 ft  |
| +D+0.750Lr        | 0.161                                 | PASS   | 13.24 ft | 1.14 | 1.66                 | 105.24  | 78.95   | 0.004        | PASS   | 0.00 ft  |
| +D+0.750S         | 0.168                                 | PASS   | 13.24 ft | 1.14 | 1.66                 | 105.24  | 78.95   | 0.004        | PASS   | 0.00 ft  |
| +D+0.60W          | 0.260                                 | PASS   | 7.87 ft  | 1.14 | 1.66                 | 105.24  | 78.95   | 0.020        | PASS   | 0.00 ft  |
| +D+0.750Lr+0.450W | 0.239                                 | PASS   | 8.50 ft  | 1.14 | 1.66                 | 105.24  | 78.95   | 0.015        | PASS   | 0.00 ft  |
| +D+0.750S+0.450W  | 0.244                                 | PASS   | 8.59 ft  | 1.14 | 1.66                 | 105.24  | 78.95   | 0.015        | PASS   | 0.00 ft  |
| +0.60D+0.60W      | 0.222                                 | PASS   | 7.43 ft  | 1.14 | 1.66                 | 105.24  | 78.95   | 0.020        | PASS   | 0.00 ft  |
| +0.60D            | 0.080                                 | PASS   | 13.24 ft | 1.14 | 1.66                 | 105.24  | 78.95   | 0.002        | PASS   | 0.00 ft  |

### Maximum Reactions

Note: Only non-zero reactions are listed.

| Load Combination | Axial Reaction |        |       | X-X Axis Reaction |       | Y-Y Axis Reaction |       | Mx - End Moments |       | My - End Moments |       |
|------------------|----------------|--------|-------|-------------------|-------|-------------------|-------|------------------|-------|------------------|-------|
|                  | @ Base         | @ Base | @ Top | @ Base            | @ Top | @ Base            | @ Top | @ Base           | @ Top | @ Base           | @ Top |
| D Only           | 3.283          | 0.078  | 0.078 |                   |       |                   |       |                  |       |                  |       |
| +D+Lr            | 4.163          | 0.100  | 0.100 |                   |       |                   |       |                  |       |                  |       |
| +D+S             | 4.383          | 0.106  | 0.106 |                   |       |                   |       |                  |       |                  |       |
| +D+0.750Lr       | 3.943          | 0.095  | 0.095 |                   |       |                   |       |                  |       |                  |       |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Steel Column

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: Column C1

### Maximum Reactions

Note: Only non-zero reactions are listed.

| Load Combination  | Axial Reaction | X-X Axis Reaction |       | k | Y-Y Axis Reaction |       | Mx - End Moments |       | k-ft | My - End Moments |       |
|-------------------|----------------|-------------------|-------|---|-------------------|-------|------------------|-------|------|------------------|-------|
|                   | @ Base         | @ Base            | @ Top |   | @ Base            | @ Top | @ Base           | @ Top |      | @ Base           | @ Top |
| +D+0.750S         | 4.108          | 0.099             | 0.099 |   |                   |       |                  |       |      |                  |       |
| +D+0.60W          | 3.811          | 0.091             | 0.091 |   | 0.500             | 0.500 |                  |       |      |                  |       |
| +D+0.750Lr+0.450W | 4.339          | 0.104             | 0.104 |   | 0.375             | 0.375 |                  |       |      |                  |       |
| +D+0.750S+0.450W  | 4.504          | 0.109             | 0.109 |   | 0.375             | 0.375 |                  |       |      |                  |       |
| +0.60D+0.60W      | 2.498          | 0.060             | 0.060 |   | 0.500             | 0.500 |                  |       |      |                  |       |
| +0.60D            | 1.970          | 0.047             | 0.047 |   |                   |       |                  |       |      |                  |       |
| Lr Only           | 0.880          | 0.022             | 0.022 |   |                   |       |                  |       |      |                  |       |
| S Only            | 1.100          | 0.028             | 0.028 |   |                   |       |                  |       |      |                  |       |
| W Only            | 0.880          | 0.022             | 0.022 |   | 0.833             | 0.833 |                  |       |      |                  |       |

### Extreme Reactions

| Item                    | Extreme Value | Axial Reaction | X-X Axis Reaction |       | k | Y-Y Axis Reaction |       | Mx - End Moments |       | k-ft | My - End Moments |       |
|-------------------------|---------------|----------------|-------------------|-------|---|-------------------|-------|------------------|-------|------|------------------|-------|
|                         |               | @ Base         | @ Base            | @ Top |   | @ Base            | @ Top | @ Base           | @ Top |      | @ Base           | @ Top |
| Axial @ Base            | Maximum       | 4.504          | 0.109             | 0.109 |   | 0.375             | 0.375 |                  |       |      |                  |       |
| "                       | Minimum       | 0.880          | 0.022             | 0.022 |   |                   |       |                  |       |      |                  |       |
| Reaction, X-X Axis Base | Maximum       | 4.504          | 0.109             | 0.109 |   | 0.375             | 0.375 |                  |       |      |                  |       |
| "                       | Minimum       | 0.880          | 0.022             | 0.022 |   |                   |       |                  |       |      |                  |       |
| Reaction, Y-Y Axis Base | Maximum       | 0.880          | 0.022             | 0.022 |   | 0.833             | 0.833 |                  |       |      |                  |       |
| "                       | Minimum       | 3.283          | 0.078             | 0.078 |   |                   |       |                  |       |      |                  |       |
| Reaction, X-X Axis Top  | Maximum       | 4.504          | 0.109             | 0.109 |   | 0.375             | 0.375 |                  |       |      |                  |       |
| "                       | Minimum       | 0.880          | 0.022             | 0.022 |   |                   |       |                  |       |      |                  |       |
| Reaction, Y-Y Axis Top  | Maximum       | 3.811          | 0.091             | 0.091 |   | 0.500             | 0.500 |                  |       |      |                  |       |
| "                       | Minimum       | 3.283          | 0.078             | 0.078 |   |                   |       |                  |       |      |                  |       |
| Moment, X-X Axis Base   | Maximum       | 3.283          |                   | 0.078 |   |                   |       |                  |       |      |                  |       |
| "                       | Minimum       | 3.283          |                   | 0.078 |   |                   |       |                  |       |      |                  |       |
| Moment, Y-Y Axis Base   | Maximum       | 3.283          | 0.078             | 0.078 |   |                   |       |                  |       |      |                  |       |
| "                       | Minimum       | 3.283          | 0.078             | 0.078 |   |                   |       |                  |       |      |                  |       |
| Moment, X-X Axis Top    | Maximum       | 3.283          | 0.078             | 0.078 |   |                   |       |                  |       |      |                  |       |
| "                       | Minimum       | 3.283          | 0.078             | 0.078 |   |                   |       |                  |       |      |                  |       |
| Moment, Y-Y Axis Top    | Maximum       | 3.283          | 0.078             | 0.078 |   |                   |       |                  |       |      |                  |       |
| "                       | Minimum       | 3.283          | 0.078             | 0.078 |   |                   |       |                  |       |      |                  |       |

### Maximum Deflections for Load Combinations

| Load Combination  | Max. Deflection in X dir | Distance | Max. Deflection in Y dir | Distance |
|-------------------|--------------------------|----------|--------------------------|----------|
| D Only            | -0.0913 in               | 7.783 ft | 0.000 in                 | 0.000 ft |
| +D+Lr             | -0.1171 in               | 7.783 ft | 0.000 in                 | 0.000 ft |
| +D+S              | -0.1236 in               | 7.783 ft | 0.000 in                 | 0.000 ft |
| +D+0.750Lr        | -0.1107 in               | 7.783 ft | 0.000 in                 | 0.000 ft |
| +D+0.750S         | -0.1155 in               | 7.783 ft | 0.000 in                 | 0.000 ft |
| +D+0.60W          | -0.1068 in               | 7.783 ft | 0.238 in                 | 6.710 ft |
| +D+0.750Lr+0.450W | -0.1223 in               | 7.783 ft | 0.179 in                 | 6.710 ft |
| +D+0.750S+0.450W  | -0.1271 in               | 7.783 ft | 0.179 in                 | 6.710 ft |
| +0.60D+0.60W      | -0.0703 in               | 7.783 ft | 0.238 in                 | 6.710 ft |
| +0.60D            | -0.0548 in               | 7.783 ft | 0.000 in                 | 0.000 ft |
| Lr Only           | -0.0258 in               | 7.783 ft | 0.000 in                 | 0.000 ft |
| S Only            | -0.0322 in               | 7.783 ft | 0.000 in                 | 0.000 ft |
| W Only            | -0.0258 in               | 7.783 ft | 0.397 in                 | 6.710 ft |

Steel Section Properties : HSS4x4x1/4

Steel Section Properties : HSS4x4x1/4



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Steel Column

Project File: Enercalc NW6thSt.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

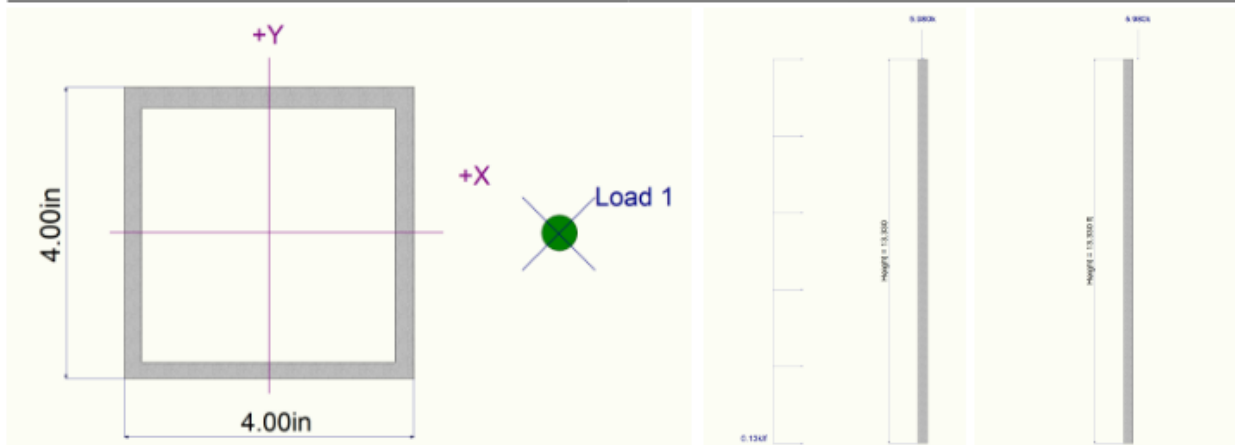
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#### DESCRIPTION: Column C1

|              |   |                       |      |   |                       |   |   |                        |
|--------------|---|-----------------------|------|---|-----------------------|---|---|------------------------|
| Depth        | = | 4.000 in              | I xx | = | 7.80 in <sup>4</sup>  | J | = | 12.800 in <sup>4</sup> |
| Design Thick | = | 0.233 in              | S xx | = | 3.90 in <sup>3</sup>  |   |   |                        |
| Width        | = | 4.000 in              | R xx | = | 1.520 in              |   |   |                        |
| Wall Thick   | = | 0.250 in              | Zx   | = | 4.690 in <sup>3</sup> |   |   |                        |
| Area         | = | 3.370 in <sup>2</sup> | I yy | = | 7.800 in <sup>4</sup> | C | = | 6.560 in <sup>3</sup>  |
| Weight       | = | 12.210 plf            | S yy | = | 3.900 in <sup>3</sup> |   |   |                        |
|              |   |                       | R yy | = | 1.520 in              |   |   |                        |

Ycg = 0.000 in

### Sketches





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Steel Column

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: Column C2

### Code References

Calculations per AISC 360-16, IBC 2021, ASCE 7-16  
Load Combinations Used: IBC 2021

### General Information

Steel Section Name: HSS4x4x1/4  
Analysis Method: Allowable Strength  
Steel Stress Grade  
Fy: Steel Yield 46.0 ksi  
E: Elastic Bending Modulus 29,000.0 ksi  
Overall Column Height 13.333 ft  
Top & Bottom Fixity Top & Bottom Pinned  
Brace condition:  
Unbraced Length for buckling ABOUT X-X Axis = 13.333 ft, K = 1.0  
Unbraced Length for buckling ABOUT Y-Y Axis = 10 ft, K = 1.0

### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included: 162.796 lbs \* Dead Load Factor

AXIAL LOADS ...

Axial Load at 13.333 ft, Xecc = 4.0 in, D = 6.050, LR = 4.350, L = 5.440, W = 4.350 k

BENDING LOADS ...

Lat. Uniform Load creating Mx-x, W = 0.1250 k/ft

### DESIGN SUMMARY

#### Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = 0.7746 : 1

Load Combination +D+0.750Lr+0.750L+0.450W

Location of max. above base 13.333 ft

At maximum location values are ...

Pa: Axial 15.513 k

Pn / Omega: Allowable 44.054 k

Ma-x: Applied 0.0 k-ft

Mn-x / Omega: Allowable 10.765 k-ft

Ma-y: Applied -5.117 k-ft

Mn-y / Omega: Allowable 10.765 k-ft

#### Maximum Load Reactions ...

Top along X-X 0.3838 k

Bottom along X-X 0.3838 k

Top along Y-Y 0.8333 k

Bottom along Y-Y 0.8333 k

#### Maximum Load Deflections ...

Along Y-Y 0.3972 in at 6.711 ft above base  
for load combination: W Only

Along X-X -0.4496 in at 7.785 ft above base  
for load combination: +D+0.750Lr+0.750L+0.450W

PASS Maximum Shear Stress Ratio 0.01967 : 1

Load Combination +D+0.60W

Location of max. above base 0.0 ft

At maximum location values are ...

Va: Applied 0.50 k

Vn / Omega: Allowable 25.423 k

### Load Combination Results

| Load Combination         | Maximum Axial + Bending Stress Ratios |        |          |  | Cb <sub>x</sub> | Cb <sub>y</sub> | K <sub>x</sub> L <sub>x</sub> /R <sub>x</sub> | K <sub>y</sub> L <sub>y</sub> /R <sub>y</sub> | Maximum Shear Ratios |        |          |
|--------------------------|---------------------------------------|--------|----------|--|-----------------|-----------------|-----------------------------------------------|-----------------------------------------------|----------------------|--------|----------|
|                          | Stress Ratio                          | Status | Location |  |                 |                 |                                               |                                               | Stress Ratio         | Status | Location |
| D Only                   | 0.258                                 | PASS   | 13.33 ft |  | 1.14            | 1.66            | 105.26                                        | 78.95                                         | 0.006                | PASS   | 0.00 ft  |
| +D+L                     | 0.581                                 | PASS   | 13.33 ft |  | 1.14            | 1.66            | 105.26                                        | 78.95                                         | 0.011                | PASS   | 0.00 ft  |
| +D+Lr                    | 0.526                                 | PASS   | 13.33 ft |  | 1.14            | 1.66            | 105.26                                        | 78.95                                         | 0.010                | PASS   | 0.00 ft  |
| +D+0.750Lr+0.750L        | 0.676                                 | PASS   | 13.33 ft |  | 1.14            | 1.66            | 105.26                                        | 78.95                                         | 0.013                | PASS   | 0.00 ft  |
| +D+0.750L                | 0.512                                 | PASS   | 13.33 ft |  | 1.14            | 1.66            | 105.26                                        | 78.95                                         | 0.010                | PASS   | 0.00 ft  |
| +D+0.60W                 | 0.483                                 | PASS   | 9.57 ft  |  | 1.14            | 1.66            | 105.26                                        | 78.95                                         | 0.020                | PASS   | 0.00 ft  |
| +D+0.750Lr+0.750L+0.450W | 0.775                                 | PASS   | 13.33 ft |  | 1.14            | 1.66            | 105.26                                        | 78.95                                         | 0.015                | PASS   | 0.00 ft  |
| +D+0.750L+0.450W         | 0.615                                 | PASS   | 12.08 ft |  | 1.14            | 1.66            | 105.26                                        | 78.95                                         | 0.015                | PASS   | 0.00 ft  |
| +0.60D+0.60W             | 0.338                                 | PASS   | 8.77 ft  |  | 1.14            | 1.66            | 105.26                                        | 78.95                                         | 0.020                | PASS   | 0.00 ft  |
| +0.60D                   | 0.155                                 | PASS   | 13.33 ft |  | 1.14            | 1.66            | 105.26                                        | 78.95                                         | 0.004                | PASS   | 0.00 ft  |

### Maximum Reactions

Note: Only non-zero reactions are listed.

| Load Combination  | Axial Reaction |  | X-X Axis Reaction |       | k | Y-Y Axis Reaction |       | Mx - End Moments k-ft |       | My - End Moments |       |
|-------------------|----------------|--|-------------------|-------|---|-------------------|-------|-----------------------|-------|------------------|-------|
|                   | @ Base         |  | @ Base            | @ Top |   | @ Base            | @ Top | @ Base                | @ Top | @ Base           | @ Top |
| D Only            | 6.213          |  | 0.151             | 0.151 |   |                   |       |                       |       |                  |       |
| +D+L              | 11.653         |  | 0.287             | 0.287 |   |                   |       |                       |       |                  |       |
| +D+Lr             | 10.563         |  | 0.260             | 0.260 |   |                   |       |                       |       |                  |       |
| +D+0.750Lr+0.750L | 13.555         |  | 0.335             | 0.335 |   |                   |       |                       |       |                  |       |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### Steel Column

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: Column C2

### Maximum Reactions

Note: Only non-zero reactions are listed.

| Load Combination         | Axial Reaction<br>@ Base | X-X Axis Reaction<br>@ Base @ Top | k | Y-Y Axis Reaction<br>@ Base @ Top | Mx - End Moments<br>@ Base @ Top | k-ft | My - End Moments<br>@ Base @ Top |
|--------------------------|--------------------------|-----------------------------------|---|-----------------------------------|----------------------------------|------|----------------------------------|
| +D+0.750L                | 10.293                   | 0.253 0.253                       |   |                                   |                                  |      |                                  |
| +D+0.60W                 | 8.823                    | 0.217 0.217                       |   | 0.500 0.500                       |                                  |      |                                  |
| +D+0.750Lr+0.750L+0.450W | 15.513                   | 0.384 0.384                       |   | 0.375 0.375                       |                                  |      |                                  |
| +D+0.750L+0.450W         | 12.250                   | 0.302 0.302                       |   | 0.375 0.375                       |                                  |      |                                  |
| +0.60D+0.60W             | 6.338                    | 0.156 0.156                       |   | 0.500 0.500                       |                                  |      |                                  |
| +0.60D                   | 3.728                    | 0.091 0.091                       |   |                                   |                                  |      |                                  |
| Lr Only                  | 4.350                    | 0.109 0.109                       |   |                                   |                                  |      |                                  |
| L Only                   | 5.440                    | 0.136 0.136                       |   |                                   |                                  |      |                                  |
| W Only                   | 4.350                    | 0.109 0.109                       |   | 0.833 0.833                       |                                  |      |                                  |

### Extreme Reactions

| Item                    | Extreme Value | Axial Reaction<br>@ Base | X-X Axis Reaction<br>@ Base @ Top | k | Y-Y Axis Reaction<br>@ Base @ Top | Mx - End Moments<br>@ Base @ Top | k-ft   | My - End Moments<br>@ Base @ Top |
|-------------------------|---------------|--------------------------|-----------------------------------|---|-----------------------------------|----------------------------------|--------|----------------------------------|
| Axial @ Base            | Maximum       | 15.513                   | 0.384 0.384                       |   | 0.375 0.375                       |                                  |        | -5.117                           |
| "                       | Minimum       | 3.728                    | 0.091 0.091                       |   |                                   |                                  |        | -1.210                           |
| Reaction, X-X Axis Base | Maximum       | 15.513                   | 0.384 0.384                       |   | 0.375 0.375                       |                                  |        | -5.117                           |
| "                       | Minimum       | 3.728                    | 0.091 0.091                       |   |                                   |                                  |        | -1.210                           |
| Reaction, Y-Y Axis Base | Maximum       | 4.350                    | 0.109 0.109                       |   | 0.833 0.833                       |                                  |        | -1.450                           |
| "                       | Minimum       | 6.213                    | 0.151 0.151                       |   |                                   |                                  |        | -2.017                           |
| Reaction, X-X Axis Top  | Maximum       | 15.513                   | 0.384 0.384                       |   | 0.375 0.375                       |                                  |        | -5.117                           |
| "                       | Minimum       | 3.728                    | 0.091 0.091                       |   |                                   |                                  |        | -1.210                           |
| Reaction, Y-Y Axis Top  | Maximum       | 8.823                    | 0.217 0.217                       |   | 0.500 0.500                       |                                  |        | -2.887                           |
| "                       | Minimum       | 6.213                    | 0.151 0.151                       |   |                                   |                                  |        | -2.017                           |
| Moment, X-X Axis Base   | Maximum       | 6.213                    | 0.151 0.151                       |   |                                   |                                  |        | -2.017                           |
| "                       | Minimum       | 6.213                    | 0.151 0.151                       |   |                                   |                                  |        | -2.017                           |
| Moment, Y-Y Axis Base   | Maximum       | 6.213                    | 0.151 0.151                       |   |                                   |                                  | -2.017 |                                  |
| "                       | Minimum       | 6.213                    | 0.151 0.151                       |   |                                   |                                  | -2.017 |                                  |
| Moment, X-X Axis Top    | Maximum       | 6.213                    | 0.151 0.151                       |   |                                   |                                  |        | -2.017                           |
| "                       | Minimum       | 6.213                    | 0.151 0.151                       |   |                                   |                                  |        | -2.017                           |
| Moment, Y-Y Axis Top    | Maximum       | 3.728                    | 0.091 0.091                       |   |                                   |                                  |        | -1.210                           |
| "                       | Minimum       | 15.513                   | 0.384 0.384                       |   | 0.375 0.375                       |                                  |        | -5.117                           |

### Maximum Deflections for Load Combinations

| Load Combination         | Max. Deflection in X dir | Distance | Max. Deflection in Y dir | Distance |
|--------------------------|--------------------------|----------|--------------------------|----------|
| D Only                   | -0.1772 in               | 7.785 ft | 0.000 in                 | 0.000 ft |
| +D+L                     | -0.3366 in               | 7.785 ft | 0.000 in                 | 0.000 ft |
| +D+Lr                    | -0.3046 in               | 7.785 ft | 0.000 in                 | 0.000 ft |
| +D+0.750Lr+0.750L        | -0.3923 in               | 7.785 ft | 0.000 in                 | 0.000 ft |
| +D+0.750L                | -0.2967 in               | 7.785 ft | 0.000 in                 | 0.000 ft |
| +D+0.60W                 | -0.2537 in               | 7.785 ft | 0.238 in                 | 6.711 ft |
| +D+0.750Lr+0.750L+0.450W | -0.4496 in               | 7.785 ft | 0.179 in                 | 6.711 ft |
| +D+0.750L+0.450W         | -0.3541 in               | 7.785 ft | 0.179 in                 | 6.711 ft |
| +0.60D+0.60W             | -0.1828 in               | 7.785 ft | 0.238 in                 | 6.711 ft |
| +0.60D                   | -0.1063 in               | 7.785 ft | 0.000 in                 | 0.000 ft |
| Lr Only                  | -0.1274 in               | 7.785 ft | 0.000 in                 | 0.000 ft |
| L Only                   | -0.1593 in               | 7.785 ft | 0.000 in                 | 0.000 ft |
| W Only                   | -0.1274 in               | 7.785 ft | 0.397 in                 | 6.711 ft |

Steel Section Properties : HSS4x4x1/4

Steel Section Properties : HSS4x4x1/4





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Steel Column

Project File: Enercalc NW6thSt.ec6

LIC# : KIW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

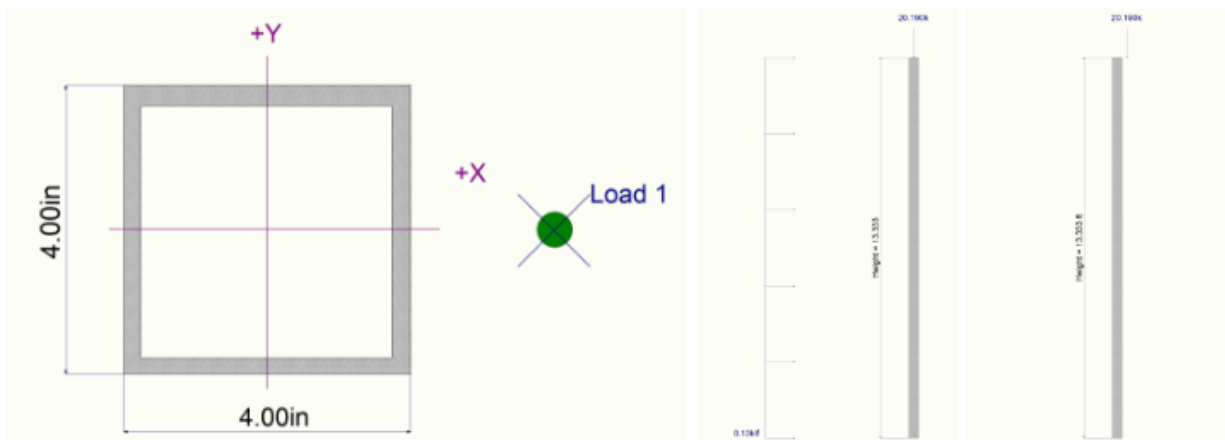
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#### DESCRIPTION: Column C2

|              |   |            |      |   |            |   |   |             |
|--------------|---|------------|------|---|------------|---|---|-------------|
| Depth        | = | 4.000 in   | I xx | = | 7.80 in^4  | J | = | 12.800 in^4 |
| Design Thick | = | 0.233 in   | S xx | = | 3.90 in^3  |   |   |             |
| Width        | = | 4.000 in   | R xx | = | 1.520 in   |   |   |             |
| Wall Thick   | = | 0.250 in   | Zx   | = | 4.690 in^3 |   |   |             |
| Area         | = | 3.370 in^2 | I yy | = | 7.800 in^4 | C | = | 6.560 in^3  |
| Weight       | = | 12.210 plf | S yy | = | 3.900 in^3 |   |   |             |
|              |   |            | R yy | = | 1.520 in   |   |   |             |

Ycg = 0.000 in

### Sketches





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### Steel Column

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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**DESCRIPTION:** Column C3

### Code References

Calculations per AISC 360-16, IBC 2021, ASCE 7-16  
 Load Combinations Used : IBC 2021

### General Information

Steel Section Name : **HSS4x4x5/16**  
 Analysis Method : Allowable Strength  
 Steel Stress Grade  
 Fy : Steel Yield 46.0 ksi  
 E : Elastic Bending Modulus 29,000.0 ksi  
 Overall Column Height 13.330 ft  
 Top & Bottom Fixity Top & Bottom Pinned  
 Brace condition :  
 Unbraced Length for buckling ABOUT X-X Axis = 13.330 ft, K = 1.0  
 Unbraced Length for buckling ABOUT Y-Y Axis = 10 ft, K = 1.0

### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 197.684 lbs \* Dead Load Factor  
 AXIAL LOADS ...  
 Axial Load at 13.330 ft, Xecc = 4.0 in, D = 10.380, LR = 7.470, S = 9.340, W = 7.470 k  
 BENDING LOADS ...  
 Lat. Uniform Load creating Mx-x, W = 0.1250 k/ft

### DESIGN SUMMARY

#### Bending & Shear Check Results

**PASS** Max. Axial+Bending Stress Ratio = **0.8808** : 1  
 Load Combination +D+0.750S+0.450W  
 Location of max.above base 13.241 ft  
 At maximum location values are ...  
 Pa : Axial 20.944 k  
 Pn / Omega : Allowable 52.015 k  
 Ma-x : Applied 0.03332 k-ft  
 Mn-x / Omega : Allowable 12.831 k-ft  
 Ma-y : Applied -6.869 k-ft  
 Mn-y / Omega : Allowable 12.831 k-ft

#### Maximum Load Reactions

Top along X-X 0.5188 k  
 Bottom along X-X 0.5188 k  
 Top along Y-Y 0.8331 k  
 Bottom along Y-Y 0.8331 k

#### Maximum Load Deflections

Along Y-Y 0.3386 in at 6.710 ft above base  
 for load combination : W Only  
 Along X-X -0.5184 in at 7.783 ft above base  
 for load combination : +D+0.750S+0.450W

**PASS** Maximum Shear Stress Ratio **0.01725** : 1  
 Load Combination +D+0.750S+0.450W  
 Location of max.above base 0.0 ft  
 At maximum location values are ...  
 Va : Applied 0.5188 k  
 Vn / Omega : Allowable 30.078 k

### Load Combination Results

| Load Combination  | Maximum Axial + Bending Stress Ratios |        |          |  | Cbx  | Cby  | KxLx/Rx | KyLy/Ry | Maximum Shear Ratios |        |          |  |
|-------------------|---------------------------------------|--------|----------|--|------|------|---------|---------|----------------------|--------|----------|--|
|                   | Stress Ratio                          | Status | Location |  |      |      |         |         | Stress Ratio         | Status | Location |  |
| D Only            | 0.441                                 | PASS   | 13.24 ft |  | 1.14 | 1.66 | 107.36  | 80.54   | 0.009                | PASS   | 0.00 ft  |  |
| +D+Lr             | 0.756                                 | PASS   | 13.24 ft |  | 1.14 | 1.66 | 107.36  | 80.54   | 0.015                | PASS   | 0.00 ft  |  |
| +D+S              | 0.835                                 | PASS   | 13.24 ft |  | 1.14 | 1.66 | 107.36  | 80.54   | 0.016                | PASS   | 0.00 ft  |  |
| +D+0.750Lr        | 0.678                                 | PASS   | 13.24 ft |  | 1.14 | 1.66 | 107.36  | 80.54   | 0.013                | PASS   | 0.00 ft  |  |
| +D+0.750S         | 0.737                                 | PASS   | 13.24 ft |  | 1.14 | 1.66 | 107.36  | 80.54   | 0.014                | PASS   | 0.00 ft  |  |
| +D+0.60W          | 0.640                                 | PASS   | 11.63 ft |  | 1.14 | 1.66 | 107.36  | 80.54   | 0.017                | PASS   | 0.00 ft  |  |
| +D+0.750Lr+0.450W | 0.822                                 | PASS   | 13.24 ft |  | 1.14 | 1.66 | 107.36  | 80.54   | 0.016                | PASS   | 0.00 ft  |  |
| +D+0.750S+0.450W  | 0.881                                 | PASS   | 13.24 ft |  | 1.14 | 1.66 | 107.36  | 80.54   | 0.017                | PASS   | 0.00 ft  |  |
| +0.60D+0.60W      | 0.480                                 | PASS   | 10.20 ft |  | 1.14 | 1.66 | 107.36  | 80.54   | 0.017                | PASS   | 0.00 ft  |  |
| +0.60D            | 0.222                                 | PASS   | 13.24 ft |  | 1.14 | 1.66 | 107.36  | 80.54   | 0.005                | PASS   | 0.00 ft  |  |

### Maximum Reactions

Note: Only non-zero reactions are listed.

| Load Combination | Axial Reaction |        |       | k | Y-Y Axis Reaction |       | Mx - End Moments k-ft |       | My - End Moments |       |
|------------------|----------------|--------|-------|---|-------------------|-------|-----------------------|-------|------------------|-------|
|                  | @ Base         | @ Base | @ Top |   | @ Base            | @ Top | @ Base                | @ Top | @ Base           | @ Top |
| D Only           | 10.578         | 0.260  | 0.260 |   |                   |       |                       |       |                  |       |
| +D+Lr            | 18.048         | 0.446  | 0.446 |   |                   |       |                       |       |                  |       |
| +D+S             | 19.918         | 0.493  | 0.493 |   |                   |       |                       |       |                  |       |
| +D+0.750Lr       | 16.180         | 0.400  | 0.400 |   |                   |       |                       |       |                  |       |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Steel Column

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: Column C3

### Maximum Reactions

Note: Only non-zero reactions are listed.

| Load Combination  | Axial Reaction | X-X Axis Reaction |       | k | Y-Y Axis Reaction |       | Mx - End Moments |       | k-ft | My - End Moments |       |
|-------------------|----------------|-------------------|-------|---|-------------------|-------|------------------|-------|------|------------------|-------|
|                   | @ Base         | @ Base            | @ Top |   | @ Base            | @ Top | @ Base           | @ Top |      | @ Base           | @ Top |
| +D+0.750S         | 17.583         | 0.435             | 0.435 |   |                   |       |                  |       |      |                  |       |
| +D+0.60W          | 15.060         | 0.372             | 0.372 |   | 0.500             | 0.500 |                  |       |      |                  |       |
| +D+0.750Lr+0.450W | 19.542         | 0.484             | 0.484 |   | 0.375             | 0.375 |                  |       |      |                  |       |
| +D+0.750S+0.450W  | 20.944         | 0.519             | 0.519 |   | 0.375             | 0.375 |                  |       |      |                  |       |
| +0.60D+0.60W      | 10.829         | 0.268             | 0.268 |   | 0.500             | 0.500 |                  |       |      |                  |       |
| +0.60D            | 6.347          | 0.156             | 0.156 |   |                   |       |                  |       |      |                  |       |
| Lr Only           | 7.470          | 0.187             | 0.187 |   |                   |       |                  |       |      |                  |       |
| S Only            | 9.340          | 0.234             | 0.234 |   |                   |       |                  |       |      |                  |       |
| W Only            | 7.470          | 0.187             | 0.187 |   | 0.833             | 0.833 |                  |       |      |                  |       |

### Extreme Reactions

| Item                    | Extreme Value | Axial Reaction | X-X Axis Reaction |       | k | Y-Y Axis Reaction |       | Mx - End Moments |       | k-ft | My - End Moments |       |
|-------------------------|---------------|----------------|-------------------|-------|---|-------------------|-------|------------------|-------|------|------------------|-------|
|                         |               | @ Base         | @ Base            | @ Top |   | @ Base            | @ Top | @ Base           | @ Top |      | @ Base           | @ Top |
| Axial @ Base            | Maximum       | 20.944         | 0.519             | 0.519 |   | 0.375             | 0.375 |                  |       |      |                  |       |
| "                       | Minimum       | 6.347          | 0.156             | 0.156 |   |                   |       |                  |       |      |                  |       |
| Reaction, X-X Axis Base | Maximum       | 20.944         | 0.519             | 0.519 |   | 0.375             | 0.375 |                  |       |      |                  |       |
| "                       | Minimum       | 6.347          | 0.156             | 0.156 |   |                   |       |                  |       |      |                  |       |
| Reaction, Y-Y Axis Base | Maximum       | 7.470          | 0.187             | 0.187 |   | 0.833             | 0.833 |                  |       |      |                  |       |
| "                       | Minimum       | 10.578         | 0.260             | 0.260 |   |                   |       |                  |       |      |                  |       |
| Reaction, X-X Axis Top  | Maximum       | 20.944         | 0.519             | 0.519 |   | 0.375             | 0.375 |                  |       |      |                  |       |
| "                       | Minimum       | 6.347          | 0.156             | 0.156 |   |                   |       |                  |       |      |                  |       |
| Reaction, Y-Y Axis Top  | Maximum       | 20.944         | 0.519             | 0.519 |   | 0.375             | 0.375 |                  |       |      |                  |       |
| "                       | Minimum       | 10.578         | 0.260             | 0.260 |   |                   |       |                  |       |      |                  |       |
| Moment, X-X Axis Base   | Maximum       | 10.578         |                   | 0.260 |   |                   |       |                  |       |      |                  |       |
| "                       | Minimum       | 10.578         |                   | 0.260 |   |                   |       |                  |       |      |                  |       |
| Moment, Y-Y Axis Base   | Maximum       | 10.578         | 0.260             | 0.260 |   |                   |       |                  |       |      |                  |       |
| "                       | Minimum       | 10.578         | 0.260             | 0.260 |   |                   |       |                  |       |      |                  |       |
| Moment, X-X Axis Top    | Maximum       | 10.578         | 0.260             | 0.260 |   |                   |       |                  |       |      |                  |       |
| "                       | Minimum       | 10.578         | 0.260             | 0.260 |   |                   |       |                  |       |      |                  |       |
| Moment, Y-Y Axis Top    | Maximum       | 10.578         | 0.260             | 0.260 |   |                   |       |                  |       |      |                  |       |
| "                       | Minimum       | 10.578         | 0.260             | 0.260 |   |                   |       |                  |       |      |                  |       |

### Maximum Deflections for Load Combinations

| Load Combination  | Max. Deflection in X dir |    | Distance | Max. Deflection in Y dir |    | Distance |
|-------------------|--------------------------|----|----------|--------------------------|----|----------|
| D Only            | -0.2594                  | in | 7.783 ft | 0.000                    | in | 0.000 ft |
| +D+Lr             | -0.4460                  | in | 7.783 ft | 0.000                    | in | 0.000 ft |
| +D+S              | -0.4927                  | in | 7.783 ft | 0.000                    | in | 0.000 ft |
| +D+0.750Lr        | -0.3993                  | in | 7.783 ft | 0.000                    | in | 0.000 ft |
| +D+0.750S         | -0.4344                  | in | 7.783 ft | 0.000                    | in | 0.000 ft |
| +D+0.60W          | -0.3713                  | in | 7.783 ft | 0.203                    | in | 6.710 ft |
| +D+0.750Lr+0.450W | -0.4833                  | in | 7.783 ft | 0.152                    | in | 6.710 ft |
| +D+0.750S+0.450W  | -0.5184                  | in | 7.783 ft | 0.152                    | in | 6.710 ft |
| +0.60D+0.60W      | -0.2676                  | in | 7.783 ft | 0.203                    | in | 6.710 ft |
| +0.60D            | -0.1556                  | in | 7.783 ft | 0.000                    | in | 0.000 ft |
| Lr Only           | -0.1866                  | in | 7.783 ft | 0.000                    | in | 0.000 ft |
| S Only            | -0.2334                  | in | 7.783 ft | 0.000                    | in | 0.000 ft |
| W Only            | -0.1866                  | in | 7.783 ft | 0.339                    | in | 6.710 ft |

Steel Section Properties : HSS4x4x5/16

Steel Section Properties : HSS4x4x5/16

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Steel Column

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

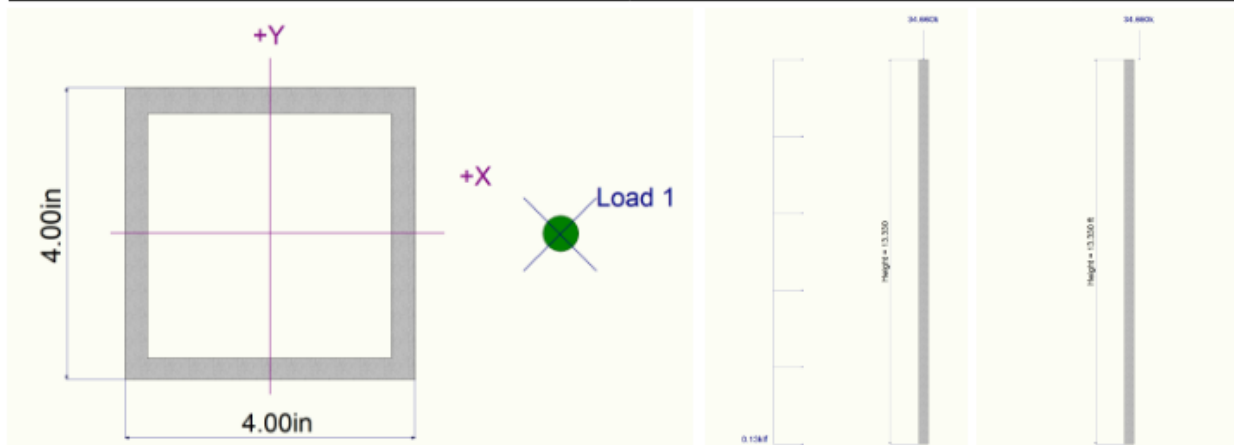
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#### DESCRIPTION: Column C3

|              |   |                       |      |   |                       |   |   |                        |
|--------------|---|-----------------------|------|---|-----------------------|---|---|------------------------|
| Depth        | = | 4.000 in              | I xx | = | 9.14 in <sup>4</sup>  | J | = | 15.300 in <sup>4</sup> |
| Design Thick | = | 0.291 in              | S xx | = | 4.57 in <sup>3</sup>  |   |   |                        |
| Width        | = | 4.000 in              | R xx | = | 1.490 in              |   |   |                        |
| Wall Thick   | = | 0.313 in              | Zx   | = | 5.590 in <sup>3</sup> |   |   |                        |
| Area         | = | 4.100 in <sup>2</sup> | I yy | = | 9.140 in <sup>4</sup> | C | = | 7.910 in <sup>3</sup>  |
| Weight       | = | 14.830 plf            | S yy | = | 4.570 in <sup>3</sup> |   |   |                        |
|              |   |                       | R yy | = | 1.490 in              |   |   |                        |

Ycg = 0.000 in

### Sketches





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Wood Beam

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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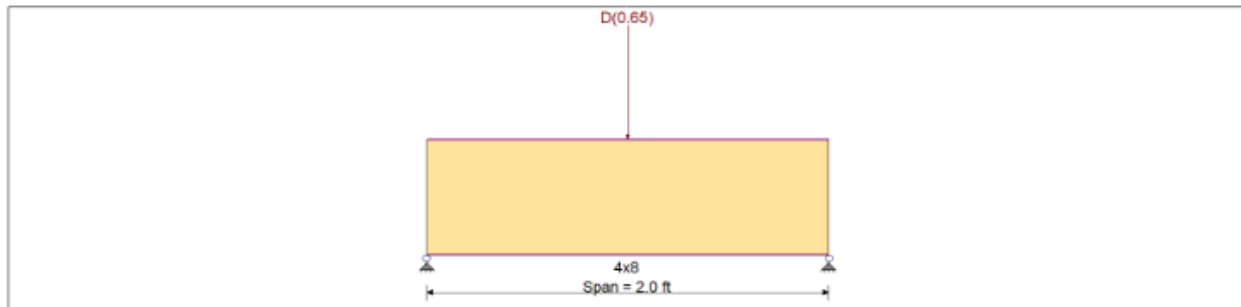
**DESCRIPTION:** Awning Blocking in Wall

### CODE REFERENCES

Calculations per NDS 2018, IBC 2021, ASCE 7-16  
Load Combination Set : IBC 2021

### Material Properties

|                                                                        |                       |                           |
|------------------------------------------------------------------------|-----------------------|---------------------------|
| Analysis Method : Allowable Stress Design                              | Fb + 900.0 psi        | E : Modulus of Elasticity |
| Load Combination : IBC 2021                                            | Fb - 900.0 psi        | Ebend- xx 1,600.0 ksi     |
|                                                                        | Fc - Prll 1,350.0 psi | Eminbend - xx 580.0 ksi   |
| Wood Species : Douglas Fir-Larch                                       | Fc - Perp 625.0 psi   |                           |
| Wood Grade : No.2                                                      | Fv 180.0 psi          |                           |
|                                                                        | Ft 575.0 psi          | Density 31.210pcf         |
| Beam Bracing : Beam is Fully Braced against lateral-torsional buckling |                       |                           |



### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added  
Point Load : D = 0.650 k @ 1.0 ft

### DESIGN SUMMARY

Design OK

|                                   |          |              |             |                             |   |            |   |
|-----------------------------------|----------|--------------|-------------|-----------------------------|---|------------|---|
| Maximum Bending Stress Ratio      | =        | 0.250        | 1           | Maximum Shear Stress Ratio  | = | 0.119      | 1 |
| Section used for this span        |          | 4x8          |             | Section used for this span  |   | 4x8        |   |
| fb: Actual                        | =        | 263.48 psi   |             | fv: Actual                  | = | 19.21 psi  |   |
| F'b                               | =        | 1,053.00 psi |             | F'v                         | = | 162.00 psi |   |
| Load Combination                  |          | D Only       |             | Load Combination            |   | D Only     |   |
| Location of maximum on span       | =        | 1.000 ft     |             | Location of maximum on span | = | 0.000 ft   |   |
| Span # where maximum occurs       | =        | Span # 1     |             | Span # where maximum occurs | = | Span # 1   |   |
| Maximum Deflection                |          |              |             |                             |   |            |   |
| Max Downward Transient Deflection | 0 in     | Ratio =      | 0 < 360     | n/a                         |   |            |   |
| Max Upward Transient Deflection   | 0 in     | Ratio =      | 0 < 360     | n/a                         |   |            |   |
| Max Downward Total Deflection     | 0.005 in | Ratio =      | 5284 >= 180 | Span: 1 : D Only            |   |            |   |
| Max Upward Total Deflection       | 0 in     | Ratio =      | 0 < 180     | n/a                         |   |            |   |

### Maximum Forces & Stresses for Load Combinations

| Load Combination | Segment Length | Span # | Max Stress Ratios |       |      |      |                |      |                |                 |                |                | Moment Values |       |         | Shear Values |      |       |
|------------------|----------------|--------|-------------------|-------|------|------|----------------|------|----------------|-----------------|----------------|----------------|---------------|-------|---------|--------------|------|-------|
|                  |                |        | M                 | V     | CD   | CM   | C <sub>t</sub> | CLx  | C <sub>F</sub> | C <sub>fu</sub> | C <sub>i</sub> | C <sub>r</sub> | M             | fb    | F'b     | V            | fv   | F'v   |
| D Only           |                |        |                   |       |      |      |                |      |                |                 |                |                |               |       | 0.0     | 0.00         | 0.0  | 0.0   |
| Length = 2.0 ft  | 1              |        | 0.250             | 0.119 | 0.90 | 1.00 | 1.00           | 1.00 | 1.300          | 1.00            | 1.00           | 1.00           | 0.32          | 263.5 | 1,053.0 | 0.33         | 19.2 | 162.0 |
| +0.60D           |                |        |                   |       |      | 1.00 | 1.00           | 1.00 | 1.300          | 1.00            | 1.00           | 1.00           |               |       | 0.0     | 0.00         | 0.0  | 0.0   |
| Length = 2.0 ft  | 1              |        | 0.084             | 0.040 | 1.60 | 1.00 | 1.00           | 1.00 | 1.300          | 1.00            | 1.00           | 1.00           | 0.20          | 158.1 | 1,872.0 | 0.20         | 11.5 | 288.0 |

### Overall Maximum Deflections

| Load Combination | Span | Max. "-" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|------------------|------|---------------|------------------|------------------|---------------|------------------|
| D Only           | 1    | 0.0045        | 1.000            |                  | 0.0000        | 0.000            |

### Vertical Reactions

Support notation : Far left is #1

Values in KIPS

| Load Combination                    | Support 1 | Support 2 |
|-------------------------------------|-----------|-----------|
| Max Upward from all Load Conditions | 0.325     | 0.325     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Wood Beam

Project File: Enercalc NW6thSt.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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**DESCRIPTION:** Awning Blocking in Wall

### Vertical Reactions

Support notation : Far left is #1

Values in KIPS

| Load Combination                  | Support 1 | Support 2 |
|-----------------------------------|-----------|-----------|
| Max Upward from Load Combinations | 0.195     | 0.195     |
| Max Upward from Load Cases        | 0.325     | 0.325     |
| D Only                            | 0.325     | 0.325     |
| +0.60D                            | 0.195     | 0.195     |



Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### Wall Footing

Project File: Enercalc NW6thSt.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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**DESCRIPTION:** Cont. Wall Footing - F1

### Code References

Calculations per ACI 318-19, IBC 2021, ASCE 7-16  
 Load Combinations Used : ASCE 7-16

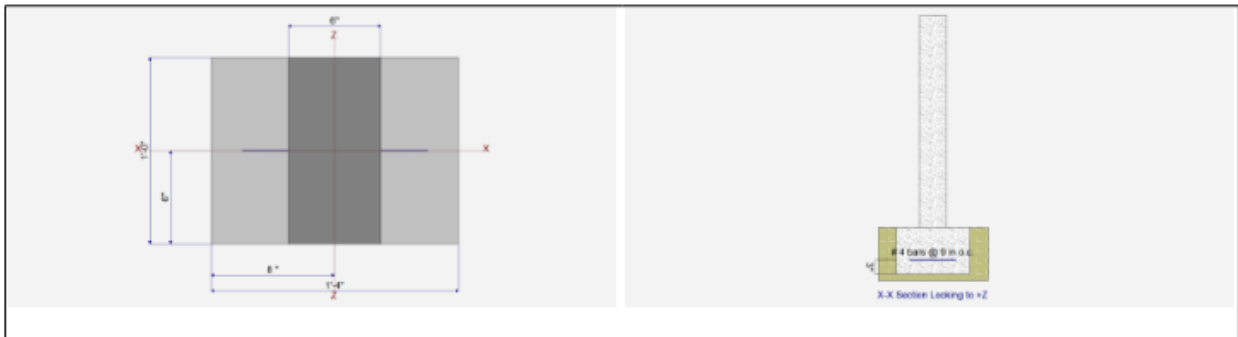
### General Information

| Material Properties             |               | Soil Design Values                                                    |             |
|---------------------------------|---------------|-----------------------------------------------------------------------|-------------|
| f'c : Concrete 28 day strength  | = 2.50 ksi    | Allowable Soil Bearing                                                | = 2.50 ksf  |
| fy : Rebar Yield                | = 60.0 ksi    | Increase Bearing By Footing Weight                                    | = No        |
| Ec : Concrete Elastic Modulus   | = 3,122.0 ksi | Soil Passive Resistance (for Sliding)                                 | = 170.0 pcf |
| Concrete Density                | = 145.0 pcf   | Soil/Concrete Friction Coeff.                                         | = 0.330     |
| φ Values                        |               |                                                                       |             |
| Flexure                         | = 0.90        |                                                                       |             |
| Shear                           | = 0.750       |                                                                       |             |
| Analysis Settings               |               | Increases based on footing Depth                                      |             |
| Min Steel % Bending Reinf.      | =             | Reference Depth below Surface                                         | = ft        |
| Min Allow % Temp Reinf.         | = 0.00180     | Allow. Pressure Increase per foot of depth when base footing is below | = ksf       |
| Min. Overturning Safety Factor  | = 1.0 : 1     |                                                                       | = ft        |
| Min. Sliding Safety Factor      | = 1.0 : 1     |                                                                       |             |
| AutoCalc Footing Weight as DL : | Yes           |                                                                       |             |
|                                 |               | Increases based on footing Width                                      |             |
|                                 |               | Allow. Pressure Increase per foot of width when footing is wider than | = ksf       |
|                                 |               |                                                                       | = ft        |
|                                 |               | Adjusted Allowable Bearing Pressure                                   | = 2.50 ksf  |

### Dimensions

### Reinforcing

|                                           |            |                                         |           |                      |        |
|-------------------------------------------|------------|-----------------------------------------|-----------|----------------------|--------|
| Footing Width                             | = 1.333 ft | Footing Thickness                       | = 10.0 in | Bars along X-X Axis  |        |
| Wall Thickness                            | = 6.0 in   | Rebar Centerline to Edge of Concrete... |           | Bar spacing          | = 9.00 |
| Wall center offset from center of footing | = 0 in     | at Bottom of footing =                  | 3.0 in    | Reinforcing Bar Size | = # 4  |



### Applied Loads

|                 | D        | Lr     | L | S | W    | E | H                       |
|-----------------|----------|--------|---|---|------|---|-------------------------|
| P : Column Load | = 0.7450 | 0.3880 |   |   | 0.50 |   | k                       |
| OB : Overburden | =        |        |   |   |      |   | ksf                     |
| V-x             | = 0.130  |        |   |   |      |   | k                       |
| M-zz            | =        |        |   |   |      |   | k-ft                    |
| Vx applied      | =        |        |   |   |      |   | in above top of footing |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Wall Footing

Project File: Enercalc NW6thSt.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: Cont. Wall Footing - F1

### DESIGN SUMMARY

Design OK

| Factor of Safety  | Item     | Applied           | Capacity     | Governing Load Combination |                     |
|-------------------|----------|-------------------|--------------|----------------------------|---------------------|
| PASS              | 5.574    | Overturning - Z-Z | 0.1083 k-ft  | 0.6039 k-ft                | D Only              |
| PASS              | 2.30     | Sliding - X-X     | 0.130 k      | 0.2990 k                   | D Only              |
| PASS              | n/a      | Uplift            | 0.0 k        | 0.0 k                      | No Uplift           |
| Utilization Ratio | Item     | Applied           | Capacity     | Governing Load Combination |                     |
| PASS              | 0.5730   | Soil Bearing      | 1.432 ksf    | 2.50 ksf                   | +D+0.750Lr+0.450W   |
| PASS              | 0.01964  | Z Flexure (+X)    | 0.1576 k-ft  | 8.024 k-ft                 | +1.20D+1.60Lr+0.50W |
| PASS              | 0.003795 | Z Flexure (-X)    | 0.03045 k-ft | 8.024 k-ft                 | +0.90D              |
| PASS              | n/a      | 1-way Shear (+X)  | 0.0 psi      | 75.0 psi                   | n/a                 |
| PASS              | 0.0      | 1-way Shear (-X)  | 0.0 psi      | 0.0 psi                    | n/a                 |

### Detailed Results

#### Soil Bearing

| Rotation Axis & Load Combination... | Gross Allowable | Xecc      | Actual Soil Bearing Stress -X | +X         | Actual / Allowable Ratio |
|-------------------------------------|-----------------|-----------|-------------------------------|------------|--------------------------|
| , D Only                            | 2.50 ksf        | 1.435 in  | 0.3142 ksf                    | 1.045 ksf  | 0.418                    |
| , +D+Lr                             | 2.50 ksf        | 1.005 in  | 0.6052 ksf                    | 1.336 ksf  | 0.535                    |
| , +D+0.750Lr                        | 2.50 ksf        | 1.086 in  | 0.5325 ksf                    | 1.264 ksf  | 0.505                    |
| , +D+0.60W                          | 2.50 ksf        | 1.078 in  | 0.5392 ksf                    | 1.270 ksf  | 0.508                    |
| , +D+0.750Lr+0.450W                 | 2.50 ksf        | 0.9142 in | 0.7013 ksf                    | 1.432 ksf  | 0.573                    |
| , +D+0.450W                         | 2.50 ksf        | 1.149 in  | 0.4830 ksf                    | 1.214 ksf  | 0.486                    |
| , +0.60D+0.60W                      | 2.50 ksf        | 0.9246 in | 0.4136 ksf                    | 0.8522 ksf | 0.341                    |
| , +0.60D                            | 2.50 ksf        | 1.435 in  | 0.1885 ksf                    | 0.6272 ksf | 0.251                    |

#### Overturning Stability

Units : k-ft

| Rotation Axis & Load Combination... | Overturning Moment | Resisting Moment | Stability Ratio | Status |
|-------------------------------------|--------------------|------------------|-----------------|--------|
| , D Only                            | 0.1083 k-ft        | 0.6039 k-ft      | 5.574           | OK     |
| , +D+Lr                             | 0.1083 k-ft        | 0.8625 k-ft      | 7.962           | OK     |
| , +D+0.750Lr                        | 0.1083 k-ft        | 0.7978 k-ft      | 7.365           | OK     |
| , +D+0.60W                          | 0.1083 k-ft        | 0.8038 k-ft      | 7.420           | OK     |
| , +D+0.750Lr+0.450W                 | 0.1083 k-ft        | 0.9478 k-ft      | 8.749           | OK     |
| , +D+0.450W                         | 0.1083 k-ft        | 0.7539 k-ft      | 6.959           | OK     |
| , +0.60D+0.60W                      | 0.0650 k-ft        | 0.5623 k-ft      | 8.651           | OK     |
| , +0.60D                            | 0.0650 k-ft        | 0.3623 k-ft      | 5.574           | OK     |

#### Sliding Stability

| Force Application Axis Load Combination... | Sliding Force | Resisting Force | Sliding SafetyRatio | Status |
|--------------------------------------------|---------------|-----------------|---------------------|--------|
| , D Only                                   | 0.130 k       | 0.2990 k        | 2.30                | OK     |
| , +D+Lr                                    | 0.130 k       | 0.4270 k        | 3.285               | OK     |
| , +D+0.750Lr                               | 0.130 k       | 0.3950 k        | 3.039               | OK     |
| , +D+0.60W                                 | 0.130 k       | 0.3980 k        | 3.062               | OK     |
| , +D+0.750Lr+0.450W                        | 0.130 k       | 0.4693 k        | 3.610               | OK     |
| , +D+0.450W                                | 0.130 k       | 0.3733 k        | 2.871               | OK     |
| , +0.60D+0.60W                             | 0.0780 k      | 0.2784 k        | 3.569               | OK     |
| , +0.60D                                   | 0.0780 k      | 0.1794 k        | 2.30                | OK     |

#### Footing Flexure

| Flexure Axis & Load Combination | Mu k-ft | Which Side ? | Tension @ Bot. or Top ? | As Req'd in^2 | Gvrn. As in^2 | Actual As in^2 | Phi*Mn k-ft | Status |
|---------------------------------|---------|--------------|-------------------------|---------------|---------------|----------------|-------------|--------|
| , +1.40D                        | 0.04737 | -X           | Bottom                  | 0.216         | Min Temp %    | 0.2667         | 8.024       | OK     |
| , +1.40D                        | 0.1177  | +X           | Bottom                  | 0.216         | Min Temp %    | 0.2667         | 8.024       | OK     |
| , +1.20D+0.50Lr                 | 0.05323 | -X           | Bottom                  | 0.216         | Min Temp %    | 0.2667         | 8.024       | OK     |
| , +1.20D+0.50Lr                 | 0.1135  | +X           | Bottom                  | 0.216         | Min Temp %    | 0.2667         | 8.024       | OK     |
| , +1.20D                        | 0.0406  | -X           | Bottom                  | 0.216         | Min Temp %    | 0.2667         | 8.024       | OK     |
| , +1.20D                        | 0.1009  | +X           | Bottom                  | 0.216         | Min Temp %    | 0.2667         | 8.024       | OK     |
| , +1.20D+1.60Lr                 | 0.081   | -X           | Bottom                  | 0.216         | Min Temp %    | 0.2667         | 8.024       | OK     |
| , +1.20D+1.60Lr                 | 0.1413  | +X           | Bottom                  | 0.216         | Min Temp %    | 0.2667         | 8.024       | OK     |
| , +1.20D+1.60Lr+0.50W           | 0.09727 | -X           | Bottom                  | 0.216         | Min Temp %    | 0.2667         | 8.024       | OK     |
| , +1.20D+1.60Lr+0.50W           | 0.1576  | +X           | Bottom                  | 0.216         | Min Temp %    | 0.2667         | 8.024       | OK     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Wall Footing

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

DESCRIPTION: Cont. Wall Footing - F1

#### Footing Flexure

| Flexure Axis & Load Combination | Mu<br>k-ft | Which<br>Side ? | Tension @ Bot.<br>or Top ? | As Req'd<br>in^2 | Gvrn. As<br>in^2 | Actual As<br>in^2 | Phi*Mn<br>k-ft | Status |
|---------------------------------|------------|-----------------|----------------------------|------------------|------------------|-------------------|----------------|--------|
| , +1.20D+0.50W                  | 0.05687    | -X              | Bottom                     | 0.216            | Min Temp %       | 0.2667            | 8.024          | OK     |
| , +1.20D+0.50W                  | 0.1172     | +X              | Bottom                     | 0.216            | Min Temp %       | 0.2667            | 8.024          | OK     |
| , +1.20D+0.50Lr+W               | 0.08576    | -X              | Bottom                     | 0.216            | Min Temp %       | 0.2667            | 8.024          | OK     |
| , +1.20D+0.50Lr+W               | 0.146      | +X              | Bottom                     | 0.216            | Min Temp %       | 0.2667            | 8.024          | OK     |
| , +1.20D+W                      | 0.07314    | -X              | Bottom                     | 0.216            | Min Temp %       | 0.2667            | 8.024          | OK     |
| , +1.20D+W                      | 0.1334     | +X              | Bottom                     | 0.216            | Min Temp %       | 0.2667            | 8.024          | OK     |
| , +0.90D+W                      | 0.06299    | -X              | Bottom                     | 0.216            | Min Temp %       | 0.2667            | 8.024          | OK     |
| , +0.90D+W                      | 0.1082     | +X              | Bottom                     | 0.216            | Min Temp %       | 0.2667            | 8.024          | OK     |
| , +0.90D                        | 0.03045    | -X              | Bottom                     | 0.216            | Min Temp %       | 0.2667            | 8.024          | OK     |
| , +0.90D                        | 0.07567    | +X              | Bottom                     | 0.216            | Min Temp %       | 0.2667            | 8.024          | OK     |

#### One Way Shear

| Load Combination... | Vu @ -X | Vu @ +X | Vu:Max | Phi Vn | Vu / Phi*Vn | Status |
|---------------------|---------|---------|--------|--------|-------------|--------|
| +1.40D              | 0 psi   | 0 psi   | 0 psi  | 75 psi | 0           | OK     |
| +1.20D+0.50Lr       | 0 psi   | 0 psi   | 0 psi  | 75 psi | 0           | OK     |
| +1.20D              | 0 psi   | 0 psi   | 0 psi  | 75 psi | 0           | OK     |
| +1.20D+1.60Lr       | 0 psi   | 0 psi   | 0 psi  | 75 psi | 0           | OK     |
| +1.20D+1.60Lr+0.50W | 0 psi   | 0 psi   | 0 psi  | 75 psi | 0           | OK     |
| +1.20D+0.50W        | 0 psi   | 0 psi   | 0 psi  | 75 psi | 0           | OK     |
| +1.20D+0.50Lr+W     | 0 psi   | 0 psi   | 0 psi  | 75 psi | 0           | OK     |
| +1.20D+W            | 0 psi   | 0 psi   | 0 psi  | 75 psi | 0           | OK     |
| +0.90D+W            | 0 psi   | 0 psi   | 0 psi  | 75 psi | 0           | OK     |
| +0.90D              | 0 psi   | 0 psi   | 0 psi  | 75 psi | 0           | OK     |

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### General Footing

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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#### DESCRIPTION: F2

#### Code References

Calculations per ACI 318-19, IBC 2021, ASCE 7-16  
 Load Combinations Used : ASCE 7-16

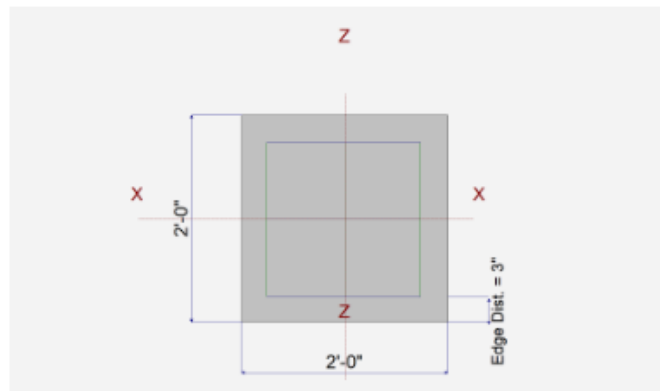
#### General Information

|                                            |   |             |                                                  |   |           |
|--------------------------------------------|---|-------------|--------------------------------------------------|---|-----------|
| <b>Material Properties</b>                 |   |             | <b>Soil Design Values</b>                        |   |           |
| fc : Concrete 28 day strength              | = | 2.50 ksi    | Allowable Soil Bearing                           | = | 2.50 ksf  |
| fy : Rebar Yield                           | = | 60.0 ksi    | Soil Density                                     | = | 110.0 pcf |
| Ec : Concrete Elastic Modulus              | = | 3,122.0 ksi | Increase Bearing By Footing Weight               | = | No        |
| Concrete Density                           | = | 145.0 pcf   | Soil Passive Resistance (for Sliding)            | = | 170.0 pcf |
| φ Values                                   | = | 0.90        | Soil/Concrete Friction Coeff.                    | = | 0.330     |
| Flexure                                    | = |             |                                                  |   |           |
| Shear                                      | = | 0.750       |                                                  |   |           |
| <b>Analysis Settings</b>                   |   |             | <b>Increases based on footing Depth</b>          |   |           |
| Min Steel % Bending Reinf.                 | = |             | Footing base depth below soil surface            | = | ft        |
| Min Allow % Temp Reinf.                    | = | 0.00180     | Allow press. increase per foot of depth          | = | ksf       |
| Min. Overturning Safety Factor             | = | 1.0 : 1     | when footing base is below                       | = | ft        |
| Min. Sliding Safety Factor                 | = | 1.0 : 1     |                                                  |   |           |
| Add Ftg Wt for Soil Pressure               | : | Yes         | <b>Increases based on footing plan dimension</b> |   |           |
| Use ftg wt for stability, moments & shears | : | Yes         | Allowable pressure increase per foot of depth    | = | ksf       |
| Add Pedestal Wt for Soil Pressure          | : | No          | when max. length or width is greater than        | = | ft        |
| Use Pedestal wt for stability, mom & shear | : | No          |                                                  |   |           |

#### Dimensions

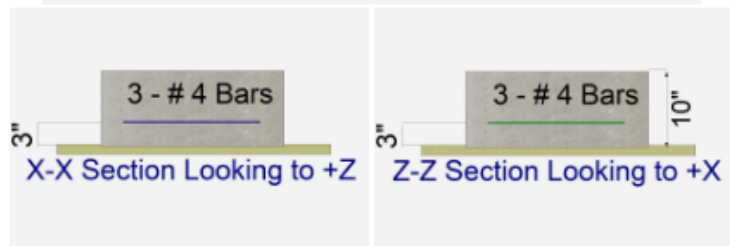
|                             |   |         |
|-----------------------------|---|---------|
| Width parallel to X-X Axis  | = | 2.0 ft  |
| Length parallel to Z-Z Axis | = | 2.0 ft  |
| Footing Thickness           | = | 10.0 in |

|                                         |          |
|-----------------------------------------|----------|
| <b>Pedestal dimensions...</b>           |          |
| px : parallel to X-X Axis               | = in     |
| pz : parallel to Z-Z Axis               | = in     |
| Height                                  | = in     |
| Rebar Centerline to Edge of Concrete... | = 3.0 in |
| at Bottom of footing                    |          |



#### Reinforcing

|                                                    |       |
|----------------------------------------------------|-------|
| <b>Bars parallel to X-X Axis</b>                   |       |
| Number of Bars                                     | = 3.0 |
| Reinforcing Bar Size                               | = # 4 |
| <b>Bars parallel to Z-Z Axis</b>                   |       |
| Number of Bars                                     | = 3.0 |
| Reinforcing Bar Size                               | = # 4 |
| <b>Bandwidth Distribution Check (ACI 15.4.4.2)</b> |       |
| Direction Requiring Closer Separation              | n/a   |
| # Bars required within zone                        | n/a   |
| # Bars required on each side of zone               | n/a   |



#### Applied Loads

|                 | D | L <sub>r</sub> | L     | S    | W     | E | H    |
|-----------------|---|----------------|-------|------|-------|---|------|
| P : Column Load | = | 4.330          | 3.120 | 3.90 | 3.120 |   | k    |
| OB : Overburden | = |                |       |      |       |   | ksf  |
| M-xx            | = |                |       |      |       |   | k-ft |
| M-zz            | = |                |       |      |       |   | k-ft |
| V-x             | = |                |       |      |       |   | k    |
| V-z             | = |                |       |      |       |   | k    |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### General Footing

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: F2

### DESIGN SUMMARY

Design OK

|      | Min. Ratio | Item              | Applied       | Capacity      | Governing Load Combination      |
|------|------------|-------------------|---------------|---------------|---------------------------------|
| PASS | 0.9144     | Soil Bearing      | 2.286 ksf     | 2.50 ksf      | +D+0.750S+0.450W about Z-Z axis |
| PASS | n/a        | Overturning - X-X | 0.0 k-ft      | 0.0 k-ft      | No Overturning                  |
| PASS | n/a        | Overturning - Z-Z | 0.0 k-ft      | 0.0 k-ft      | No Overturning                  |
| PASS | n/a        | Sliding - X-X     | 0.0 k         | 0.0 k         | No Sliding                      |
| PASS | n/a        | Sliding - Z-Z     | 0.0 k         | 0.0 k         | No Sliding                      |
| PASS | n/a        | Uplift            | 0.0 k         | 0.0 k         | No Uplift                       |
| PASS | 0.1810     | Z Flexure (+X)    | 1.625 k-ft/ft | 8.974 k-ft/ft | +1.20D+1.60S+0.50W              |
| PASS | 0.1810     | Z Flexure (-X)    | 1.625 k-ft/ft | 8.974 k-ft/ft | +1.20D+1.60S+0.50W              |
| PASS | 0.1810     | X Flexure (+Z)    | 1.625 k-ft/ft | 8.974 k-ft/ft | +1.20D+1.60S+0.50W              |
| PASS | 0.1810     | X Flexure (-Z)    | 1.625 k-ft/ft | 8.974 k-ft/ft | +1.20D+1.60S+0.50W              |
| PASS | 0.3543     | 1-way Shear (+X)  | 16.245 psi    | 45.857 psi    | +1.20D+1.60S+0.50W              |
| PASS | 0.3543     | 1-way Shear (-X)  | 16.245 psi    | 45.857 psi    | +1.20D+1.60S+0.50W              |
| PASS | 0.3543     | 1-way Shear (+Z)  | 16.245 psi    | 45.857 psi    | +1.20D+1.60S+0.50W              |
| PASS | 0.3543     | 1-way Shear (-Z)  | 16.245 psi    | 45.857 psi    | +1.20D+1.60S+0.50W              |
| PASS | 0.4023     | 2-way Punching    | 60.339 psi    | 150.0 psi     | +1.20D+1.60S+0.50W              |

### Detailed Results

#### Soil Bearing

| Rotation Axis & Load Combination... | Gross Allowable | Xecc | Zecc | Actual Soil Bearing Stress @ Location |         |          |           | Actual / Allow Ratio |
|-------------------------------------|-----------------|------|------|---------------------------------------|---------|----------|-----------|----------------------|
|                                     |                 |      | (in) | Bottom, -Z                            | Top, +Z | Left, -X | Right, +X |                      |
| X-X, D Only                         | 2.50            | n/a  | 0.0  | 1.203                                 | 1.203   | n/a      | n/a       | 0.481                |
| X-X, +D+Lr                          | 2.50            | n/a  | 0.0  | 1.983                                 | 1.983   | n/a      | n/a       | 0.793                |
| X-X, +D+S                           | 2.50            | n/a  | 0.0  | 2.178                                 | 2.178   | n/a      | n/a       | 0.871                |
| X-X, +D+0.750Lr                     | 2.50            | n/a  | 0.0  | 1.788                                 | 1.788   | n/a      | n/a       | 0.715                |
| X-X, +D+0.750S                      | 2.50            | n/a  | 0.0  | 1.935                                 | 1.935   | n/a      | n/a       | 0.774                |
| X-X, +D+0.60W                       | 2.50            | n/a  | 0.0  | 1.671                                 | 1.671   | n/a      | n/a       | 0.668                |
| X-X, +D+0.750Lr+0.450W              | 2.50            | n/a  | 0.0  | 2.139                                 | 2.139   | n/a      | n/a       | 0.856                |
| X-X, +D+0.750S+0.450W               | 2.50            | n/a  | 0.0  | 2.286                                 | 2.286   | n/a      | n/a       | 0.914                |
| X-X, +0.60D+0.60W                   | 2.50            | n/a  | 0.0  | 1.190                                 | 1.190   | n/a      | n/a       | 0.476                |
| X-X, +0.60D                         | 2.50            | n/a  | 0.0  | 0.7220                                | 0.7220  | n/a      | n/a       | 0.289                |
| Z-Z, D Only                         | 2.50            | 0.0  | n/a  | n/a                                   | n/a     | 1.203    | 1.203     | 0.481                |
| Z-Z, +D+Lr                          | 2.50            | 0.0  | n/a  | n/a                                   | n/a     | 1.983    | 1.983     | 0.793                |
| Z-Z, +D+S                           | 2.50            | 0.0  | n/a  | n/a                                   | n/a     | 2.178    | 2.178     | 0.871                |
| Z-Z, +D+0.750Lr                     | 2.50            | 0.0  | n/a  | n/a                                   | n/a     | 1.788    | 1.788     | 0.715                |
| Z-Z, +D+0.750S                      | 2.50            | 0.0  | n/a  | n/a                                   | n/a     | 1.935    | 1.935     | 0.774                |
| Z-Z, +D+0.60W                       | 2.50            | 0.0  | n/a  | n/a                                   | n/a     | 1.671    | 1.671     | 0.668                |
| Z-Z, +D+0.750Lr+0.450W              | 2.50            | 0.0  | n/a  | n/a                                   | n/a     | 2.139    | 2.139     | 0.856                |
| Z-Z, +D+0.750S+0.450W               | 2.50            | 0.0  | n/a  | n/a                                   | n/a     | 2.286    | 2.286     | 0.914                |
| Z-Z, +0.60D+0.60W                   | 2.50            | 0.0  | n/a  | n/a                                   | n/a     | 1.190    | 1.190     | 0.476                |
| Z-Z, +0.60D                         | 2.50            | 0.0  | n/a  | n/a                                   | n/a     | 0.7220   | 0.7220    | 0.289                |

### Overturning Stability

| Rotation Axis & Load Combination... | Overturning Moment | Resisting Moment | Stability Ratio | Status |
|-------------------------------------|--------------------|------------------|-----------------|--------|
| Footing Has NO Overturning          |                    |                  |                 |        |

All units k

### Sliding Stability

| Force Application Axis Load Combination... | Sliding Force | Resisting Force | Stability Ratio | Status |
|--------------------------------------------|---------------|-----------------|-----------------|--------|
| Footing Has NO Sliding                     |               |                 |                 |        |

### Footing Flexure

| Flexure Axis & Load Combination | Mu k-ft | Side | Tension Surface | As Req'd in^2 | Gvrn. As in^2 | Actual As in^2 | Phi*Mn k-ft | Status |
|---------------------------------|---------|------|-----------------|---------------|---------------|----------------|-------------|--------|
| X-X, +1.40D                     | 0.7578  | +Z   | Bottom          | 0.2160        | ACI 7.6.1.1   | 0.30           | 8.974       | OK     |
| X-X, +1.40D                     | 0.7578  | -Z   | Bottom          | 0.2160        | ACI 7.6.1.1   | 0.30           | 8.974       | OK     |
| X-X, +1.20D+0.50Lr              | 0.8445  | +Z   | Bottom          | 0.2160        | ACI 7.6.1.1   | 0.30           | 8.974       | OK     |
| X-X, +1.20D+0.50Lr              | 0.8445  | -Z   | Bottom          | 0.2160        | ACI 7.6.1.1   | 0.30           | 8.974       | OK     |
| X-X, +1.20D+0.50S               | 0.8933  | +Z   | Bottom          | 0.2160        | ACI 7.6.1.1   | 0.30           | 8.974       | OK     |





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### General Footing

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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### DESCRIPTION: F2

#### Footing Flexure

| Flexure Axis & Load Combination | Mu<br>k-ft | Side | Tension<br>Surface | As Req'd<br>in <sup>2</sup> | Gvrm. As<br>in <sup>2</sup> | Actual As<br>in <sup>2</sup> | Phi*Mn<br>k-ft | Status |
|---------------------------------|------------|------|--------------------|-----------------------------|-----------------------------|------------------------------|----------------|--------|
| X-X, +1.20D+0.50S               | 0.8933     | -Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+1.60Lr              | 1.274      | +Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+1.60Lr              | 1.274      | -Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+1.60Lr+0.50W        | 1.469      | +Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+1.60Lr+0.50W        | 1.469      | -Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+1.60S               | 1.430      | +Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+1.60S               | 1.430      | -Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+1.60S+0.50W         | 1.625      | +Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+1.60S+0.50W         | 1.625      | -Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+0.50Lr+W            | 1.235      | +Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+0.50Lr+W            | 1.235      | -Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+0.50S+W             | 1.283      | +Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+0.50S+W             | 1.283      | -Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +0.90D+W                   | 0.8771     | +Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +0.90D+W                   | 0.8771     | -Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+0.20S               | 0.7470     | +Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +1.20D+0.20S               | 0.7470     | -Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +0.90D                     | 0.4871     | +Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| X-X, +0.90D                     | 0.4871     | -Z   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.40D                     | 0.7578     | -X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.40D                     | 0.7578     | +X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+0.50Lr              | 0.8445     | -X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+0.50Lr              | 0.8445     | +X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+0.50S               | 0.8933     | -X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+0.50S               | 0.8933     | +X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+1.60Lr              | 1.274      | -X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+1.60Lr              | 1.274      | +X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+1.60Lr+0.50W        | 1.469      | -X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+1.60Lr+0.50W        | 1.469      | +X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+1.60S               | 1.430      | -X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+1.60S               | 1.430      | +X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+1.60S+0.50W         | 1.625      | -X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+1.60S+0.50W         | 1.625      | +X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+0.50Lr+W            | 1.235      | -X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+0.50Lr+W            | 1.235      | +X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+0.50S+W             | 1.283      | -X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+0.50S+W             | 1.283      | +X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +0.90D+W                   | 0.8771     | -X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +0.90D+W                   | 0.8771     | +X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+0.20S               | 0.7470     | -X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +1.20D+0.20S               | 0.7470     | +X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +0.90D                     | 0.4871     | -X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |
| Z-Z, +0.90D                     | 0.4871     | +X   | Bottom             | 0.2160                      | ACI 7.6.1.1                 | 0.30                         | 8.974          | OK     |

#### One Way Shear X

| Load Combination... | Vu @ -X   | Vu @ +X   | Vu:Max    | Phi Vn    | Vu / Phi*Vn | Status |
|---------------------|-----------|-----------|-----------|-----------|-------------|--------|
| +1.40D              | 7.58 psi  | 7.58 psi  | 7.58 psi  | 45.86 psi | 0.17        | OK     |
| +1.20D+0.50Lr       | 8.45 psi  | 8.45 psi  | 8.45 psi  | 45.86 psi | 0.18        | OK     |
| +1.20D+0.50S        | 8.93 psi  | 8.93 psi  | 8.93 psi  | 45.86 psi | 0.19        | OK     |
| +1.20D+1.60Lr       | 12.74 psi | 12.74 psi | 12.74 psi | 45.86 psi | 0.28        | OK     |
| +1.20D+1.60Lr+0.50W | 14.69 psi | 14.69 psi | 14.69 psi | 45.86 psi | 0.32        | OK     |
| +1.20D+1.60S        | 14.30 psi | 14.30 psi | 14.30 psi | 45.86 psi | 0.31        | OK     |
| +1.20D+1.60S+0.50W  | 16.25 psi | 16.25 psi | 16.25 psi | 45.86 psi | 0.35        | OK     |
| +1.20D+0.50Lr+W     | 12.35 psi | 12.35 psi | 12.35 psi | 45.86 psi | 0.27        | OK     |
| +1.20D+0.50S+W      | 12.83 psi | 12.83 psi | 12.83 psi | 45.86 psi | 0.28        | OK     |
| +0.90D+W            | 8.77 psi  | 8.77 psi  | 8.77 psi  | 45.86 psi | 0.19        | OK     |
| +1.20D+0.20S        | 7.47 psi  | 7.47 psi  | 7.47 psi  | 45.86 psi | 0.16        | OK     |
| +0.90D              | 4.87 psi  | 4.87 psi  | 4.87 psi  | 45.86 psi | 0.11        | OK     |

#### One Way Shear Z

| Load Combination... | Vu @ -Z  | Vu @ +Z  | Vu:Max   | Phi Vn    | Vu / Phi*Vn | Status |
|---------------------|----------|----------|----------|-----------|-------------|--------|
| +1.40D              | 7.58 psi | 7.58 psi | 7.58 psi | 45.86 psi | 0.17        | OK     |
| +1.20D+0.50Lr       | 8.45 psi | 8.45 psi | 8.45 psi | 45.86 psi | 0.18        | OK     |





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### General Footing

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

DESCRIPTION: F2

#### One Way Shear Z

| Load Combination... | Vu @ -Z   | Vu @ +Z   | Vu:Max    | Phi Vn    | Vu / Phi*Vn | Status |
|---------------------|-----------|-----------|-----------|-----------|-------------|--------|
| +1.20D+0.50S        | 8.93 psi  | 8.93 psi  | 8.93 psi  | 45.86 psi | 0.19        | OK     |
| +1.20D+1.60Lr       | 12.74 psi | 12.74 psi | 12.74 psi | 45.86 psi | 0.28        | OK     |
| +1.20D+1.60Lr+0.50W | 14.69 psi | 14.69 psi | 14.69 psi | 45.86 psi | 0.32        | OK     |
| +1.20D+1.60S        | 14.30 psi | 14.30 psi | 14.30 psi | 45.86 psi | 0.31        | OK     |
| +1.20D+1.60S+0.50W  | 16.25 psi | 16.25 psi | 16.25 psi | 45.86 psi | 0.35        | OK     |
| +1.20D+0.50Lr+W     | 12.35 psi | 12.35 psi | 12.35 psi | 45.86 psi | 0.27        | OK     |
| +1.20D+0.50S+W      | 12.83 psi | 12.83 psi | 12.83 psi | 45.86 psi | 0.28        | OK     |
| +0.90D+W            | 8.77 psi  | 8.77 psi  | 8.77 psi  | 45.86 psi | 0.19        | OK     |
| +1.20D+0.20S        | 7.47 psi  | 7.47 psi  | 7.47 psi  | 45.86 psi | 0.16        | OK     |
| +0.90D              | 4.87 psi  | 4.87 psi  | 4.87 psi  | 45.86 psi | 0.11        | OK     |

#### Two-Way "Punching" Shear

All units k

| Load Combination... | Vu        | Phi*Vn    | Vu / Phi*Vn | Status |
|---------------------|-----------|-----------|-------------|--------|
| +1.40D              | 28.15 psi | 150.00psi | 0.1876      | OK     |
| +1.20D+0.50Lr       | 31.37 psi | 150.00psi | 0.2091      | OK     |
| +1.20D+0.50S        | 33.18 psi | 150.00psi | 0.2212      | OK     |
| +1.20D+1.60Lr       | 47.30 psi | 150.00psi | 0.3153      | OK     |
| +1.20D+1.60Lr+0.50W | 54.54 psi | 150.00psi | 0.3636      | OK     |
| +1.20D+1.60S        | 53.10 psi | 150.00psi | 0.354       | OK     |
| +1.20D+1.60S+0.50W  | 60.34 psi | 150.00psi | 0.4023      | OK     |
| +1.20D+0.50Lr+W     | 45.85 psi | 150.00psi | 0.3057      | OK     |
| +1.20D+0.50S+W      | 47.66 psi | 150.00psi | 0.3178      | OK     |
| +0.90D+W            | 32.58 psi | 150.00psi | 0.2172      | OK     |
| +1.20D+0.20S        | 27.75 psi | 150.00psi | 0.185       | OK     |
| +0.90D              | 18.09 psi | 150.00psi | 0.1206      | OK     |

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### General Footing

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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### DESCRIPTION: F3

### Code References

Calculations per ACI 318-19, IBC 2021, ASCE 7-16  
 Load Combinations Used : ASCE 7-16

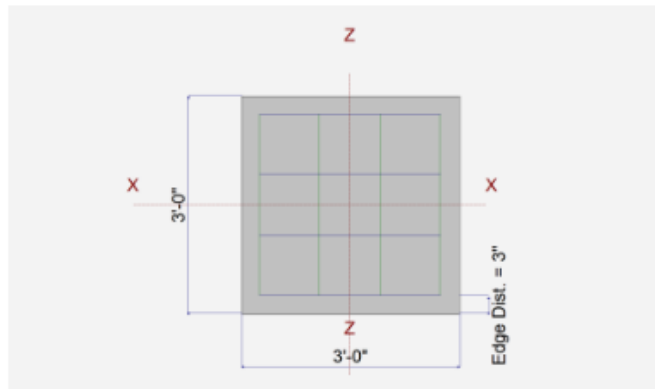
### General Information

|                                            |         |   |             |                                               |  |   |           |
|--------------------------------------------|---------|---|-------------|-----------------------------------------------|--|---|-----------|
| Material Properties                        |         |   |             | Soil Design Values                            |  |   |           |
| fc : Concrete 28 day strength              |         | = | 2.50 ksi    | Allowable Soil Bearing                        |  | = | 2.50 ksf  |
| fy : Rebar Yield                           |         | = | 60.0 ksi    | Soil Density                                  |  | = | 110.0 pcf |
| Ec : Concrete Elastic Modulus              |         | = | 3,122.0 ksi | Increase Bearing By Footing Weight            |  | = | No        |
| Concrete Density                           |         | = | 145.0 pcf   | Soil Passive Resistance (for Sliding)         |  | = | 170.0 pcf |
| φ Values                                   | Flexure | = | 0.90        | Soil/Concrete Friction Coeff.                 |  | = | 0.330     |
|                                            | Shear   | = | 0.750       |                                               |  |   |           |
| Analysis Settings                          |         |   |             | Increases based on footing Depth              |  |   |           |
| Min Steel % Bending Reinf.                 |         | = |             | Footing base depth below soil surface         |  | = | ft        |
| Min Allow % Temp Reinf.                    |         | = | 0.00180     | Allow press. increase per foot of depth       |  | = | ksf       |
| Min. Overturning Safety Factor             |         | = | 1.0 : 1     | when footing base is below                    |  | = | ft        |
| Min. Sliding Safety Factor                 |         | = | 1.0 : 1     | Increases based on footing plan dimension     |  |   |           |
| Add Ftg Wt for Soil Pressure               |         | : | Yes         | Allowable pressure increase per foot of depth |  |   |           |
| Use ftg wt for stability, moments & shears |         | : | Yes         |                                               |  | = | ksf       |
| Add Pedestal Wt for Soil Pressure          |         | : | No          | when max. length or width is greater than     |  |   |           |
| Use Pedestal wt for stability, mom & shear |         | : | No          |                                               |  | = | ft        |

### Dimensions

|                             |   |         |
|-----------------------------|---|---------|
| Width parallel to X-X Axis  | = | 3.0 ft  |
| Length parallel to Z-Z Axis | = | 3.0 ft  |
| Footing Thickness           | = | 12.0 in |

|                                         |   |        |
|-----------------------------------------|---|--------|
| <b>Pedestal dimensions...</b>           |   |        |
| px : parallel to X-X Axis               | = | in     |
| pz : parallel to Z-Z Axis               | = | in     |
| Height                                  | = | in     |
| Rebar Centerline to Edge of Concrete... | = | 3.0 in |
| at Bottom of footing                    |   |        |



### Reinforcing

|                                                    |   |     |
|----------------------------------------------------|---|-----|
| <b>Bars parallel to X-X Axis</b>                   |   |     |
| Number of Bars                                     | = | 4.0 |
| Reinforcing Bar Size                               | = | # 4 |
| <b>Bars parallel to Z-Z Axis</b>                   |   |     |
| Number of Bars                                     | = | 4.0 |
| Reinforcing Bar Size                               | = | # 4 |
| <b>Bandwidth Distribution Check (ACI 15.4.4.2)</b> |   |     |
| Direction Requiring Closer Separation              | = | n/a |
| # Bars required within zone                        | = | n/a |
| # Bars required on each side of zone               | = | n/a |



### Applied Loads

|                 | D | Lr     | L     | S     | W     | E | H    |
|-----------------|---|--------|-------|-------|-------|---|------|
| P : Column Load | = | 10.380 | 7.470 | 9.340 | 7.470 |   | k    |
| OB : Overburden | = |        |       |       |       |   | ksf  |
| M-xx            | = |        |       |       |       |   | k-ft |
| M-zz            | = |        |       |       |       |   | k-ft |
| V-x             | = |        |       |       |       |   | k    |
| V-z             | = |        |       |       |       |   | k    |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### General Footing

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: F3

### DESIGN SUMMARY

Design OK

|      | Min. Ratio | Item              | Applied       | Capacity       | Governing Load Combination      |
|------|------------|-------------------|---------------|----------------|---------------------------------|
| PASS | 0.980      | Soil Bearing      | 2.450 ksf     | 2.50 ksf       | +D+0.750S+0.450W about Z-Z axis |
| PASS | n/a        | Overturning - X-X | 0.0 k-ft      | 0.0 k-ft       | No Overturning                  |
| PASS | n/a        | Overturning - Z-Z | 0.0 k-ft      | 0.0 k-ft       | No Overturning                  |
| PASS | n/a        | Sliding - X-X     | 0.0 k         | 0.0 k          | No Sliding                      |
| PASS | n/a        | Sliding - Z-Z     | 0.0 k         | 0.0 k          | No Sliding                      |
| PASS | n/a        | Uplift            | 0.0 k         | 0.0 k          | No Uplift                       |
| PASS | 0.3734     | Z Flexure (+X)    | 3.892 k-ft/ft | 10.424 k-ft/ft | +1.20D+1.60S+0.50W              |
| PASS | 0.3734     | Z Flexure (-X)    | 3.892 k-ft/ft | 10.424 k-ft/ft | +1.20D+1.60S+0.50W              |
| PASS | 0.3734     | X Flexure (+Z)    | 3.892 k-ft/ft | 10.424 k-ft/ft | +1.20D+1.60S+0.50W              |
| PASS | 0.3734     | X Flexure (-Z)    | 3.892 k-ft/ft | 10.424 k-ft/ft | +1.20D+1.60S+0.50W              |
| PASS | 0.5925     | 1-way Shear (+X)  | 24.024 psi    | 40.548 psi     | +1.20D+1.60S+0.50W              |
| PASS | 0.5925     | 1-way Shear (-X)  | 24.024 psi    | 40.548 psi     | +1.20D+1.60S+0.50W              |
| PASS | 0.5925     | 1-way Shear (+Z)  | 24.024 psi    | 40.548 psi     | +1.20D+1.60S+0.50W              |
| PASS | 0.5925     | 1-way Shear (-Z)  | 24.024 psi    | 40.548 psi     | +1.20D+1.60S+0.50W              |
| PASS | 0.6006     | 2-way Punching    | 90.090 psi    | 150.0 psi      | +1.20D+1.60S+0.50W              |

### Detailed Results

#### Soil Bearing

| Rotation Axis & Load Combination... | Gross Allowable | Xecc (in) | Zecc (in) | Actual Soil Bearing Stress @ Location |         |          |           | Actual / Allow Ratio |
|-------------------------------------|-----------------|-----------|-----------|---------------------------------------|---------|----------|-----------|----------------------|
|                                     |                 |           |           | Bottom, -Z                            | Top, +Z | Left, -X | Right, +X |                      |
| X-X, D Only                         | 2.50            | n/a       | 0.0       | 1.298                                 | 1.298   | n/a      | n/a       | 0.519                |
| X-X, +D+Lr                          | 2.50            | n/a       | 0.0       | 2.128                                 | 2.128   | n/a      | n/a       | 0.851                |
| X-X, +D+S                           | 2.50            | n/a       | 0.0       | 2.336                                 | 2.336   | n/a      | n/a       | 0.934                |
| X-X, +D+0.750Lr                     | 2.50            | n/a       | 0.0       | 1.921                                 | 1.921   | n/a      | n/a       | 0.768                |
| X-X, +D+0.750S                      | 2.50            | n/a       | 0.0       | 2.077                                 | 2.077   | n/a      | n/a       | 0.831                |
| X-X, +D+0.60W                       | 2.50            | n/a       | 0.0       | 1.796                                 | 1.796   | n/a      | n/a       | 0.718                |
| X-X, +D+0.750Lr+0.450W              | 2.50            | n/a       | 0.0       | 2.294                                 | 2.294   | n/a      | n/a       | 0.918                |
| X-X, +D+0.750S+0.450W               | 2.50            | n/a       | 0.0       | 2.450                                 | 2.450   | n/a      | n/a       | 0.980                |
| X-X, +0.60D+0.60W                   | 2.50            | n/a       | 0.0       | 1.277                                 | 1.277   | n/a      | n/a       | 0.511                |
| X-X, +0.60D                         | 2.50            | n/a       | 0.0       | 0.7790                                | 0.7790  | n/a      | n/a       | 0.312                |
| Z-Z, D Only                         | 2.50            | 0.0       | n/a       | n/a                                   | n/a     | 1.298    | 1.298     | 0.519                |
| Z-Z, +D+Lr                          | 2.50            | 0.0       | n/a       | n/a                                   | n/a     | 2.128    | 2.128     | 0.851                |
| Z-Z, +D+S                           | 2.50            | 0.0       | n/a       | n/a                                   | n/a     | 2.336    | 2.336     | 0.934                |
| Z-Z, +D+0.750Lr                     | 2.50            | 0.0       | n/a       | n/a                                   | n/a     | 1.921    | 1.921     | 0.768                |
| Z-Z, +D+0.750S                      | 2.50            | 0.0       | n/a       | n/a                                   | n/a     | 2.077    | 2.077     | 0.831                |
| Z-Z, +D+0.60W                       | 2.50            | 0.0       | n/a       | n/a                                   | n/a     | 1.796    | 1.796     | 0.718                |
| Z-Z, +D+0.750Lr+0.450W              | 2.50            | 0.0       | n/a       | n/a                                   | n/a     | 2.294    | 2.294     | 0.918                |
| Z-Z, +D+0.750S+0.450W               | 2.50            | 0.0       | n/a       | n/a                                   | n/a     | 2.450    | 2.450     | 0.980                |
| Z-Z, +0.60D+0.60W                   | 2.50            | 0.0       | n/a       | n/a                                   | n/a     | 1.277    | 1.277     | 0.511                |
| Z-Z, +0.60D                         | 2.50            | 0.0       | n/a       | n/a                                   | n/a     | 0.7790   | 0.7790    | 0.312                |

#### Overturning Stability

| Rotation Axis & Load Combination... | Overturning Moment | Resisting Moment | Stability Ratio | Status |
|-------------------------------------|--------------------|------------------|-----------------|--------|
| Footing Has NO Overturning          |                    |                  |                 |        |

All units k

#### Sliding Stability

| Force Application Axis Load Combination... | Sliding Force | Resisting Force | Stability Ratio | Status |
|--------------------------------------------|---------------|-----------------|-----------------|--------|
| Footing Has NO Sliding                     |               |                 |                 |        |

#### Footing Flexure

| Flexure Axis & Load Combination | Mu k-ft | Side | Tension Surface | As Req'd in^2 | Gvrn. As in^2 | Actual As in^2 | Phi*Mn k-ft | Status |
|---------------------------------|---------|------|-----------------|---------------|---------------|----------------|-------------|--------|
| X-X, +1.40D                     | 1.817   | +Z   | Bottom          | 0.2592        | ACI 7.6.1.1   | 0.2667         | 10.424      | OK     |
| X-X, +1.40D                     | 1.817   | -Z   | Bottom          | 0.2592        | ACI 7.6.1.1   | 0.2667         | 10.424      | OK     |
| X-X, +1.20D+0.50Lr              | 2.024   | +Z   | Bottom          | 0.2592        | ACI 7.6.1.1   | 0.2667         | 10.424      | OK     |
| X-X, +1.20D+0.50Lr              | 2.024   | -Z   | Bottom          | 0.2592        | ACI 7.6.1.1   | 0.2667         | 10.424      | OK     |
| X-X, +1.20D+0.50S               | 2.141   | +Z   | Bottom          | 0.2592        | ACI 7.6.1.1   | 0.2667         | 10.424      | OK     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### General Footing

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

### DESCRIPTION: F3

#### Footing Flexure

| Flexure Axis & Load Combination | Mu<br>k-ft | Side | Tension<br>Surface | As Req'd<br>in <sup>2</sup> | Gvrm. As<br>in <sup>2</sup> | Actual As<br>in <sup>2</sup> | Phi*Mn<br>k-ft | Status |
|---------------------------------|------------|------|--------------------|-----------------------------|-----------------------------|------------------------------|----------------|--------|
| X-X, +1.20D+0.50S               | 2.141      | -Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+1.60Lr              | 3.051      | +Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+1.60Lr              | 3.051      | -Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+1.60Lr+0.50W        | 3.518      | +Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+1.60Lr+0.50W        | 3.518      | -Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+1.60S               | 3.425      | +Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+1.60S               | 3.425      | -Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+1.60S+0.50W         | 3.892      | +Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+1.60S+0.50W         | 3.892      | -Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+0.50Lr+W            | 2.958      | +Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+0.50Lr+W            | 2.958      | -Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+0.50S+W             | 3.075      | +Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+0.50S+W             | 3.075      | -Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +0.90D+W                   | 2.102      | +Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +0.90D+W                   | 2.102      | -Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+0.20S               | 1.791      | +Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +1.20D+0.20S               | 1.791      | -Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +0.90D                     | 1.168      | +Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| X-X, +0.90D                     | 1.168      | -Z   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.40D                     | 1.817      | -X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.40D                     | 1.817      | +X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+0.50Lr              | 2.024      | -X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+0.50Lr              | 2.024      | +X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+0.50S               | 2.141      | -X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+0.50S               | 2.141      | +X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+1.60Lr              | 3.051      | -X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+1.60Lr              | 3.051      | +X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+1.60Lr+0.50W        | 3.518      | -X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+1.60Lr+0.50W        | 3.518      | +X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+1.60S               | 3.425      | -X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+1.60S               | 3.425      | +X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+1.60S+0.50W         | 3.892      | -X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+1.60S+0.50W         | 3.892      | +X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+0.50Lr+W            | 2.958      | -X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+0.50Lr+W            | 2.958      | +X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+0.50S+W             | 3.075      | -X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+0.50S+W             | 3.075      | +X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +0.90D+W                   | 2.102      | -X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +0.90D+W                   | 2.102      | +X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+0.20S               | 1.791      | -X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +1.20D+0.20S               | 1.791      | +X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +0.90D                     | 1.168      | -X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |
| Z-Z, +0.90D                     | 1.168      | +X   | Bottom             | 0.2592                      | ACI 7.6.1.1                 | 0.2667                       | 10.424         | OK     |

#### One Way Shear X

| Load Combination... | Vu @ -X   | Vu @ +X   | Vu:Max    | Phi Vn    | Vu / Phi*Vn | Status |
|---------------------|-----------|-----------|-----------|-----------|-------------|--------|
| +1.40D              | 11.21 psi | 11.21 psi | 11.21 psi | 40.55 psi | 0.28        | OK     |
| +1.20D+0.50Lr       | 12.49 psi | 12.49 psi | 12.49 psi | 40.55 psi | 0.31        | OK     |
| +1.20D+0.50S        | 13.22 psi | 13.22 psi | 13.22 psi | 40.55 psi | 0.33        | OK     |
| +1.20D+1.60Lr       | 18.83 psi | 18.83 psi | 18.83 psi | 40.55 psi | 0.46        | OK     |
| +1.20D+1.60Lr+0.50W | 21.72 psi | 21.72 psi | 21.72 psi | 40.55 psi | 0.54        | OK     |
| +1.20D+1.60S        | 21.14 psi | 21.14 psi | 21.14 psi | 40.55 psi | 0.52        | OK     |
| +1.20D+1.60S+0.50W  | 24.02 psi | 24.02 psi | 24.02 psi | 40.55 psi | 0.59        | OK     |
| +1.20D+0.50Lr+W     | 18.26 psi | 18.26 psi | 18.26 psi | 40.55 psi | 0.45        | OK     |
| +1.20D+0.50S+W      | 18.98 psi | 18.98 psi | 18.98 psi | 40.55 psi | 0.47        | OK     |
| +0.90D+W            | 12.97 psi | 12.97 psi | 12.97 psi | 40.55 psi | 0.32        | OK     |
| +1.20D+0.20S        | 11.05 psi | 11.05 psi | 11.05 psi | 40.55 psi | 0.27        | OK     |
| +0.90D              | 7.21 psi  | 7.21 psi  | 7.21 psi  | 40.55 psi | 0.18        | OK     |

#### One Way Shear Z

| Load Combination... | Vu @ -Z   | Vu @ +Z   | Vu:Max    | Phi Vn    | Vu / Phi*Vn | Status |
|---------------------|-----------|-----------|-----------|-----------|-------------|--------|
| +1.40D              | 11.21 psi | 11.21 psi | 11.21 psi | 40.55 psi | 0.28        | OK     |
| +1.20D+0.50Lr       | 12.49 psi | 12.49 psi | 12.49 psi | 40.55 psi | 0.31        | OK     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### General Footing

Project File: Enercalc NW6thSt.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

DESCRIPTION: F3

#### One Way Shear Z

| Load Combination... | Vu @ -Z   | Vu @ +Z   | Vu:Max    | Phi Vn    | Vu / Phi*Vn | Status |
|---------------------|-----------|-----------|-----------|-----------|-------------|--------|
| +1.20D+0.50S        | 13.22 psi | 13.22 psi | 13.22 psi | 40.55 psi | 0.33        | OK     |
| +1.20D+1.60Lr       | 18.83 psi | 18.83 psi | 18.83 psi | 40.55 psi | 0.46        | OK     |
| +1.20D+1.60Lr+0.50W | 21.72 psi | 21.72 psi | 21.72 psi | 40.55 psi | 0.54        | OK     |
| +1.20D+1.60S        | 21.14 psi | 21.14 psi | 21.14 psi | 40.55 psi | 0.52        | OK     |
| +1.20D+1.60S+0.50W  | 24.02 psi | 24.02 psi | 24.02 psi | 40.55 psi | 0.59        | OK     |
| +1.20D+0.50Lr+W     | 18.26 psi | 18.26 psi | 18.26 psi | 40.55 psi | 0.45        | OK     |
| +1.20D+0.50S+W      | 18.98 psi | 18.98 psi | 18.98 psi | 40.55 psi | 0.47        | OK     |
| +0.90D+W            | 12.97 psi | 12.97 psi | 12.97 psi | 40.55 psi | 0.32        | OK     |
| +1.20D+0.20S        | 11.05 psi | 11.05 psi | 11.05 psi | 40.55 psi | 0.27        | OK     |
| +0.90D              | 7.21 psi  | 7.21 psi  | 7.21 psi  | 40.55 psi | 0.18        | OK     |

All units k

#### Two-Way "Punching" Shear

| Load Combination... | Vu        | Phi*Vn    | Vu / Phi*Vn | Status |
|---------------------|-----------|-----------|-------------|--------|
| +1.40D              | 42.05 psi | 150.00psi | 0.2803      | OK     |
| +1.20D+0.50Lr       | 46.85 psi | 150.00psi | 0.3123      | OK     |
| +1.20D+0.50S        | 49.55 psi | 150.00psi | 0.3304      | OK     |
| +1.20D+1.60Lr       | 70.63 psi | 150.00psi | 0.4708      | OK     |
| +1.20D+1.60Lr+0.50W | 81.43 psi | 150.00psi | 0.5429      | OK     |
| +1.20D+1.60S        | 79.28 psi | 150.00psi | 0.5285      | OK     |
| +1.20D+1.60S+0.50W  | 90.09 psi | 150.00psi | 0.6006      | OK     |
| +1.20D+0.50Lr+W     | 68.46 psi | 150.00psi | 0.4564      | OK     |
| +1.20D+0.50S+W      | 71.17 psi | 150.00psi | 0.4745      | OK     |
| +0.90D+W            | 48.65 psi | 150.00psi | 0.3243      | OK     |
| +1.20D+0.20S        | 41.45 psi | 150.00psi | 0.2763      | OK     |
| +0.90D              | 27.03 psi | 150.00psi | 0.1802      | OK     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### General Footing

Project File: Enercalc NW6thSt.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

#### DESCRIPTION: F3

#### One Way Shear Z

| Load Combination... | Vu @ -Z   | Vu @ +Z   | Vu:Max    | Phi Vn    | Vu / Phi*Vn | Status |
|---------------------|-----------|-----------|-----------|-----------|-------------|--------|
| +1.20D+0.50S        | 13.22 psi | 13.22 psi | 13.22 psi | 40.55 psi | 0.33        | OK     |
| +1.20D+1.60Lr       | 18.83 psi | 18.83 psi | 18.83 psi | 40.55 psi | 0.46        | OK     |
| +1.20D+1.60Lr+0.50W | 21.72 psi | 21.72 psi | 21.72 psi | 40.55 psi | 0.54        | OK     |
| +1.20D+1.60S        | 21.14 psi | 21.14 psi | 21.14 psi | 40.55 psi | 0.52        | OK     |
| +1.20D+1.60S+0.50W  | 24.02 psi | 24.02 psi | 24.02 psi | 40.55 psi | 0.59        | OK     |
| +1.20D+0.50Lr+W     | 18.26 psi | 18.26 psi | 18.26 psi | 40.55 psi | 0.45        | OK     |
| +1.20D+0.50S+W      | 18.98 psi | 18.98 psi | 18.98 psi | 40.55 psi | 0.47        | OK     |
| +0.90D+W            | 12.97 psi | 12.97 psi | 12.97 psi | 40.55 psi | 0.32        | OK     |
| +1.20D+0.20S        | 11.05 psi | 11.05 psi | 11.05 psi | 40.55 psi | 0.27        | OK     |
| +0.90D              | 7.21 psi  | 7.21 psi  | 7.21 psi  | 40.55 psi | 0.18        | OK     |

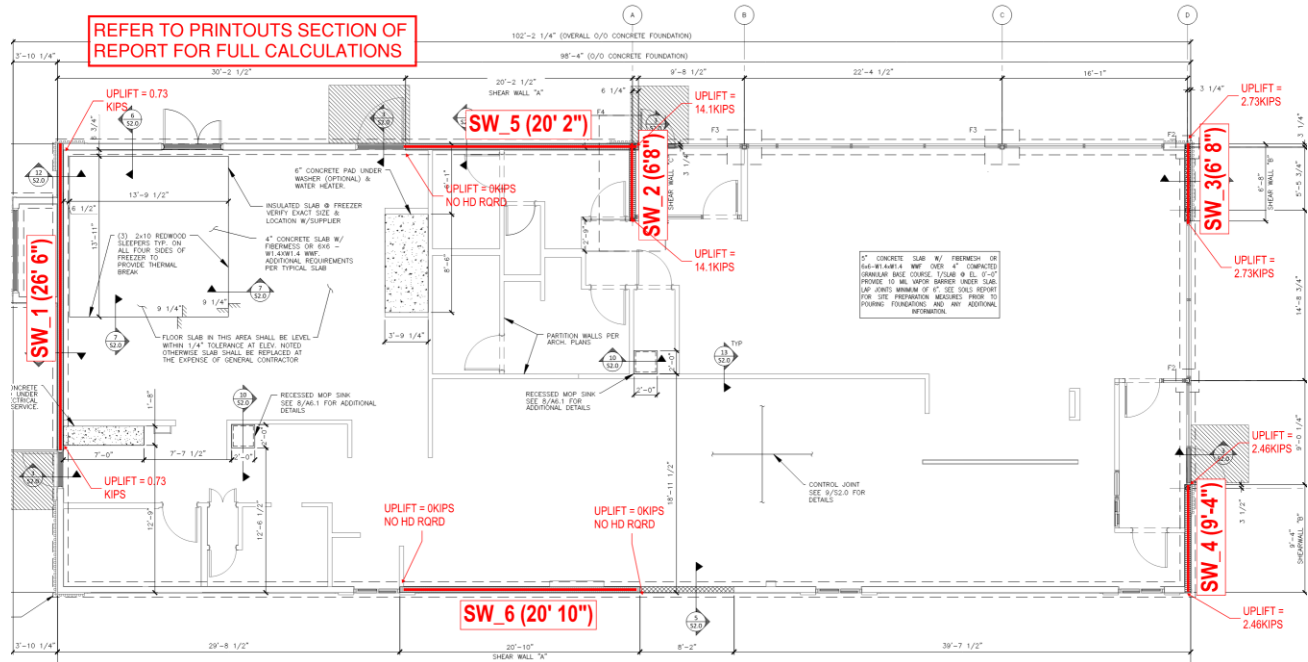
All units k

#### Two-Way "Punching" Shear

| Load Combination... | Vu        | Phi*Vn    | Vu / Phi*Vn | Status |
|---------------------|-----------|-----------|-------------|--------|
| +1.40D              | 42.05 psi | 150.00psi | 0.2803      | OK     |
| +1.20D+0.50Lr       | 46.85 psi | 150.00psi | 0.3123      | OK     |
| +1.20D+0.50S        | 49.55 psi | 150.00psi | 0.3304      | OK     |
| +1.20D+1.60Lr       | 70.63 psi | 150.00psi | 0.4708      | OK     |
| +1.20D+1.60Lr+0.50W | 81.43 psi | 150.00psi | 0.5429      | OK     |
| +1.20D+1.60S        | 79.28 psi | 150.00psi | 0.5285      | OK     |
| +1.20D+1.60S+0.50W  | 90.09 psi | 150.00psi | 0.6006      | OK     |
| +1.20D+0.50Lr+W     | 68.46 psi | 150.00psi | 0.4564      | OK     |
| +1.20D+0.50S+W      | 71.17 psi | 150.00psi | 0.4745      | OK     |
| +0.90D+W            | 48.65 psi | 150.00psi | 0.3243      | OK     |
| +1.20D+0.20S        | 41.45 psi | 150.00psi | 0.2763      | OK     |
| +0.90D              | 27.03 psi | 150.00psi | 0.1802      | OK     |

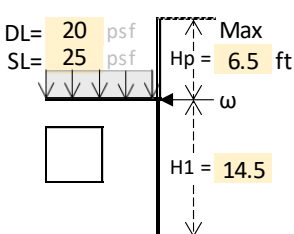
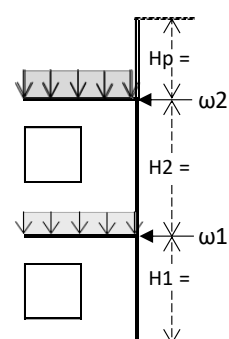


## LATERAL ANALYSIS



### WIND vs SEISMIC

Flat Roof - Based on ASCE 7-16, Chapter 28 Part 2

| BUILDING PARAMETERS                                                                       | <input checked="" type="checkbox"/> SINGLE LEVEL BUILDING                                                                                         | <input type="checkbox"/> TWO LEVEL BUILDING                                         |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Roof Area<br>Length (L)= 98.33<br>Width (W)= 38.83<br>Slope (x:12)= 0<br>Wall Weight = 17 |  <p>Note: Snow loads 30psf and less are not included in calc</p> |  |

### DESIGN WIND PRESSURES

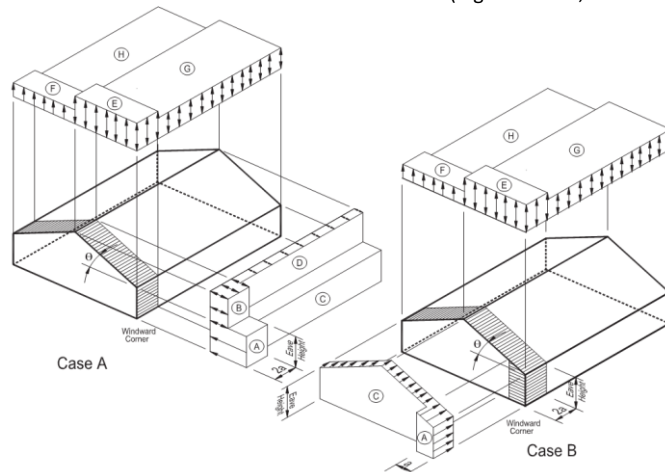
(Figure 28.6-1,  $h \leq 60$ -ft)

Horizontal Pressure Input (psf)  
 Zone A= 16.0 Zone C= 16.0  
 (Ch. 28.2 Part 2 Calc)

Parapet Pressures Results (psf)  
 Pp = 16. psf  
 (Ch. 28.2 Part I Calc)

Min. Wind Load = 16 psf  
 (Ch. 28.4.4)

Corner Pressue "a"  
 $0.1W = 3.9$  ft  
 $0.4h = 5.8$  ft  
 $a = \geq 0.4W = 1.6$  ft  
 $3\text{-ft} = 3.0$  ft  
 $2a = 2(a \text{ min.}) = 3.1$  ft



### Horizontal Wind Results

Roof (Parapet) Wall Case  
 A = 16.0 psf A = 16.0 psf  
 B = 16.0 psf B = 16.0 psf

### Single Level Diaphragm Wind

| Case | Load $\omega$   |
|------|-----------------|
| A    | 220 plf 21633.3 |
| B    | 220 plf 8543.3  |

### SEISMIC

Roof Area  
 Roof Area = 3,819 sf  
 Wall Length = 274 ft  
 Weight = 110,294 lbf  
 Cs = 0.1538  
 Base Shear V = 10,360 lbf

### Single Level Diaphragm Seismic

| Case | Load $\omega$ |
|------|---------------|
| A    | 105 plf       |
| B    | 267 plf       |

### GOVERNING CONDITIONS

| Diaph.   | Case | Load    | Governing Factor | ASD<br>0.6*Wind 0.7*Seis. |
|----------|------|---------|------------------|---------------------------|
| $\omega$ | A    | 220 plf | Wind             | 132 plf                   |
|          | B    | 267 plf | Seismic          | 187 plf                   |





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Combined Footing

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: Shearwall Footing

### DESIGN SUMMARY

Design OK

| Factor of Safety  | Item                               | Applied      | Capacity     | Governing Load Combination |
|-------------------|------------------------------------|--------------|--------------|----------------------------|
| PASS 1.093        | Overturning                        | 116.640 k-ft | 127.499 k-ft | +0.60D+0.60W               |
| PASS No Sliding   | Sliding                            | 0.0 k        | 7.818 k      | No Sliding                 |
| PASS 2.206        | Uplift                             | 12.960 k     | 28.596 k     | +0.60D+0.60W               |
| Utilization Ratio | Item                               | Applied      | Capacity     | Governing Load Combination |
| PASS 0.7776       | Soil Bearing                       | 2.592 ksf    | 3.333 ksf    | +0.60D+0.60W               |
| PASS 0.1532       | 1-way Shear - Col #1               | 11.493 psi   | 75.0 psi     | +0.90D+W                   |
| PASS 0.07905      | 1-way Shear - Col #2               | 5.929 psi    | 75.0 psi     | +0.90D+W                   |
| PASS 0.04634      | 2-way Punching - Col #1            | 6.951 psi    | 150.0 psi    | +0.90D+W                   |
| PASS 0.04843      | 2-way Punching - Col #2            | 7.265 psi    | 150.0 psi    | +1.20D+0.50Lr+W            |
| PASS No Bending   | Flexure - Left of Col #1 - Top     | 0.0 k-ft     | 0.0 k-ft     | N/A                        |
| PASS 0.09158      | Flexure - Left of Col #1 - Bottom  | 49.917 k-ft  | 545.07 k-ft  | +0.90D+W                   |
| PASS 0.01383      | Flexure - Between Cols - Top       | -7.535 k-ft  | 545.07 k-ft  | +1.20D+0.50W               |
| PASS 0.09803      | Flexure - Between Cols - Bottom    | 53.432 k-ft  | 545.07 k-ft  | +0.90D+W                   |
| PASS 0.01431      | Flexure - Right of Col #2 - Top    | -7.797 k-ft  | 545.07 k-ft  | +1.20D+W                   |
| PASS 0.001110     | Flexure - Right of Col #2 - Bottom | 0.6053 k-ft  | 545.07 k-ft  | +1.20D+1.60Lr              |

### Soil Bearing

| Load Combination... | Total Bearing | Eccentricity from Ftg CL | Actual Soil Bearing Stress @ Left Edge | Actual Soil Bearing Stress @ Right Edge | Allowable | Actual / Allow Ratio |
|---------------------|---------------|--------------------------|----------------------------------------|-----------------------------------------|-----------|----------------------|
| D Only              | 26.06 k       | 0.000 ft                 | 0.39 ksf                               | 0.39 ksf                                | 3.33 ksf  | 0.116                |
| +D+Lr               | 26.31 k       | 0.000 ft                 | 0.39 ksf                               | 0.39 ksf                                | 3.33 ksf  | 0.117                |
| +D+0.750Lr          | 26.25 k       | 0.000 ft                 | 0.39 ksf                               | 0.39 ksf                                | 3.33 ksf  | 0.117                |
| +D+0.60W            | 26.06 k       | -3.108 ft                | 1.09 ksf                               | 0.00 ksf                                | 3.33 ksf  | 0.327                |
| +D+0.70E            | 26.06 k       | -1.746 ft                | 0.73 ksf                               | 0.04 ksf                                | 3.33 ksf  | 0.219                |
| +D+0.750Lr+0.450W   | 26.25 k       | -2.315 ft                | 0.85 ksf                               | 0.00 ksf                                | 3.33 ksf  | 0.256                |
| +D+0.450W           | 26.06 k       | -2.331 ft                | 0.85 ksf                               | 0.00 ksf                                | 3.33 ksf  | 0.255                |
| +D+0.5250E          | 26.06 k       | -1.310 ft                | 0.64 ksf                               | 0.13 ksf                                | 3.33 ksf  | 0.193                |
| +0.60D+0.60W        | 15.64 k       | -5.180 ft                | 2.59 ksf                               | 0.00 ksf                                | 3.33 ksf  | 0.778                |
| +0.60D+0.70E        | 15.64 k       | -2.910 ft                | 0.61 ksf                               | 0.00 ksf                                | 3.33 ksf  | 0.183                |

### Overturning Stability

| Load Combination... | Moments about Left Edge k-ft |           |         | Moments about Right Edge k-ft |           |         |
|---------------------|------------------------------|-----------|---------|-------------------------------|-----------|---------|
|                     | Overturning                  | Resisting | Ratio   | Overturning                   | Resisting | Ratio   |
| D Only              | 0.00                         | 0.00      | 999.000 | 0.00                          | 0.00      | 999.000 |
| +D+Lr               | 0.00                         | 0.00      | 999.000 | 0.00                          | 0.00      | 999.000 |
| +D+0.750Lr          | 0.00                         | 0.00      | 999.000 | 0.00                          | 0.00      | 999.000 |
| +D+0.60W            | 116.64                       | 188.74    | 1.618   | 35.64                         | 269.74    | 7.568   |
| +D+0.70E            | 65.52                        | 173.12    | 2.642   | 20.02                         | 218.62    | 10.920  |
| +D+0.750Lr+0.450W   | 87.48                        | 180.93    | 2.068   | 26.73                         | 241.68    | 9.042   |
| +D+0.450W           | 87.48                        | 179.83    | 2.056   | 26.73                         | 240.58    | 9.000   |
| +D+0.5250E          | 49.14                        | 168.11    | 3.421   | 15.02                         | 202.24    | 13.469  |
| +0.60D+0.60W        | 116.64                       | 127.50    | 1.093   | 35.64                         | 208.50    | 5.850   |
| +0.60D+0.70E        | 65.52                        | 111.88    | 1.708   | 20.02                         | 157.38    | 7.861   |

### Sliding Stability

| Load Combination... | Sliding Force | Resisting Force | Sliding Safety Ratio |
|---------------------|---------------|-----------------|----------------------|
| D Only              | 0.00 k        | 7.82 k          | 999                  |
| +D+Lr               | 0.00 k        | 7.89 k          | 999                  |
| +D+0.750Lr          | 0.00 k        | 7.87 k          | 999                  |
| +D+0.60W            | 0.00 k        | 7.82 k          | 999                  |
| +D+0.70E            | 0.00 k        | 7.82 k          | 999                  |
| +D+0.750Lr+0.450W   | 0.00 k        | 7.87 k          | 999                  |
| +D+0.450W           | 0.00 k        | 7.82 k          | 999                  |
| +D+0.5250E          | 0.00 k        | 7.82 k          | 999                  |
| +0.60D+0.60W        | 0.00 k        | 4.69 k          | 999                  |
| +0.60D+0.70E        | 0.00 k        | 4.69 k          | 999                  |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Combined Footing

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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### DESCRIPTION: Shearwall Footing

#### Z-Axis Footing Flexure - Maximum Values for Load Combination

| Load Combination... | Mu<br>(ft-k) | Distance<br>from left<br>(ft) | Tension<br>Side | As Req'd<br>(in <sup>2</sup> ) | Governed<br>by | Actual As<br>(in <sup>2</sup> ) | Phi*Mn<br>(ft-k) | Mu / PhiMn |
|---------------------|--------------|-------------------------------|-----------------|--------------------------------|----------------|---------------------------------|------------------|------------|
| +0.60D+0.70E        | 0.000        | 0.000                         | 0               | 0.000                          | 0              | 0.000                           | 0.000            | 0.000      |
| +0.90D+W            | 0.054        | 0.029                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.000      |
| +0.90D+W            | 0.210        | 0.059                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.000      |
| +0.90D+W            | 0.459        | 0.088                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.001      |
| +0.90D+W            | 0.792        | 0.118                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.001      |
| +0.90D+W            | 1.200        | 0.147                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.002      |
| +0.90D+W            | 1.673        | 0.176                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.003      |
| +0.90D+W            | 2.201        | 0.206                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.004      |
| +0.90D+W            | 2.776        | 0.235                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.005      |
| +0.90D+W            | 3.388        | 0.264                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.006      |
| +0.90D+W            | 4.028        | 0.294                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.007      |
| +0.90D+W            | 4.686        | 0.323                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.009      |
| +0.90D+W            | 5.354        | 0.353                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.010      |
| +0.90D+W            | 6.023        | 0.382                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.011      |
| +0.90D+W            | 6.690        | 0.411                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.012      |
| +0.90D+W            | 7.355        | 0.441                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.013      |
| +0.90D+W            | 8.019        | 0.470                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.015      |
| +0.90D+W            | 8.681        | 0.499                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.016      |
| +0.90D+W            | 9.342        | 0.529                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.017      |
| +0.90D+W            | 10.001       | 0.558                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.018      |
| +0.90D+W            | 10.658       | 0.588                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.020      |
| +0.90D+W            | 11.314       | 0.617                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.021      |
| +0.90D+W            | 11.968       | 0.646                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.022      |
| +0.90D+W            | 12.621       | 0.676                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.023      |
| +0.90D+W            | 13.272       | 0.705                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.024      |
| +0.90D+W            | 13.921       | 0.734                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.026      |
| +0.90D+W            | 14.569       | 0.764                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.027      |
| +0.90D+W            | 15.215       | 0.793                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.028      |
| +0.90D+W            | 15.859       | 0.823                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.029      |
| +0.90D+W            | 16.502       | 0.852                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.030      |
| +0.90D+W            | 17.143       | 0.881                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.031      |
| +0.90D+W            | 17.783       | 0.911                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.033      |
| +0.90D+W            | 18.421       | 0.940                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.034      |
| +0.90D+W            | 19.057       | 0.969                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.035      |
| +0.90D+W            | 19.692       | 0.999                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.036      |
| +0.90D+W            | 20.325       | 1.028                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.037      |
| +0.90D+W            | 20.957       | 1.058                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.038      |
| +0.90D+W            | 21.586       | 1.087                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.040      |
| +0.90D+W            | 22.215       | 1.116                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.041      |
| +0.90D+W            | 22.841       | 1.146                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.042      |
| +0.90D+W            | 23.466       | 1.175                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.043      |
| +0.90D+W            | 24.090       | 1.204                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.044      |
| +0.90D+W            | 24.712       | 1.234                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.045      |
| +0.90D+W            | 25.332       | 1.263                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.046      |
| +0.90D+W            | 25.950       | 1.293                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.048      |
| +0.90D+W            | 26.567       | 1.322                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.049      |
| +0.90D+W            | 27.183       | 1.351                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.050      |
| +0.90D+W            | 27.796       | 1.381                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.051      |
| +0.90D+W            | 28.408       | 1.410                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.052      |
| +0.90D+W            | 29.019       | 1.439                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.053      |
| +0.90D+W            | 29.628       | 1.469                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.054      |
| +0.90D+W            | 30.235       | 1.498                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.055      |
| +0.90D+W            | 30.840       | 1.528                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.057      |
| +0.90D+W            | 31.444       | 1.557                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.058      |
| +0.90D+W            | 32.047       | 1.586                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.059      |
| +0.90D+W            | 32.648       | 1.616                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.060      |
| +0.90D+W            | 33.247       | 1.645                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.061      |
| +0.90D+W            | 33.844       | 1.674                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.062      |
| +0.90D+W            | 34.440       | 1.704                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.063      |
| +0.90D+W            | 35.034       | 1.733                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.064      |
| +0.90D+W            | 35.627       | 1.763                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.065      |
| +0.90D+W            | 36.218       | 1.792                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.066      |
| +0.90D+W            | 36.807       | 1.821                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.068      |





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Combined Footing

Project File: Enercalc NW6thSt.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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#### DESCRIPTION: Shearwall Footing

#### Z-Axis Footing Flexure - Maximum Values for Load Combination

| Load Combination... | Mu<br>(ft-k) | Distance<br>from left<br>(ft) | Tension<br>Side | As Req'd<br>(in <sup>2</sup> ) | Governed<br>by | Actual As<br>(in <sup>2</sup> ) | Phi*Mn<br>(ft-k) | Mu / PhiMn |
|---------------------|--------------|-------------------------------|-----------------|--------------------------------|----------------|---------------------------------|------------------|------------|
| +0.90D+W            | 37.395       | 1.851                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.069      |
| +0.90D+W            | 37.981       | 1.880                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.070      |
| +0.90D+W            | 38.566       | 1.909                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.071      |
| +0.90D+W            | 39.149       | 1.939                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.072      |
| +0.90D+W            | 39.730       | 1.968                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.073      |
| +0.90D+W            | 40.310       | 1.998                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.074      |
| +0.90D+W            | 40.888       | 2.027                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.075      |
| +0.90D+W            | 41.464       | 2.056                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.076      |
| +0.90D+W            | 42.039       | 2.086                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.077      |
| +0.90D+W            | 42.613       | 2.115                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.078      |
| +0.90D+W            | 43.184       | 2.144                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.079      |
| +0.90D+W            | 43.754       | 2.174                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.080      |
| +0.90D+W            | 44.323       | 2.203                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.081      |
| +0.90D+W            | 44.889       | 2.233                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.082      |
| +0.90D+W            | 45.454       | 2.262                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.083      |
| +0.90D+W            | 46.018       | 2.291                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.084      |
| +0.90D+W            | 46.580       | 2.321                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.085      |
| +0.90D+W            | 47.140       | 2.350                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.086      |
| +0.90D+W            | 47.699       | 2.379                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.088      |
| +0.90D+W            | 48.256       | 2.409                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.089      |
| +0.90D+W            | 48.811       | 2.438                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.090      |
| +0.90D+W            | 49.365       | 2.468                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.091      |
| +0.90D+W            | 49.917       | 2.497                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.092      |
| +0.90D+W            | 50.452       | 2.526                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.093      |
| +0.90D+W            | 50.948       | 2.556                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.093      |
| +0.90D+W            | 51.403       | 2.585                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.094      |
| +0.90D+W            | 51.818       | 2.614                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.095      |
| +0.90D+W            | 52.193       | 2.644                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.096      |
| +0.90D+W            | 52.528       | 2.673                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.096      |
| +0.90D+W            | 52.822       | 2.703                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.097      |
| +0.90D+W            | 53.077       | 2.732                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.097      |
| +0.90D+W            | 53.292       | 2.761                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.098      |
| +0.90D+W            | 53.466       | 2.791                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.098      |
| +0.90D+W            | 53.600       | 2.820                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.098      |
| +0.90D+W            | 53.694       | 2.849                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.099      |
| +0.90D+W            | 53.748       | 2.879                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.099      |
| +0.90D+W            | 53.762       | 2.908                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.099      |
| +0.90D+W            | 53.736       | 2.937                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.099      |
| +0.90D+W            | 53.670       | 2.967                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.098      |
| +0.90D+W            | 53.564       | 2.996                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.098      |
| +0.90D+W            | 53.432       | 3.026                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.098      |
| +0.90D+W            | 53.298       | 3.055                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.098      |
| +0.90D+W            | 53.162       | 3.084                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.098      |
| +0.90D+W            | 53.025       | 3.114                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.097      |
| +0.90D+W            | 52.887       | 3.143                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.097      |
| +0.90D+W            | 52.747       | 3.172                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.097      |
| +0.90D+W            | 52.605       | 3.202                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.097      |
| +0.90D+W            | 52.461       | 3.231                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.096      |
| +0.90D+W            | 52.316       | 3.261                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.096      |
| +0.90D+W            | 52.169       | 3.290                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.096      |
| +0.90D+W            | 52.021       | 3.319                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.095      |
| +0.90D+W            | 51.871       | 3.349                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.095      |
| +0.90D+W            | 51.719       | 3.378                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.095      |
| +0.90D+W            | 51.566       | 3.407                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.095      |
| +0.90D+W            | 51.411       | 3.437                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.094      |
| +0.90D+W            | 51.255       | 3.466                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.094      |
| +0.90D+W            | 51.097       | 3.496                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.094      |
| +0.90D+W            | 50.937       | 3.525                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.093      |
| +0.90D+W            | 50.776       | 3.554                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.093      |
| +0.90D+W            | 50.613       | 3.584                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.093      |
| +0.90D+W            | 50.448       | 3.613                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.093      |
| +0.90D+W            | 50.282       | 3.642                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.092      |
| +0.90D+W            | 50.114       | 3.672                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.092      |





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Combined Footing

Project File: Enercalc NW6thSt.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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#### DESCRIPTION: Shearwall Footing

#### Z-Axis Footing Flexure - Maximum Values for Load Combination

| Load Combination... | Mu<br>(ft-k) | Distance<br>from left<br>(ft) | Tension<br>Side | As Req'd<br>(in <sup>2</sup> ) | Governed<br>by | Actual As<br>(in <sup>2</sup> ) | Phi*Mn<br>(ft-k) | Mu / PhiMn |
|---------------------|--------------|-------------------------------|-----------------|--------------------------------|----------------|---------------------------------|------------------|------------|
| +0.90D+W            | 49.945       | 3.701                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.092      |
| +0.90D+W            | 49.774       | 3.731                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.091      |
| +0.90D+W            | 49.601       | 3.760                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.091      |
| +0.90D+W            | 49.427       | 3.789                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.091      |
| +0.90D+W            | 49.251       | 3.819                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.090      |
| +0.90D+W            | 49.073       | 3.848                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.090      |
| +0.90D+W            | 48.894       | 3.877                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.090      |
| +0.90D+W            | 48.714       | 3.907                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.089      |
| +0.90D+W            | 48.531       | 3.936                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.089      |
| +0.90D+W            | 48.347       | 3.966                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.089      |
| +0.90D+W            | 48.162       | 3.995                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.088      |
| +0.90D+W            | 47.974       | 4.024                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.088      |
| +0.90D+W            | 47.786       | 4.054                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.088      |
| +0.90D+W            | 47.595       | 4.083                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.087      |
| +0.90D+W            | 47.403       | 4.112                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.087      |
| +0.90D+W            | 47.209       | 4.142                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.087      |
| +0.90D+W            | 47.014       | 4.171                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.086      |
| +0.90D+W            | 46.817       | 4.201                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.086      |
| +0.90D+W            | 46.619       | 4.230                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.086      |
| +0.90D+W            | 46.418       | 4.259                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.085      |
| +0.90D+W            | 46.217       | 4.289                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.085      |
| +0.90D+W            | 46.013       | 4.318                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.084      |
| +0.90D+W            | 45.808       | 4.347                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.084      |
| +0.90D+W            | 45.602       | 4.377                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.084      |
| +0.90D+W            | 45.393       | 4.406                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.083      |
| +0.90D+W            | 45.183       | 4.436                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.083      |
| +0.90D+W            | 44.972       | 4.465                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.083      |
| +0.90D+W            | 44.759       | 4.494                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.082      |
| +0.90D+W            | 44.544       | 4.524                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.082      |
| +0.90D+W            | 44.328       | 4.553                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.081      |
| +0.90D+W            | 44.110       | 4.582                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.081      |
| +0.90D+W            | 43.890       | 4.612                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.081      |
| +0.90D+W            | 43.669       | 4.641                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.080      |
| +0.90D+W            | 43.446       | 4.671                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.080      |
| +0.90D+W            | 43.222       | 4.700                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.079      |
| +0.90D+W            | 42.996       | 4.729                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.079      |
| +0.90D+W            | 42.768       | 4.759                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.078      |
| +0.90D+W            | 42.539       | 4.788                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.078      |
| +0.90D+W            | 42.308       | 4.817                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.078      |
| +0.90D+W            | 42.075       | 4.847                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.077      |
| +0.90D+W            | 41.841       | 4.876                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.077      |
| +0.90D+W            | 41.605       | 4.906                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.076      |
| +0.90D+W            | 41.368       | 4.935                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.076      |
| +0.90D+W            | 41.129       | 4.964                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.075      |
| +0.90D+W            | 40.888       | 4.994                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.075      |
| +0.90D+W            | 40.646       | 5.023                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.075      |
| +0.90D+W            | 40.402       | 5.052                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.074      |
| +0.90D+W            | 40.157       | 5.082                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.074      |
| +0.90D+W            | 39.909       | 5.111                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.073      |
| +0.90D+W            | 39.661       | 5.141                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.073      |
| +0.90D+W            | 39.410       | 5.170                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.072      |
| +0.90D+W            | 39.158       | 5.199                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.072      |
| +0.90D+W            | 38.905       | 5.229                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.071      |
| +0.90D+W            | 38.650       | 5.258                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.071      |
| +0.90D+W            | 38.393       | 5.287                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.070      |
| +0.90D+W            | 38.134       | 5.317                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.070      |
| +0.90D+W            | 37.874       | 5.346                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.069      |
| +0.90D+W            | 37.613       | 5.376                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.069      |
| +0.90D+W            | 37.349       | 5.405                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.069      |
| +0.90D+W            | 37.084       | 5.434                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.068      |
| +0.90D+W            | 36.818       | 5.464                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.068      |
| +0.90D+W            | 36.550       | 5.493                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.067      |
| +0.90D+W            | 36.280       | 5.522                         | Bottom          | 3.726                          | Min Temp %     | 4.650                           | 545.067          | 0.067      |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### PARAPET ANALYSIS

#### PARAPET WALL

Description: **Wind Loading Analysis - MWFRS** | Date: **12/10/2024**  
(Enclosed & Partially Enclosed Low-Rise Buildings (ASCE 7-16, CH 28.2, Part I))

#### INPUT DATA

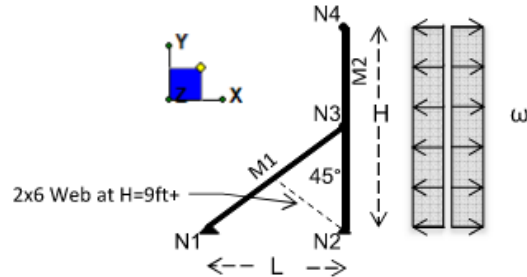
|                        |        |           |                               |
|------------------------|--------|-----------|-------------------------------|
| Risk Category          |        | II        | (Table 1.5-1)                 |
| Wind Speed             | V      | 98 mph    | Figure 26.5-1A, B, or C)      |
| Exposure Category      |        | C         | (Fig. 26.7)                   |
| Wind Directional       | Kd     | 0.85      | (Sect. 26.6 and Table 26.6-1) |
| Average Roof Height    | h      | 20.5 ft   |                               |
| Topographic            | Kzt    | 1.0       | (Sect. 26.8 and Table 26.8-1) |
| Gust Effect            | G      | 0.85      | (Sect. 26.9)                  |
| Enclosure Class.       |        | Encl.     | (Sect. 26.10)                 |
| Internal Pressure      | (GCpi) | 0.0       | (Table 26.13-1)               |
| Velocity Press. Coeff. | Kz,Kh  | 0.9       | (Table 26.10-1)               |
| Velocity Pressure      | qz     | 18.81 psf | (Eq. 28.3-1)                  |
| Parapets               |        | 28.2 psf  | (Eq. 28.3-2, Windward)        |
|                        |        | -18.8 psf | (Eq. 28.3-2, Leeward)         |
| Total Pressure         | Pp     | 47.0 psf  |                               |

### PARAPET WALL WITH 45° KICKER

Description: **Design Tables**

Date: 12/10/2024

Material: 2x DF #2 or better  
Stud Spacing: 24" o.c. Max.  
Wall Load  $w$ : Wind or Seismic  
Load Combo: ASD  
Deflection Ratio:  $L/360$  Min.



| H      | Studs | Kicker<br>(min.) L |     | 50 plf               |     |     |     |        |               |      | 75 plf               |     |     |     |        |               |      |
|--------|-------|--------------------|-----|----------------------|-----|-----|-----|--------|---------------|------|----------------------|-----|-----|-----|--------|---------------|------|
|        |       |                    |     | Joint Reactions (lb) |     |     |     | Defl.  | Bending Ratio |      | Joint Reactions (lb) |     |     |     | Defl.  | Bending Ratio |      |
|        |       |                    |     | N1x                  | N1y | N2x | N2y | at N4x | M1            | M2   | N1x                  | N1y | N2x | N2y | at N4x | M1            | M2   |
| 4 ft   | 2x6   | 2x4                | 2.0 | 116                  | 120 | 5   | 120 | 0.01"  | 0.04          | 0.10 | 175                  | 180 | 8   | 180 | 0.01"  | 0.06          | 0.15 |
|        | 2x8   |                    |     | 118                  | 120 | 5   | 120 | 0.01"  | 0.04          | 0.07 | 177                  | 180 | 8   | 180 | 0.01"  | 0.06          | 0.10 |
| 4.5 ft | 2x6   | 2x4                | 2.0 | 150                  | 155 | 15  | 155 | 0.02"  | 0.05          | 0.12 | 225                  | 230 | 20  | 230 | 0.03"  | 0.08          | 0.20 |
|        | 2x8   |                    |     | 150                  | 155 | 15  | 155 | 0.01"  | 0.05          | 0.09 | 225                  | 230 | 20  | 230 | 0.01"  | 0.08          | 0.14 |
| 5 ft   | 2x6   | 2x4                | 2.0 | 180                  | 190 | 30  | 190 | 0.03"  | 0.07          | 0.18 | 270                  | 290 | 40  | 290 | 0.05"  | 0.10          | 0.27 |
|        | 2x8   |                    |     | 185                  | 190 | 35  | 190 | 0.02"  | 0.06          | 0.13 | 275                  | 290 | 50  | 290 | 0.03"  | 0.10          | 0.19 |
| 5.5 ft | 2x6   | 2x4                | 2.0 | 215                  | 230 | 50  | 230 | 0.05"  | 0.09          | 0.25 | 320                  | 340 | 75  | 340 | 0.08"  | 0.14          | 0.38 |
|        | 2x8   |                    |     | 220                  | 230 | 60  | 230 | 0.03"  | 0.08          | 0.17 | 330                  | 340 | 85  | 340 | 0.04"  | 0.12          | 0.25 |
|        | 2x6   | 2x4                | 2.5 | 175                  | 185 | 10  | 185 | 0.03"  | 0.09          | 0.18 | 265                  | 275 | 15  | 275 | 0.05"  | 0.13          | 0.28 |
|        | 2x8   |                    |     | 180                  | 185 | 15  | 185 | 0.02"  | 0.09          | 0.13 | 270                  | 275 | 20  | 275 | 0.03"  | 0.13          | 0.19 |
| 6 ft   | 2x6   | 2x6                | 2.5 | 190                  | 216 | 10  | 216 | 0.05"  | 0.10          | 0.28 | 285                  | 325 | 15  | 325 | 0.07"  | 0.15          | 0.43 |
|        | 2x8   |                    |     | 200                  | 216 | 20  | 216 | 0.03"  | 0.07          | 0.18 | 300                  | 325 | 30  | 325 | 0.04"  | 0.10          | 0.28 |
|        | 2x6   | 2x6                | 3.0 | 170                  | 180 | 15  | 180 | 0.03"  | 0.08          | 0.21 | 250                  | 270 | 25  | 270 | 0.04"  | 0.11          | 0.32 |
|        | 2x8   |                    |     | 175                  | 180 | 10  | 180 | 0.02"  | 0.08          | 0.14 | 260                  | 270 | 15  | 270 | 0.02"  | 0.12          | 0.21 |
| 7 ft   | 2x6   | 2x6                | 3.0 | 220                  | 250 | 10  | 250 | 0.08"  | 0.13          | 0.32 | 325                  | 370 | 10  | 370 | 0.12"  | 0.21          | 0.49 |
|        | 2x8   |                    |     | 230                  | 250 | 20  | 250 | 0.04"  | 0.10          | 0.20 | 345                  | 370 | 26  | 370 | 0.06"  | 0.16          | 0.31 |
|        | 2x6   | 2x6                | 3.5 | 195                  | 210 | 20  | 210 | 0.05"  | 0.12          | 0.28 | 290                  | 315 | 26  | 315 | 0.08"  | 0.18          | 0.43 |
|        | 2x8   |                    |     | 200                  | 210 | 15  | 210 | 0.03"  | 0.12          | 0.18 | 300                  | 315 | 16  | 315 | 0.04"  | 0.18          | 0.28 |
| 8 ft   | 2x6   | 2x6                | 3.0 | 275                  | 320 | 35  | 320 | 0.18"  | 0.22          | 0.56 | 410                  | 480 | 50  | 480 | 0.28"  | 0.34          | 0.84 |
|        | 2x8   |                    |     | 295                  | 320 | 55  | 320 | 0.09"  | 0.14          | 0.36 | 440                  | 480 | 80  | 480 | 0.14"  | 0.22          | 0.54 |
|        | 2x6   | 2x6                | 4.0 | 335                  | 360 | 30  | 360 | 0.13"  | 0.26          | 0.55 | 335                  | 360 | 30  | 360 | 0.13"  | 0.26          | 0.55 |
|        | 2x8   |                    |     | 345                  | 360 | 20  | 360 | 0.07"  | 0.27          | 0.35 | 345                  | 360 | 20  | 360 | 0.07"  | 0.27          | 0.35 |
| 8.5 ft | 2x6   | 2x6                | 3.0 | 305                  | 365 | 50  | 365 | 0.26"  | 0.27          | 0.63 | 455                  | 545 | 70  | 545 | 0.39"  | 0.42          | 0.95 |
|        | 2x8   |                    |     | 330                  | 365 | 75  | 365 | 0.13"  | 0.17          | 0.40 | 490                  | 545 | 110 | 545 | 0.19"  | 0.27          | 0.60 |
|        | 2x6   | 2x6                | 4.0 | 225                  | 240 | 20  | 240 | 0.09"  | 0.17          | 0.36 | 335                  | 360 | 30  | 360 | 0.13"  | 0.26          | 0.55 |
|        | 2x8   |                    |     | 230                  | 240 | 15  | 240 | 0.05"  | 0.18          | 0.24 | 345                  | 360 | 20  | 360 | 0.07"  | 0.27          | 0.35 |
| 9 ft   | 2x6   | 2x6                | 4.0 | 275                  | 305 | 5   | 305 | 0.20"  | 0.23          | 0.52 | 406                  | 460 | 5   | 460 | 0.29"  | 0.39          | 0.78 |
|        | 2x8   |                    |     | 290                  | 305 | 15  | 305 | 0.10"  | 0.22          | 0.33 | 430                  | 460 | 25  | 460 | 0.15"  | 0.33          | 0.49 |
|        | 2x6   | 2x6                | 4.5 | 275                  | 270 | 5   | 270 | 0.12"  | 0.20          | 0.46 | 415                  | 415 | 10  | 415 | 0.18"  | 0.30          | 0.69 |
|        | 2x8   |                    |     | 275                  | 270 | 5   | 270 | 0.07"  | 0.13          | 0.30 | 410                  | 405 | 5   | 405 | 0.10"  | 0.20          | 0.45 |
| 10 ft  | 2x6   | 2x6                | 5.0 | 310                  | 300 | 10  | 300 | 0.18"  | 0.25          | 0.57 | 460                  | 450 | 10  | 450 | 0.27"  | 0.38          | 0.85 |
|        | 2x8   |                    |     | 305                  | 300 | 5   | 300 | 0.10"  | 0.16          | 0.36 | 460                  | 450 | 5   | 450 | 0.14"  | 0.25          | 0.54 |
| 11 ft  | 2x6   | 2x6                | 5.5 | 340                  | 330 | 10  | 330 | 0.26"  | 0.31          | 0.68 | -                    | -   | -   | -   | -      | -             | -    |
|        | 2x8   |                    |     | 340                  | 330 | 5   | 330 | 0.14"  | 0.21          | 0.43 | 500                  | 500 | 10  | 500 | 0.21"  | 0.32          | 0.65 |

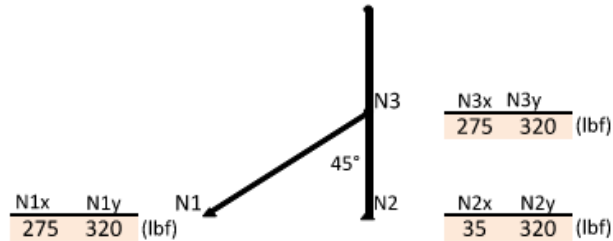
Notes: 1) Shaded zones indicate deflection for  $L/240$

2) Node N3x = N1x

### PARAPET WALL

Description: Wall and Kicker Attachments

Date: 12/10/2024

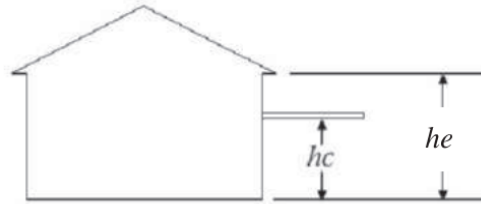


| N1<br>Kicker                                                                                                                                                                                                                                                                        | N2<br>Parapet Wall to Roof                                                                                                                                                                                                                                                                    | N1<br>Kicker to Parapet Wall                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Kicker Blocking</b><br><br>4x4<br>Nailers<br>2x8                                                                                                                                                                                                                                 | <b>On Roof &amp; Screws? YES</b><br><br>Type: SDS<br>Size: 1/4 in.<br>Length: 4.5 in.<br>Z 350 lbf ea.<br>W 475 lbf ea.<br>Qty: 2<br>Spacing: 24 in o.c.<br>Required Shear: 35 lbf<br>Required Pullout: 320 lbf<br><b>Total Shear 350 lbf</b><br><b>Total Withdrawal: 475 lbf</b><br>OK<br>OK | <b>Lap Attachment? YES</b><br><br>Type: 10D<br>Size: 0.148 in.<br>Length: 3 in.<br>Z 189 lbf ea.<br>Qty: 4<br>Required: 275 lbf<br><b>Total Shear 756 lbf</b><br>OK |
| <b>Nailer To Blocking</b><br><br>Type: SDS<br>Size: 1/4 in.<br>Length: 4.5 in.<br>Z 350 lbf ea.<br>W 475 lbf ea.<br>Qty: 1<br>Spacing: 6 in o.c.<br>Required Shear: 275 lbf<br>Required Pullout: 320 lbf<br><b>Total Shear 700 lbf</b><br><b>Total Pullout: 950 lbf</b><br>OK<br>OK | <b>On Roof &amp; Strap? NO</b><br>                                                                                                                                                                                                                                                            | <b>Ledger Attach.? NO</b><br>                                                                                                                                       |
| <b>Kicker Shear</b><br><br>Angle: A34<br>Fastn'r: SDS<br>Z: 515 lbf ea.<br>W: 240 lbf ea.<br>Qty: 1<br>Required: 275 lbf<br><b>Total Shear 515 lbf</b><br>OK                                                                                                                        | <b>To Roof Side? NO</b><br>                                                                                                                                                                                                                                                                   |                                                                                                                                                                     |
| <b>Kicker Uplift</b><br><br>Tie: H3<br>Uplift F: 455 lbf ea.<br>Qty: 1<br>Add Angle? Yes<br>Required: 320 lbf<br><b>Total Shear: 695 lbf</b><br>OK                                                                                                                                  |                                                                                                                                                                                                                                                                                               |                                                                                                                                                                     |

### AWNING ANALYSIS

#### WIND LOADING ANALYSIS - MWFRS

Description: **Attached Canopies on Buildings with  $h \leq 60$  ft (ASCE 7-16, Ch. 30.11)** Date: **12/10/2024**



ELEVATION

#### INPUT DATA

|                        |      |                  |                                 |
|------------------------|------|------------------|---------------------------------|
| Risk Category          |      | <b>II</b>        | (Table 1.5-1)                   |
| Wind Speed             | V    | <b>98</b> mph    | Figure 26.5-1A, B, or C)        |
| Wind Directional       | Kd   | <b>0.85</b>      | (Sect. 26.6 and Table 26.6-1)   |
| Exposure Category      |      | <b>C</b>         | (Sect. 26.7)                    |
| Topographic            | Kv   | <b>1.0</b>       | (Sect. 26.8 and Table 26.8-1)   |
| Ground Elev. Abv Sea   | Zg   | <b>69</b> ft     | (Section 26.9 and Table 26.9-1) |
|                        | Ke   | <b>1.00</b>      | (Note 2)                        |
| Canopy Height          | hc   | <b>10</b> ft     | Mean Canopy Height              |
| Eave/Parapet Height    | he   | <b>15</b> ft     | Mean Eave Height                |
| Enclosure Class.       |      | <b>Open</b>      | (Sect. 26.12)                   |
| Internal Pressure      | GCpi | <b>18.0</b> ±    | (Sect. 26.13 and Table 26.13-1) |
| Canopy Height          | hc   | <b>9</b> ft      |                                 |
| Velocity Press. Coeff. | Kh   | <b>0.85</b>      | (Table 26.10-1)                 |
| Velocity Pressure      | qh   | <b>17.72</b> psf | (Eq. 26.10-1)                   |
| External Pressure      | GCp  | <b>0.55</b> ±    | (Figs. 30.11-1A or B)           |
| Wind Pressure          | p    | <b>9.75</b> psf  | (Eq. 30.11-1)                   |

#### Notation

$hc$  = Mean canopy height, in ft (m).

$he$  = Mean eave height, in ft (m).

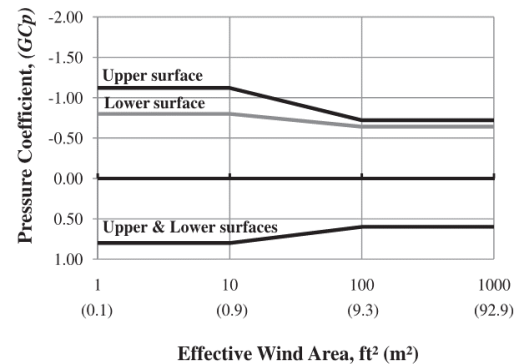
( $GCp$ ) = Pressure coefficients.

$q_h$  = Velocity pressure evaluated at height  $z = h$ , in lb/ft<sup>2</sup> (N/m<sup>2</sup>).

#### Notes

1. Pressures are based on the most critical values for all ratios of  $hc/he$ .
2. Vertical scale denotes ( $GCp$ ) to be used with  $q_h$ .
3. Horizontal scale denotes effective wind area, in ft<sup>2</sup> (m<sup>2</sup>).
4. Negative signs signify pressures acting away from the surface.

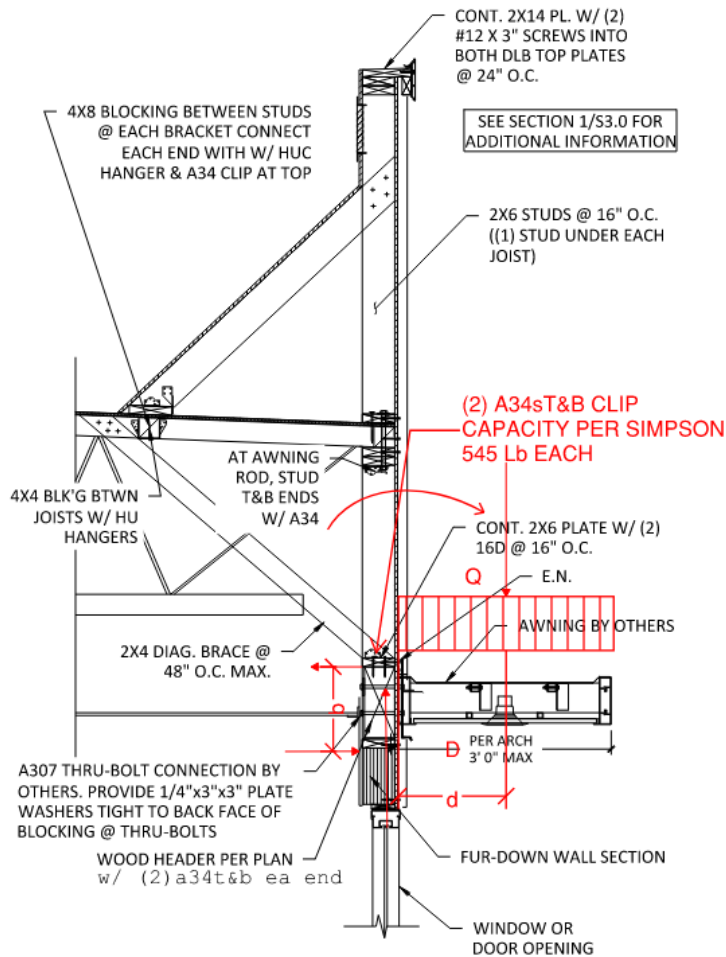
#### Pressure Coefficient



Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124



### AWNING ANCHORAGE:

DL= 10 PSF

RL= 20 PSF

WL= 10 PSF ( SEE CANOPIES ON BUILDING EXCEL CALC)

$Q = DL + RL + 0.6WL = 36 \text{ PSF}$  -- GOVERNS

$Q = DL + 0.6WL = 16 \text{ PSF}$

For 4' 6\" Canopy:

$F_y = Q \cdot D = 36 \cdot 4.5' = 162 \text{ PLF}$

$\text{RESISTING MOMENT} = 2 \cdot 545 \text{ lb} \cdot b = 1090 \cdot 1 \text{ ft} = 1090 \text{ p.f}$

ANCHOR SPACING MAX 5'

$\text{ACTING MOMENT} = \text{CANOPY WT} / 2 \cdot d$   
 $= (36 \text{ psf} \cdot 5' \cdot 4.5 \text{ ft}) / 2 \cdot 2.25 \text{ ft} = 912 \text{ p.f}$

$\text{RESISTING MOMENT} > \text{ACTING MOMENT}$  ---- OK!

For 3' Canopy:

$F_y = Q \cdot D = 36 \cdot 3 = 108 \text{ PLF}$

$\text{RESISTING MOMENT} = 2 \cdot 545 \text{ lb} \cdot b = 1090 \cdot 1 \text{ ft} = 1090 \text{ p.f}$

ANCHOR SPACING MAX 5'

$\text{ACTING MOMENT} = \text{CANOPY WT} / 2 \cdot d$   
 $= (36 \text{ psf} \cdot 5 \text{ ft} \cdot 3 \text{ ft}) / 2 \cdot 1.5 \text{ ft} = 405 \text{ p.f}$

$\text{RESISTING MOMENT} > \text{ACTING MOMENT}$  ---- OK



## SITE LIGHT FOOTING ANALYSIS

## NON-STRUCTURAL COMPONENTS

**Description: | Site Light Footing -Seismic & Wind Analysis**

Date: 12/10/2024

## Specifications

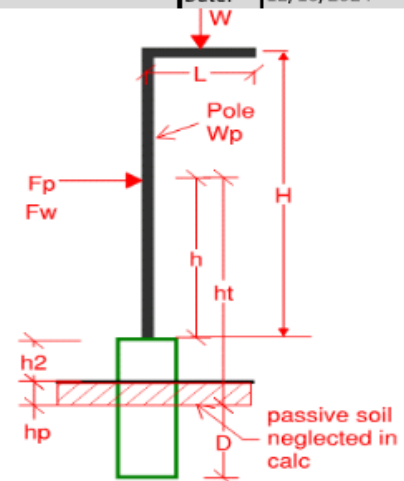
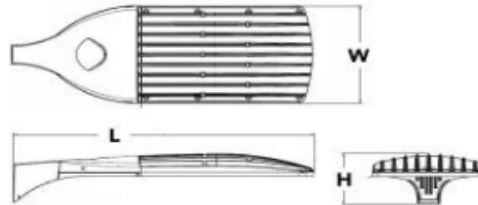
**EPA:** 1.1 ft<sup>2</sup>  
(0.10 m<sup>2</sup>)

**Length:** 40"  
(101.6 cm)

**Width:** 15"  
(38.1 cm)

**Height:** 7-1/4"  
(18.4 cm)

**Weight (max):** 36 lbs  
(16.3 kg)



## SITE LIGHT SPECIFICATIONS

|                       |      |     |                           |                |    |
|-----------------------|------|-----|---------------------------|----------------|----|
| Light Box Weight W=   | 36   | lb  | Footing above grade h2=   | 2.5            | ft |
| Pole Weight Wp=       | 10   | plf | Passive soil layer hp=    | 1              | ft |
| Pole Height H=        | 25   | ft  | Reaction height abv fnd h |                |    |
| Light Box length L=   | 3.33 | ft  | Effective Foot'g Depth D= | (see Enercalc) |    |
| Applied load height h |      |     |                           |                |    |

|                                                   |       |                                |      |                                                  |                       |                            |    |
|---------------------------------------------------|-------|--------------------------------|------|--------------------------------------------------|-----------------------|----------------------------|----|
| WIND ANALYSIS (ASCE 7-16, Ch 29.4)                |       |                                |      | SEISMIC ANALYSIS (ASCE 7-16, Ch 13.3)            |                       |                            |    |
| Risk Category                                     | II    |                                |      | Risk Category                                    | II                    |                            |    |
| Basic Wind Speed                                  | 98    | mph                            |      | Occup. Import. Factor $I_p$                      | 1                     |                            |    |
| Directional Factor $K_d$                          | 0.85  | (Solid Freestanding Walls)     |      | Spectral Accel. at Short SDS                     | 1                     |                            |    |
| Surf. Roughness Cat.                              | B     | (Urban and Suburban Areas)     |      | Component Amp. Factor $a_p$                      | 1                     |                            |    |
| Exposure Category                                 | C     |                                |      | Comp. Resp. Mod. Factor $R_p$                    | 2.5                   |                            |    |
| Topographic Factor $K_{zt}$                       | 1     |                                |      | Total Comp. Weight $W_t$                         | 286                   | lb                         |    |
| Gust Effects $G$                                  | 0.85  | (Rigid Structure - As deter'd) |      | Horizontal Shear $F_p$                           | 0.481                 | (case 1)                   |    |
| Enclosure Classif.                                | Open  |                                |      | $F_p$ no greater than                            | 1.605                 | (Max. case 2)              |    |
| $G_{cpi}$                                         | 0     |                                |      | $F_p$ no less than                               | 0.301                 | (Min. case 3)              |    |
| Vel. Press. Coef. $K_z$ or $K_h$                  | 0.90  |                                |      | Design $F_p$                                     | 138                   | lb                         |    |
| Velocity Pressure<br>$q_z=0.00256K_zK_{zt}K_dV^2$ | 18.81 | psf                            |      | Vertical Shear $F_v$                             | 57                    | lb                         |    |
| Minimum Design Press.                             | 16    | psf                            |      |                                                  |                       |                            |    |
| Design Wind Load $F=qhGCfAs$                      |       |                                |      |                                                  |                       |                            |    |
| Net Force Coefficient                             |       |                                |      | Equations:                                       |                       |                            |    |
| Case A & B                                        |       | Case C                         |      | Horizontal Shear                                 |                       |                            |    |
| Pole Height, $s$                                  | 25 ft | $S=$                           | 4    | Design $F_p = (1.2a_p S_{DS} W_p) / (R_p / I_p)$ |                       |                            |    |
| Height to top pole, $h$                           | 25 ft | $B/s=$                         | 0.04 | $F_p$ is not required to be taken greater than   |                       |                            |    |
| $s/h$                                             | 1.0   | Multiplier when $s/h > 0.8$    |      | $F_p = 1.6 S_{DS} I_p W_p$                       |                       |                            |    |
| Length, $B=$                                      | 1     | $1.8-s/h=$                     | 0.8  | $F_p$ shall not be taken less than,              |                       |                            |    |
| Aspect Ratio $B/s$                                | 0.04  | Region                         | 2    | 1.40                                             | F (lb)                | $F_p = 0.3 S_{DS} I_p W_p$ |    |
| $C_f$ at aspect ratio 1                           | 1.8   | 0-s                            | 2.25 | 2.25                                             | 61                    | Vertical Shear             |    |
| $C_f$ at aspect ratio 2                           | 0     | $s$ to $2s$                    | 1.5  | 1.5                                              | 41                    | $F_v = 0.2 S_{DS} W_p$     |    |
| Assume max. $C_f$                                 | 1.40  | $2s$ to $3s$                   | 0    | 0                                                | 0                     |                            |    |
| Trib To Post                                      | 0.5   | $3s$ to $10s$                  | 0    | 0                                                | 0                     |                            |    |
| Area $As=$                                        | 12.5  |                                |      | LIGHT POLE FOOTING LOADS                         |                       |                            |    |
| Design Wind Load, $F$                             | 280   |                                |      | Governing Load                                   | Wind                  | 280                        | lb |
| Applied at $h = H/2 + 0.05H =$                    | 13.75 | ft                             |      | Applied load at grade $ht=$                      | 17.3                  | ft                         |    |
|                                                   |       |                                |      | Pole Base Moment                                 | Moment at Grade       | Resultant at ht            |    |
|                                                   |       |                                |      | $M = F \cdot h + W(L/2)$                         | $F \cdot ht + W(L/2)$ | $R = M/ht$                 |    |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Pole Footing Embedded in Soil

Project File: Enercalc Site Light Footing.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

**DESCRIPTION:** Site Light Footing

#### Code References

Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16  
Load Combinations Used : IBC 2018

#### General Information

Pole Footing Shape Circular  
Pole Footing Diameter 30.0 in  
Calculate Min. Depth for Allowable Pressures  
No Lateral Restraint at Ground Surface  
Allow Passive 250.0 pcf  
Max Passive 1,500.0 psf

#### Controlling Values

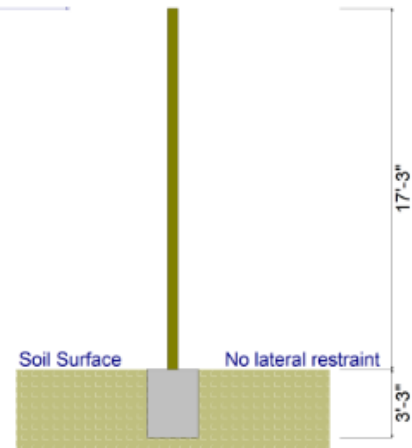
Governing Load Combination D+0.60W  
Lateral Load 0.1344 k  
Moment 2.318 k-ft  
**NO Ground Surface Restraint**

Pressures at 1/3 Depth  
Actual 267.719 psf  
Allowable 268.050 psf

**Minimum Required Depth 3.250 ft**

Footing Base Area 4.909 ft<sup>2</sup>  
Maximum Soil Pressure 0.06112 ksf

Point Load



#### Applied Loads

| Lateral Concentrated Load (k)      |           | Lateral Distributed Loads (k)       |      | Vertical Load (k) |
|------------------------------------|-----------|-------------------------------------|------|-------------------|
| D : Dead Load                      | k         |                                     | k/ft | 0.30 k            |
| Lr : Roof Live                     | k         |                                     | k/ft | k                 |
| L : Live                           | k         |                                     | k/ft | k                 |
| S : Snow                           | k         |                                     | k/ft | k                 |
| W : Wind                           | 0.2240 k  |                                     | k/ft | k                 |
| E : Earthquake                     | k         |                                     | k/ft | k                 |
| H : Lateral Earth                  | k         |                                     | k/ft | k                 |
| Load distance above ground surface | 17.250 ft | TOP of Load above ground surface    | ft   |                   |
|                                    |           | BOTTOM of Load above ground surface | ft   |                   |

#### Load Combination Results

| Load Combination | Forces @ Ground Surface |                  | Required Depth - (ft) | Pressure at 1/3 Depth |               | Soil Increase Factor |
|------------------|-------------------------|------------------|-----------------------|-----------------------|---------------|----------------------|
|                  | Loads - (k)             | Moments - (ft-k) |                       | Actual - (psf)        | Allow - (psf) |                      |
| D Only           | 0.000                   | 0.000            | 0.13                  | 0.0                   | 0.0           | 1.000                |
| +D+0.60W         | 0.134                   | 2.318            | 3.25                  | 267.7                 | 268.1         | 1.000                |
| +D+0.450W        | 0.101                   | 1.739            | 3.00                  | 242.0                 | 242.4         | 1.000                |
| +0.60D+0.60W     | 0.134                   | 2.318            | 3.25                  | 267.7                 | 268.1         | 1.000                |
| +0.60D           | 0.000                   | 0.000            | 0.13                  | 0.0                   | 0.0           | 1.000                |

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124



|           |                         |       |            |
|-----------|-------------------------|-------|------------|
| Company:  | WCD & Associates        | Date: | 11/18/2024 |
| Engineer: |                         | Page: | 1/7        |
| Project:  |                         |       |            |
| Address:  | 6930 Destiny Drive #300 |       |            |
| Phone:    | 916 251 9798            |       |            |
| E-mail:   |                         |       |            |

### 1. Project information

Project description:  
 Location:  
 Fastening description:

### 2. Input Data & Anchor Parameters

#### General

Design method: ACI 318-14  
 Units: Imperial units

#### Anchor Information:

Anchor type: Cast-in-place  
 Material: F1554 Grade 36  
 Diameter (inch): 0.750  
 Effective Embedment depth,  $h_{ef}$  (inch): 24.000  
 Anchor category: -  
 Anchor ductility: Yes  
 $h_{min}$  (inch): 25.50  
 $C_{min}$  (inch): 4.50  
 $S_{min}$  (inch): 4.50

#### Base Material

Concrete: Normal-weight  
 Concrete thickness,  $h$  (inch): 60.00  
 State: Cracked  
 Compressive strength,  $f_c$  (psi): 2500  
 $\Psi_{c,v}$ : 1.0  
 Reinforcement condition: B tension, B shear  
 Supplemental edge reinforcement: Not applicable  
 Reinforcement provided at corners: Yes  
 Ignore concrete breakout in tension: No  
 Ignore concrete breakout in shear: No  
 Ignore 6do requirement: No  
 Build-up grout pad: No

#### Base Plate

Length x Width x Thickness (inch): 12.00 x 12.00 x 0.75  
 Yield stress: 34084 psi

Profile type/size: HSS4X4X1/4

#### Recommended Anchor

Anchor Name: Heavy Hex Bolt - 3/4"Ø Heavy Hex Bolt, F1554 Gr. 36



Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124



**Anchor Designer™**  
Software  
Version 3.2.2311.2

|           |                         |       |            |
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| Phone:    | 916 251 9798            |       |            |
| E-mail:   |                         |       |            |

### Load and Geometry

Load factor source: ACI 318 Section 5.3

Load combination: not set

Seismic design: No

Anchors subjected to sustained tension: Not applicable

Apply entire shear load at front row: No

Anchors only resisting wind and/or seismic loads: No

Strength level loads:

$N_{ux}$  [lb]: 0

$V_{uxx}$  [lb]: 224

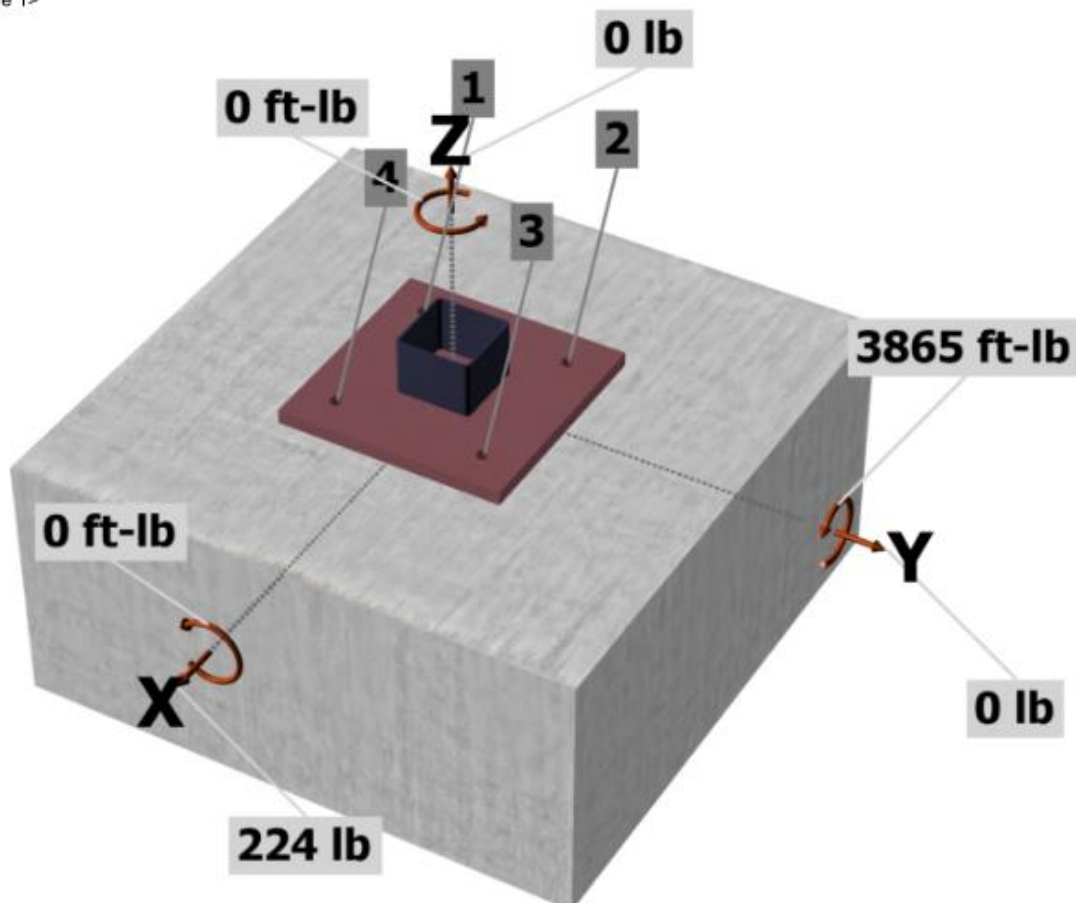
$V_{uxy}$  [lb]: 0

$M_{ux}$  [ft-lb]: 0

$M_{uy}$  [ft-lb]: 3865

$M_{uz}$  [ft-lb]: 0

<Figure 1>



Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

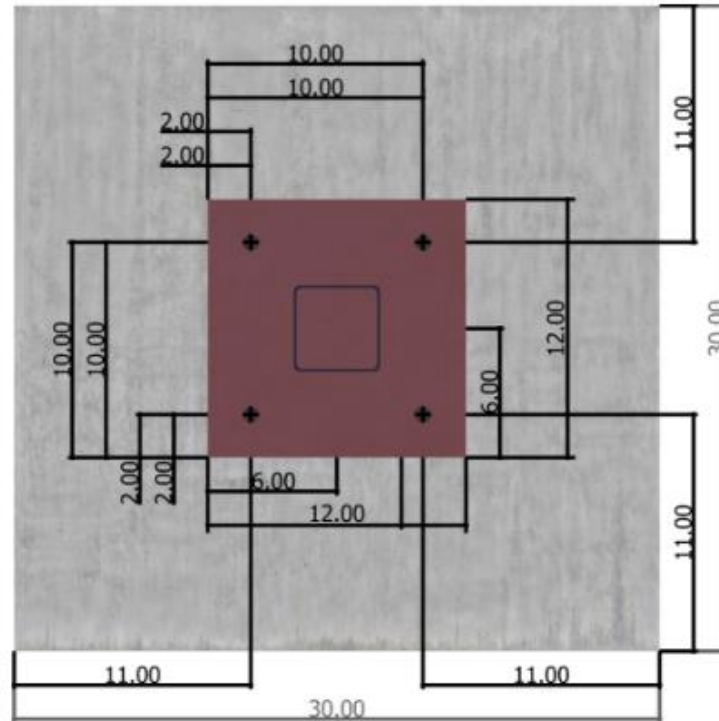
Project No.: CN112124



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| Project:  |                         |       |            |
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| E-mail:   |                         |       |            |

<Figure 2>



Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124



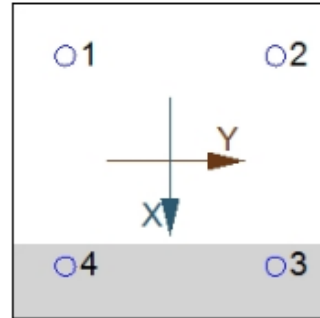
|           |                         |       |            |
|-----------|-------------------------|-------|------------|
| Company:  | WCD & Associates        | Date: | 11/18/2024 |
| Engineer: |                         | Page: | 4/7        |
| Project:  |                         |       |            |
| Address:  | 6930 Destiny Drive #300 |       |            |
| Phone:    | 916 251 9798            |       |            |
| E-mail:   |                         |       |            |

### 3. Resulting Anchor Forces

| Anchor | Tension load,<br>N <sub>ua</sub> (lb) | Shear load x,<br>V <sub>ux</sub> (lb) | Shear load y,<br>V <sub>uy</sub> (lb) | Shear load combined,<br>$\sqrt{(V_{ux})^2 + (V_{uy})^2}$ (lb) |
|--------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------------------------------|
| 1      | 2561.6                                | 56.0                                  | 0.0                                   | 56.0                                                          |
| 2      | 2561.6                                | 56.0                                  | 0.0                                   | 56.0                                                          |
| 3      | 0.0                                   | 56.0                                  | 0.0                                   | 56.0                                                          |
| 4      | 0.0                                   | 56.0                                  | 0.0                                   | 56.0                                                          |
| Sum    | 5123.3                                | 224.0                                 | 0.0                                   | 224.0                                                         |

Maximum concrete compression strain (‰): 0.07  
 Maximum concrete compression stress (psi): 300  
 Resultant tension force (lb): 5123  
 Resultant compression force (lb): 5123  
 Eccentricity of resultant tension forces in x-axis, e'<sub>nx</sub> (inch): 0.00  
 Eccentricity of resultant tension forces in y-axis, e'<sub>ny</sub> (inch): 0.00  
 Eccentricity of resultant shear forces in x-axis, e'<sub>vx</sub> (inch): 0.00  
 Eccentricity of resultant shear forces in y-axis, e'<sub>vy</sub> (inch): 0.00

<Figure 3>



### 4. Steel Strength of Anchor in Tension (Sec. 17.4.1)

| N <sub>sa</sub> (lb) | φ    | φN <sub>sa</sub> (lb) |
|----------------------|------|-----------------------|
| 19370                | 0.75 | 14528                 |

### 5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.4.2)

$$N_b = 16\lambda_a \sqrt{f_c} h_{ef}^{5/3} \text{ (Eq. 17.4.2.2b)}$$

| λ <sub>a</sub> | f <sub>c</sub> (psi) | h <sub>ef</sub> (in) | N <sub>b</sub> (lb) |
|----------------|----------------------|----------------------|---------------------|
| 1.00           | 2500                 | 12.667               | 55063               |

$$\phi N_{cbg} = \phi (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b \text{ (Sec. 17.3.1 & Eq. 17.4.2.1b)}$$

| A <sub>Nc</sub> (in <sup>2</sup> ) | A <sub>Nco</sub> (in <sup>2</sup> ) | c <sub>a,min</sub> (in) | Ψ <sub>ec,N</sub> | Ψ <sub>ed,N</sub> | Ψ <sub>c,N</sub> | Ψ <sub>cp,N</sub> | N <sub>b</sub> (lb) | φ    | φN <sub>cbg</sub> (lb) |
|------------------------------------|-------------------------------------|-------------------------|-------------------|-------------------|------------------|-------------------|---------------------|------|------------------------|
| 900.00                             | 1444.00                             | 11.00                   | 1.000             | 0.874             | 1.00             | 1.000             | 55063               | 0.70 | 20989                  |

### 6. Pullout Strength of Anchor in Tension (Sec. 17.4.3)

$$\phi N_{po} = \phi \Psi_{c,P} N_p = \phi \Psi_{c,P} 8 A_{brg} f_c \text{ (Sec. 17.3.1, Eq. 17.4.3.1 & 17.4.3.4)}$$

| Ψ <sub>c,P</sub> | A <sub>brg</sub> (in <sup>2</sup> ) | f <sub>c</sub> (psi) | φ    | φN <sub>po</sub> (lb) |
|------------------|-------------------------------------|----------------------|------|-----------------------|
| 1.0              | 0.91                                | 2500                 | 0.70 | 12754                 |





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124



|           |                         |       |            |
|-----------|-------------------------|-------|------------|
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| Engineer: |                         | Page: | 5/7        |
| Project:  |                         |       |            |
| Address:  | 6930 Destiny Drive #300 |       |            |
| Phone:    | 916 251 9798            |       |            |
| E-mail:   |                         |       |            |

### 8. Steel Strength of Anchor in Shear (Sec. 17.5.1)

| $V_{sa}$ (lb) | $\phi_{grou}$ | $\phi$ | $\phi_{grou}\phi V_{sa}$ (lb) |
|---------------|---------------|--------|-------------------------------|
| 11625         | 1.0           | 0.65   | 7556                          |

### 9. Concrete Breakout Strength of Anchor in Shear (Sec. 17.5.2)

Shear perpendicular to edge in x-direction:

$$V_{bx} = \min[7(l_e / d_a)^{0.2} \sqrt{d_a \lambda_a \sqrt{f_c} C_{at}^{1.5}}; 9 \lambda_a \sqrt{f_c} C_{at}^{1.5}] \text{ (Eq. 17.5.2.2a \& Eq. 17.5.2.2b)}$$

| $l_e$ (in) | $d_a$ (in) | $\lambda_a$ | $f_c$ (psi) | $C_{at}$ (in) | $V_{bx}$ (lb) |
|------------|------------|-------------|-------------|---------------|---------------|
| 6.00       | 0.750      | 1.00        | 2500        | 19.00         | 37269         |

$$\phi V_{cbgx} = \phi (A_{Vc} / A_{Vco}) \Psi_{ec,V} \Psi_{ed,V} \Psi_{c,V} \Psi_{h,V} V_{bx} \text{ (Sec. 17.3.1 \& Eq. 17.5.2.1b)}$$

| $A_{Vc}$ (in <sup>2</sup> ) | $A_{Vco}$ (in <sup>2</sup> ) | $\Psi_{ec,V}$ | $\Psi_{ed,V}$ | $\Psi_{c,V}$ | $\Psi_{h,V}$ | $V_{bx}$ (lb) | $\phi$ | $\phi V_{cbgx}$ (lb) |
|-----------------------------|------------------------------|---------------|---------------|--------------|--------------|---------------|--------|----------------------|
| 855.00                      | 1624.50                      | 1.000         | 0.816         | 1.000        | 1.000        | 37269         | 0.70   | 11201                |

Shear parallel to edge in y-direction:

$$V_{by} = \min[7(l_e / d_a)^{0.2} \sqrt{d_a \lambda_a \sqrt{f_c} C_{at}^{1.5}}; 9 \lambda_a \sqrt{f_c} C_{at}^{1.5}] \text{ (Eq. 17.5.2.2a \& Eq. 17.5.2.2b)}$$

| $l_e$ (in) | $d_a$ (in) | $\lambda_a$ | $f_c$ (psi) | $C_{at}$ (in) | $V_{by}$ (lb) |
|------------|------------|-------------|-------------|---------------|---------------|
| 6.00       | 0.750      | 1.00        | 2500        | 11.00         | 16417         |

$$\phi V_{cbgy} = \phi (2)(A_{Vc} / A_{Vco}) \Psi_{ec,V} \Psi_{ed,V} \Psi_{c,V} \Psi_{h,V} V_{by} \text{ (Sec. 17.3.1, 17.5.2.1(c) \& Eq. 17.5.2.1b)}$$

| $A_{Vc}$ (in <sup>2</sup> ) | $A_{Vco}$ (in <sup>2</sup> ) | $\Psi_{ec,V}$ | $\Psi_{ed,V}$ | $\Psi_{c,V}$ | $\Psi_{h,V}$ | $V_{by}$ (lb) | $\phi$ | $\phi V_{cbgy}$ (lb) |
|-----------------------------|------------------------------|---------------|---------------|--------------|--------------|---------------|--------|----------------------|
| 495.00                      | 544.50                       | 1.000         | 1.000         | 1.000        | 1.000        | 16417         | 0.70   | 20895                |

### 10. Concrete Pryout Strength of Anchor in Shear (Sec. 17.5.3)

$$\phi V_{cpq} = \phi K_{cp} N_{cbg} = \phi K_{cp} (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b \text{ (Sec. 17.3.1 \& Eq. 17.5.3.1b)}$$

| $K_{cp}$ | $A_{Nc}$ (in <sup>2</sup> ) | $A_{Nco}$ (in <sup>2</sup> ) | $\Psi_{ec,N}$ | $\Psi_{ed,N}$ | $\Psi_{c,N}$ | $\Psi_{cp,N}$ | $N_b$ (lb) | $\phi$ | $\phi V_{cpq}$ (lb) |
|----------|-----------------------------|------------------------------|---------------|---------------|--------------|---------------|------------|--------|---------------------|
| 2.0      | 900.00                      | 484.00                       | 1.000         | 1.000         | 1.000        | 1.000         | 22144      | 0.70   | 57648               |

## 11. Results

### Interaction of Tensile and Shear Forces (Sec. 17.6)

| Tension           | Factored Load, $N_{ua}$ (lb) | Design Strength, $\phi N_n$ (lb) | Ratio | Status         |
|-------------------|------------------------------|----------------------------------|-------|----------------|
| Steel             | 2562                         | 14528                            | 0.18  | Pass           |
| Concrete breakout | 5123                         | 20989                            | 0.24  | Pass (Governs) |
| Pullout           | 2562                         | 12754                            | 0.20  | Pass           |

| Shear                  | Factored Load, $V_{ua}$ (lb) | Design Strength, $\phi V_n$ (lb) | Ratio | Status         |
|------------------------|------------------------------|----------------------------------|-------|----------------|
| Steel                  | 56                           | 7556                             | 0.01  | Pass           |
| T Concrete breakout x+ | 224                          | 11201                            | 0.02  | Pass (Governs) |
| Concrete breakout y+   | 112                          | 20895                            | 0.01  | Pass (Governs) |
| Pryout                 | 224                          | 57648                            | 0.00  | Pass           |

| Interaction check | $N_{ua} / \phi N_n$ | $V_{ua} / \phi V_n$ | Combined Ratio | Permissible | Status |
|-------------------|---------------------|---------------------|----------------|-------------|--------|
| Sec. 17.6.1       | 0.24                | 0.00                | 24.4%          | 1.0         | Pass   |

3/4"Ø Heavy Hex Bolt, F1554 Gr. 36 with hef = 24.000 inch meets the selected design criteria.

ADDRESS: 6930 Destiny Drive Suite #300, Rocklin, CA 95677 | PHONE: 916-251-9798 | WEB: www.WCDAssociates.com

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124



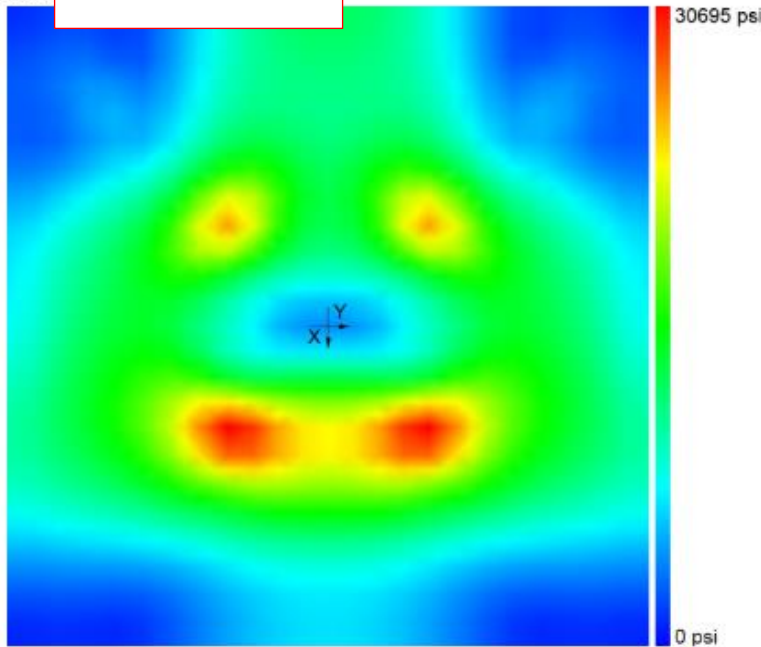
|           |                         |       |            |
|-----------|-------------------------|-------|------------|
| Company:  | WCD & Associates        | Date: | 11/18/2024 |
| Engineer: |                         | Page: | 6/7        |
| Project:  |                         |       |            |
| Address:  | 6930 Destiny Drive #300 |       |            |
| Phone:    | 916 251 9798            |       |            |
| E-mail:   |                         |       |            |

### Base Plate Thickness

Required base plate thickness: 0.578 inch

Steel 34084 psi  
 Maximum stress 30695 psi  
 Calculated plate thickness 0.578 inch

Stress DESIGN IS SUITABLE



For ACI and CSA design methods, maximum base plate stress is limited to 0.9 times yield stress.  
 For ETAG design method, maximum base plate stress is limited to yield stress divide by 1.5.  
 Plate stress is derived using Von Mises theory.

$$\sigma_{xx} = \frac{F_{xx}}{t} + \frac{6M_{xx}}{t^2} (@ \text{bottom}) \text{ or } \sigma_{xx} = \frac{F_{xx}}{t} - \frac{6M_{xx}}{t^2} (@ \text{top})$$

$$\sigma_{yy} = \frac{F_{yy}}{t} + \frac{6M_{yy}}{t^2} (@ \text{bottom}) \text{ or } \sigma_{yy} = \frac{F_{yy}}{t} - \frac{6M_{yy}}{t^2} (@ \text{top})$$

$$\sigma_{xy} = \frac{F_{xy}}{t} + \frac{6M_{xy}}{t^2} (@ \text{bottom}) \text{ or } \sigma_{xy} = \frac{F_{xy}}{t} - \frac{6M_{xy}}{t^2} (@ \text{top})$$

$$\sigma_{xz} = \frac{V_x}{t}$$

$$\sigma_{yz} = \frac{V_y}{t}$$

$\sigma_{xx}, \sigma_{yy}, \sigma_{xy}$  as follows:

$$S_1 = \frac{\sigma_{xx} + \sigma_{yy}}{2} + \sqrt{\left(\frac{\sigma_{xx} - \sigma_{yy}}{2}\right)^2 + \sigma_{xy}^2}$$

$$S_2 = \frac{\sigma_{xx} + \sigma_{yy}}{2} - \sqrt{\left(\frac{\sigma_{xx} - \sigma_{yy}}{2}\right)^2 + \sigma_{xy}^2}$$

$$S_3 = 0$$

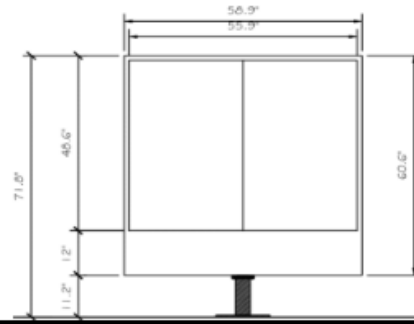
$$\sigma_{\text{Von Mises}} = \sqrt{\frac{(S_1 - S_2)^2 + (S_1 - S_3)^2 + (S_2 - S_3)^2}{2}}$$

### MENU BOARD ANALYSIS

#### NON-STRUCTURAL COMPONENTS

Description: **Menu Board Footing -Seismic & Wind Analysis**

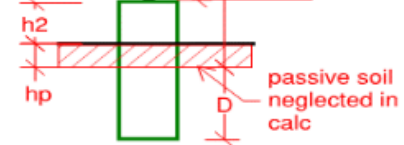
Date: **12/10/2024**



ELECTRICAL:  
 AMP 120/1/60, 15  
 SECOND CIRCUIT: 120/1/60, 15  
 SHIP WEIGHT: 1,200 LBS.  
 MEDIA PLAYER: STRATACACHE

#### SITE LIGHT SPECIFICATIONS

Weight W= 1200 lb Footing above grade h2= 0.5 ft  
 Pole Weight Wp= 10 plf Passive soil layer hp= 1 ft  
 Height H= 6 ft Reaction height abv fnd h  
 length B, L= 4.9 ft Effective Foot'g Depth D= (see Enercalc)



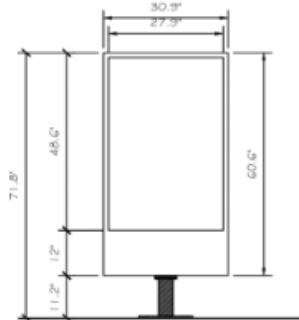
Applied load height h

| WIND ANALYSIS (ASCE 7-16, Ch 29.4) |       |                                |      | SEISMIC ANALYSIS (ASCE 7-16, Ch 13.3)       |                 |                 |       |
|------------------------------------|-------|--------------------------------|------|---------------------------------------------|-----------------|-----------------|-------|
| Risk Category                      | II    |                                |      | Risk Category                               | II              |                 |       |
| Basic Wind Speed                   | 98    | mph                            |      | Occup. Import. Factor Ip=                   | 1               |                 |       |
| Directional Factor Kd              | 0.85  | (Solid Freestanding Walls)     |      | Spectral Accel. at Short SDS =              | 1               |                 |       |
| Surf. Roughness Cat.               | B     | (Urban and Suburban Areas)     |      | Component Amp. Factor ap=                   | 1               |                 |       |
| Exposure Category                  | C     |                                |      | Comp. Resp. Mod. Factor Rp=                 | 2.5             |                 |       |
| Topographic Factor Kzt             | 1     |                                |      | Total Comp. Weight Wt=                      | 1260            | lb              |       |
| Gust Effects G                     | 0.85  | (Rigid Structure - As deter'd) |      |                                             |                 |                 |       |
| Enclosure Classif.                 | Open  |                                |      | Horizontal Shear Fp=                        | 0.481           | (case 1)        |       |
| Gcpi                               | 0     |                                |      | Fp no greater than=                         | 1.605           | (Max. case 2)   |       |
| Vel. Press. Coef. Kz or Kh         | 0.90  |                                |      | Fp no less than =                           | 0.301           | (Min. case 3)   |       |
| Velocity Pressure                  | 18.81 | psf                            |      | Design Fp=                                  | 607             | lb              |       |
| qz=0.00256KzKztKdV2                |       |                                |      |                                             |                 |                 |       |
| Minimum Design Press.              | 16    | psf                            |      | Vertical Shear Fv=                          | 253             | lb              |       |
| Design Wind Load F=qhGCfAs         |       |                                |      |                                             |                 |                 |       |
| Net Force Coefficient              |       |                                |      | Equations:                                  |                 |                 |       |
| Case A & B                         |       | Case C                         |      | Horizontal Shear                            |                 |                 |       |
| Height, s =                        | 5 ft  | S=                             | 5    | Design Fp = (1.2apSDSWp) / (Rp/Ip)          |                 |                 |       |
| Height to top, h =                 | 6 ft  | B/s=                           | 0.97 | Fp is not required to be taken greater than |                 |                 |       |
| s/h                                | 0.8   | Multiplier when s/h > 0.8      |      | Fp = 1.6SDS Ip Wp                           |                 |                 |       |
| Length, B=                         | 4.9   | 1.8-s/h =                      | 1.0  | Fp shall not be taken less than,            |                 |                 |       |
| Aspect Ratio B/s                   | 0.97  | Region                         | 2    | Fp = 0.3SDS Ip Wp                           |                 |                 |       |
| Cf at aspect ratio 1=              | 0.97  | 0-s                            | 2.25 | Vertical Shear                              |                 |                 |       |
| Cf at aspect ratio 2=              | 0     | s to 2s                        | 1.5  | Fv= 0.2SDSWp                                |                 |                 |       |
| Asusme max. Cf =                   | 1.40  | 2s to 3s                       | 0    |                                             |                 |                 |       |
| Trib To Post =                     | 0.5   | 3s to 10s                      | 0    |                                             |                 |                 |       |
| Area As=                           | 2.525 |                                |      |                                             |                 |                 |       |
| Design Wind Load, F                | 57    |                                |      |                                             |                 |                 |       |
| Applied at h =H/2+0.05H=           | 3.3   |                                |      | LIGHT POLE FOOTING LOADS                    |                 |                 |       |
|                                    |       |                                |      | Governing Load                              | Seis            | 607             | lb    |
|                                    |       |                                |      | Applied load at grade ht=                   | 4.8             | ft              |       |
|                                    |       |                                |      | Pole Base Moment                            | Moment at Grade | Resultant at ht |       |
|                                    |       |                                |      | M=F*h+W(L/2)                                | F*ht+W*(L/2)    | R=M/ht          |       |
|                                    |       |                                |      | 2602                                        | lb-ft           | 3512            | lb-ft |
|                                    |       |                                |      |                                             |                 | 542             | lb-ft |

### NON-STRUCTURAL COMPONENTS

Description: **Pre-Browser Footing -Seismic & Wind Analysis**

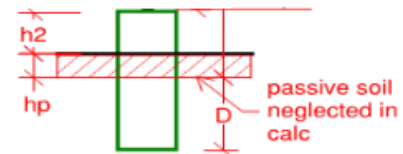
Date: 12/10/2024



ELECTRICAL: FIRST CIRCUIT: 120V/60, 15 AMP  
 SECOND CIRCUIT: 120V/60, 10 AMP  
 SHEP WEIGHT: 350 LBS.  
 MEDIA PLAYER: STRATACACHE

### SITE LIGHT SPECIFICATIONS

|                       |        |                           |                |
|-----------------------|--------|---------------------------|----------------|
| Weight W=             | 350 lb | Footing above grade h2=   | 0.5 ft         |
| Pole Weight Wp=       | 10 plf | Passive soil layer hp=    | 1 ft           |
| Height H=             | 6 ft   | Reaction height abv fnd h |                |
| length B, L=          | 2.6 ft | Effective Foot'g Depth D= | (see Enercalc) |
| Applied load height h |        |                           |                |



| WIND ANALYSIS (ASCE 7-16, Ch 29.4) |                                     |                           |      | SEISMIC ANALYSIS (ASCE 7-16, Ch 13.3)       |                     |                 |  |
|------------------------------------|-------------------------------------|---------------------------|------|---------------------------------------------|---------------------|-----------------|--|
| Risk Category                      | II                                  |                           |      | Risk Category                               | II                  |                 |  |
| Basic Wind Speed                   | 98 mph                              |                           |      | Occup. Import. Factor Ip=                   | 1                   |                 |  |
| Directional Factor Kd              | 0.85 (Solid Freestanding Walls)     |                           |      | Spectral Accel. at Short SDS =              | 1                   |                 |  |
| Surf. Roughness Cat.               | B (Urban and Suburban Areas)        |                           |      | Component Amp. Factor ap=                   | 1                   |                 |  |
| Exposure Category                  | C                                   |                           |      | Comp. Resp. Mod. Factor Rp=                 | 2.5                 |                 |  |
| Topographic Factor Kzt             | 1                                   |                           |      | Total Comp. Weight Wt=                      | 410 lb              |                 |  |
| Gust Effects G                     | 0.85 (Rigid Structure - As deter'd) |                           |      |                                             |                     |                 |  |
| Enclosure Classif.                 | Open                                |                           |      | Horizontal Shear Fp=                        | 0.481 (case 1)      |                 |  |
| Gcpi                               | 0                                   |                           |      | Fp no greater than=                         | 1.605 (Max. case 2) |                 |  |
| Vel. Press. Coef. Kz or Kh         | 0.90                                |                           |      | Fp no less than =                           | 0.301 (Min. case 3) |                 |  |
| Velocity Pressure                  | 18.81 psf                           |                           |      | Design Fp=                                  | 197 lb              |                 |  |
| qz=0.00256KzKztKdV2                |                                     |                           |      |                                             |                     |                 |  |
| Minimum Design Press.              | 16 psf                              |                           |      | Vertical Shear Fv=                          | 82 lb               |                 |  |
| Design Wind Load F=qhGCfAs         |                                     |                           |      |                                             |                     |                 |  |
| Net Force Coefficient              |                                     |                           |      | Equations:                                  |                     |                 |  |
| Case A & B                         | Case C                              |                           |      | Horizontal Shear                            |                     |                 |  |
| Height, s =                        | 5 ft                                | S=                        | 5    | Design Fp = (1.2apSDsWp) / (Rp/Ip)          |                     |                 |  |
| Height to top, h =                 | 6 ft                                | B/s=                      | 0.51 | Fp is not required to be taken greater than |                     |                 |  |
| s/h                                | 0.8                                 | Multiplier when s/h > 0.8 |      | Fp = 1.6SDsIpWp                             |                     |                 |  |
| Length, B=                         | 2.6                                 | 1.8-s/h =                 | 1.0  | Fp shall not be taken less than,            |                     |                 |  |
| Aspect Ratio B/s                   | 0.51                                | Region                    | 2    | Fp = 0.3SDsIpWp                             |                     |                 |  |
| Cf at aspect ratio 1=              | 0.51                                | 0-s                       | 2.25 | Vertical Shear                              |                     |                 |  |
| Cf at aspect ratio 2=              | 0                                   | s to 2s                   | 1.5  | Fv= 0.2SDSWp                                |                     |                 |  |
| Asusme max. Cf=                    | 1.40                                | 2s to 3s                  | 0    |                                             |                     |                 |  |
| Trib To Post =                     | 0.5                                 | 3s to 10s                 | 0    |                                             |                     |                 |  |
| Area As=                           | 2.525                               |                           |      |                                             |                     |                 |  |
| Design Wind Load, F                | 57                                  |                           |      |                                             |                     |                 |  |
| Applied at h =H/2+0.05H=           | 3.3 ft                              |                           |      |                                             |                     |                 |  |
|                                    |                                     |                           |      | LIGHT POLE FOOTING LOADS                    |                     |                 |  |
|                                    |                                     |                           |      | Governing Load                              | Seis                | 197 lb          |  |
|                                    |                                     |                           |      | Applied load at grade ht=                   | 4.8 ft              |                 |  |
|                                    |                                     |                           |      | Pole Base Moment                            | Moment at Grade     | Resultant at ht |  |
|                                    |                                     |                           |      | M=F*ht+W*(L/2)                              | F*ht+W*(L/2)        | R=M/ht          |  |
|                                    |                                     |                           |      | 826 lb-ft                                   | 1122 lb-ft          | 172 lbf         |  |

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### Pole Footing Embedded in Soil

Project File: Enercalc Menu Board Footing.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

**DESCRIPTION:** Menu Board & Pre-Browser footing

### Code References

Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16  
 Load Combinations Used : ASCE 7-16

### General Information

Pole Footing Shape Circular  
 Pole Footing Diameter 24.0 in  
 Calculate Min. Depth for Allowable Pressures  
 No Lateral Restraint at Ground Surface  
 Allow Passive 250.0 pcf  
 Max Passive 1,500.0 psf

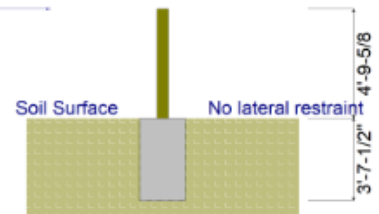
### Controlling Values

Governing Load Combination D+0.70E  
 Lateral Load 0.3794 k  
 Moment 1.821 k-ft  
**NO Ground Surface Restraint**  
 Pressures at 1/3 Depth  
 Actual 300.197 psf  
 Allowable 301.449 psf

**Minimum Required Depth 3.625 ft**

Footing Base Area 3.142 ft<sup>2</sup>  
 Maximum Soil Pressure 0.4011 ksf

Point Load



### Applied Loads

| Lateral Concentrated Load (k)      |          | Lateral Distributed Loads (k)       |      | Vertical Load (k) |
|------------------------------------|----------|-------------------------------------|------|-------------------|
| D : Dead Load                      | k        |                                     | k/ft | 1.260 k           |
| Lr : Roof Live                     | k        |                                     | k/ft | k                 |
| L : Live                           | k        |                                     | k/ft | k                 |
| S : Snow                           | k        |                                     | k/ft | k                 |
| W : Wind                           | 0.1640 k |                                     | k/ft | k                 |
| E : Earthquake                     | 0.5420 k |                                     | k/ft | k                 |
| H : Lateral Earth                  | k        |                                     | k/ft | k                 |
| Load distance above ground surface | 4.80 ft  | TOP of Load above ground surface    | ft   |                   |
|                                    |          | BOTTOM of Load above ground surface | ft   |                   |

### Load Combination Results

| Load Combination | Forces @ Ground Surface |                  | Required Depth - (ft) | Pressure at 1/3 Depth |               | Soil Increase Factor |
|------------------|-------------------------|------------------|-----------------------|-----------------------|---------------|----------------------|
|                  | Loads - (k)             | Moments - (ft-k) |                       | Actual - (psf)        | Allow - (psf) |                      |
| D Only           | 0.000                   | 0.000            | 0.13                  | 0.0                   | 0.0           | 1.000                |
| +D+0.60W         | 0.098                   | 0.472            | 2.25                  | 180.2                 | 181.3         | 1.000                |
| +D+0.450W        | 0.074                   | 0.354            | 2.00                  | 162.3                 | 163.0         | 1.000                |
| +0.60D+0.60W     | 0.098                   | 0.472            | 2.25                  | 180.2                 | 181.3         | 1.000                |
| +D+0.70E         | 0.379                   | 1.821            | 3.63                  | 300.2                 | 301.4         | 1.000                |
| +D+0.5250E       | 0.285                   | 1.366            | 3.25                  | 269.5                 | 269.5         | 1.000                |
| +0.60D+0.70E     | 0.379                   | 1.821            | 3.63                  | 300.2                 | 301.4         | 1.000                |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124



Anchor Designer™  
Software  
Version 3.2.2311.2

|           |                                     |       |            |
|-----------|-------------------------------------|-------|------------|
| Company:  | WCD & Associates                    | Date: | 11/18/2024 |
| Engineer: |                                     | Page: | 1/5        |
| Project:  |                                     |       |            |
| Address:  | 6930 Destiny Drive Rocklin CA 95677 |       |            |
| Phone:    | (916) 251-9798                      |       |            |
| E-mail:   |                                     |       |            |

### 1. Project information

Project description: Steel Base Plate  
Location:  
Fastening description:

### 2. Input Data & Anchor Parameters

#### General

Design method: ACI 318-14  
Units: Imperial units

#### Anchor Information:

Anchor type: Cast-in-place  
Material: F1554 Grade 36  
Diameter (inch): 0.750  
Effective Embedment depth,  $h_{ef}$  (inch): 24.000  
Anchor category: -  
Anchor ductility: Yes  
 $h_{min}$  (inch): 25.50  
 $C_{min}$  (inch): 4.50  
 $S_{min}$  (inch): 4.50

#### Base Material

Concrete: Normal-weight  
Concrete thickness,  $h$  (inch): 60.00  
State: Cracked  
Compressive strength,  $f'_c$  (psi): 4000  
 $\Psi_{c,v}$ : 1.0  
Reinforcement condition: A tension, A shear  
Supplemental edge reinforcement: Not applicable  
Reinforcement provided at corners: Yes  
Ignore concrete breakout in tension: No  
Ignore concrete breakout in shear: No  
Ignore 6do requirement: No  
Build-up grout pad: No

#### Base Plate

Length x Width x Thickness (inch): 10.00 x 10.00 x 0.50

#### Recommended Anchor

Anchor Name: Heavy Hex Bolt - 3/4"Ø Heavy Hex Bolt, F1554 Gr. 36





Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124



|           |                                     |       |            |
|-----------|-------------------------------------|-------|------------|
| Company:  | WCD & Associates                    | Date: | 11/18/2024 |
| Engineer: |                                     | Page: | 2/5        |
| Project:  |                                     |       |            |
| Address:  | 6930 Destiny Drive Rocklin CA 95677 |       |            |
| Phone:    | (916) 251-9798                      |       |            |
| E-mail:   |                                     |       |            |

### Load and Geometry

Load factor source: ACI 318 Section 5.3

Load combination:  $U = 0.9D + 1.0E$

Seismic design: Yes

Anchors subjected to sustained tension: Not applicable

Ductility section for tension: 17.2.3.4.3 (b) is satisfied

Ductility section for shear: 17.2.3.5.3 (c) is satisfied

$\Omega_0$  factor: 2.5

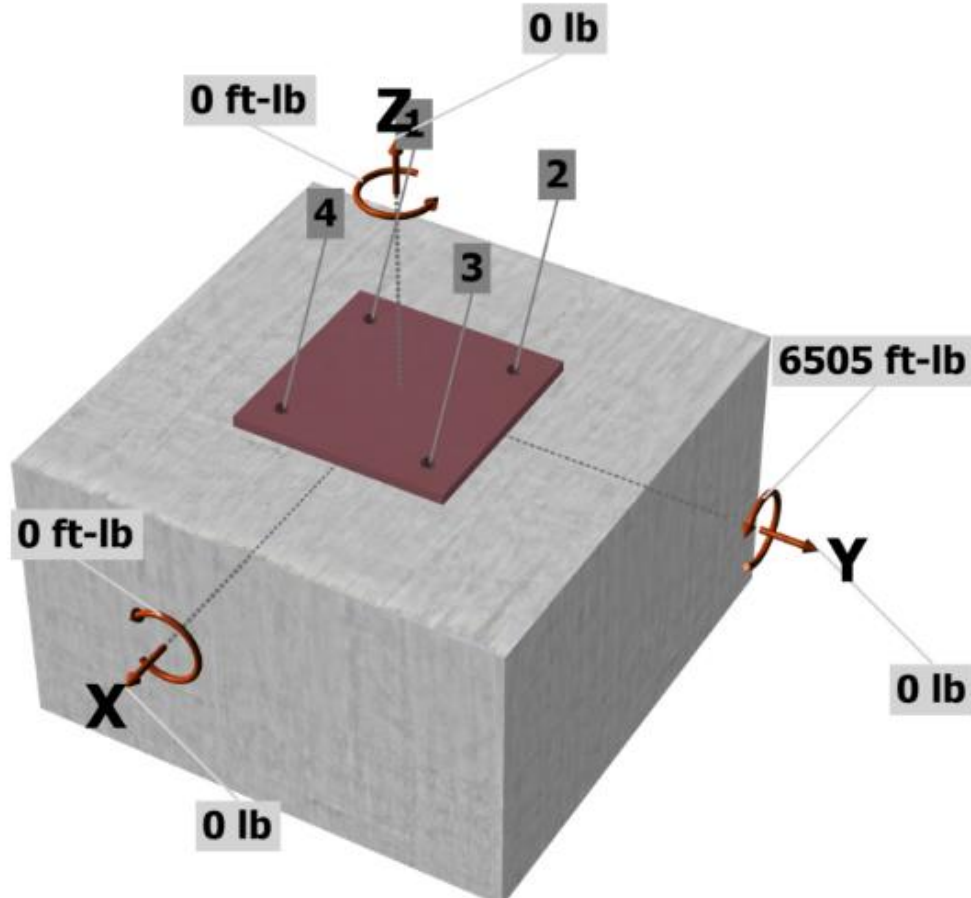
Apply entire shear load at front row: No

Anchors only resisting wind and/or seismic loads: Yes

Service level loads:

|                | D | E    | Strength level loads |
|----------------|---|------|----------------------|
| $N_s$ [lb]:    | 0 | 0    | 0                    |
| $V_{sx}$ [lb]: | 0 | 0    | 0                    |
| $V_{sy}$ [lb]: | 0 | 0    | 0                    |
| $M_x$ [ft-lb]: | 0 | 0    | 0                    |
| $M_y$ [ft-lb]: | 0 | 2602 | 6505                 |
| $M_z$ [ft-lb]: | 0 | 0    | 0                    |

<Figure 1>



Project Name: New Construction for McDonald's in Puyallup, WA

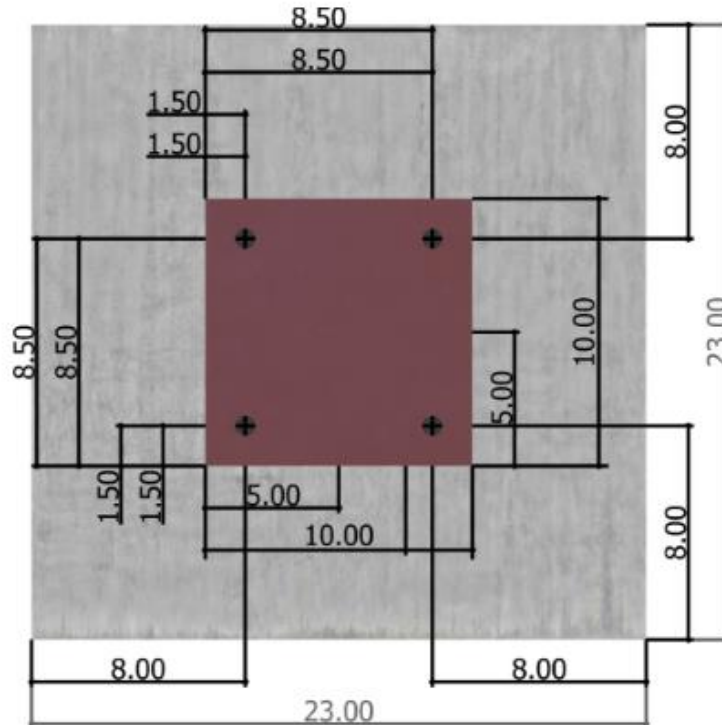
Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124



|           |                                     |       |            |
|-----------|-------------------------------------|-------|------------|
| Company:  | WCD & Associates                    | Date: | 11/18/2024 |
| Engineer: |                                     | Page: | 3/5        |
| Project:  |                                     |       |            |
| Address:  | 6930 Destiny Drive Rocklin CA 95677 |       |            |
| Phone:    | (916) 251-9798                      |       |            |
| E-mail:   |                                     |       |            |

<Figure 2>



Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124



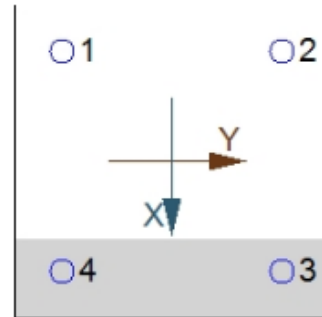
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|-----------|-------------------------------------|-------|------------|
| Company:  | WCD & Associates                    | Date: | 11/18/2024 |
| Engineer: |                                     | Page: | 4/5        |
| Project:  |                                     |       |            |
| Address:  | 6930 Destiny Drive Rocklin CA 95677 |       |            |
| Phone:    | (916) 251-9798                      |       |            |
| E-mail:   |                                     |       |            |

### 3. Resulting Anchor Forces

| Anchor | Tension load,<br>$N_{ux}$ (lb) | Shear load x,<br>$V_{uxx}$ (lb) | Shear load y,<br>$V_{uyy}$ (lb) | Shear load combined,<br>$\sqrt{(V_{uxx})^2 + (V_{uyy})^2}$ (lb) |
|--------|--------------------------------|---------------------------------|---------------------------------|-----------------------------------------------------------------|
| 1      | 5097.8                         | 0.0                             | 0.0                             | 0.0                                                             |
| 2      | 5097.8                         | 0.0                             | 0.0                             | 0.0                                                             |
| 3      | 0.0                            | 0.0                             | 0.0                             | 0.0                                                             |
| 4      | 0.0                            | 0.0                             | 0.0                             | 0.0                                                             |
| Sum    | 10195.7                        | 0.0                             | 0.0                             | 0.0                                                             |

Maximum concrete compression strain ( $\epsilon_c$ ): 0.19  
 Maximum concrete compression stress (psi): 805  
 Resultant tension force (lb): 10196  
 Resultant compression force (lb): 10196  
 Eccentricity of resultant tension forces in x-axis,  $e'_{nx}$  (inch): 0.00  
 Eccentricity of resultant tension forces in y-axis,  $e'_{ny}$  (inch): 0.00

<Figure 3>



### 4. Steel Strength of Anchor in Tension (Sec. 17.4.1)

| $N_{sa}$ (lb) | $\phi$ | $\phi N_{sa}$ (lb) |
|---------------|--------|--------------------|
| 19370         | 0.75   | 14528              |

### 5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.4.2)

$$N_b = 16\lambda_a \sqrt{f'_c} h_{ef}^{5/3} \text{ (Eq. 17.4.2.2b)}$$

| $\lambda_a$ | $f'_c$ (psi) | $h_{ef}$ (in) | $N_b$ (lb) |
|-------------|--------------|---------------|------------|
| 1.00        | 4000         | 10.000        | 46970      |

$$0.75\phi N_{cbg} = 0.75\phi (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b \text{ (Sec. 17.3.1 & Eq. 17.4.2.1b)}$$

| $A_{Nc}$ (in <sup>2</sup> ) | $A_{Nco}$ (in <sup>2</sup> ) | $C_{a,min}$ (in) | $\Psi_{ec,N}$ | $\Psi_{ed,N}$ | $\Psi_{c,N}$ | $\Psi_{cp,N}$ | $N_b$ (lb) | $\phi$ | $0.75\phi N_{cbg}$ (lb) |
|-----------------------------|------------------------------|------------------|---------------|---------------|--------------|---------------|------------|--------|-------------------------|
| 529.00                      | 900.00                       | 8.00             | 1.000         | 0.860         | 1.00         | 1.000         | 46970      | 0.75   | 13355                   |

### 6. Pullout Strength of Anchor in Tension (Sec. 17.4.3)

$$0.75\phi N_{pn} = 0.75\phi \Psi_{c,p} N_p = 0.75\phi \Psi_{c,p} 8A_{brg} f'_c \text{ (Sec. 17.3.1, Eq. 17.4.3.1 & 17.4.3.4)}$$

| $\Psi_{c,p}$ | $A_{brg}$ (in <sup>2</sup> ) | $f'_c$ (psi) | $\phi$ | $0.75\phi N_{pn}$ (lb) |
|--------------|------------------------------|--------------|--------|------------------------|
| 1.0          | 0.91                         | 4000         | 0.70   | 15305                  |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124



|           |                                     |       |            |
|-----------|-------------------------------------|-------|------------|
| Company:  | WCD & Associates                    | Date: | 11/18/2024 |
| Engineer: |                                     | Page: | 5/5        |
| Project:  |                                     |       |            |
| Address:  | 6930 Destiny Drive Rocklin CA 95677 |       |            |
| Phone:    | (916) 251-9798                      |       |            |
| E-mail:   |                                     |       |            |

### 7. Side-Face Blowout Strength of Anchor in Tension (Sec. 17.4.4)

$$0.75\phi N_{sb} = 0.75\phi \left[ (1 + C_{a2}/C_{a1})/4 \right] (1 + s/6C_{a1}) N_{so} = 0.75\phi \left[ (1 + C_{a2}/C_{a1})/4 \right] (1 + s/6C_{a1}) (160C_{a1}\sqrt{A_{brg}})\lambda\sqrt{f'_c} \text{ (Sec. 17.3.1, Eq. 17.4.4.1 \& 17.4.4.2)}$$

| s (in) | C <sub>a1</sub> (in) | C <sub>a2</sub> (in) | A <sub>brg</sub> (in <sup>2</sup> ) | λ <sub>a</sub> | f' <sub>c</sub> (psi) | φ    | 0.75φN <sub>sb</sub> (lb) |
|--------|----------------------|----------------------|-------------------------------------|----------------|-----------------------|------|---------------------------|
| 7.00   | 8.00                 | 8.00                 | 0.91                                | 1.00           | 4000                  | 0.75 | 24901                     |

## 11. Results

### Interaction of Tensile and Shear Forces (Sec. 17.6)

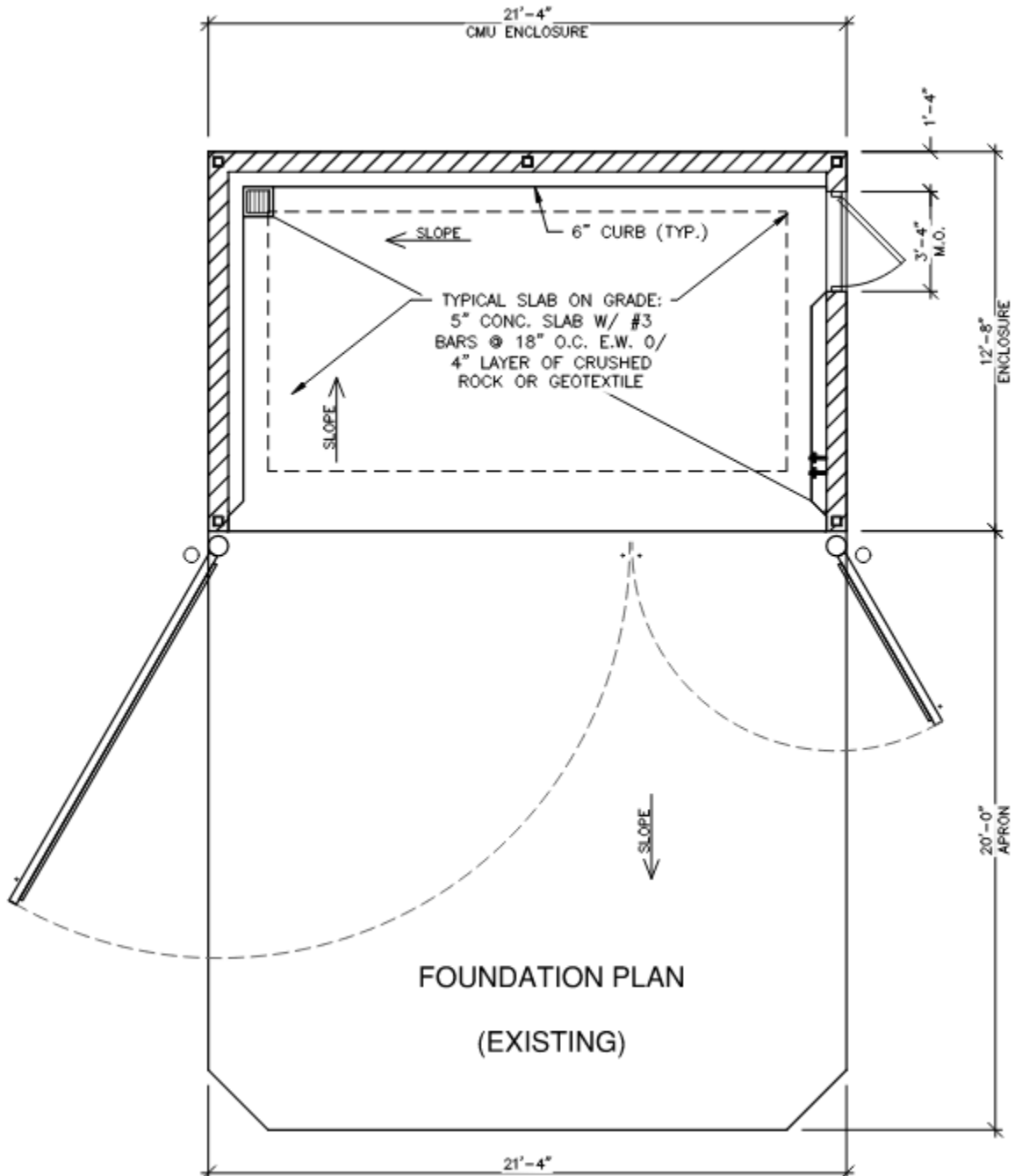
| Tension           | Factored Load, N <sub>ua</sub> (lb) | Design Strength, φN <sub>t</sub> (lb) | Ratio | Status         |
|-------------------|-------------------------------------|---------------------------------------|-------|----------------|
| Steel             | 5098                                | 14528                                 | 0.35  | Pass           |
| Concrete breakout | 10196                               | 13355                                 | 0.76  | Pass (Governs) |
| Pullout           | 5098                                | 15305                                 | 0.33  | Pass           |
| Side-face blowout | 10196                               | 24901                                 | 0.41  | Pass           |

3/4"Ø Heavy Hex Bolt, F1554 Gr. 36 with hef = 24.000 inch meets the selected design criteria.

## 12. Warnings

- Per designer input, ductility requirements for tension have been determined to be satisfied – designer to verify.
- Per designer input, ductility requirements for shear have been determined to be satisfied – designer to verify.
- Designer must exercise own judgement to determine if this design is suitable.

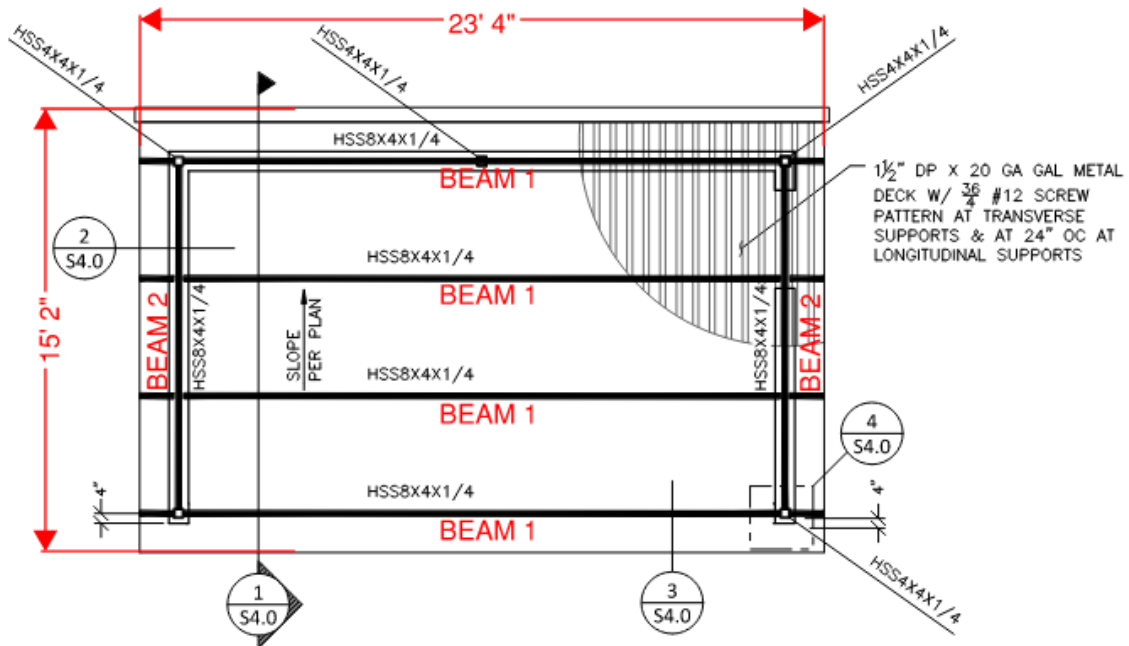
### TRASH ENCLOSURE ANALYSIS



REFER TO PRINTOUTS  
SECTION OF REPORT FOR  
FULL CALCS

**ROOF LOADS:**  
DL=10 psf  
RL=20 psf  
WL = 16 psf uplift

**LATERAL WIND LOADS:**  
WL = 16 psf



Roof Area = 23.333' x 15.167' = 354 sf  
Uplift = 354 sf \* 16psf = 5.664 kips





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Wind Load on Freestanding Wall

Per ASCE 7-16 Ch. 26.10.2

$$q_h = 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot K_e \cdot V^2$$

$$K_z = K_h = 0.85$$

$$K_{zt} = 1.0$$

$$K_d = 0.85$$

$$K_e = 1.0$$

$$V = 96 \text{ mph (10 yr MRI)}$$

$$q_h = 17.77 \text{ psf}$$

Per ASCE 7-16 Ch. 29.3-1

$$F = q_h \cdot G \cdot C_f \cdot A_s$$

$$G = 0.85$$

### TRASH ENCLOSURE 1

#### SHORT WALL

$$C_f = 1.425$$

$$A_s = 101 \text{ ft}^2$$

$$F = 2174 \text{ lb (Divide by area to get a PSF load)}$$

$$F = 21.5 \text{ psf}$$

#### Wall Dimensions:

$$\text{Length} = 12.667 \text{ ft (B)}$$

$$\text{Height} = 8 \text{ ft (h, s)}$$

$$B/s = 1.583$$

$$s/h = 1$$

#### LONG WALL

$$C_f = 1.38$$

$$A_s = 171 \text{ ft}^2$$

$$F = 3564 \text{ lb (Divide by area to get a PSF load)}$$

$$F = 20.8 \text{ psf}$$

#### Wall Dimensions:

$$\text{Length} = 21.333 \text{ ft (B)}$$

$$\text{Height} = 8 \text{ ft (h, s)}$$

$$B/s = 2.666$$

$$s/h = 1$$

USE MAX. F FOR WIND LOAD ON WALL

CAN USE 0.42 FOR WIND FACTOR FOR  
CALCULATING THE DEFLECTION

| Force Coefficients, $C_f$ , for Case A and Case B |                     |      |      |      |      |      |      |      |      |      |           |
|---------------------------------------------------|---------------------|------|------|------|------|------|------|------|------|------|-----------|
| Clearance<br>Ratio, $s/h$                         | Aspect Ratio, $B/s$ |      |      |      |      |      |      |      |      |      |           |
|                                                   | $\leq 0.05$         | 0.1  | 0.2  | 0.5  | 1    | 2    | 4    | 5    | 10   | 20   | $\geq 30$ |
| 1                                                 | 1.80                | 1.70 | 1.65 | 1.55 | 1.45 | 1.40 | 1.35 | 1.35 | 1.30 | 1.30 | 1.30      |
| 0.9                                               | 1.85                | 1.75 | 1.70 | 1.60 | 1.55 | 1.50 | 1.45 | 1.45 | 1.40 | 1.40 | 1.40      |
| 0.7                                               | 1.90                | 1.85 | 1.75 | 1.70 | 1.65 | 1.60 | 1.60 | 1.55 | 1.55 | 1.55 | 1.55      |
| 0.5                                               | 1.95                | 1.85 | 1.80 | 1.75 | 1.75 | 1.70 | 1.70 | 1.70 | 1.70 | 1.70 | 1.75      |
| 0.3                                               | 1.95                | 1.90 | 1.85 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.85 | 1.85      |
| 0.2                                               | 1.95                | 1.90 | 1.85 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.85 | 1.90 | 1.95      |
| $\leq 0.16$                                       | 1.95                | 1.90 | 1.85 | 1.85 | 1.80 | 1.80 | 1.85 | 1.85 | 1.85 | 1.90 | 1.95      |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Seismic Design for Non-structural components

$$F_p = 0.4a_p \cdot \text{SDS} \cdot W_p / (R_p / I_p) \cdot (1 + 2 \cdot z/h)$$

$$\text{SDS} = 1.003$$

$$a_p = 1$$

$$W_p = 55 \text{ psf}$$

$$R_p = 2.5$$

$$I_p = 1$$

$$z/h = 1$$

$$F_p = 26.48 \text{ psf}$$

### TRASH ENCLOSURE ROOF

$$\text{AREA} = 23.33\text{FT} \cdot 15.167\text{FT} = 354 \text{ SF}$$

$$\text{DL} = 10 \text{ PSF}$$

$$\text{WEIGHT} = 3540 \text{ \#}$$

$$F_p = 1704.4 \text{ \#}$$

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

T:  
F:

Project:

Number:

Date: March 18, 2025

By:

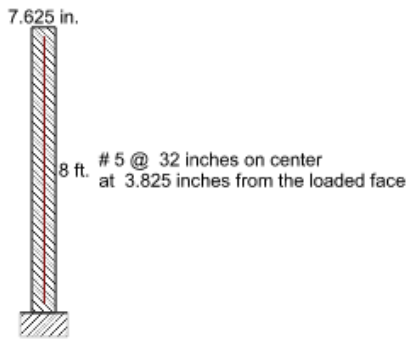
Sheet of

CMD21.00.00

Reinforced Concrete Masonry Out-Of-Plane Loaded Wall per 2021 IBC Section 2107 (2016 TMS Section 8.3)  
 - Working Stress Design -

Filename: cmu wall design.dat

### Input:



### Wall Section

### Wall Geometry:

8.00' high, 8" nominal thickness CMU wall  
 Cells Grouted at 32" o.c.

$h' = 192$  in  $r = 2.592$  in  $h'/r = 74.08$

### Wall Material Properties:

$f'_m = 2,000$  psi

$f_y = 60,000$  psi

$E_m = 1,800$  ksi

$E_s = 29,000$  ksi

$n = 16.11$

### Applied Loads:

|                         | P<br>plf | M<br>plf-in | Wall Weight<br>psf |
|-------------------------|----------|-------------|--------------------|
| Dead Load               | 0        | 0           | 55                 |
| Floor Live Load         | 0        | 0           |                    |
| Roof Live Load          | 0        | 0           |                    |
| Snow Load               | 0        | 0           |                    |
| Horizontal Seismic Load | 0        | 0           |                    |
| Vertical Seismic Load   | 0        | 0           | 0                  |
| Vertical Wind Load      | 0        | 0           |                    |

### Lateral Loading:

| # | Load<br>Condition    | Load<br>Type         | Load Start<br>Location | Load Value       | Load End<br>Location | Load Value |
|---|----------------------|----------------------|------------------------|------------------|----------------------|------------|
|   | E, W, H <sup>1</sup> | P, T, M <sup>2</sup> | ft                     | plf, psf, plf-in | ft                   | psf        |
| 1 | E                    | T                    | 0.0                    | 26               | 8.0                  | 26         |
| 2 | W                    | T                    | 0.0                    | 22               | 8.0                  | 22         |

Seismic Performance Category: D

### Output:

#### Allowable Stresses:

$R = 1 - (h'/140r)^2 = 0.72$  maximum  $M/Vd = 6.30$

(TMS EQ.8-26)  $F_{vm} = 1/2(4.0 - 1.75M/Vd)\sqrt{f'_m} + 0.25P/A_n (\leq 2.0\sqrt{f'_m}\gamma_g) = 53.09$  psi

(TMS EQ.8-18)  $F_a = 0.25f'_m[1 - (h'/140r)^2] = 360.0$  psi

(TMS 8.3.4.2.2)  $F_b = 0.45f'_m = 900.0$  psi

(TMS 8.3.3.1)  $F_s = 32,000$  psi



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

T:  
F:

Project:

Number:

Date: March 18, 2025

By:

Sheet of

CMD21.00.00

Reinforced Concrete Masonry Out-Of-Plane Loaded Wall per 2021 IBC Section 2107 (2016 TMS Section 8.3)  
- Working Stress Design -

Filename: cmu wall design.dat

**For Input Positive Moment Reinforcement:** - #5 @ 32" o.c.,  $A_s = 0.12 \text{ in}^2/\text{ft}$ , at  $d = 3.825 \text{ in}$

Governing Load Combination:  $D - 0.7E_h + 0.7E_v$

Calculated Load Combinations and Stresses:

$$P = D + 0.7E_v = 1,173 \text{ lbs/bar space}$$

$$M = -0.7E_h = 1,582 \text{ lb-ft/bar space}$$

$$K = M/bd^2 = 40.54 \text{ psi}$$

$$k = 0.248 \quad j = 0.917 \quad \rho = 0.0025$$

$$f_a = P/A_e = 10 \text{ psi} \leq F_a = 360 \text{ psi OK}$$

$$f_v = V/(b't) = 6.24 \text{ psi} \leq F_v = 54.9 \text{ psi OK}$$

$$f_b = 2*M/(bjkd^2) = 357 \text{ psi} \leq F_b = 900 \text{ psi OK}$$

$$f_s = M/(A_sjd) = 17,449 \text{ psi} \leq F_s = 32,000 \text{ psi OK}$$

$$\text{Interaction Stress Ratio} = 0.407 = (f_a + f_b)/F_b \leq 1.00 - \text{OK}$$

**For Input Negative Moment Reinforcement:** - #5 @ 32" o.c.,  $A_s = 0.12 \text{ in}^2/\text{ft}$ , at  $d = 3.800 \text{ in}$

Governing Load Combination:  $D + 0.7E_h + 0.7E_v$

Calculated Load Combinations and Stresses:

$$P = D + 0.7E_v = 1,173 \text{ lbs/bar space}$$

$$M = 0.7E_h = -1,582 \text{ lb-ft/bar space}$$

$$K = M/bd^2 = -41.08 \text{ psi}$$

$$k = 0.248 \quad j = 0.917 \quad \rho = 0.0025$$

$$f_a = P/A_e = 10 \text{ psi} \leq F_a = 360 \text{ psi OK}$$

$$f_v = V/A_n = 12.52 \text{ psi} \leq F_v = 54.9 \text{ psi OK}$$

$$f_b = 2*M/(bjkd^2) = 361 \text{ psi} \leq F_b = 900 \text{ psi OK}$$

$$f_s = M/(A_sjd) = 17,568 \text{ psi} \leq F_s = 32,000 \text{ psi OK}$$

$$\text{Interaction Stress Ratio} = 0.411 = (f_a + f_b)/F_b \leq 1.00 - \text{OK}$$

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### Wall Footing

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

**DESCRIPTION:** Cantilevered Wall Footing

### Code References

Calculations per ACI 318-19, IBC 2021, ASCE 7-16  
 Load Combinations Used : IBC 2021

### General Information

#### Material Properties

|                                  |   |             |
|----------------------------------|---|-------------|
| $f_c$ : Concrete 28 day strength | = | 2.50 ksi    |
| $f_y$ : Rebar Yield              | = | 60.0 ksi    |
| $E_c$ : Concrete Elastic Modulus | = | 3,122.0 ksi |
| Concrete Density                 | = | 145.0 pcf   |
| $\phi$ Values Flexure            | = | 0.90        |
| Shear                            | = | 0.750       |

#### Analysis Settings

|                                 |   |         |
|---------------------------------|---|---------|
| Min Steel % Bending Reinf.      | = |         |
| Min Allow % Temp Reinf.         | = |         |
| Min. Overturning Safety Factor  | = | 1.0 : 1 |
| Min. Sliding Safety Factor      | = | 1.0 : 1 |
| AutoCalc Footing Weight as DL : | = | Yes     |

#### Soil Design Values

|                                       |   |           |
|---------------------------------------|---|-----------|
| Allowable Soil Bearing                | = | 2.50 ksf  |
| Increase Bearing By Footing Weight    | = | No        |
| Soil Passive Resistance (for Sliding) | = | 250.0 pcf |
| Soil/Concrete Friction Coeff.         | = | 0.30      |

#### Increases based on footing Depth

|                                                                       |   |     |
|-----------------------------------------------------------------------|---|-----|
| Reference Depth below Surface                                         | = | ft  |
| Allow. Pressure Increase per foot of depth when base footing is below | = | ksf |

#### Increases based on footing Width

|                                                                       |   |     |
|-----------------------------------------------------------------------|---|-----|
| Allow. Pressure Increase per foot of width when footing is wider than | = | ksf |
|                                                                       | = | ft  |

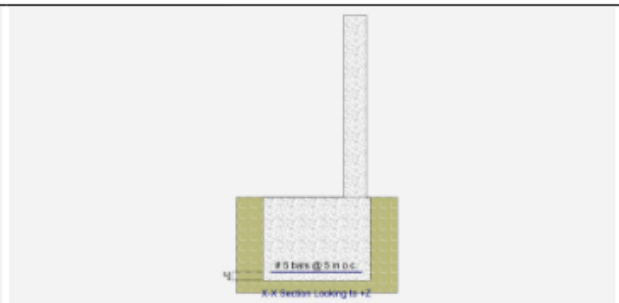
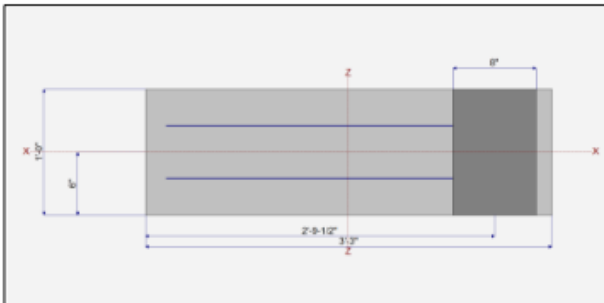
Adjusted Allowable Bearing Pressure = 3.325 ksf

### Dimensions

|                                           |   |          |
|-------------------------------------------|---|----------|
| Footing Width                             | = | 3.250 ft |
| Wall Thickness                            | = | 8.0 in   |
| Wall center offset from center of footing | = | 14 in    |

### Reinforcing

|                                         |   |         |
|-----------------------------------------|---|---------|
| Footing Thickness                       | = | 30.0 in |
| Rebar Centerline to Edge of Concrete... | = |         |
| at Bottom of footing =                  | = | 3.0 in  |
| Bars along X-X Axis                     | = |         |
| Bar spacing                             | = | 5.00    |
| Reinforcing Bar Size                    | = | # 5     |



### Applied Loads

|                 | D | Lr    | L | S | W      | E      | H                       |
|-----------------|---|-------|---|---|--------|--------|-------------------------|
| P : Column Load | = | 0.470 |   |   |        |        | k                       |
| OB : Overburden | = |       |   |   |        |        | ksf                     |
| V-x             | = |       |   |   | 0.1720 | 0.2120 | k                       |
| M-zz            | = |       |   |   | 0.6880 | 0.8470 | k-ft                    |
| Vx applied      | = |       |   |   |        |        | in above top of footing |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Wall Footing

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

DESCRIPTION: Cantilevered Wall Footing

### DESIGN SUMMARY

Design OK

| Factor of Safety  | Item     | Applied          | Capacity     | Governing Load Combination |              |
|-------------------|----------|------------------|--------------|----------------------------|--------------|
| PASS              | 1.326    | Overturing - Z-Z | 0.9639 k-ft  | 1.278 k-ft                 | +0.60D+0.70E |
| PASS              | 1.999    | Sliding - X-X    | 0.1484 k     | 0.2967 k                   | +0.60D+0.70E |
| PASS              | n/a      | Uplift           | 0.0 k        | 0.0 k                      | No Uplift    |
| Utilization Ratio | Item     | Applied          | Capacity     | Governing Load Combination |              |
| PASS              | 0.6237   | Soil Bearing     | 2.074 ksf    | 3.325 ksf                  | +0.60D+0.70E |
| PASS              | 0.000233 | Z Flexure (+X)   | 0.02042 k-ft | 87.466 k-ft                | +0.90D+E     |
| PASS              | 0.000128 | Z Flexure (-X)   | 0.01123 k-ft | 87.466 k-ft                | +0.90D+E     |
| PASS              | n/a      | 1-way Shear (+X) | 0.0 psi      | 75.0 psi                   | n/a          |
| PASS              | 0.005697 | 1-way Shear (-X) | 0.4273 psi   | 75.0 psi                   | +1.40D       |

### Detailed Results

#### Soil Bearing

| Rotation Axis & Load Combination... | Gross Allowable | Xecc      | Actual Soil Bearing Stress -X | Actual Soil Bearing Stress +X | Actual / Allowable Ratio |
|-------------------------------------|-----------------|-----------|-------------------------------|-------------------------------|--------------------------|
| , D Only                            | 2.50 ksf        | 3.992 in  | 0.1958 ksf                    | 0.8184 ksf                    | 0.327                    |
| , +D+0.60W                          | 3.325 ksf       | 8.877 in  | 0.0 ksf                       | 1.241 ksf                     | 0.373                    |
| , +D+0.70E                          | 3.325 ksf       | 11.011 in | 0.0 ksf                       | 1.552 ksf                     | 0.467                    |
| , +D+0.450W                         | 3.325 ksf       | 7.655 in  | 0.0 ksf                       | 1.113 ksf                     | 0.335                    |
| , +D+0.5250E                        | 3.325 ksf       | 9.256 in  | 0.0 ksf                       | 1.287 ksf                     | 0.387                    |
| , +0.60D+0.60W                      | 3.325 ksf       | 12.133 in | 0.0 ksf                       | 1.073 ksf                     | 0.323                    |
| , +0.60D+0.70E                      | 3.325 ksf       | 15.689 in | 0.0 ksf                       | 2.074 ksf                     | 0.624                    |

#### Overturing Stability

Units : k-ft

| Rotation Axis & Load Combination... | Overturing Moment | Resisting Moment | Stability Ratio | Status |
|-------------------------------------|-------------------|------------------|-----------------|--------|
| , D Only                            | None              | 2.130 k-ft       | Infinity        | OK     |
| , +D+0.60W                          | 0.6708 k-ft       | 2.130 k-ft       | 3.175           | OK     |
| , +D+0.70E                          | 0.9639 k-ft       | 2.130 k-ft       | 2.210           | OK     |
| , +D+0.450W                         | 0.5031 k-ft       | 2.130 k-ft       | 4.233           | OK     |
| , +D+0.5250E                        | 0.7229 k-ft       | 2.130 k-ft       | 2.946           | OK     |
| , +0.60D+0.60W                      | 0.6708 k-ft       | 1.278 k-ft       | 1.905           | OK     |
| , +0.60D+0.70E                      | 0.9639 k-ft       | 1.278 k-ft       | 1.326           | OK     |

#### Sliding Stability

| Force Application Axis Load Combination... | Sliding Force | Resisting Force | Sliding SafetyRatio | Status |
|--------------------------------------------|---------------|-----------------|---------------------|--------|
| , D Only                                   | 0.0 k         | 0.4944 k        | No Sliding          | OK     |
| , +D+0.60W                                 | 0.1032 k      | 0.4944 k        | 4.791               | OK     |
| , +D+0.70E                                 | 0.1484 k      | 0.4944 k        | 3.332               | OK     |
| , +D+0.450W                                | 0.07740 k     | 0.4944 k        | 6.388               | OK     |
| , +D+0.5250E                               | 0.1113 k      | 0.4944 k        | 4.442               | OK     |
| , +0.60D+0.60W                             | 0.1032 k      | 0.2967 k        | 2.875               | OK     |
| , +0.60D+0.70E                             | 0.1484 k      | 0.2967 k        | 1.999               | OK     |

#### Footing Flexure

| Flexure Axis & Load Combination | Mu k-ft  | Which Side ? | Tension @ Bot. or Top ? | As Req'd in^2 | Gvrn. As in^2   | Actual As in^2 | Phi*Mn k-ft | Status |
|---------------------------------|----------|--------------|-------------------------|---------------|-----------------|----------------|-------------|--------|
| , +1.40D                        | 1.492    | -X           | Bottom                  | 0.0123        | Min for Bending | 0.744          | 87.466      | OK     |
| , +1.40D                        | 0.008866 | +X           | Bottom                  | 0.0001        | Min for Bending | 0.744          | 87.466      | OK     |
| , +1.20D                        | 1.279    | -X           | Bottom                  | 0.0105        | Min for Bending | 0.744          | 87.466      | OK     |
| , +1.20D                        | 0.007599 | +X           | Bottom                  | 0.0001        | Min for Bending | 0.744          | 87.466      | OK     |
| , +1.20D+0.50W                  | 0.8047   | -X           | Bottom                  | 0.0066        | Min for Bending | 0.744          | 87.466      | OK     |
| , +1.20D+0.50W                  | 0.01006  | +X           | Bottom                  | 0.0001        | Min for Bending | 0.744          | 87.466      | OK     |
| , +1.20D+W                      | 0.3717   | -X           | Bottom                  | 0.0031        | Min for Bending | 0.744          | 87.466      | OK     |
| , +1.20D+W                      | 0.0139   | +X           | Bottom                  | 0.0001        | Min for Bending | 0.744          | 87.466      | OK     |
| , +1.20D+E                      | 0.204    | -X           | Bottom                  | 0.0017        | Min for Bending | 0.744          | 87.466      | OK     |
| , +1.20D+E                      | 0.01688  | +X           | Bottom                  | 0.0001        | Min for Bending | 0.744          | 87.466      | OK     |
| , +0.90D+W                      | 0.106    | -X           | Bottom                  | 0.0009        | Min for Bending | 0.744          | 87.466      | OK     |
| , +0.90D+W                      | 0.01397  | +X           | Bottom                  | 0.0001        | Min for Bending | 0.744          | 87.466      | OK     |
| , +0.90D+E                      | 0.01123  | -X           | Bottom                  | 0.0001        | Min for Bending | 0.744          | 87.466      | OK     |





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Wall Footing

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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**DESCRIPTION:** Cantilevered Wall Footing

#### Footing Flexure

| Flexure Axis & Load Combination    | Mu<br>k-ft | Which<br>Side ? | Tension @ Bot.<br>or Top ? | As Req'd<br>in^2 | Gvrn. As<br>in^2 | Actual As<br>in^2 | Phi*Mn<br>k-ft      | Status |
|------------------------------------|------------|-----------------|----------------------------|------------------|------------------|-------------------|---------------------|--------|
| , +0.90D+E<br><b>One Way Shear</b> | 0.02042    | +X              | Bottom                     | 0.0002           | Min for Bending  | 0.744             | 87.466<br>Units : k | OK     |

| Load Combination... | Vu @ -X    | Vu @ +X | Vu:Max     | Phi Vn | Vu / Phi*Vn | Status |
|---------------------|------------|---------|------------|--------|-------------|--------|
| +1.40D              | 0.4273 psi | 0 psi   | 0.4273 psi | 75 psi | 0.005697    | OK     |
| +1.20D              | 0.3663 psi | 0 psi   | 0.3663 psi | 75 psi | 0.004883    | OK     |
| +1.20D+0.50W        | 0.3663 psi | 0 psi   | 0.3663 psi | 75 psi | 0.004883    | OK     |
| +1.20D+W            | 0.3663 psi | 0 psi   | 0.3663 psi | 75 psi | 0.004883    | OK     |
| +1.20D+E            | 0.3663 psi | 0 psi   | 0.3663 psi | 75 psi | 0.004883    | OK     |
| +0.90D+W            | 0.2747 psi | 0 psi   | 0.2747 psi | 75 psi | 0.003662    | OK     |
| +0.90D+E            | 0.2747 psi | 0 psi   | 0.2747 psi | 75 psi | 0.003662    | OK     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Steel Beam

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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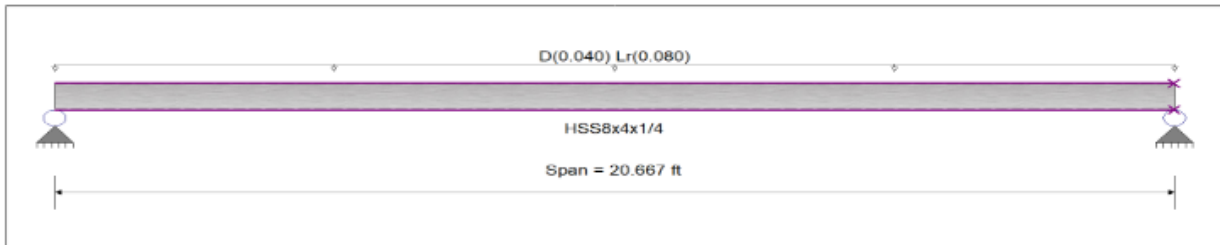
DESCRIPTION: BEAM 1

### CODE REFERENCES

Calculations per AISC 360-16, IBC 2021, ASCE 7-16  
Load Combination Set : IBC 2021

### Material Properties

Analysis Method : Allowable Strength Design  
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling  
Bending Axis : Major Axis Bending  
Fy : Steel Yield : 50.0 ksi  
E : Modulus : 29,000.0 ksi



### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading  
Uniform Load : D = 0.010, Lr = 0.020 ksf, Tributary Width = 4.0 ft, (Roof Load)

### DESIGN SUMMARY

Design OK

|                                   |                      |                              |                   |
|-----------------------------------|----------------------|------------------------------|-------------------|
| Maximum Bending Stress Ratio =    | 0.224 : 1            | Maximum Shear Stress Ratio = | 0.024 : 1         |
| Section used for this span        | HSS8x4x1/4           | Section used for this span   | HSS8x4x1/4        |
| Ma : Applied                      | 7.422 k-ft           | Va : Applied                 | 1.437 k           |
| Mn / Omega : Allowable            | 33.184 k-ft          | Vn/Omega : Allowable         | 61.119 k          |
| Load Combination                  | +D+Lr                | Load Combination             | +D+Lr             |
| Span # where maximum occurs       | Span # 1             | Location of maximum on span  | 20.667 ft         |
| Span # where maximum occurs       | Span # 1             | Span # where maximum occurs  | Span # 1          |
| Maximum Deflection                |                      |                              |                   |
| Max Downward Transient Deflection | 0.268 in Ratio = 926 | >=360                        | Span: 1 : Lr Only |
| Max Upward Transient Deflection   | 0 in Ratio = 0       | <360                         | n/a               |
| Max Downward Total Deflection     | 0.465 in Ratio = 533 | >=180                        | Span: 1 : +D+Lr   |
| Max Upward Total Deflection       | 0 in Ratio = 0       | <180                         | n/a               |

### Maximum Forces & Stresses for Load Combinations

| Load Combination   | Segment Length | Span # | Max Stress Ratios |       | Summary of Moment Values |        |        |       |           |      |      | Summary of Shear Values |        |           |
|--------------------|----------------|--------|-------------------|-------|--------------------------|--------|--------|-------|-----------|------|------|-------------------------|--------|-----------|
|                    |                |        | M                 | V     | Mmax +                   | Mmax - | Ma Max | Mnx   | Mnx/Omega | Cb   | Rm   | Va Max                  | Vnx    | Vnx/Omega |
| D Only             |                |        |                   |       |                          |        |        |       |           |      |      |                         |        |           |
| Dsgn. L = 20.67 ft |                | 1      | 0.095             | 0.010 | 3.15                     |        | 3.15   | 55.42 | 33.18     | 1.00 | 1.00 | 0.61                    | 102.07 | 61.12     |
| +D+Lr              |                |        |                   |       |                          |        |        |       |           |      |      |                         |        |           |
| Dsgn. L = 20.67 ft |                | 1      | 0.224             | 0.024 | 7.42                     |        | 7.42   | 55.42 | 33.18     | 1.00 | 1.00 | 1.44                    | 102.07 | 61.12     |
| +D+0.750Lr         |                |        |                   |       |                          |        |        |       |           |      |      |                         |        |           |
| Dsgn. L = 20.67 ft |                | 1      | 0.191             | 0.020 | 6.35                     |        | 6.35   | 55.42 | 33.18     | 1.00 | 1.00 | 1.23                    | 102.07 | 61.12     |
| +0.60D             |                |        |                   |       |                          |        |        |       |           |      |      |                         |        |           |
| Dsgn. L = 20.67 ft |                | 1      | 0.057             | 0.006 | 1.89                     |        | 1.89   | 55.42 | 33.18     | 1.00 | 1.00 | 0.37                    | 102.07 | 61.12     |

### Overall Maximum Deflections

| Load Combination | Span | Max. "-" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|------------------|------|---------------|------------------|------------------|---------------|------------------|
| +D+Lr            | 1    | 0.4651        | 10.393           |                  | 0.0000        | 0.000            |

### Vertical Reactions

Support notation : Far left is #

Values in KIPS

| Load Combination                    | Support 1 | Support 2 |
|-------------------------------------|-----------|-----------|
| Max Upward from all Load Conditions | 1.437     | 1.437     |
| Max Upward from Load Combinations   | 1.437     | 1.437     |
| Max Upward from Load Cases          | 0.827     | 0.827     |
| D Only                              | 0.610     | 0.610     |
| +D+Lr                               | 1.437     | 1.437     |
| +D+0.750Lr                          | 1.230     | 1.230     |
| +0.60D                              | 0.366     | 0.366     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Steel Beam

Project File: Enercalc TE.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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**DESCRIPTION:** BEAM 1

### Vertical Reactions

Support notation : Far left is #

Values in KIPS

| Load Combination | Support 1 | Support 2 |
|------------------|-----------|-----------|
| Lr Only          | 0.827     | 0.827     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Steel Beam

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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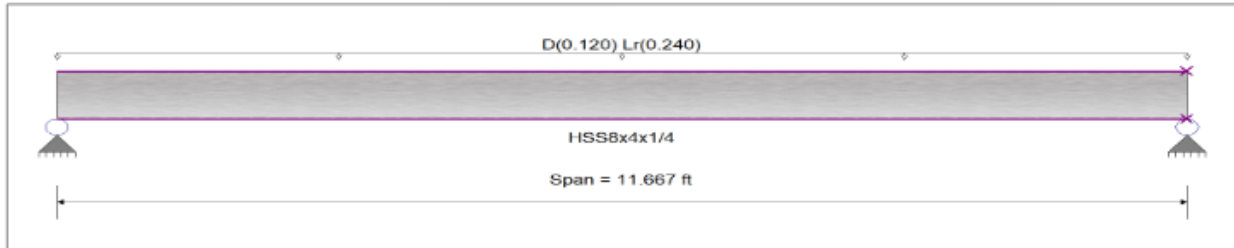
DESCRIPTION: BEAM 2

### CODE REFERENCES

Calculations per AISC 360-16, IBC 2021, ASCE 7-16  
Load Combination Set : IBC 2021

### Material Properties

Analysis Method Allowable Strength Design  
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling  
Bending Axis : Major Axis Bending  
Fy : Steel Yield : 50.0 ksi  
E : Modulus : 29,000.0 ksi



### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading  
Uniform Load : D = 0.010, Lr = 0.020 ksf, Tributary Width = 12.0 ft, (Roof Load)

### DESIGN SUMMARY

Design OK

|                                   |                        |                              |                   |
|-----------------------------------|------------------------|------------------------------|-------------------|
| Maximum Bending Stress Ratio =    | 0.194 : 1              | Maximum Shear Stress Ratio = | 0.036 : 1         |
| Section used for this span        | HSS8x4x1/4             | Section used for this span   | HSS8x4x1/4        |
| Ma : Applied                      | 6.449 k-ft             | Va : Applied                 | 2.211 k           |
| Mn / Omega : Allowable            | 33.184 k-ft            | Vn/Omega : Allowable         | 61.119 k          |
| Load Combination                  | +D+Lr                  | Load Combination             | +D+Lr             |
| Span # where maximum occurs       | Span # 1               | Location of maximum on span  | 11.667 ft         |
| Span # where maximum occurs       | Span # 1               | Span # where maximum occurs  | Span # 1          |
| Maximum Deflection                |                        |                              |                   |
| Max Downward Transient Deflection | 0.082 in Ratio = 1,716 | >=360                        | Span: 1 : Lr Only |
| Max Upward Transient Deflection   | 0 in Ratio = 0         | <360                         | n/a               |
| Max Downward Total Deflection     | 0.129 in Ratio = 1087  | >=180                        | Span: 1 : +D+Lr   |
| Max Upward Total Deflection       | 0 in Ratio = 0         | <180                         | n/a               |

### Maximum Forces & Stresses for Load Combinations

| Load Combination   | Segment Length | Span # | Max Stress Ratios |      | Summary of Moment Values |        |        |       |           |      |      | Summary of Shear Values |        |           |
|--------------------|----------------|--------|-------------------|------|--------------------------|--------|--------|-------|-----------|------|------|-------------------------|--------|-----------|
|                    |                |        | M                 | V    | Mmax +                   | Mmax - | Ma Max | Mnx   | Mnx/Omega | Cb   | Rm   | Va Max                  | Vnx    | Vnx/Omega |
| D Only             |                |        |                   |      |                          |        |        |       |           |      |      |                         |        |           |
| Dsgn. L = 11.67 ft | 1              | 0.071  | 0.013             | 2.37 |                          |        | 2.37   | 55.42 | 33.18     | 1.00 | 1.00 | 0.81                    | 102.07 | 61.12     |
| +D+Lr              |                |        |                   |      |                          |        |        |       |           |      |      |                         |        |           |
| Dsgn. L = 11.67 ft | 1              | 0.194  | 0.036             | 6.45 |                          |        | 6.45   | 55.42 | 33.18     | 1.00 | 1.00 | 2.21                    | 102.07 | 61.12     |
| +D+0.750Lr         |                |        |                   |      |                          |        |        |       |           |      |      |                         |        |           |
| Dsgn. L = 11.67 ft | 1              | 0.164  | 0.030             | 5.43 |                          |        | 5.43   | 55.42 | 33.18     | 1.00 | 1.00 | 1.86                    | 102.07 | 61.12     |
| +0.60D             |                |        |                   |      |                          |        |        |       |           |      |      |                         |        |           |
| Dsgn. L = 11.67 ft | 1              | 0.043  | 0.008             | 1.42 |                          |        | 1.42   | 55.42 | 33.18     | 1.00 | 1.00 | 0.49                    | 102.07 | 61.12     |

### Overall Maximum Deflections

| Load Combination | Span | Max. "+" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|------------------|------|---------------|------------------|------------------|---------------|------------------|
| +D+Lr            | 1    | 0.1288        | 5.867            |                  | 0.0000        | 0.000            |

### Vertical Reactions

Support notation : Far left is #

Values in KIPS

| Load Combination                    | Support 1 | Support 2 |
|-------------------------------------|-----------|-----------|
| Max Upward from all Load Conditions | 2.211     | 2.211     |
| Max Upward from Load Combinations   | 2.211     | 2.211     |
| Max Upward from Load Cases          | 1.400     | 1.400     |
| D Only                              | 0.811     | 0.811     |
| +D+Lr                               | 2.211     | 2.211     |
| +D+0.750Lr                          | 1.861     | 1.861     |
| +0.60D                              | 0.487     | 0.487     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Steel Beam

Project File: Enercalc TE.ec6

LIC# : KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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**DESCRIPTION:** BEAM 2

### Vertical Reactions

Support notation : Far left is #:

Values in KIPS

| Load Combination | Support 1 | Support 2 |
|------------------|-----------|-----------|
| Lr Only          | 1.400     | 1.400     |

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

ESR-1056 | Most Widely Accepted and Trusted

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TABLE 4—IBC AND IRC ALLOWABLE TENSION AND SHEAR LOADS FOR CARBON STEEL TITEN HD SCREW ANCHORS  
 INSTALLED IN TOP OF GROUT-FILLED CMU MASONRY<sup>1</sup>

| ANCHOR MATERIAL | ANCHOR DIA. (in) | DRILL BIT DIA. (in) | MINIMUM EMBEDMENT DEPTH (in) | ANCHOR LOCATION <sup>2</sup> (in) |                      |                 | IBC AND IRC ALLOWABLE LOADS <sup>3,4</sup> (lbf) |                                  |                                       |
|-----------------|------------------|---------------------|------------------------------|-----------------------------------|----------------------|-----------------|--------------------------------------------------|----------------------------------|---------------------------------------|
|                 |                  |                     |                              | Minimum Edge Distance             | Minimum End Distance | Minimum Spacing | Tension                                          | Parallel to Edge of Masonry Wall | Perpendicular to Edge of Masonry Wall |
| CARBON STEEL    | 1/2              | 1/2                 | 4 1/2                        | 1 3/4                             | 8                    | 8               | 570                                              | 585                              | 160                                   |
|                 | 5/8              | 5/8                 | 4 1/2                        | 1 3/4                             | 10                   | 10              | 570                                              | 675                              | 160                                   |

For SI: 1 inch = 25.4 mm, 1 pound = 4.45 N, 1 psi = 6.89 kPa.

<sup>1</sup>The allowable tension and shear loads in Table 4 are applicable when anchors are installed in structures regulated by the IRC or IBC.

<sup>2</sup>Minimum edge and end distances are measured from the anchor centerline to the edge and end of the CMU masonry wall, respectively. Refer to Figure 3. Minimum spacing is measured from center-to-center of two anchors. Anchors installed in the mortared head joint are outside the scope of this report.

<sup>3</sup>The allowable loads in Table 4 are for anchors resisting dead, live, wind, and earthquake load applications. For short-term loading due to wind and earthquake forces under 2006 and 2009 codes, the allowable loads may be adjusted in accordance with Section 5.3.

<sup>4</sup>Allowable tension and shear loads are based on a safety factor of 5.0.

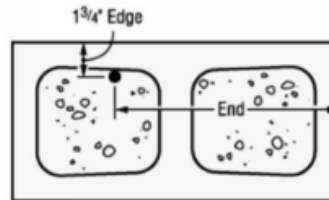


FIGURE 3—EDGE AND END DISTANCES FOR THE CARBON STEEL TITEN HD ANCHOR  
 INSTALLED IN THE TOP OF GROUT-FILLED CMU MANSORY WALL CONSTRUCTION (Refer to Table 4)

Lateral Seismic Base Shear  $V = 1.70K$   
 Roof supported by (4) columns  
 $V/4 = 0.426 K$  per col.  
 $ASD\_V = 0.7 \times 0.426K = 0.293K$   
 If (2) 5/8\" Dia. anchor bolts  
 $V_{a\_perp} = 160\# \times 2$   
 $V_{a\_prll} = 675\# \times 2$   
 Two (2) 5/8\" Titen HD bolts  
 $V_a > ASD\_V$  OK!!  
 Works!

**ANCHOR UPLIFT:**  
 $WL = +/- 5.664K$   
 IF 5 POSTS  
 $WL/5 = 1.13 K$   
 $ASD\_WL = 1.13 \times 0.6 = 0.68 k$   
 Allowed Tension  $T_a = 570\#/\text{bolt}$   
 If (2) 5/8\" Dia. per post  
 $F_w = 2 \times 570 = 1.14K > \text{uplift OK!!}$

**LATERAL WIND = 16 PSF**  
 $\text{Area} = 4.667\text{ft} \times 23.333 = 109 \text{ sqft}$   
 IF 4 POSTS TAKE WIND LOAD  
 Required shear  $V = 1.744K/4 = 0.436K$  (WIND)  
 $ASD\_V = 0.6 \times 0.436 = 0.261K$   
 If 5/8\" Dia. bolt centered to CMU wall  
 $V_{a\_perp} = 160\#$   
 $V_{a\_prll} = 675\#$   
 Two (2) Titen HD bolts  
 $V_a > ASD\_V$  OK!!  
 (use of wet set anchors also OK)





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Steel Column

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: HSS4X4X1/4

### Code References

Calculations per AISC 360-16, IBC 2021, ASCE 7-16  
Load Combinations Used : IBC 2021

### General Information

Steel Section Name : HSS4x4x1/4

Analysis Method : Allowable Strength

Steel Stress Grade

Fy : Steel Yield 46.0 ksi

E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 7.0 ft

Top & Bottom Fixity Top & Bottom Pinned

Brace condition :

Unbraced Length for buckling ABOUT X-X Axis = 7.0 ft, K = 1.0

Unbraced Length for buckling ABOUT Y-Y Axis = 7.0 ft, K = 1.0

### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 85.470 lbs \* Dead Load Factor

AXIAL LOADS . . .

Axial Load at 7.0 ft, D = 0.8850, LR = 1.770 k

BENDING LOADS . . .

Lat. Point Load at 7.0 ft creating Mx-x, W = 0.4360, E = 0.4260 k

### DESIGN SUMMARY

#### Bending & Shear Check Results

**PASS** Max. Axial+Bending Stress Ratio = 0.03626 : 1

Load Combination

+D+Lr

Location of max.above base

0.0 ft

At maximum location values are . . .

Pa : Axial

2.740 k

Pn / Omega : Allowable

75.588 k

Ma-x : Applied

0.0 k-ft

Mn-x / Omega : Allowable

10.765 k-ft

Ma-y : Applied

0.0 k-ft

Mn-y / Omega : Allowable

10.765 k-ft

#### Maximum Load Reactions . .

Top along X-X 0.0 k

Bottom along X-X 0.0 k

Top along Y-Y 0.4360 k

Bottom along Y-Y 0.0 k

#### Maximum Load Deflections . . .

Along Y-Y 0.0 in at 0.0ft above base  
for load combination :

Along X-X 0.0 in at 0.0ft above base  
for load combination :

**PASS** Maximum Shear Stress Ratio = 0.01173 : 1

Load Combination

+D+0.70E

Location of max.above base

7.0 ft

At maximum location values are . . .

Va : Applied

0.2982 k

Vn / Omega : Allowable

25.423 k

### Load Combination Results

| Load Combination  | Maximum Axial + Bending Stress Ratios |        |          |              | Cbx  | Cby   | KxLx/Rx | KyLy/Ry | Maximum Shear Ratios |          |  |
|-------------------|---------------------------------------|--------|----------|--------------|------|-------|---------|---------|----------------------|----------|--|
|                   | Stress Ratio                          | Status | Location | Stress Ratio |      |       |         |         | Status               | Location |  |
| D Only            | 0.013                                 | PASS   | 0.00 ft  | 1.00         | 1.00 | 55.26 | 55.26   | 0.000   | PASS                 | 0.00 ft  |  |
| +D+Lr             | 0.036                                 | PASS   | 0.00 ft  | 1.00         | 1.00 | 55.26 | 55.26   | 0.000   | PASS                 | 0.00 ft  |  |
| +D+0.750Lr        | 0.030                                 | PASS   | 0.00 ft  | 1.00         | 1.00 | 55.26 | 55.26   | 0.000   | PASS                 | 0.00 ft  |  |
| +D+0.60W          | 0.013                                 | PASS   | 0.00 ft  | 1.00         | 1.00 | 55.26 | 55.26   | 0.010   | PASS                 | 7.00 ft  |  |
| +D+0.70E          | 0.013                                 | PASS   | 0.00 ft  | 1.00         | 1.00 | 55.26 | 55.26   | 0.012   | PASS                 | 7.00 ft  |  |
| +D+0.750Lr+0.450W | 0.030                                 | PASS   | 0.00 ft  | 1.00         | 1.00 | 55.26 | 55.26   | 0.008   | PASS                 | 7.00 ft  |  |
| +D+0.450W         | 0.013                                 | PASS   | 0.00 ft  | 1.00         | 1.00 | 55.26 | 55.26   | 0.008   | PASS                 | 7.00 ft  |  |
| +D+0.5250E        | 0.013                                 | PASS   | 0.00 ft  | 1.00         | 1.00 | 55.26 | 55.26   | 0.009   | PASS                 | 7.00 ft  |  |
| +0.60D+0.60W      | 0.008                                 | PASS   | 0.00 ft  | 1.00         | 1.00 | 55.26 | 55.26   | 0.010   | PASS                 | 7.00 ft  |  |
| +0.60D+0.70E      | 0.008                                 | PASS   | 0.00 ft  | 1.00         | 1.00 | 55.26 | 55.26   | 0.012   | PASS                 | 7.00 ft  |  |

### Maximum Reactions

Note: Only non-zero reactions are listed.

| Load Combination | Axial Reaction |  | X-X Axis Reaction |       | k | Y-Y Axis Reaction |       | Mx - End Moments |       | My - End Moments |       |
|------------------|----------------|--|-------------------|-------|---|-------------------|-------|------------------|-------|------------------|-------|
|                  | @ Base         |  | @ Base            | @ Top |   | @ Base            | @ Top | @ Base           | @ Top | @ Base           | @ Top |
| D Only           | 0.970          |  |                   |       |   |                   |       |                  |       |                  |       |
| +D+Lr            | 2.740          |  |                   |       |   |                   |       |                  |       |                  |       |
| +D+0.750Lr       | 2.298          |  |                   |       |   |                   |       |                  |       |                  |       |
| +D+0.60W         | 0.970          |  |                   |       |   | 0.262             |       |                  |       |                  |       |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### Steel Column

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: HSS4X4X1/4

### Maximum Reactions

Note: Only non-zero reactions are listed.

| Load Combination  | Axial Reaction<br>@ Base | X-X Axis Reaction<br>@ Base @ Top | k | Y-Y Axis Reaction<br>@ Base @ Top | Mx - End Moments<br>@ Base @ Top | k-ft | My - End Moments<br>@ Base @ Top |
|-------------------|--------------------------|-----------------------------------|---|-----------------------------------|----------------------------------|------|----------------------------------|
| +D+0.70E          | 0.970                    |                                   |   | 0.298                             |                                  |      |                                  |
| +D+0.750Lr+0.450W | 2.298                    |                                   |   | 0.196                             |                                  |      |                                  |
| +D+0.450W         | 0.970                    |                                   |   | 0.196                             |                                  |      |                                  |
| +D+0.5250E        | 0.970                    |                                   |   | 0.224                             |                                  |      |                                  |
| +0.60D+0.60W      | 0.582                    |                                   |   | 0.262                             |                                  |      |                                  |
| +0.60D+0.70E      | 0.582                    |                                   |   | 0.298                             |                                  |      |                                  |
| Lr Only           | 1.770                    |                                   |   |                                   |                                  |      |                                  |
| W Only            |                          |                                   |   | 0.436                             |                                  |      |                                  |
| E Only            |                          |                                   |   | 0.426                             |                                  |      |                                  |

### Extreme Reactions

| Item                    | Extreme Value | Axial Reaction<br>@ Base | X-X Axis Reaction<br>@ Base @ Top | k | Y-Y Axis Reaction<br>@ Base @ Top | Mx - End Moments<br>@ Base @ Top | k-ft | My - End Moments<br>@ Base @ Top |
|-------------------------|---------------|--------------------------|-----------------------------------|---|-----------------------------------|----------------------------------|------|----------------------------------|
| Axial @ Base            | Maximum       | 2.740                    |                                   |   |                                   |                                  |      |                                  |
| "                       | Minimum       |                          |                                   |   | 0.436                             |                                  |      |                                  |
| Reaction, X-X Axis Base | Maximum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| "                       | Minimum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| Reaction, Y-Y Axis Base | Maximum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| "                       | Minimum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| Reaction, X-X Axis Top  | Maximum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| "                       | Minimum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| Reaction, Y-Y Axis Top  | Maximum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| "                       | Minimum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| Moment, X-X Axis Base   | Maximum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| "                       | Minimum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| Moment, Y-Y Axis Base   | Maximum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| "                       | Minimum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| Moment, X-X Axis Top    | Maximum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| "                       | Minimum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| Moment, Y-Y Axis Top    | Maximum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |
| "                       | Minimum       | 0.970                    |                                   |   |                                   |                                  |      |                                  |

### Maximum Deflections for Load Combinations

| Load Combination  | Max. Deflection in X dir | Distance | Max. Deflection in Y dir | Distance |
|-------------------|--------------------------|----------|--------------------------|----------|
| D Only            | 0.0000 in                | 0.000 ft | 0.000 in                 | 0.000 ft |
| +D+Lr             | 0.0000 in                | 0.000 ft | 0.000 in                 | 0.000 ft |
| +D+0.750Lr        | 0.0000 in                | 0.000 ft | 0.000 in                 | 0.000 ft |
| +D+0.60W          | 0.0000 in                | 0.000 ft | 0.000 in                 | 0.000 ft |
| +D+0.70E          | 0.0000 in                | 0.000 ft | 0.000 in                 | 0.000 ft |
| +D+0.750Lr+0.450W | 0.0000 in                | 0.000 ft | 0.000 in                 | 0.000 ft |
| +D+0.450W         | 0.0000 in                | 0.000 ft | 0.000 in                 | 0.000 ft |
| +D+0.5250E        | 0.0000 in                | 0.000 ft | 0.000 in                 | 0.000 ft |
| +0.60D+0.60W      | 0.0000 in                | 0.000 ft | 0.000 in                 | 0.000 ft |
| +0.60D+0.70E      | 0.0000 in                | 0.000 ft | 0.000 in                 | 0.000 ft |
| Lr Only           | 0.0000 in                | 0.000 ft | 0.000 in                 | 0.000 ft |
| W Only            | 0.0000 in                | 0.000 ft | 0.000 in                 | 0.000 ft |
| E Only            | 0.0000 in                | 0.000 ft | 0.000 in                 | 0.000 ft |

Steel Section Properties : HSS4x4x1/4

Steel Section Properties : HSS4x4x1/4



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Steel Column

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

#### DESCRIPTION: HSS4X4X1/4

|              |   |            |      |   |            |   |   |             |
|--------------|---|------------|------|---|------------|---|---|-------------|
| Depth        | = | 4.000 in   | I xx | = | 7.80 in^4  | J | = | 12.800 in^4 |
| Design Thick | = | 0.233 in   | S xx | = | 3.90 in^3  |   |   |             |
| Width        | = | 4.000 in   | R xx | = | 1.520 in   |   |   |             |
| Wall Thick   | = | 0.250 in   | Zx   | = | 4.690 in^3 |   |   |             |
| Area         | = | 3.370 in^2 | I yy | = | 7.800 in^4 | C | = | 6.560 in^3  |
| Weight       | = | 12.210 plf | S yy | = | 3.900 in^3 |   |   |             |
|              |   |            | R yy | = | 1.520 in   |   |   |             |

Ycg = 0.000 in

### Sketches

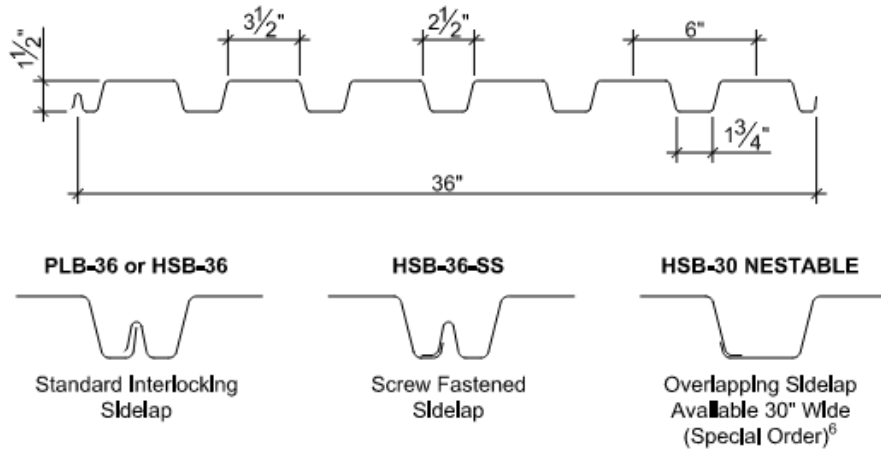


## Type PLB™-36 or HSB®-36

- 1½" Deep Roof Deck
- Primer Painted or Galvanized
- PLB-36 Deck used with PunchLok II System
- HSB-36 Deck used with TSWs, BPs or Screws



### Dimensions



### Deck Weight and Section Properties

| Gage | Weight |         | $I_d$ for Deflection   |                        | Moment                 |                        | Allowable Reactions per ft of Width (lb) due to Web Crippling |      |                         |      |                    |      |                         |      |
|------|--------|---------|------------------------|------------------------|------------------------|------------------------|---------------------------------------------------------------|------|-------------------------|------|--------------------|------|-------------------------|------|
|      | Galv   | Painted | Single Span            | Multi Span             | + $S_{eff}$            | - $S_{eff}$            | One Flange Loading                                            |      |                         |      | Two Flange Loading |      |                         |      |
|      |        |         |                        |                        |                        |                        | End Bearing Length                                            |      | Interior Bearing Length |      | End Bearing Length |      | Interior Bearing Length |      |
|      | (psf)  | (psf)   | (in. <sup>4</sup> /ft) | (in. <sup>4</sup> /ft) | (in. <sup>3</sup> /ft) | (in. <sup>3</sup> /ft) | 2"                                                            | 3"   | 4"                      | 3"   | 4"                 | 2"   | 3"                      | 4"   |
| 22   | 1.9    | 1.8     | 0.177                  | 0.192                  | 0.176                  | 0.188                  | 935                                                           | 1076 | 1163                    | 1559 | 1671               | 962  | 1078                    | 1150 |
| 20   | 2.3    | 2.2     | 0.219                  | 0.231                  | 0.230                  | 0.237                  | 1301                                                          | 1492 | 1609                    | 2190 | 2340               | 1413 | 1576                    | 1675 |
| 18   | 2.9    | 2.8     | 0.302                  | 0.306                  | 0.314                  | 0.331                  | 2181                                                          | 2484 | 2667                    | 3714 | 3950               | 2551 | 2823                    | 2987 |
| 16   | 3.5    | 3.4     | 0.381                  | 0.381                  | 0.399                  | 0.410                  | 3265                                                          | 3699 | 3955                    | 5607 | 5938               | 4018 | 4422                    | 4660 |

#### Notes:

1. Section properties are based on  $F_y = 50,000$  psi.
2.  $I_d$  is for deflection due to uniform loads.
3.  $S_{eff}$  (+ or -) is the effective section modulus.
4. Multiply tabulated deck values listed above by the following adjustment factors to obtain acoustical deck section properties:

| Deck Type      | $I_d$ for Deflection |            | Moment      |             | Allowable Reactions per ft of Width (lb) |                  |
|----------------|----------------------|------------|-------------|-------------|------------------------------------------|------------------|
|                | Single Span          | Multi Span | + $S_{eff}$ | - $S_{eff}$ | End Bearing                              | Interior Bearing |
| B - Acoustical | 0.98                 | 0.98       | 0.97        | 0.97        | 1.00                                     | 0.76             |

5. Allowable (ASD) reactions are based on web crippling, per AISI S100 Section C3.4, where  $\Omega_w = 1.70$  for end bearing and 1.75 for interior bearing. Nominal reactions may be determined by multiplying the table values by  $\Omega_w$ . LRFD reactions may be determined by multiplying nominal reactions by  $\Phi_w = 0.90$  for end reactions and 0.85 for interior reactions.
6. Diaphragm values for HSB-30 Nestable are outside the scope of Verco's Evaluation Report.

### Type PLB™-36 or HSB®-36

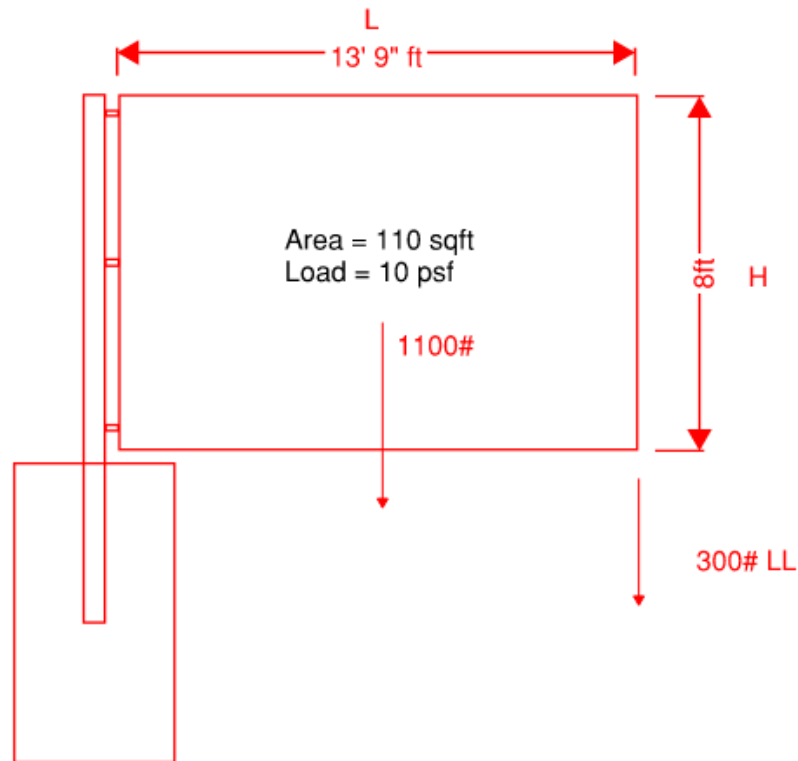


#### Allowable Uniform Loads (psf)

| DECK   |      | SPAN (ft.-in.) |       |       |       |       |       |       |       |                                             |       |       |       |       |       |        |        |        |    |
|--------|------|----------------|-------|-------|-------|-------|-------|-------|-------|---------------------------------------------|-------|-------|-------|-------|-------|--------|--------|--------|----|
| SPAN   | GAGE | CRITERIA       | 2'-0" | 3'-0" | 4'-0" | 5'-0" | 5'-6" | 6'-0" | 6'-6" | 7'-0"                                       | 7'-6" | 8'-0" | 8'-6" | 9'-0" | 9'-6" | 10'-0" | 11'-0" | 12'-0" |    |
| SINGLE | 22   | Stress         | 300   | 300   | 220   | 141   | 116   | 98    | 83    | 72                                          | 63    | 55    | 49    | 43    | 39    | 35     | 29     | 24     |    |
|        |      | L/360          | +++   | 287   | 121   | 62    | 47    | 36    | 28    | 23                                          | 18    | 15    | 13    | 11    | 9     | 8      | 6      | 4      |    |
|        |      | L/240          | +++   | +++   | 182   | 93    | 70    | 54    | 42    | 34                                          | 28    | 23    | 19    | 16    | 14    | 12     | 9      | 7      |    |
|        |      | L/180          | +++   | +++   | +++   | 124   | 93    | 72    | 56    | 45                                          | 37    | 30    | 25    | 21    | 18    | 15     | 12     | 9      |    |
|        | 20   | Stress         | 300   | 300   | 288   | 184   | 152   | 128   | 109   | 94                                          | 82    | 72    | 64    | 57    | 51    | 46     | 38     | 32     |    |
|        |      | L/360          | +++   | +++   | 150   | 77    | 58    | 44    | 35    | 28                                          | 23    | 19    | 16    | 13    | 11    | 10     | 7      | 6      |    |
|        |      | L/240          | +++   | +++   | 225   | 115   | 86    | 67    | 52    | 42                                          | 34    | 28    | 23    | 20    | 17    | 14     | 11     | 8      |    |
|        |      | L/180          | +++   | +++   | +++   | 153   | 115   | 89    | 70    | 56                                          | 45    | 37    | 31    | 26    | 22    | 19     | 14     | 11     |    |
|        | 18   | Stress         | 300   | 300   | 300   | 251   | 208   | 174   | 149   | 128                                         | 112   | 98    | 87    | 78    | 70    | 63     | 52     | 44     |    |
|        |      | L/360          | +++   | +++   | 207   | 106   | 79    | 61    | 48    | 39                                          | 31    | 26    | 22    | 18    | 15    | 13     | 10     | 8      |    |
|        |      | L/240          | +++   | +++   | +++   | 159   | 119   | 92    | 72    | 58                                          | 47    | 39    | 32    | 27    | 23    | 20     | 15     | 11     |    |
|        |      | L/180          | +++   | +++   | +++   | 212   | 159   | 122   | 96    | 77                                          | 63    | 52    | 43    | 36    | 31    | 26     | 20     | 15     |    |
|        | 16   | Stress         | 300   | 300   | 300   | 300   | 264   | 222   | 189   | 163                                         | 142   | 125   | 110   | 99    | 88    | 80     | 66     | 55     |    |
|        |      | L/360          | +++   | +++   | 261   | 133   | 100   | 77    | 61    | 49                                          | 40    | 33    | 27    | 23    | 19    | 17     | 13     | 10     |    |
|        |      | L/240          | +++   | +++   | +++   | 200   | 150   | 116   | 91    | 73                                          | 59    | 49    | 41    | 34    | 29    | 25     | 19     | 14     |    |
|        |      | L/180          | +++   | +++   | +++   | 267   | 200   | 154   | 121   | 97                                          | 79    | 65    | 54    | 46    | 39    | 33     | 25     | 19     |    |
| DOUBLE | 22   | Stress         | 300   | 300   | 235   | 150   | 124   | 104   | 89    | Demand=DL+RL<br>=10psf + 20psf=35psf<br>OK! |       |       |       |       |       | 42     | 38     | 31     | 26 |
|        |      | L/360          | +++   | +++   | +++   | +++   | 122   | 94    | 74    |                                             |       |       |       |       |       | 24     | 20     | 15     | 12 |
|        |      | L/240          | +++   | +++   | +++   | +++   | +++   | +++   | +++   |                                             |       |       |       |       |       | 35     | 30     | 23     | 18 |
|        |      | L/180          | +++   | +++   | +++   | +++   | +++   | +++   | +++   |                                             |       |       |       |       |       | +++    | +++    | 30     | 23 |
|        | 20   | Stress         | 300   | 300   | 296   | 190   | 157   | 132   | 112   | 97                                          | 84    | 74    | 66    | 59    | 53    | 47     | 39     | 33     |    |
|        |      | L/360          | +++   | +++   | +++   | +++   | 146   | 113   | 89    | 71                                          | 58    | 48    | 40    | 33    | 28    | 24     | 18     | 14     |    |
|        |      | L/240          | +++   | +++   | +++   | +++   | +++   | +++   | +++   | +++                                         | +++   | 71    | 59    | 50    | 43    | 37     | 27     | 21     |    |
|        |      | L/180          | +++   | +++   | +++   | +++   | +++   | +++   | +++   | +++                                         | +++   | +++   | +++   | +++   | +++   | +++    | 37     | 28     |    |
|        | 18   | Stress         | 300   | 300   | 300   | 265   | 219   | 184   | 157   | 135                                         | 118   | 103   | 92    | 82    | 73    | 66     | 55     | 46     |    |
|        |      | L/360          | +++   | +++   | +++   | 258   | 194   | 149   | 117   | 94                                          | 76    | 63    | 53    | 44    | 38    | 32     | 24     | 19     |    |
|        |      | L/240          | +++   | +++   | +++   | +++   | +++   | +++   | +++   | +++                                         | 115   | 94    | 79    | 66    | 56    | 48     | 36     | 28     |    |
|        |      | L/180          | +++   | +++   | +++   | +++   | +++   | +++   | +++   | +++                                         | +++   | +++   | +++   | +++   | +++   | 64     | 48     | 37     |    |
|        | 16   | Stress         | 300   | 300   | 300   | 300   | 271   | 228   | 194   | 167                                         | 146   | 128   | 113   | 101   | 91    | 82     | 68     | 57     |    |
|        |      | L/360          | +++   | +++   | +++   | +++   | 241   | 186   | 146   | 117                                         | 95    | 78    | 65    | 55    | 47    | 40     | 30     | 23     |    |
|        |      | L/240          | +++   | +++   | +++   | +++   | +++   | +++   | +++   | +++                                         | 143   | 118   | 98    | 83    | 70    | 60     | 45     | 35     |    |
|        |      | L/180          | +++   | +++   | +++   | +++   | +++   | +++   | +++   | +++                                         | +++   | +++   | +++   | +++   | +++   | 80     | 60     | 46     |    |
| TRIPLE | 22   | Stress         | 300   | 300   | 294   | 188   | 155   | 131   | 111   | 96                                          | 84    | 73    | 65    | 58    | 52    | 47     | 39     | 33     |    |
|        |      | L/360          | +++   | +++   | 247   | 127   | 95    | 73    | 58    | 46                                          | 38    | 31    | 26    | 22    | 18    | 16     | 12     | 9      |    |
|        |      | L/240          | +++   | +++   | +++   | +++   | 143   | 110   | 86    | 69                                          | 56    | 46    | 39    | 33    | 28    | 24     | 18     | 14     |    |
|        |      | L/180          | +++   | +++   | +++   | +++   | +++   | +++   | +++   | 92                                          | 75    | 62    | 52    | 43    | 37    | 32     | 24     | 18     |    |
|        | 20   | Stress         | 300   | 300   | 300   | 237   | 196   | 165   | 140   | 121                                         | 105   | 93    | 82    | 73    | 66    | 59     | 49     | 41     |    |
|        |      | L/360          | +++   | +++   | 298   | 152   | 115   | 88    | 69    | 56                                          | 45    | 37    | 31    | 26    | 22    | 19     | 14     | 11     |    |
|        |      | L/240          | +++   | +++   | +++   | 229   | 172   | 132   | 104   | 83                                          | 68    | 56    | 47    | 39    | 33    | 29     | 21     | 17     |    |
|        |      | L/180          | +++   | +++   | +++   | +++   | +++   | +++   | 139   | 111                                         | 90    | 74    | 62    | 52    | 44    | 38     | 29     | 22     |    |
|        | 18   | Stress         | 300   | 300   | 300   | 300   | 274   | 230   | 196   | 169                                         | 147   | 129   | 115   | 102   | 92    | 83     | 68     | 57     |    |
|        |      | L/360          | +++   | +++   | +++   | 202   | 152   | 117   | 92    | 74                                          | 60    | 49    | 41    | 35    | 29    | 25     | 19     | 15     |    |
|        |      | L/240          | +++   | +++   | +++   | +++   | 228   | 175   | 138   | 110                                         | 90    | 74    | 62    | 52    | 44    | 38     | 28     | 22     |    |
|        |      | L/180          | +++   | +++   | +++   | +++   | +++   | +++   | 184   | 147                                         | 120   | 99    | 82    | 69    | 59    | 50     | 38     | 29     |    |
|        | 16   | Stress         | 300   | 300   | 300   | 300   | 300   | 285   | 243   | 209                                         | 182   | 160   | 142   | 127   | 114   | 103    | 85     | 71     |    |
|        |      | L/360          | +++   | +++   | +++   | 251   | 189   | 145   | 114   | 92                                          | 74    | 61    | 51    | 43    | 37    | 31     | 24     | 18     |    |
|        |      | L/240          | +++   | +++   | +++   | +++   | 283   | 218   | 172   | 137                                         | 112   | 92    | 77    | 65    | 55    | 47     | 35     | 27     |    |
|        |      | L/180          | +++   | +++   | +++   | +++   | +++   | +++   | 229   | 183                                         | 149   | 123   | 102   | 86    | 73    | 63     | 47     | 36     |    |

See footnotes on page 27.

### GATE POST CALC



Moment at Base due to Dead Load:

$$M = F \cdot (L/2) = 1110 \# \cdot 13.75'/2 = 7631.25 \text{ lb-ft}$$

Reaction at Top of Post

$$M/H = 7631.25/8 \text{ ft} = 954 \# \text{ @ } 8 \text{ ft from base}$$

Moment at Base due to Wind Load:

$$W = 21.5 \text{ psf}$$

$$\text{Area} = 110 \text{ ft}$$

$$\text{Load} = 2365\#$$

$$M = 2365\# \cdot 13.75/2 \text{ ft} = 16259.4 \text{ lb-ft}$$

Reaction at Top of Post

$$M/H = 16259.4 / 8 \text{ ft} = 2032\# \text{ @ } 8 \text{ ft from base}$$

Moment at Base due to Live Load:

$$\text{Live Load}$$

$$M = F \cdot L = 300 \cdot 13.75' = 4125 \text{ lbft}$$

Reaction at Top of Post

$$M/H = 4125 / 8 = 516\# \text{ @ } 8 \text{ ft from base}$$

SEE ENERCALC FOR FOOTING CALC



Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### General Footing

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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**DESCRIPTION:** Gate Footing Calc (13.75 FT GATE)

### Code References

Calculations per ACI 318-19, IBC 2021, ASCE 7-16  
 Load Combinations Used : IBC 2021

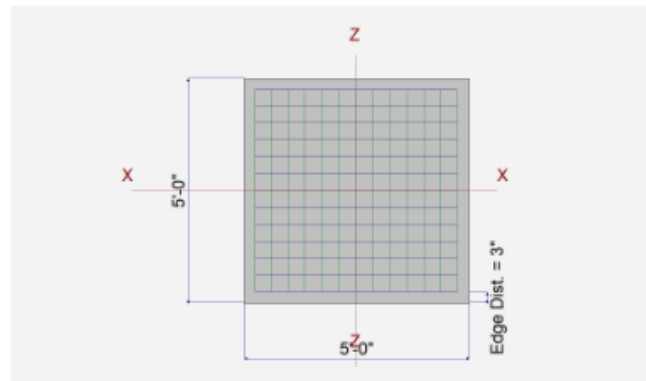
### General Information

|                                            |   |             |                                                  |   |           |
|--------------------------------------------|---|-------------|--------------------------------------------------|---|-----------|
| <b>Material Properties</b>                 |   |             | <b>Soil Design Values</b>                        |   |           |
| fc : Concrete 28 day strength              | = | 3.0 ksi     | Allowable Soil Bearing                           | = | 2.50 ksf  |
| fy : Rebar Yield                           | = | 60.0 ksi    | Soil Density                                     | = | 110.0 pcf |
| Ec : Concrete Elastic Modulus              | = | 3,122.0 ksi | Increase Bearing By Footing Weight               | = | No        |
| Concrete Density                           | = | 145.0 pcf   | Soil Passive Resistance (for Sliding)            | = | 250.0 pcf |
| φ Values Flexure                           | = | 0.90        | Soil/Concrete Friction Coeff.                    | = | 0.30      |
| Shear                                      | = | 0.750       | <b>Increases based on footing Depth</b>          |   |           |
| <b>Analysis Settings</b>                   |   |             | Footing base depth below soil surface            |   |           |
| Min Steel % Bending Reinf.                 | = |             | Allow press. increase per foot of depth          | = | ft        |
| Min Allow % Temp Reinf.                    | = | 0.00180     | when footing base is below                       | = | ksf       |
| Min. Overturning Safety Factor             | = | 1.0 : 1     |                                                  |   | ft        |
| Min. Sliding Safety Factor                 | = | 1.0 : 1     | <b>Increases based on footing plan dimension</b> |   |           |
| Add Ftg Wt for Soil Pressure               | : | Yes         | Allowable pressure increase per foot of depth    |   |           |
| Use ftg wt for stability, moments & shears | : | Yes         |                                                  | = | ksf       |
| Add Pedestal Wt for Soil Pressure          | : | No          | when max. length or width is greater than        |   |           |
| Use Pedestal wt for stability, mom & shear | : | No          |                                                  | = | ft        |

### Dimensions

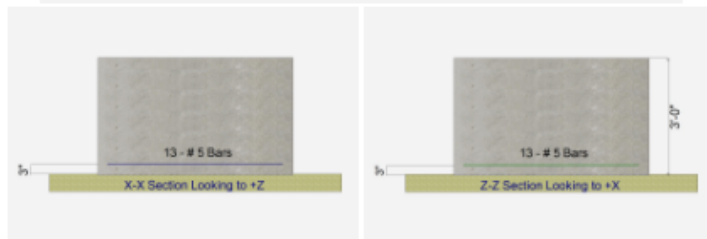
|                             |   |         |
|-----------------------------|---|---------|
| Width parallel to X-X Axis  | = | 5.0 ft  |
| Length parallel to Z-Z Axis | = | 5.0 ft  |
| Footing Thickness           | = | 36.0 in |

|                                         |   |        |
|-----------------------------------------|---|--------|
| <b>Pedestal dimensions...</b>           |   |        |
| px : parallel to X-X Axis               | = | in     |
| pz : parallel to Z-Z Axis               | = | in     |
| Height                                  | = | in     |
| Rebar Centerline to Edge of Concrete... |   |        |
| at Bottom of footing                    | = | 3.0 in |



### Reinforcing

|                                                    |   |      |
|----------------------------------------------------|---|------|
| <b>Bars parallel to X-X Axis</b>                   |   |      |
| Number of Bars                                     | = | 13.0 |
| Reinforcing Bar Size                               | = | # 5  |
| <b>Bars parallel to Z-Z Axis</b>                   |   |      |
| Number of Bars                                     | = | 13.0 |
| Reinforcing Bar Size                               | = | # 5  |
| <b>Bandwidth Distribution Check (ACI 15.4.4.2)</b> |   |      |
| Direction Requiring Closer Separation              |   | n/a  |
| # Bars required within zone                        |   | n/a  |
| # Bars required on each side of zone               |   | n/a  |



### Applied Loads

|                 | D | Lr    | L     | S | W      | E | H    |
|-----------------|---|-------|-------|---|--------|---|------|
| P : Column Load | = | 1.110 |       |   |        |   | k    |
| OB : Overburden | = |       |       |   |        |   | ksf  |
| M-xx            | = |       |       |   |        |   | k-ft |
| M-zz            | = | 7.631 | 4.125 |   | 16.260 |   | k-ft |
| V-x             | = |       |       |   |        |   | k    |
| V-z             | = |       |       |   |        |   | k    |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### General Footing

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

DESCRIPTION: Gate Footing Calc (13.75 FT GATE)

### DESIGN SUMMARY

Design OK

|      | Min. Ratio | Item              | Applied        | Capacity        | Governing Load Combination  |
|------|------------|-------------------|----------------|-----------------|-----------------------------|
| PASS | 0.7448     | Soil Bearing      | 1.862 ksf      | 2.50 ksf        | +0.60D+0.60W about Z-Z axis |
| PASS | n/a        | Overturning - X-X | 0.0 k-ft       | 0.0 k-ft        | No Overturning              |
| PASS | 1.254      | Overturning - Z-Z | 14.335 k-ft    | 17.978 k-ft     | +0.60D+0.60W                |
| PASS | n/a        | Sliding - X-X     | 0.0 k          | 0.0 k           | No Sliding                  |
| PASS | n/a        | Sliding - Z-Z     | 0.0 k          | 0.0 k           | No Sliding                  |
| PASS | n/a        | Uplift            | 0.0 k          | 0.0 k           | No Uplift                   |
| PASS | 0.03307    | Z Flexure (+X)    | 3.864 k-ft/ft  | 116.825 k-ft/ft | +1.20D+0.50L+W              |
| PASS | 0.01396    | Z Flexure (-X)    | 1.631 k-ft/ft  | 116.825 k-ft/ft | +1.20D+0.50L+W              |
| PASS | 0.001663   | X Flexure (+Z)    | 0.1943 k-ft/ft | 116.825 k-ft/ft | +1.40D                      |
| PASS | 0.001663   | X Flexure (-Z)    | 0.1943 k-ft/ft | 116.825 k-ft/ft | +1.40D                      |
| PASS | n/a        | 1-way Shear (+X)  | 0.0 psi        | 28.404 psi      | n/a                         |
| PASS | 0.0        | 1-way Shear (-X)  | 0.0 psi        | 0.0 psi         | n/a                         |
| PASS | n/a        | 1-way Shear (+Z)  | 0.0 psi        | 28.404 psi      | n/a                         |
| PASS | n/a        | 1-way Shear (-Z)  | 0.0 psi        | 28.404 psi      | n/a                         |
| PASS | n/a        | 2-way Punching    | 0.9614 psi     | 28.404 psi      | +1.20D+0.50L+W              |



Top reinforcing mat required (see 'Bending' tab).

Hand check required for anchor pullout.

### Detailed Results

#### Soil Bearing

| Rotation Axis & Load Combination... | Gross Allowable | Xecc   | Zecc | Actual Soil Bearing Stress @ Location |         |          |           | Actual / Allow Ratio |
|-------------------------------------|-----------------|--------|------|---------------------------------------|---------|----------|-----------|----------------------|
|                                     |                 |        |      | Bottom, -Z                            | Top, +Z | Left, -X | Right, +X |                      |
| X-X, D Only                         | 2.50            | n/a    | 0.0  | 0.4794                                | 0.4794  | n/a      | n/a       | 0.192                |
| X-X, +D+L                           | 2.50            | n/a    | 0.0  | 0.4794                                | 0.4794  | n/a      | n/a       | 0.192                |
| X-X, +D+0.750L                      | 2.50            | n/a    | 0.0  | 0.4794                                | 0.4794  | n/a      | n/a       | 0.192                |
| X-X, +D+0.60W                       | 2.50            | n/a    | 0.0  | 0.4794                                | 0.4794  | n/a      | n/a       | 0.192                |
| X-X, +D+0.750L+0.450W               | 2.50            | n/a    | 0.0  | 0.4794                                | 0.4794  | n/a      | n/a       | 0.192                |
| X-X, +0.60D+0.60W                   | 2.50            | n/a    | 0.0  | 0.2876                                | 0.2876  | n/a      | n/a       | 0.115                |
| X-X, +0.60D                         | 2.50            | n/a    | 0.0  | 0.2876                                | 0.2876  | n/a      | n/a       | 0.115                |
| Z-Z, D Only                         | 2.50            | 7.641  | n/a  | n/a                                   | n/a     | 0.1168   | 0.8420    | 0.337                |
| Z-Z, +D+L                           | 2.50            | 11.771 | n/a  | n/a                                   | n/a     | 0.0      | 1.046     | 0.418                |
| Z-Z, +D+0.750L                      | 2.50            | 10.738 | n/a  | n/a                                   | n/a     | 0.0      | 0.9904    | 0.396                |
| Z-Z, +D+0.60W                       | 2.50            | 17.409 | n/a  | n/a                                   | n/a     | 0.0      | 1.511     | 0.604                |
| Z-Z, +D+0.750L+0.450W               | 2.50            | 18.064 | n/a  | n/a                                   | n/a     | 0.0      | 1.593     | 0.637                |
| Z-Z, +0.60D+0.60W                   | 2.50            | 23.921 | n/a  | n/a                                   | n/a     | 0.0      | 1.862     | 0.745                |
| Z-Z, +0.60D                         | 2.50            | 7.641  | n/a  | n/a                                   | n/a     | 0.07007  | 0.5052    | 0.202                |

#### Overturning Stability

| Rotation Axis & Load Combination... | Overturning Moment | Resisting Moment | Stability Ratio | Status |
|-------------------------------------|--------------------|------------------|-----------------|--------|
| X-X, D Only                         | None               | 0.0 k-ft         | Infinity        | OK     |
| X-X, +D+L                           | None               | 0.0 k-ft         | Infinity        | OK     |
| X-X, +D+0.750L                      | None               | 0.0 k-ft         | Infinity        | OK     |
| X-X, +D+0.60W                       | None               | 0.0 k-ft         | Infinity        | OK     |
| X-X, +D+0.750L+0.450W               | None               | 0.0 k-ft         | Infinity        | OK     |
| X-X, +0.60D+0.60W                   | None               | 0.0 k-ft         | Infinity        | OK     |
| X-X, +0.60D                         | None               | 0.0 k-ft         | Infinity        | OK     |
| Z-Z, D Only                         | 7.631 k-ft         | 29.963 k-ft      | 3.926           | OK     |
| Z-Z, +D+L                           | 11.756 k-ft        | 29.963 k-ft      | 2.549           | OK     |
| Z-Z, +D+0.750L                      | 10.725 k-ft        | 29.963 k-ft      | 2.794           | OK     |
| Z-Z, +D+0.60W                       | 17.387 k-ft        | 29.963 k-ft      | 1.723           | OK     |
| Z-Z, +D+0.750L+0.450W               | 18.042 k-ft        | 29.963 k-ft      | 1.661           | OK     |
| Z-Z, +0.60D+0.60W                   | 14.335 k-ft        | 17.978 k-ft      | 1.254           | OK     |
| Z-Z, +0.60D                         | 4.579 k-ft         | 17.978 k-ft      | 3.926           | OK     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### General Footing

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: Gate Footing Calc (13.75 FT GATE)

### Sliding Stability

All units k

| Force Application Axis<br>Load Combination... | Sliding Force | Resisting Force | Stability Ratio | Status |
|-----------------------------------------------|---------------|-----------------|-----------------|--------|
| Footing Has NO Sliding                        |               |                 |                 |        |

### Footing Flexure

| Flexure Axis & Load Combination | Mu<br>k-ft | Side | Tension<br>Surface | As Req'd<br>in <sup>2</sup> | Gvrn. As<br>in <sup>2</sup> | Actual As<br>in <sup>2</sup> | Phi*Mn<br>k-ft | Status |
|---------------------------------|------------|------|--------------------|-----------------------------|-----------------------------|------------------------------|----------------|--------|
| X-X, +1.40D                     | 0.1943     | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| X-X, +1.40D                     | 0.1943     | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| X-X, +1.20D+1.60L               | 0.1665     | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| X-X, +1.20D+1.60L               | 0.1665     | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| X-X, +1.20D+0.50L               | 0.1665     | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| X-X, +1.20D+0.50L               | 0.1665     | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| X-X, +1.20D+0.50W               | 0.1665     | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| X-X, +1.20D+0.50W               | 0.1665     | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| X-X, +1.20D+0.50L+W             | 0.1665     | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| X-X, +1.20D+0.50L+W             | 0.1665     | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| X-X, +0.90D+W                   | 0.1249     | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| X-X, +0.90D+W                   | 0.1249     | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| X-X, +0.90D                     | 0.1249     | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| X-X, +0.90D                     | 0.1249     | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +1.40D                     | 0.8740     | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +1.40D                     | 1.262      | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +1.20D+1.60L               | 1.360      | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +1.20D+1.60L               | 1.792      | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +1.20D+0.50L               | 0.9554     | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +1.20D+0.50L               | 1.288      | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +1.20D+0.50W               | 1.460      | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +1.20D+0.50W               | 1.997      | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +1.20D+0.50L+W             | 1.631      | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +1.20D+0.50L+W             | 3.864      | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +0.90D+W                   | 1.223      | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +0.90D+W                   | 3.40       | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +0.90D                     | 0.5618     | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |
| Z-Z, +0.90D                     | 0.8116     | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8060                       | 116.825        | OK     |

### One Way Shear X

| Load Combination... | Vu @ -X  | Vu @ +X  | Vu:Max   | Phi Vn    | Vu / Phi*Vn | Status |
|---------------------|----------|----------|----------|-----------|-------------|--------|
| +1.40D              | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |
| +1.20D+1.60L        | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |
| +1.20D+0.50L        | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |
| +1.20D+0.50W        | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |
| +1.20D+0.50L+W      | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |
| +0.90D+W            | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |
| +0.90D              | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |

### One Way Shear Z

| Load Combination... | Vu @ -Z  | Vu @ +Z  | Vu:Max   | Phi Vn    | Vu / Phi*Vn | Status |
|---------------------|----------|----------|----------|-----------|-------------|--------|
| +1.40D              | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |
| +1.20D+1.60L        | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |
| +1.20D+0.50L        | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |
| +1.20D+0.50W        | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |
| +1.20D+0.50L+W      | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |
| +0.90D+W            | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |
| +0.90D              | 0.00 psi | 0.00 psi | 0.00 psi | 28.40 psi | 0.00        | OK     |

### Two-Way "Punching" Shear

All units k

| Load Combination... | Vu       | Phi*Vn    | Vu / Phi*Vn | Status |
|---------------------|----------|-----------|-------------|--------|
| +1.40D              | 0.25 psi | 164.32psi | 0.001538    | OK     |
| +1.20D+1.60L        | 0.25 psi | 164.32psi | 0.001522    | OK     |
| +1.20D+0.50L        | 0.22 psi | 164.32psi | 0.001318    | OK     |
| +1.20D+0.50W        | 0.29 psi | 164.32psi | 0.001791    | OK     |
| +1.20D+0.50L+W      | 0.96 psi | 164.32psi | 0.005851    | OK     |
| +0.90D+W            | 0.88 psi | 164.32psi | 0.005379    | OK     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### General Footing

Project File: Enercalc TE.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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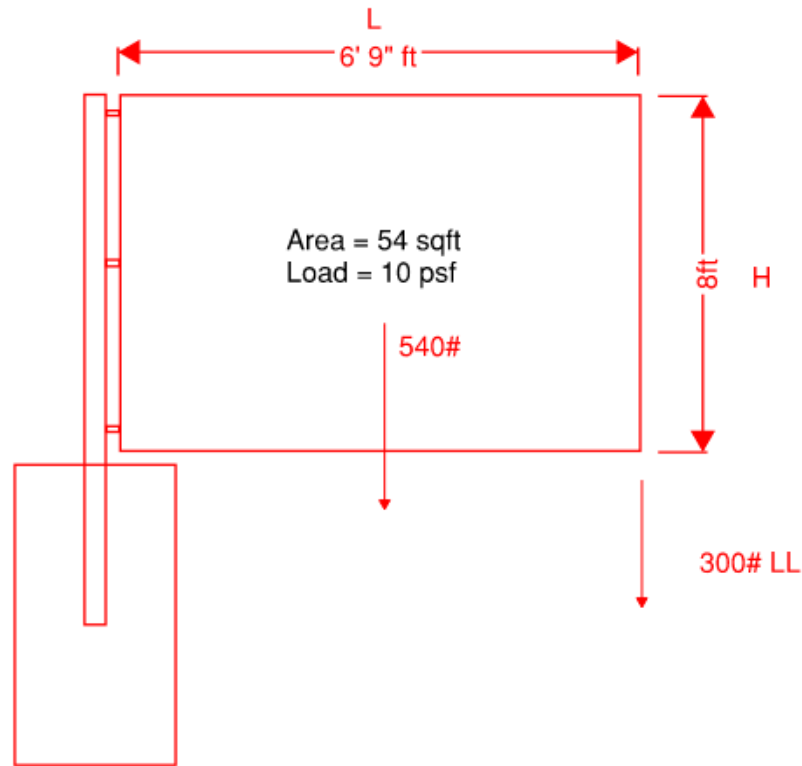
**DESCRIPTION:** Gate Footing Calc (13.75 FT GATE)

#### Two-Way "Punching" Shear

All units k

| Load Combination... | Vu       | Phi*Vn    | Vu / Phi*Vn | Status |
|---------------------|----------|-----------|-------------|--------|
| +0.90D              | 0.16 psi | 164.32psi | 0.000989    | OK     |

### GATE POST CALC



Moment at Base due to Dead Load:

$$M = F \cdot (L/2) = 540 \# \cdot 6.75'/2 = 1823 \text{ lb-ft}$$

Reaction at Top of Post

$$M/H = 1823/8 \text{ ft} = 228 \# \text{ @ } 8 \text{ ft from base}$$

Moment at Base due to Wind Load:

$$W = 21.5 \text{ psf}$$

$$\text{Area} = 54 \text{ ft}$$

$$\text{Load} = 1161$$

$$M = 1161 \# \cdot 6.75'/2 \text{ ft} = 3920 \text{ lb-ft}$$

Reaction at Top of Post

$$M/H = 3920 / 8 \text{ ft} = 490 \# \text{ @ } 8 \text{ ft from base}$$

Moment at Base due to Live Load:

Live Load

$$M = F \cdot L = 300 \cdot 6.75' = 2025 \text{ lbft}$$

Reaction at Top of Post

$$M/H = 2025/8 = 253 \# \text{ @ } 8 \text{ ft from base}$$

SEE ENERCALC FOR FOOTING CALC

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### General Footing

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build: 20.23.12.07

WCD & ASSOCIATES

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**DESCRIPTION:** Gate Footing Calc (6.75ft long gate)

### Code References

Calculations per ACI 318-19, IBC 2021, ASCE 7-16  
 Load Combinations Used : IBC 2021

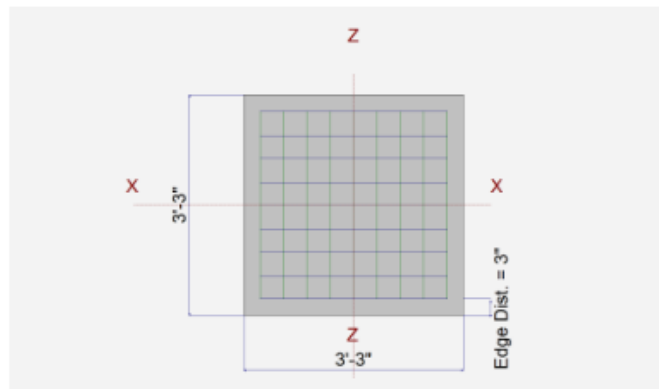
### General Information

|                                            |   |             |                                               |   |           |
|--------------------------------------------|---|-------------|-----------------------------------------------|---|-----------|
| Material Properties                        |   |             | Soil Design Values                            |   |           |
| f'c : Concrete 28 day strength             | = | 3.0 ksi     | Allowable Soil Bearing                        | = | 2.50 ksf  |
| fy : Rebar Yield                           | = | 60.0 ksi    | Soil Density                                  | = | 110.0 pcf |
| Ec : Concrete Elastic Modulus              | = | 3,122.0 ksi | Increase Bearing By Footing Weight            | = | No        |
| Concrete Density                           | = | 145.0 pcf   | Soil Passive Resistance (for Sliding)         | = | 250.0 pcf |
| φ Values Flexure                           | = | 0.90        | Soil/Concrete Friction Coeff.                 | = | 0.30      |
| Shear                                      | = | 0.750       | Increases based on footing Depth              |   |           |
| Analysis Settings                          |   |             | Footing base depth below soil surface         | = | ft        |
| Min Steel % Bending Reinf.                 | = |             | Allow press. increase per foot of depth       | = | ksf       |
| Min Allow % Temp Reinf.                    | = | 0.00180     | when footing base is below                    | = | ft        |
| Min. Overturning Safety Factor             | = | 1.0 : 1     | Increases based on footing plan dimension     |   |           |
| Min. Sliding Safety Factor                 | = | 1.0 : 1     | Allowable pressure increase per foot of depth | = | ksf       |
| Add Ftg Wt for Soil Pressure               | : | Yes         | when max. length or width is greater than     | = | ft        |
| Use ftg wt for stability, moments & shears | : | Yes         |                                               |   |           |
| Add Pedestal Wt for Soil Pressure          | : | No          |                                               |   |           |
| Use Pedestal wt for stability, mom & shear | : | No          |                                               |   |           |

### Dimensions

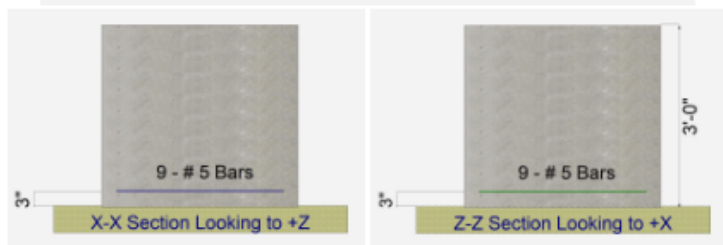
|                             |   |          |
|-----------------------------|---|----------|
| Width parallel to X-X Axis  | = | 3.250 ft |
| Length parallel to Z-Z Axis | = | 3.250 ft |
| Footing Thickness           | = | 36.0 in  |

|                                                                 |   |        |
|-----------------------------------------------------------------|---|--------|
| <b>Pedestal dimensions...</b>                                   |   |        |
| px : parallel to X-X Axis                                       | = | in     |
| pz : parallel to Z-Z Axis                                       | = | in     |
| Height                                                          | = | in     |
| Rebar Centerline to Edge of Concrete...<br>at Bottom of footing | = | 3.0 in |



### Reinforcing

|                                                    |   |     |
|----------------------------------------------------|---|-----|
| <b>Bars parallel to X-X Axis</b>                   |   |     |
| Number of Bars                                     | = | 9   |
| Reinforcing Bar Size                               | = | # 5 |
| <b>Bars parallel to Z-Z Axis</b>                   |   |     |
| Number of Bars                                     | = | 9   |
| Reinforcing Bar Size                               | = | # 5 |
| <b>Bandwidth Distribution Check (ACI 15.4.4.2)</b> |   |     |
| Direction Requiring Closer Separation              | = | n/a |
| # Bars required within zone                        | = | n/a |
| # Bars required on each side of zone               | = | n/a |



### Applied Loads

|                 | D | Lr    | L     | S | W     | E | H    |
|-----------------|---|-------|-------|---|-------|---|------|
| P : Column Load | = | 0.540 |       |   |       |   | k    |
| OB : Overburden | = |       |       |   |       |   | ksf  |
| M-xx            | = |       |       |   |       |   | k-ft |
| M-zz            | = | 1.823 | 2.025 |   | 3.920 |   | k-ft |
| V-x             | = |       |       |   |       |   | k    |
| V-z             | = |       |       |   |       |   | k    |





## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### General Footing

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: Gate Footing Calc (6.75ft long gate)

### DESIGN SUMMARY

Design OK

|      | Min. Ratio | Item              | Applied         | Capacity        | Governing Load Combination      |
|------|------------|-------------------|-----------------|-----------------|---------------------------------|
| PASS | 0.6624     | Soil Bearing      | 1.656 ksf       | 2.50 ksf        | +D+0.750L+0.450W about Z-Z axis |
| PASS | n/a        | Overturning - X-X | 0.0 k-ft        | 0.0 k-ft        | No Overturning                  |
| PASS | 1.453      | Overturning - Z-Z | 3.446 k-ft      | 5.006 k-ft      | +0.60D+0.60W                    |
| PASS | n/a        | Sliding - X-X     | 0.0 k           | 0.0 k           | No Sliding                      |
| PASS | n/a        | Sliding - Z-Z     | 0.0 k           | 0.0 k           | No Sliding                      |
| PASS | n/a        | Uplift            | 0.0 k           | 0.0 k           | No Uplift                       |
| PASS | 0.01209    | Z Flexure (+X)    | 1.501 k-ft/ft   | 124.230 k-ft/ft | +1.20D+0.50L+W                  |
| PASS | 0.005548   | Z Flexure (-X)    | 0.6892 k-ft/ft  | 124.230 k-ft/ft | +1.20D+0.50L+W                  |
| PASS | 0.000761   | X Flexure (+Z)    | 0.09450 k-ft/ft | 124.230 k-ft/ft | +1.40D                          |
| PASS | 0.000761   | X Flexure (-Z)    | 0.09450 k-ft/ft | 124.230 k-ft/ft | +1.40D                          |
| PASS | n/a        | 1-way Shear (+X)  | 0.0 psi         | 29.007 psi      | n/a                             |
| PASS | 0.0        | 1-way Shear (-X)  | 0.0 psi         | 0.0 psi         | n/a                             |
| PASS | n/a        | 1-way Shear (+Z)  | 0.0 psi         | 29.007 psi      | n/a                             |
| PASS | n/a        | 1-way Shear (-Z)  | 0.0 psi         | 29.007 psi      | n/a                             |
| PASS | n/a        | 2-way Punching    | 0.2519 psi      | 29.007 psi      | +1.20D+0.50L+W                  |



Top reinforcing mat required (see 'Bending' tab).

Hand check required for anchor pullout.

### Detailed Results

#### Soil Bearing

| Rotation Axis & Load Combination... | Gross Allowable | Xecc   | Zecc (in) | Actual Soil Bearing Stress @ Location |         |          |           | Actual / Allow Ratio |
|-------------------------------------|-----------------|--------|-----------|---------------------------------------|---------|----------|-----------|----------------------|
|                                     |                 |        |           | Bottom, -Z                            | Top, +Z | Left, -X | Right, +X |                      |
| X-X, D Only                         | 2.50            | n/a    | 0.0       | 0.4861                                | 0.4861  | n/a      | n/a       | 0.194                |
| X-X, +D+L                           | 2.50            | n/a    | 0.0       | 0.4861                                | 0.4861  | n/a      | n/a       | 0.194                |
| X-X, +D+0.750L                      | 2.50            | n/a    | 0.0       | 0.4861                                | 0.4861  | n/a      | n/a       | 0.194                |
| X-X, +D+0.60W                       | 2.50            | n/a    | 0.0       | 0.4861                                | 0.4861  | n/a      | n/a       | 0.194                |
| X-X, +D+0.750L+0.450W               | 2.50            | n/a    | 0.0       | 0.4861                                | 0.4861  | n/a      | n/a       | 0.194                |
| X-X, +0.60D+0.60W                   | 2.50            | n/a    | 0.0       | 0.2917                                | 0.2917  | n/a      | n/a       | 0.117                |
| X-X, +0.60D                         | 2.50            | n/a    | 0.0       | 0.2917                                | 0.2917  | n/a      | n/a       | 0.117                |
| Z-Z, D Only                         | 2.50            | 4.260  | n/a       | n/a                                   | n/a     | 0.1707   | 0.8016    | 0.321                |
| Z-Z, +D+L                           | 2.50            | 8.993  | n/a       | n/a                                   | n/a     | 0.0      | 1.195     | 0.478                |
| Z-Z, +D+0.750L                      | 2.50            | 7.810  | n/a       | n/a                                   | n/a     | 0.0      | 1.075     | 0.430                |
| Z-Z, +D+0.60W                       | 2.50            | 9.757  | n/a       | n/a                                   | n/a     | 0.0      | 1.289     | 0.516                |
| Z-Z, +D+0.750L+0.450W               | 2.50            | 11.932 | n/a       | n/a                                   | n/a     | 0.0      | 1.656     | 0.662                |
| Z-Z, +0.60D+0.60W                   | 2.50            | 13.422 | n/a       | n/a                                   | n/a     | 0.0      | 1.234     | 0.494                |
| Z-Z, +0.60D                         | 2.50            | 4.260  | n/a       | n/a                                   | n/a     | 0.1024   | 0.4809    | 0.192                |

#### Overturning Stability

| Rotation Axis & Load Combination... | Overturning Moment | Resisting Moment | Stability Ratio | Status |
|-------------------------------------|--------------------|------------------|-----------------|--------|
| X-X, D Only                         | None               | 0.0 k-ft         | Infinity        | OK     |
| X-X, +D+L                           | None               | 0.0 k-ft         | Infinity        | OK     |
| X-X, +D+0.750L                      | None               | 0.0 k-ft         | Infinity        | OK     |
| X-X, +D+0.60W                       | None               | 0.0 k-ft         | Infinity        | OK     |
| X-X, +D+0.750L+0.450W               | None               | 0.0 k-ft         | Infinity        | OK     |
| X-X, +0.60D+0.60W                   | None               | 0.0 k-ft         | Infinity        | OK     |
| X-X, +0.60D                         | None               | 0.0 k-ft         | Infinity        | OK     |
| Z-Z, D Only                         | 1.823 k-ft         | 8.344 k-ft       | 4.577           | OK     |
| Z-Z, +D+L                           | 3.848 k-ft         | 8.344 k-ft       | 2.168           | OK     |
| Z-Z, +D+0.750L                      | 3.342 k-ft         | 8.344 k-ft       | 2.497           | OK     |
| Z-Z, +D+0.60W                       | 4.175 k-ft         | 8.344 k-ft       | 1.999           | OK     |
| Z-Z, +D+0.750L+0.450W               | 5.106 k-ft         | 8.344 k-ft       | 1.634           | OK     |
| Z-Z, +0.60D+0.60W                   | 3.446 k-ft         | 5.006 k-ft       | 1.453           | OK     |
| Z-Z, +0.60D                         | 1.094 k-ft         | 5.006 k-ft       | 4.577           | OK     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### General Footing

Project File: Enercalc TE.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

**DESCRIPTION:** Gate Footing Calc (6.75ft long gate)

### Sliding Stability

All units k

Force Application Axis  
Load Combination...

Sliding Force

Resisting Force

Stability Ratio

Status

Footing Has NO Sliding

### Footing Flexure

| Flexure Axis & Load Combination | Mu<br>k-ft | Side | Tension<br>Surface | As Req'd<br>in <sup>2</sup> | Gvrn. As<br>in <sup>2</sup> | Actual As<br>in <sup>2</sup> | Phi*Mn<br>k-ft | Status |
|---------------------------------|------------|------|--------------------|-----------------------------|-----------------------------|------------------------------|----------------|--------|
| X-X, +1.40D                     | 0.09450    | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| X-X, +1.40D                     | 0.09450    | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| X-X, +1.20D+1.60L               | 0.0810     | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| X-X, +1.20D+1.60L               | 0.0810     | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| X-X, +1.20D+0.50L               | 0.0810     | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| X-X, +1.20D+0.50L               | 0.0810     | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| X-X, +1.20D+0.50W               | 0.0810     | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| X-X, +1.20D+0.50W               | 0.0810     | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| X-X, +1.20D+0.50L+W             | 0.0810     | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| X-X, +1.20D+0.50L+W             | 0.0810     | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| X-X, +0.90D+W                   | 0.06075    | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| X-X, +0.90D+W                   | 0.06075    | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| X-X, +0.90D                     | 0.06075    | +Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| X-X, +0.90D                     | 0.06075    | -Z   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +1.40D                     | 0.2981     | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +1.40D                     | 0.4871     | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +1.20D+1.60L               | 0.6608     | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +1.20D+1.60L               | 1.009      | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +1.20D+0.50L               | 0.4113     | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +1.20D+0.50L               | 0.5733     | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +1.20D+0.50W               | 0.5447     | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +1.20D+0.50W               | 0.7313     | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +1.20D+0.50L+W             | 0.6892     | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +1.20D+0.50L+W             | 1.501      | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +0.90D+W                   | 0.5169     | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +0.90D+W                   | 1.194      | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +0.90D                     | 0.1916     | -X   | Top                | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |
| Z-Z, +0.90D                     | 0.3131     | +X   | Bottom             | 0.7776                      | ACI 7.6.1.1                 | 0.8585                       | 124.230        | OK     |

### One Way Shear X

| Load Combination... | Vu @ -X  | Vu @ +X  | Vu:Max   | Phi Vn    | Vu / Phi*Vn | Status |
|---------------------|----------|----------|----------|-----------|-------------|--------|
| +1.40D              | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |
| +1.20D+1.60L        | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |
| +1.20D+0.50L        | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |
| +1.20D+0.50W        | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |
| +1.20D+0.50L+W      | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |
| +0.90D+W            | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |
| +0.90D              | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |

### One Way Shear Z

| Load Combination... | Vu @ -Z  | Vu @ +Z  | Vu:Max   | Phi Vn    | Vu / Phi*Vn | Status |
|---------------------|----------|----------|----------|-----------|-------------|--------|
| +1.40D              | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |
| +1.20D+1.60L        | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |
| +1.20D+0.50L        | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |
| +1.20D+0.50W        | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |
| +1.20D+0.50L+W      | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |
| +0.90D+W            | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |
| +0.90D              | 0.00 psi | 0.00 psi | 0.00 psi | 29.01 psi | 0.00        | OK     |

### Two-Way "Punching" Shear

| Load Combination... | Vu       | Phi*Vn    | Vu / Phi*Vn | Status |
|---------------------|----------|-----------|-------------|--------|
| +1.40D              | 0.05 psi | 164.32psi | 0.000311    | OK     |
| +1.20D+1.60L        | 0.11 psi | 164.32psi | 0.000696    | OK     |
| +1.20D+0.50L        | 0.04 psi | 164.32psi | 0.000267    | OK     |
| +1.20D+0.50W        | 0.06 psi | 164.32psi | 0.000366    | OK     |
| +1.20D+0.50L+W      | 0.25 psi | 164.32psi | 0.001533    | OK     |
| +0.90D+W            | 0.22 psi | 164.32psi | 0.001332    | OK     |

All units k



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### General Footing

Project File: Enercalc TE.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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**DESCRIPTION:** Gate Footing Calc (6.75ft long gate)

### Two-Way "Punching" Shear

All units k

| Load Combination... | Vu       | Phi*Vn     | Vu / Phi*Vn | Status |
|---------------------|----------|------------|-------------|--------|
| +0.90D              | 0.03 psi | 164.32 psi | 0.0002      | OK     |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
Project No.: CN112124

### Steel Column

Project File: Enercalc TE.ec6

LIC#: KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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DESCRIPTION: GATE COLUMN

### Code References

Calculations per AISC 360-16, IBC 2021, ASCE 7-16  
Load Combinations Used : IBC 2021

### General Information

Steel Section Name : Pipe8STD  
Analysis Method : Allowable Strength  
Steel Stress Grade  
Fy : Steel Yield 36.0 ksi  
E : Elastic Bending Modulus 29,000.0 ksi  
Overall Column Height 8 ft  
Top & Bottom Fixity Top Free, Bottom Fixed  
Brace condition :  
Fully braced against buckling ABOUT X-X Axis  
Fully braced against buckling ABOUT Y-Y Axis

### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 228.80 lbs \* Dead Load Factor  
BENDING LOADS . . .

Lat. Point Load at 8.0 ft creating Mx-x, D = 0.9540, L = 0.5160, W = 2.032 k

### DESIGN SUMMARY

#### Bending & Shear Check Results

**PASS** Max. Axial+Bending Stress Ratio = 0.4836 : 1  
Load Combination +D+0.750L+0.450W  
Location of max.above base 0.0 ft  
At maximum location values are . . .  
Pa : Axial 0.2288 k  
Pn / Omega : Allowable 169.222 k  
Ma-x : Applied -18.043 k-ft  
Mn-x / Omega : Allowable 37.365 k-ft  
Ma-y : Applied 0.0 k-ft  
Mn-y / Omega : Allowable 37.365 k-ft

#### Maximum Load Reactions . .

Top along X-X 0.0 k  
Bottom along X-X 0.0 k  
Top along Y-Y 0.0 k  
Bottom along Y-Y 2.255 k

#### Maximum Load Deflections . . .

Along Y-Y 0.3351 in at 8.0ft above base  
for load combination : +D+0.750L+0.450W  
Along X-X 0.0 in at 0.0ft above base  
for load combination :

**PASS** Maximum Shear Stress Ratio 0.04443 : 1  
Load Combination +D+0.750L+0.450W  
Location of max.above base 0.0 ft  
At maximum location values are . . .  
Va : Applied 2.255 k  
Vn / Omega : Allowable 50.766 k

### Load Combination Results

| Load Combination | Maximum Axial + Bending Stress Ratios |        |          |      | Maximum Shear Ratios |         |         |              |        |          |  |
|------------------|---------------------------------------|--------|----------|------|----------------------|---------|---------|--------------|--------|----------|--|
|                  | Stress Ratio                          | Status | Location | Cbx  | Cby                  | KxLx/Rx | KyLy/Ry | Stress Ratio | Status | Location |  |
| D Only           | 0.205                                 | PASS   | 0.00 ft  | 1.00 | 1.00                 | 0.00    | 0.00    | 0.019        | PASS   | 0.00 ft  |  |
| +D+L             | 0.315                                 | PASS   | 0.00 ft  | 1.00 | 1.00                 | 0.00    | 0.00    | 0.029        | PASS   | 0.00 ft  |  |
| +D+0.750L        | 0.288                                 | PASS   | 0.00 ft  | 1.00 | 1.00                 | 0.00    | 0.00    | 0.026        | PASS   | 0.00 ft  |  |
| +D+0.60W         | 0.466                                 | PASS   | 0.00 ft  | 1.00 | 1.00                 | 0.00    | 0.00    | 0.043        | PASS   | 0.00 ft  |  |
| +D+0.750L+0.450W | 0.484                                 | PASS   | 0.00 ft  | 1.00 | 1.00                 | 0.00    | 0.00    | 0.044        | PASS   | 0.00 ft  |  |
| +0.60D+0.60W     | 0.384                                 | PASS   | 0.00 ft  | 1.00 | 1.00                 | 0.00    | 0.00    | 0.035        | PASS   | 0.00 ft  |  |
| +0.60D           | 0.123                                 | PASS   | 0.00 ft  | 1.00 | 1.00                 | 0.00    | 0.00    | 0.011        | PASS   | 0.00 ft  |  |

### Maximum Reactions

Note: Only non-zero reactions are listed.

| Load Combination | Axial Reaction |  | X-X Axis Reaction |       | k | Y-Y Axis Reaction |       | Mx - End Moments k-ft |       | My - End Moments |       |
|------------------|----------------|--|-------------------|-------|---|-------------------|-------|-----------------------|-------|------------------|-------|
|                  | @ Base         |  | @ Base            | @ Top |   | @ Base            | @ Top | @ Base                | @ Top | @ Base           | @ Top |
| D Only           | 0.229          |  |                   |       |   | 0.954             |       | -7.632                |       |                  |       |
| +D+L             | 0.229          |  |                   |       |   | 1.470             |       | -11.760               |       |                  |       |
| +D+0.750L        | 0.229          |  |                   |       |   | 1.341             |       | -10.728               |       |                  |       |
| +D+0.60W         | 0.229          |  |                   |       |   | 2.173             |       | -17.386               |       |                  |       |
| +D+0.750L+0.450W | 0.229          |  |                   |       |   | 2.255             |       | -18.043               |       |                  |       |
| +0.60D+0.60W     | 0.137          |  |                   |       |   | 1.792             |       | -14.333               |       |                  |       |
| +0.60D           | 0.137          |  |                   |       |   | 0.572             |       | -4.579                |       |                  |       |
| L Only           |                |  |                   |       |   | 0.516             |       | -4.128                |       |                  |       |
| W Only           |                |  |                   |       |   | 2.032             |       | -16.256               |       |                  |       |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
 Location: 2902 Pioneer E. Puyallup, WA 98372  
 Project No.: CN112124

### Steel Column

Project File: Enercalc TE.ec6

LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

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### DESCRIPTION: GATE COLUMN

### Extreme Reactions

| Item                    | Extreme Value | Axial Reaction | X-X Axis Reaction |       | k | Y-Y Axis Reaction |       | Mx - End Moments |       | k-ft | My - End Moments |       |
|-------------------------|---------------|----------------|-------------------|-------|---|-------------------|-------|------------------|-------|------|------------------|-------|
|                         |               | @ Base         | @ Base            | @ Top |   | @ Base            | @ Top | @ Base           | @ Top |      | @ Base           | @ Top |
| Axial @ Base            | Maximum       | 0.229          |                   |       |   | 0.954             |       | -7.632           |       |      |                  |       |
| "                       | Minimum       |                |                   |       |   | 0.516             |       | -4.128           |       |      |                  |       |
| Reaction, X-X Axis Base | Maximum       | 0.229          |                   |       |   | 0.954             |       | -7.632           |       |      |                  |       |
| "                       | Minimum       | 0.229          |                   |       |   | 0.954             |       | -7.632           |       |      |                  |       |
| Reaction, Y-Y Axis Base | Maximum       | 0.229          |                   |       |   | 2.255             |       | -18.043          |       |      |                  |       |
| "                       | Minimum       |                |                   |       |   | 0.516             |       |                  |       |      | -4.128           |       |
| Reaction, X-X Axis Top  | Maximum       | 0.229          |                   |       |   | 0.954             |       | -7.632           |       |      |                  |       |
| "                       | Minimum       | 0.229          |                   |       |   | 0.954             |       | -7.632           |       |      |                  |       |
| Reaction, Y-Y Axis Top  | Maximum       | 0.229          |                   |       |   | 0.954             |       | -7.632           |       |      |                  |       |
| "                       | Minimum       | 0.229          |                   |       |   | 0.954             |       | -7.632           |       |      |                  |       |
| Moment, X-X Axis Base   | Maximum       |                | -4.128            |       |   | 0.516             |       | -4.128           |       |      |                  |       |
| "                       | Minimum       | 0.229          | -18.043           |       |   | 2.255             |       | -18.043          |       |      |                  |       |
| Moment, Y-Y Axis Base   | Maximum       | 0.229          |                   |       |   | 0.954             |       | -7.632           |       |      |                  |       |
| "                       | Minimum       | 0.229          |                   |       |   | 0.954             |       | -7.632           |       |      |                  |       |
| Moment, X-X Axis Top    | Maximum       | 0.229          |                   |       |   | 0.954             |       | -7.632           |       |      |                  |       |
| "                       | Minimum       | 0.229          |                   |       |   | 0.954             |       | -7.632           |       |      |                  |       |
| Moment, Y-Y Axis Top    | Maximum       | 0.229          |                   |       |   | 0.954             |       | -7.632           |       |      |                  |       |
| "                       | Minimum       | 0.229          |                   |       |   | 0.954             |       | -7.632           |       |      |                  |       |

### Maximum Deflections for Load Combinations

| Load Combination | Max. Deflection in X dir | Distance | Max. Deflection in Y dir | Distance |
|------------------|--------------------------|----------|--------------------------|----------|
| D Only           | 0.0000 in                | 0.000 ft | 0.142 in                 | 8.000 ft |
| +D+L             | 0.0000 in                | 0.000 ft | 0.218 in                 | 8.000 ft |
| +D+0.750L        | 0.0000 in                | 0.000 ft | 0.199 in                 | 8.000 ft |
| +D+0.60W         | 0.0000 in                | 0.000 ft | 0.323 in                 | 8.000 ft |
| +D+0.750L+0.450W | 0.0000 in                | 0.000 ft | 0.335 in                 | 8.000 ft |
| +0.60D+0.60W     | 0.0000 in                | 0.000 ft | 0.266 in                 | 8.000 ft |
| +0.60D           | 0.0000 in                | 0.000 ft | 0.085 in                 | 8.000 ft |
| L Only           | 0.0000 in                | 0.000 ft | 0.077 in                 | 8.000 ft |
| W Only           | 0.0000 in                | 0.000 ft | 0.299 in                 | 7.946 ft |

### Steel Section Properties : Pipe8STD

|            |   |            |      |   |             |   |   |              |
|------------|---|------------|------|---|-------------|---|---|--------------|
| Depth      | = | 8.625 in   | I xx | = | 68.10 in^4  | J | = | 136.000 in^4 |
|            |   |            | S xx | = | 15.80 in^3  |   |   |              |
| Diameter   | = | 8.625 in   | R xx | = | 2.950 in    |   |   |              |
| Wall Thick | = | 0.322 in   | Zx   | = | 20.800 in^3 |   |   |              |
| Area       | = | 7.850 in^2 | I yy | = | 68.100 in^4 |   |   |              |
| Weight     | = | 28.600 plf | S yy | = | 15.800 in^3 |   |   |              |
|            |   |            | R yy | = | 2.950 in    |   |   |              |
| Ycg        | = | 0.000 in   |      |   |             |   |   |              |



## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA

Location: 2902 Pioneer E. Puyallup, WA 98372

Project No.: CN112124

### Steel Column

Project File: Enercalc TE.ec6

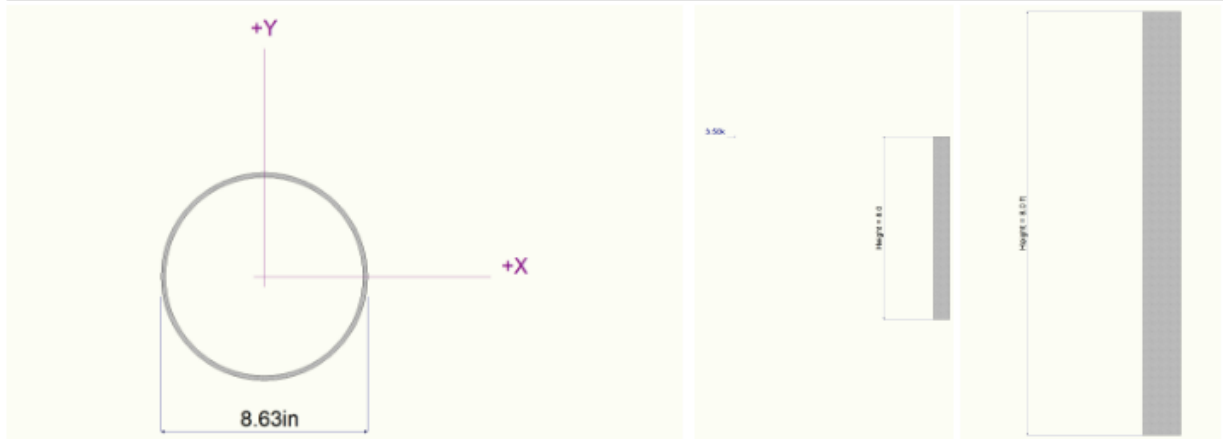
LIC# : KW-06014798, Build:20.23.12.07

WCD & ASSOCIATES

(c) ENERCALC INC 1983-2023

DESCRIPTION: **GATE COLUMN**

### Sketches







## STRUCTURAL CALCULATIONS

Project Name: New Construction for McDonald's in Puyallup, WA  
Location: 2902 Pioneer E. Puyallup, WA 98372  
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### 1. Project information

Project description: Gate Post Anchor Bolt  
Location:  
Fastening description:

### 2. Input Data & Anchor Parameters

#### General

Design method: ACI 318-19  
Units: Imperial units

#### Anchor Information:

Anchor type: Cast-in-place  
Material: AB  
Diameter (inch): 1.000  
Effective Embedment depth,  $h_{ef}$  (inch): 18.000  
Anchor category: -  
Anchor ductility: Yes  
 $h_{min}$  (inch): 20.63  
 $C_{min}$  (inch): 6.00  
 $S_{min}$  (inch): 6.00

#### Base Material

Concrete: Normal-weight  
Concrete thickness,  $h$  (inch): 36.00  
State: Uncracked  
Compressive strength,  $f_c$  (psi): 2500  
 $\Psi_{c,v}$ : 1.4  
Reinforcement condition: Supplementary reinforcement not present  
Supplemental edge reinforcement: No  
Reinforcement provided at corners: No  
Ignore concrete breakout in tension: No  
Ignore concrete breakout in shear: No  
Ignore 6do requirement: No  
Build-up grout pad: No

#### Base Plate

Length x Width x Thickness (inch): 12.00 x 12.00 x 1.00  
Yield stress: 36000 psi

Profile type/size: Pipe8XS

#### Recommended Anchor

Anchor Name: PAB Pre-Assembled Anchor Bolt - PAB8 (1"Ø)



Project Name: New Construction for McDonald's in Puyallup, WA

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### Load and Geometry

Load factor source: ACI 318 Section 5.3

Load combination:  $U = 1.2D + 1.0W + 1.0L + 0.5(Lr \text{ or } S \text{ or } R)$

Seismic design: No

Anchors subjected to sustained tension: Not applicable

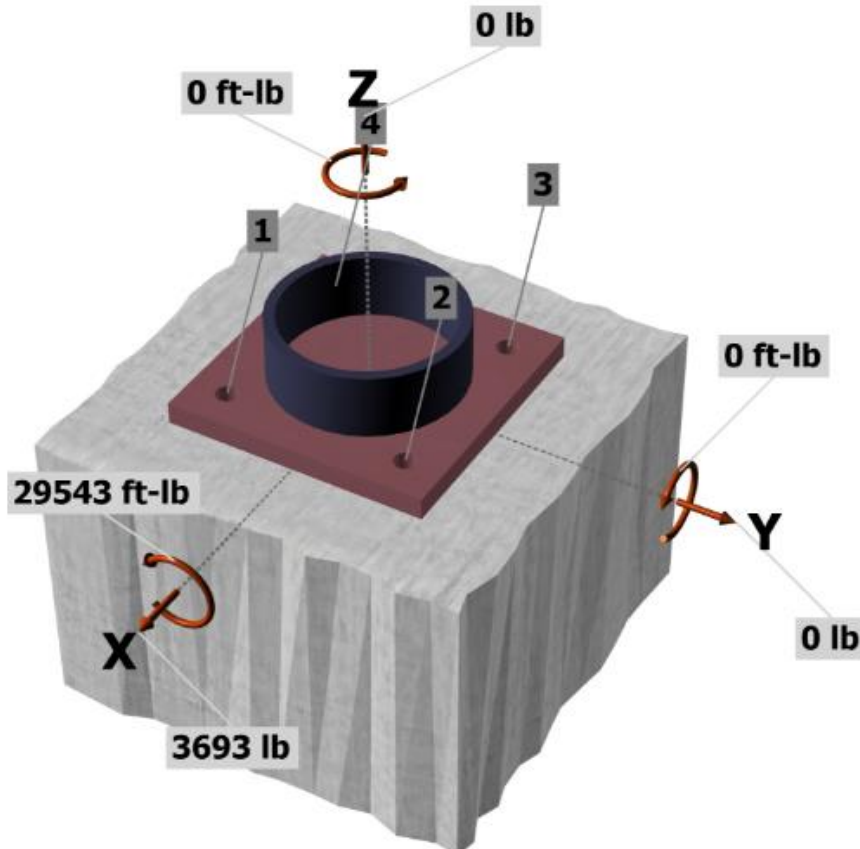
Apply entire shear load at front row: No

Anchors only resisting wind and/or seismic loads: No

### Service level loads:

|                | D    | W     | L    | Lr/S/R | Strength level loads |
|----------------|------|-------|------|--------|----------------------|
| $N_a$ [lb]:    | 0    | 0     | 0    | 0      | 0                    |
| $V_{ax}$ [lb]: | 954  | 2032  | 516  | 0      | 3693                 |
| $V_{ay}$ [lb]: | 0    | 0     | 0    | 0      | 0                    |
| $M_x$ [ft-lb]: | 7632 | 16260 | 4125 | 0      | 29543                |
| $M_y$ [ft-lb]: | 0    | 0     | 0    | 0      | 0                    |
| $M_z$ [ft-lb]: | 0    | 0     | 0    | 0      | 0                    |

<Figure 1>



Project Name: New Construction for McDonald's in Puyallup, WA

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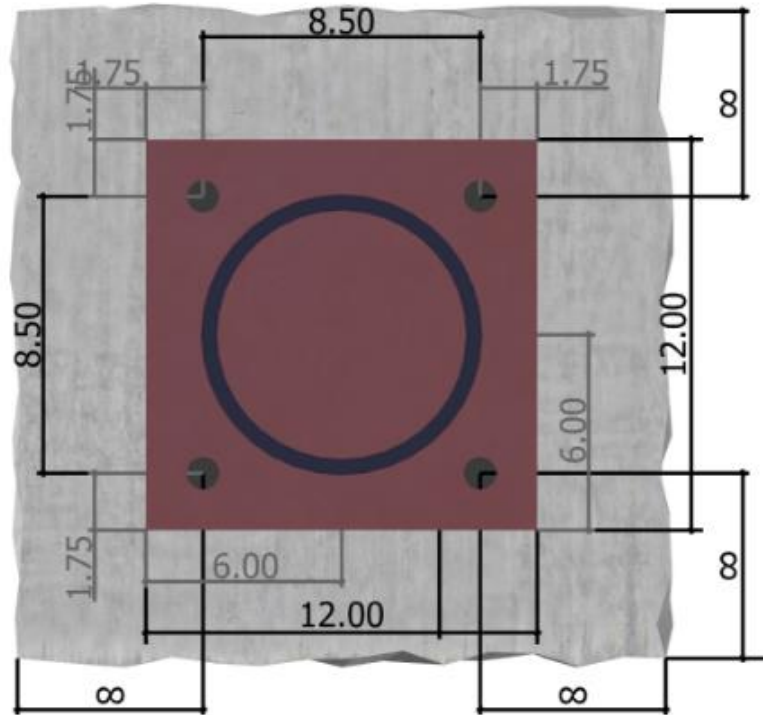
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<Figure 2>



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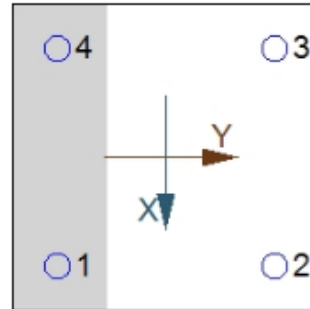
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### 3. Resulting Anchor Forces

| Anchor | Tension load, $N_{ux}$ (lb) | Shear load x, $V_{uxx}$ (lb) | Shear load y, $V_{uxy}$ (lb) | Shear load combined, $\sqrt{(V_{uxx})^2 + (V_{uxy})^2}$ (lb) |
|--------|-----------------------------|------------------------------|------------------------------|--------------------------------------------------------------|
| 1      | 0.0                         | 923.3                        | 0.0                          | 923.3                                                        |
| 2      | 19640.6                     | 923.3                        | 0.0                          | 923.3                                                        |
| 3      | 19640.6                     | 923.3                        | 0.0                          | 923.3                                                        |
| 4      | 0.0                         | 923.3                        | 0.0                          | 923.3                                                        |
| Sum    | 39281.3                     | 3693.0                       | 0.0                          | 3693.0                                                       |

Maximum concrete compression strain ( $\epsilon_{cs}$ ): 0.41  
 Maximum concrete compression stress (psi): 1781  
 Resultant tension force (lb): 39281  
 Resultant compression force (lb): 39281  
 Eccentricity of resultant tension forces in x-axis,  $e'_{tx}$  (inch): 0.00  
 Eccentricity of resultant tension forces in y-axis,  $e'_{ty}$  (inch): 0.00  
 Eccentricity of resultant shear forces in x-axis,  $e'_{sx}$  (inch): 0.00  
 Eccentricity of resultant shear forces in y-axis,  $e'_{sy}$  (inch): 0.00

<Figure 3>



### 4. Steel Strength of Anchor in Tension (Sec. 17.6.1)

| $N_{sa}$ (lb) | $\phi$ | $\phi N_{sa}$ (lb) |
|---------------|--------|--------------------|
| 35150         | 0.75   | 26363              |

### 5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.6.2)

$$N_b = 16 \lambda_a \sqrt{f_c} h_{ef}^{5/3} \text{ (Eq. 17.6.2.2.1)}$$

| $\lambda_a$ | $f_c$ (psi) | $h_{ef}$ (in) | $N_b$ (lb) |
|-------------|-------------|---------------|------------|
| 1.00        | 2500        | 18.000        | 98903      |

$$\phi N_{cbg} = \phi (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b \text{ (Sec. 17.5.1.2 \& Eq. 17.6.2.1a)}$$

| $A_{Nc}$ (in <sup>2</sup> ) | $A_{Nco}$ (in <sup>2</sup> ) | $c_{a,min}$ (in) | $\Psi_{ec,N}$ | $\Psi_{ed,N}$ | $\Psi_{c,N}$ | $\Psi_{cp,N}$ | $N_b$ (lb) | $\phi$ | $\phi N_{cbg}$ (lb) |
|-----------------------------|------------------------------|------------------|---------------|---------------|--------------|---------------|------------|--------|---------------------|
| 3702.94                     | 2916.00                      | -                | 1.000         | 1.000         | 1.25         | 1.000         | 98903      | 0.70   | 109895              |

### 6. Pullout Strength of Anchor in Tension (Sec. 17.6.3)

$$\phi N_{pn} = \phi \Psi_{c,P} N_p = \phi \Psi_{c,P} 8 A_{brg} f_c \text{ (Sec. 17.5.1.2, Eq. 17.6.3.1 \& 17.6.3.2.2a)}$$

| $\Psi_{c,P}$ | $A_{brg}$ (in <sup>2</sup> ) | $f_c$ (psi) | $\phi$ | $\phi N_{pn}$ (lb) |
|--------------|------------------------------|-------------|--------|--------------------|
| 1.4          | 5.15                         | 2500        | 0.70   | 101018             |



## STRUCTURAL CALCULATIONS

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### 8. Steel Strength of Anchor in Shear (Sec. 17.7.1)

| $V_{sb}$ (lb) | $\phi_{grout}$ | $\phi$ | $\phi_{grout}\phi V_{sb}$ (lb) |
|---------------|----------------|--------|--------------------------------|
| 21090         | 1.0            | 0.65   | 13709                          |

### 10. Concrete Pryout Strength of Anchor in Shear (Sec. 17.7.3)

$\phi V_{spg} = \phi K_{cp} N_{cbg} = \phi K_{cp} (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$  (Sec. 17.5.1.2 & Eq. 17.7.3.1b)

| $K_{cp}$ | $A_{Nc}$ (in <sup>2</sup> ) | $A_{Nco}$ (in <sup>2</sup> ) | $\Psi_{ec,N}$ | $\Psi_{ed,N}$ | $\Psi_{c,N}$ | $\Psi_{cp,N}$ | $N_b$ (lb) | $\phi$ | $\phi V_{spg}$ (lb) |
|----------|-----------------------------|------------------------------|---------------|---------------|--------------|---------------|------------|--------|---------------------|
| 2.0      | 4257.56                     | 2916.00                      | 1.000         | 1.000         | 1.250        | 1.000         | 98903      | 0.70   | 252710              |

## 11. Results

### Interaction of Tensile and Shear Forces (Sec. 17.8)

| Tension           | Factored Load, $N_{ua}$ (lb) | Design Strength, $\phi N_n$ (lb) | Ratio          | Status         |        |
|-------------------|------------------------------|----------------------------------|----------------|----------------|--------|
| Steel             | 19641                        | 26363                            | 0.75           | Pass (Governs) |        |
| Concrete breakout | 39281                        | 109895                           | 0.36           | Pass           |        |
| Pullout           | 19641                        | 101018                           | 0.19           | Pass           |        |
| Shear             | Factored Load, $V_{ua}$ (lb) | Design Strength, $\phi V_n$ (lb) | Ratio          | Status         |        |
| Steel             | 923                          | 13709                            | 0.07           | Pass (Governs) |        |
| Pryout            | 3693                         | 252710                           | 0.01           | Pass           |        |
| Interaction check | $N_{ua}/\phi N_n$            | $V_{ua}/\phi V_n$                | Combined Ratio | Permissible    | Status |
| Sec. 17.8.1       | 0.75                         | 0.00                             | 74.5%          | 1.0            | Pass   |

PAB8 (1"Ø) with hef = 18.000 inch meets the selected design criteria.

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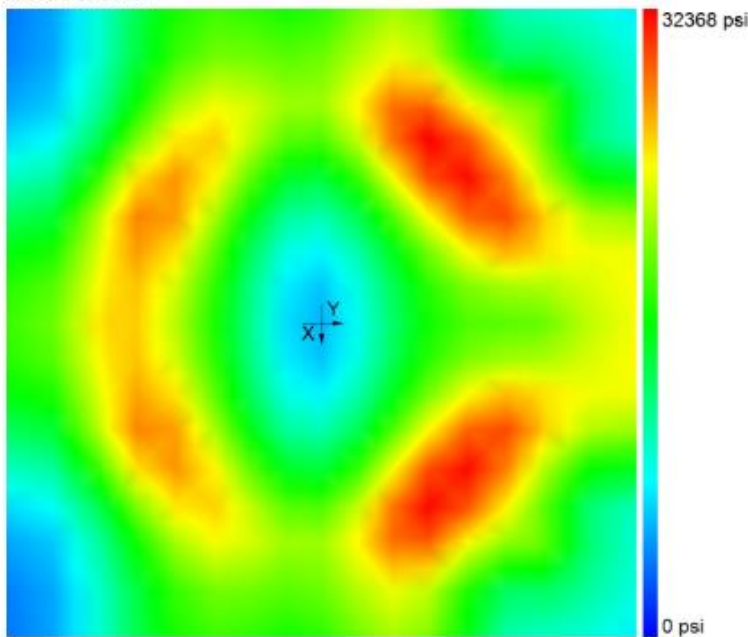
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### Base Plate Thickness

Required base plate thickness: 0.971 inch

Steel **36000 psi**  
 Maximum stress **32368 psi**  
 Calculated plate thickness **0.971 inch**

Stress distribution



For ACI and CSA design methods, maximum base plate stress is limited to 0.9 times yield stress.  
 For ETAG design method, maximum base plate stress is limited to yield stress divide by 1.5.  
 Plate stress is derived using Von Mises theory.

$$\sigma_{xx} = \frac{F_{xx}}{t} + \frac{6M_{xx}}{t^2} (@ \text{bottom}) \text{ or } \sigma_{xx} = \frac{F_{xx}}{t} - \frac{6M_{xx}}{t^2} (@ \text{top})$$

$$\sigma_{yy} = \frac{F_{yy}}{t} + \frac{6M_{yy}}{t^2} (@ \text{bottom}) \text{ or } \sigma_{yy} = \frac{F_{yy}}{t} - \frac{6M_{yy}}{t^2} (@ \text{top})$$

$$\sigma_{xy} = \frac{F_{xy}}{t} + \frac{6M_{xy}}{t^2} (@ \text{bottom}) \text{ or } \sigma_{xy} = \frac{F_{xy}}{t} - \frac{6M_{xy}}{t^2} (@ \text{top})$$

$$\sigma_{xz} = \frac{V_x}{t}$$

$$\sigma_{yz} = \frac{V_y}{t}$$

$\sigma_{xx}, \sigma_{yy}, \sigma_{xy}$  as follows:

$$S_1 = \frac{\sigma_{xx} + \sigma_{yy}}{2} + \sqrt{\left(\frac{\sigma_{xx} - \sigma_{yy}}{2}\right)^2 + \sigma_{xy}^2}$$

$$S_2 = \frac{\sigma_{xx} + \sigma_{yy}}{2} - \sqrt{\left(\frac{\sigma_{xx} - \sigma_{yy}}{2}\right)^2 + \sigma_{xy}^2}$$

$$S_3 = 0$$

$$\sigma_{\text{Von Mises}} = \sqrt{\frac{(S_1 - S_2)^2 + (S_1 - S_3)^2 + (S_2 - S_3)^2}{2}}$$