

DEPARTMENT OF VETERANS AFFAIRS
NATIONAL CEMETERY ADMINISTRATION

**ADMINISTRATION/ PUBLIC RESTROOM RENOVATION
AND NEW EQUIPMENT BUILDING**

LONG ISLAND NATIONAL CEMETERY
FARMINGDALE, NY

PROJECT NO. 805 CM 3038

CALCULATIONS AND CUT SHEETS
CD2 SUBMISSION

MAY 6, 2014

PREPARED BY:

MTR LANDSCAPE ARCHITECTS
101 BELLEVUE ROAD, PITTSBURGH, PA 15299

KCI TECHNOLOGIES
936 RIDGEBROOK RD., SPARKS, MD 21152

LONG ISLAND NATIONAL CEMETERY

Administration / Public Restroom Renovation
And New Equipment Building

CIVIL DESIGN CALCULATIONS

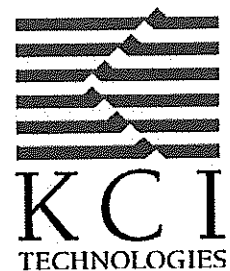
Project 815CM 3038

Structural Engineer:

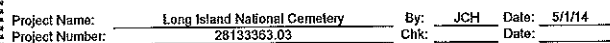
KCI Technologies, Inc

Contact – James Hankinson, PE
936 Ridgebrook Road
Sparks, MD 21152

KCI Project No: 28133363.03A



May 6, 2014



Disturbed Area (LOD) = 2.54 ac
Soil Hydrologic Classification = 'B' (Haven Loam, 0 to 2 percent slopes)

Existing Conditions Impervious =	2.17 ac
Existing Conditions Pervious =	0.37 ac

Proposed Conditions Impervious = 2.04 ac
Proposed Conditions Pervious = 0.50 ac

Impervious area Reduction = 0.13 ac.

Proposed improvements reduce the onsite impervious area, therefore peak runoff will be reduced. By reducing the peak runoff, the project will comply with Section 438 of EISA 2007.

LONG ISLAND NATIONAL CEMETERY

Administration / Public Restroom Renovation
And New Equipment Building

STRUCTURAL DESIGN CALCULATIONS

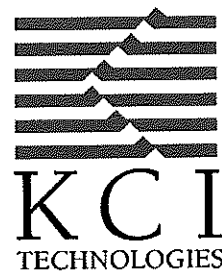
Project 815CM 3038

Structural Engineer:

KCI Technologies, Inc

Contact – Nicole Baer, PE
936 Ridgebrook Road
Sparks, MD 21152

KCI Project No: 28133363.03A



May 6, 2014

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Design Criteria per IBC

 PROJECT Long Island NC
 KCI # 28133363.03A

 DESIGNED BY NDB DATE 11-02-2013
 CHECKED BY LJB DATE 1-9-14
SCOPE:

Determine wind, snow, seismic, and live loads applicable to the project.

REFERENCE CODES/TECHNICAL DATA:

Per International Building Code (IBC 2009), with reference to ASCE 7 (05) "Design Loads for Buildings and Other Structures"

SITE/BUILDING INFORMATION:
 OCCUPANCY CATEGORY: II (Standard)
 WIND EXPOSURE: C
 LOCATION: East Farmingdale, Suffolk County, NY 11735
LIVE LOADS:
 IBC Table 1607.1: Offices = 50 PSF
 Corridors = 100 PSF
 Storage Areas = 125 PSF
USE: 50 PSF (Admin) / 125 PSF (ESB)ROOF LIVE LOAD:
 IBC Table : Ordinary Flat Roof: 20 PSF (plus 300 lb concentrated load)
 Awnings and Canopies: 5 PSF
USE: 30 PSF RLLSNOW LOADS:

ASCE 7 (Figure 7-1): East Farmingdale, NY	$P_g := 30 \cdot \text{psf}$	Ground snow load
ASCE 7 (Table 7-4): Occupancy III	$I_s := 1.0$	Snow importance factor
ASCE 7 (Table 7-2): Exp B, Partial	$C_e := 1.0$	Exposure factor
ASCE 7 (Table 7-3): Unheated	$C_t := 1.2$	Thermal factor
ASCE 7 Section 7.3.4:	$P_{f2} := 20 \cdot \text{psf}$	Minimum flat roof load

2(4)

$$P_{f1} := 0.7 \cdot P_g \cdot C_e \cdot C_t \cdot I_s = 25.2 \text{ psf}$$

Calculated flat roof snow load

$$P_f := \max(P_{f1}, P_{f2}) = 25.2 \text{ psf} \quad \text{FLAT ROOF SNOW LOAD}$$

DRIFT LOAD AT LOW ROOF:

$$l_{opp_long} := 99.5 \quad \text{length opposite the long side, ft} \quad l_u := l_{opp_long} = 99.5$$

$$p_g := \frac{P_g}{\text{psf}} = 30 \quad (\text{converts to unitless for equation below})$$

$$\text{density} := 0.13 \cdot p_g + 14 = 17.9 \quad \gamma := \text{density} \cdot \text{pcf}$$

$$\text{Long side height: } h_d := 0.43 \cdot (l_u)^{\frac{1}{3}} \cdot (p_g + 10)^{\frac{1}{4}} - 1.5 = 3.511 \quad \text{feet}$$

$$\text{Long side load: } \text{Snow_Drift}_{long} := \gamma \cdot h_d \cdot \text{ft} = 62.847 \text{ psf}$$

$$\text{Width_Drift}_{long} := 4 \cdot h_d \cdot \text{ft} = 14.044 \text{ ft}$$

$$l_{opp_short} := 97.5 \quad \text{length opposite the short side, ft} \quad l_u := l_{opp_short} = 97.5$$

*Note: Used maximum length of low roof, because high roof extends beyond several low roofs

$$\text{Short side height: } h_d := 0.43 \cdot (l_u)^{\frac{1}{3}} \cdot (p_g + 10)^{\frac{1}{4}} - 1.5 = 3.477 \quad \text{feet}$$

$$\text{Snow_Drift}_{short} := \gamma \cdot h_d \cdot \text{ft} = 62.242 \text{ psf}$$

$$\text{Width_Drift}_{short} := 4 \cdot h_d \cdot \text{ft} = 13.909 \text{ ft}$$

WIND LOAD CRITERIA:

IBC (Figure 1-609): East Farmington, NY

$$\text{wind_speed} := 120 \cdot \text{mph}$$

ASCE 7 (Table 6-1) : Occupancy II, non hurricane

$$I_w := 1.0$$

Site Parameters:

Exposure C

SEISMIC LOAD CRITERIA: EQUIVALENT LATERAL FORCE PROCEDURE

Soil Site Class: Site Class D (ASSUMED)

Approximate Period (ASCE 7-05, Section 12.8.2.1): $C_t := 0.028$ coefficients - steel moment-resisting frames

$$x := 0.8$$

$$h_n := 20 \quad \text{height above grade in feet}$$

$$T_a := C_t \cdot h_n^x = 0.308 \quad \text{APPROXIMATE PERIOD}$$

3/4

Long Period Transition Period (ASCE 7-05, Section 11.4.5, Figure 22-15):

$$T_L := 6$$

SEISMIC DESIGN CATEGORY:

Per 22-1 (5s) and 22-2 (S1)

$$S_s := 0.224$$

$$S_1 := 0.064$$

Unadjusted spectral
response, see Fig 1

ASCE 7 (05) Table 11.4-1 Site Coefficient:

$$F_a := 1.6$$

based on Site Class D

ASCE 7 (05) Table 11.4-2 Site Coefficient:

$$F_v := 2.4$$

based on Site Class D

$$S_{DS} := \frac{2 \cdot S_s \cdot F_a}{3} = 0.239$$

$$S_{D1} := \frac{2 \cdot S_1 \cdot F_v}{3} = 0.102$$

Table 11.6-1:
Design Category BTable 11.6-2:
Design Category B

SEISMIC DESIGN CATEGORY = B

ASCE 7 (Table 11.5-1): Occupancy II

$$I_e := 1.00$$

RESPONSE MODIFICATION FACTOR (R)

ASCE 7 (Table 12.1-1): Ordinary Steel Concentric Frame

$$R_{mod} := 3.25$$

SEISMIC RESPONSE COEFFICIENT (Cs):

ASCE 7 (12.8.1.1):

$$C_{s2} := \frac{S_{DS}}{\left(\frac{R_{mod}}{I_e} \right)} = 0.074$$

(Equation 12.8-2)

$$C_{s_{max_check}} := T_a > T_L = 0$$

$$C_{s_{min_check}} := S_1 \geq 0.6 = 0$$

$$C_{s3} := \frac{S_{D1}}{T_a \cdot \left(\frac{R_{mod}}{I_e} \right)} = 0.102$$

(Equation 12.8-3)

$$C_{s5} := \frac{0.5 \cdot S_1}{\left(\frac{R_{mod}}{I_e} \right)} = 0.01$$

$$C_{s4} := \frac{S_{D1} \cdot T_L}{T_a^2 \cdot \left(\frac{R_{mod}}{I_e} \right)} = 1.998$$

(Equation 12.8-4)

DESIGN CRITERIA (IBC)**Long Island NC
28133363.03A**

$$C_{s_max} := \text{if}(C_{s_max_check} = 1, C_{s4}, C_{s3}) = 0.102$$

$$C_{s_min} := \text{if}(C_{s_min_check} = 1, C_{s5}, C_{s2}) = 0.074 \quad 4/4$$

Per code, C_s is equal to equation 12.8-2, but need not be more than $C_{s(max)}$. It also must be at least $C_{s(min)}$ when S_I is greater than or equal to 0.6. User to check this criteria and adjust C_s below if necessary.

$$C_s := \min(C_{s_min}, C_{s_max}) = 0.074$$

Effective weight of structure (estimated):

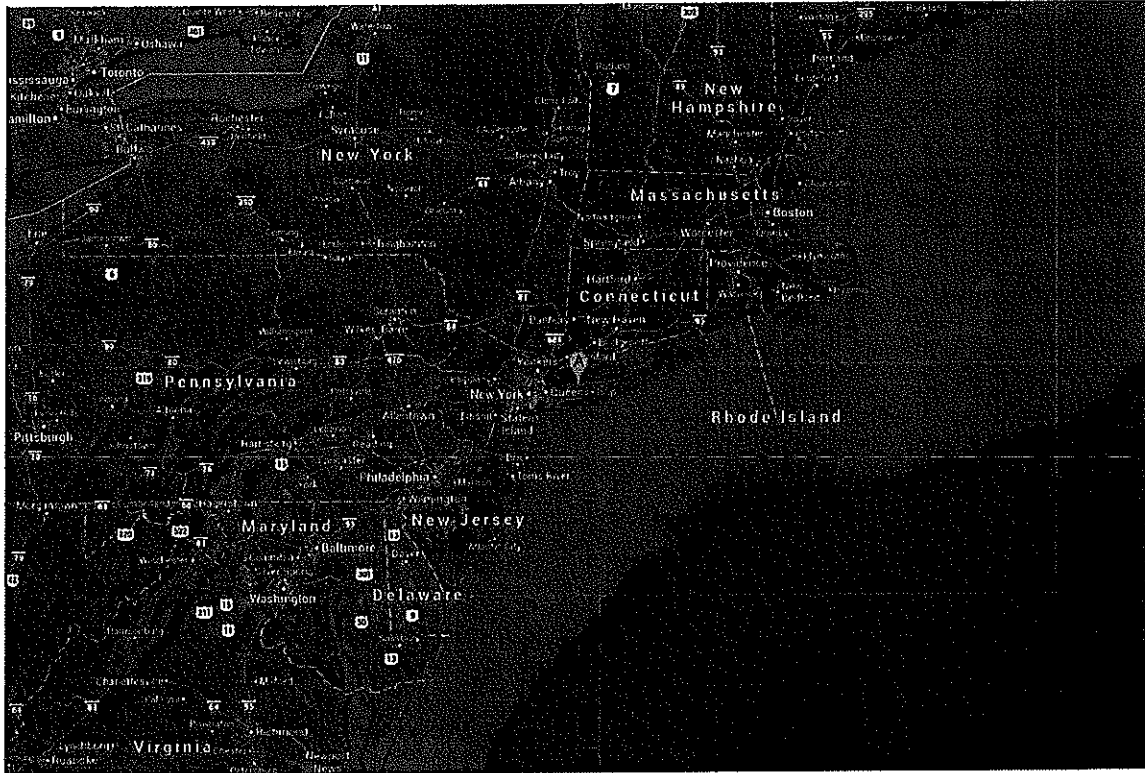
$$W_{total} := 221 \cdot \text{kip}$$

BASE SHEAR (V):

$$V := C_s \cdot W_{total} = 16.25 \text{ kip}$$

Google

To see all the details that are visible on the screen, use the "Print" link next to the map.





Design Report
SBS 10.5B
54104

USED AS B.O.D. FOR FOOTING
DESIGNS

Dave Severance
Project ID:
59 Fine Road
High Bridge, NJ, 08829

Order

Release:
Service Rep:
District Manager:
Purchaser:

SBS 10.5B
Marcy Turner
Dave Severance

Shipping Point:
Sec. to Pri. Connection:
Est. Date:
Project ID:

Elizabethton, TN
Welded Clips
12/20/2013

BUILDING CODE

Project Use Category: Commercial ✓
Building Code: 2010 New York ✓

Jobsite State: NY ✓
Jobsite County: Suffolk ✓
Jobsite City:

Live/Wind

Live Load: 20.000 psf ✓
Reduction: No

Wind Speed: 120.00 mph ✓
Wind Exposure: Exposure B ✓
Hurricane Coastline: No

Wind Category: N/A
Miles From Coastline: N/A
Rain Intensity: 6.0000 in/hr

Snow

Ground Snow Load: 30.000 psf ✓
Min Roof Snow Load: 0.000 psf
Thermal Condition: N/A

Snow Exposure: Partially Exposed
Rain Load: N/A
Elevation Above Sea Level: N/A

Seismic

Spectral Response(Ss): 16.00 % ✓
Spectral Response(Sh): N/A
Spectral Response(S1): 6.00 % ✓
Spectral Response(S2): N/A
Velocity Coefficient(Aa): N/A
Accelerated Coefficient(Av): N/A

% of Snow Load for Seismic: Normal
Seismic Zone: N/A
Near Source Factor: N/A
Design Seismic For Schools: N/A
Soil Type: (D) Stiff Soil ✓



Design Report
SBS 10.5B
54104

Dave Severance
Project ID:

BUILDING A - Vehicle Storage

Label:	A	Type:	Stand Alone
Structure:	New	Frame Type:	Symmetrical
Attachment:	No	Elevation A:	Sidewall

GEOMETRY, SIDEWALLS & ENDWALLS

Width: 58'-6" Length: 92'-0"

SWA

Eave Height: 15'-0"
Roof Slope: 2.000000 / 12
Dist. to Ridge: 29'-3"
Girts: 8.0" - 1" Outset

SWC

Eave Height: 15'-0"
Roof Slope: 2.000000 / 12
Dist. to Ridge: 29'-3"
Girts: 8.0" - 1" Outset

EWB

Type: Non-Expandable Bearing Frame
Girts: 8.0" - 1" Outset
User Specified Setback: System Standard 0'-4"
Designed Setback: System Standard 0'-4"
Gable Flash: Yes
Insulation Trim: No
Purlins: 8.0" Z
Steel Shop Coat: Red
Bolt Finish: Unpainted

EWD

Type: Non-Expandable Bearing Frame
Girts: 8.0" - 1" Outset
User Specified Setback: System Standard 0'-4"
Designed Setback: System Standard 0'-4"
Gable Flash: System Standard 0'-4"
Insulation Trim: Yes
Pregalv. Secondary: No
Hot-Dipped Primary: No
Seal Welds: N/A
Frame Bolt Washers: No



Design Report
SBS 10.5B
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Dave Severance
Project ID:

BUILDING A - Vehicle Storage

SPACINGS:

Bay Spacing (EWB-EWD): 23'-0", 23'-0", 23'-0", 23'-0"

EWB COL. Spacing (SWC-SWA): 14'-3", 30'-0", 14'-3"

EWD COL. Spacing (SWA-SWC): 14'-3", 30'-0", 14'-3"

EWB COL. Recesses (SWC-SWA): 0", 0", 0", 0"

EWD COL. Recesses (SWA-SWC): 0", 0", 0", 0"

* Note - Negative column recess raises the base of the column above the finished floor.

SWA Girt Locations (Base to Eave): 3'-6", 7'-4", 10'-10"

SWC Girt Locations (Base to Eave): 3'-6", 7'-4", 10'-10"

EWB Girt Locations (Base to Peak): 3'-6", 7'-4", 10'-10", 15'-10 1/2", 18'-2"

EWD Girt Locations (Base to Peak): 3'-6", 7'-4", 10'-10", 15'-10 1/2", 18'-2"

Purlin Spacing: System Standard

Purlin Locations on the Slope (SWA - Eave to Peak): 2@4'-8 7/8", 5'-0 1/4", 4'-9 13/16", 4'-1 1/4", 5'-0 1/4"

Purlin Locations on the Slope (SWC - Eave to Peak): 2@4'-8 7/8", 5'-0 1/4", 4'-9 13/16", 4'-1 1/4", 5'-0 1/4"

FRAME GROUPS

Group Number: 1

Frame Lines: 2, 3, 4

SWA

Column: Tapered Allowed
Unbraced: No
Max Col. Web Depth: 72.00"
Max Raf. Web Depth: 72.00"
Ext Col. Elevation: At Finished Floor

SWC

Column: Tapered Allowed
Unbraced: No
Max Col. Web Depth: 72.00"
Max Raf. Web Depth: 72.00"
Ext Col. Elevation: At Finished Floor



Design Report
SBS 10.5B
54104

Dave Severance
Project ID:

Building A - Vehicle Storage

LOADS, WIND ENCLOSURE, DEFLECTIONS & SIDESWAY

Building Loads

Roof Snow Load By Design:
Occupancy Category:
Thermal Condition:
Seismic Design Category:

21,000 psf $X 1.2 = 25,200$
II - Normal
~~Heated~~ UNHEATED
B

Importance Factors

Snow Is: 1.00
Wind Is: 1.00
Seismic Is: 1.00
Designed Snow Exposure: Partially Exposed

Wind Enclosure

Wind Enclosure:
Are framed openings enclosed with materials that are designed to withstand the wind load and wind borne debris (if applicable):
Are all Open Areas for Other enclosed with materials designed to resist the wind load and wind borne debris (if applicable):
Open Building Condition:

Calculated - Enclosed

Yes

Yes

Obstructed flow

Uniform Collateral Loads

Ceiling Load: 0.000 psf
Ceiling Type: Acoustical/Other
Brittle Wall/Dryvit: No

Other: 15,000 psf

✓ SOLAR
PANELS

Deflections

Purlins Live: L/150 - Default
Purlins Snow: L/180 - Default
Purlins Wind: L/180 - Default
Purlins Total Gravity: L/120 - Default
Purlins Total Uplift: N/A - Default

Rafters Live: L/180 - Default
Rafters Snow: L/180 - Default
Rafters Wind: L/180 - Default
Rafters Total Gravity: L/120 - Default
Rafters Total Uplift: N/A - Default

Girts: L/90 - Default

Endwall Columns: L/120 - Default

Roof Panel Live: L/60 - Default
Roof Panel Snow: L/60 - Default
Roof Panel Wind: L/60 - Default
Roof Panel Total Gravity: L/60 - Default
Roof Panel Total Uplift: L/60 - Default
Wall Panel Total Wind: L/60 - Default

Sidesway

Portal Frame Wind: H/60 - Default
Portal Frame Seismic: H/50 - Default
Crane: H/100 - Default

Frame Live: H/60 - Default
Frame Snow: H/60 - Default
Frame Wind: H/60 - Default
Frame Total Gravity: H/60 - Default
Frame Total Wind: H/60 - Default
Frame Total Seismic: H/50 - Default

Note - It is the responsibility of the Builder to interpret all aspects of the End Customer's specifications and incorporate the appropriate specifications, design criteria, and design loads into the Order Documents submitted to Star Building Systems.

* Note - The material supplied by Star has been designed with the following minimum deflection criteria. The actual deflection may be less depending on actual load and member length. The frame sideway for wind loading is based on ASCE 7 commentary equation CC-3 of $0.7W$.



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Project ID:

BUILDING A - Vehicle Storage

BRACING

SWA	1 Tier Rod	(EWB to EWD) @ Bays:	2
Roof:	Rod	(EWB to EWD) @ Bays:	2
SWC:	1 Tier Rod	(EWD to EWB) @ Bays:	3
EWB:	1-Tier Rod	(SWC to SWA) @ Bays:	1
EWD:	1-Tier Rod	(SWA to SWC) @ Bays:	3
Purlin:	Angles		
Girt:	Angles		
Rafter Flange Braces:	Knife Plate		
Column Flange Braces:	Standard		

Portal Frames:

SWA

Rod Tiers Above: N/A
Max Column Web Depth: 0.00"
Max Rafter Web Depth: 0.00"

SWC

Rod Tiers Above: N/A
Max Column Web Depth: 0.00"
Max Rafter Web Depth: 0.00"

Preliminary
(not for construction)

Note: It may be possible to reduce bracing costs by locating the bracing in a wider bay.
If the braced bay is not as wide as it is tall, consider moving the bracing to a bigger bay if possible.

OF PANEL (5,489 sqft)

Type: Double-Lok
Gauge: 24
Thickness: N/A
Color: SIG - 300 TBD*
Finish Warranty: Yes
Perforation Guarantee: N/A
Interior Panel: N/A
R Value: N/A

Options

SS Clip Type: High Thermal (Up to 12" Blkt. Insulation)
Thermal Blocks: None
Non-Handed Erection: N/A
Direction: N/A
UL90: Yes
UL Letter: No
Ridge Pan: No
Alignment Strip: Yes
Eave Panel Extension: No

Fastener Information

Type: Self-Drilling
Head Finish: Stainless
Length: Standard

WALL PANEL (4,782 sqft)

Type: PBR
Gauge: 26
Color: SIG - 300 TBD*
Thickness: N/A
Finish Warranty: Yes
Interior Panel: N/A
R Value: N/A

Options

Reverse Rolled: No
Washers: N/A
Concrete Notch: No

Fastener Information

Type: Self-Drilling
Head Finish: Standard
Length: 2"

SE CONDITION

Framing: Angle
Trim: F407
Closure: Foam Strip



**Design Report
SBS 10.5B
54104**

**Dave Severance
Project ID:**

BUILDING A - Vehicle Storage

TRIM

SWA Options

Trim Type:	Gutters and Downspouts
Downspout Drops:	2
Include Elbow:	Yes
Downspout Height:	15'-0"

EWB Options

Trim Type:	Gable Trim
------------	------------

Color Selections

Eave:	SIG - 300 TBD*
Gable:	SIG - 300 TBD*
Corner:	SIG - 300 TBD*
Base:	SIG - 300 TBD*
All Other:	SIG - 300 TBD*
Gutters:	SIG - 300 TBD*
Downspouts:	SIG - 300 TBD*
Roof to Roof:	N/A
Roof to Wall:	N/A

SWC Options

Trim Type:	Gutters and Downspouts
Downspout Drops:	2
Include Elbow:	Yes
Downspout Height:	15'-0"

EWD Options

Trim Type:	Gable Trim
------------	------------

Trim Profile:

Trim is 26 gauge unless noted otherwise.

(*) Denotes Signature 300 color.

Trim for roof system with Sig 300 color is 24 gauge.

Trim for wall system with Sig 300 color is 24 gauge.



Design Report
SBS 10.5B
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Dave Severance
Project ID:

BUILDING A - Vehicle Storage

DESIGN DATA FRAME(S): 2

Inside Clearance: 53'-1 1/2" Peak Clearance: 17'-1 3/4"
Peak Rafter Depth: 24.06"

Column 1 (SWC) -- S-102: Col # D-1

Column Depth
Base: 8.63"
Knee: 30.50"
Knee
Rafter Depth: 24.19"
Clearance: 12'-8 7/16"

Anchor Rods
Quantity: 4
Diameter: 0.75"
Gauge: 4.00"
Base Plate:
Length: 8.63"
Width: 6.00"
Thickness: 0.38"

Maximum Reactions
Vertical: ~~27.13 Kips~~ 29.05 Kips -15.62 Kips ✓
Horizontal: ~~15.98 Kips~~ 17.45 Kips -7.27 Kips ✓
Longitudinal: 0.00 Kips ✓ -4.48 Kips ✓

Preliminary (not for construction)

Column 2 (SWA) -- S-102: Col # D-4

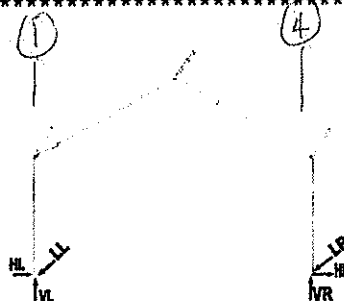
Column Depth
Base: 8.63"
Knee: 30.50"
Knee
Rafter Depth: 24.19"
Clearance: 12'-8 7/16"

Anchor Rods
Quantity: 4
Diameter: 0.75"
Gauge: 4.00"
Base Plate:
Length: 8.63"
Width: 6.00"
Thickness: 0.38"

Maximum Reactions
Vertical: ~~27.13 Kips~~ 29.05 Kips -15.62 Kips ✓
Horizontal: 7.27 Kips ✓ -15.98 Kips -17.45 Kips ✓
Longitudinal: 0.00 Kips ✓ -4.48 Kips ✓

* These reactions control the design of the anchor rods. The load combinations of these *
* reactions may not be the controlling combinations required for the design of the produced *
* foundation. It is the responsibility of the foundation engineer to determine the load *
* combinations which are required for the design of the foundation. *
* Anchor rods are not supplied by Manufacturer. *

Column 1 (SWC) -->





Design Report
SBS 10.5B
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Dave Severance
Project ID:

BUILDING A - Vehicle Storage

Individual Loads - Unfactored	Vertical	Horizontal	Longitudinal
Column 1 (SWC)			
Brace Downward forces due to Longitudinal Wind	2.919 Kips	0.003 Kips	-0.000 Kips
Brace Downward forces due to Seismic	2.044 Kips	0.002 Kips	-0.000 Kips
Brace Upward forces due to Longitudinal Wind	-2.919 Kips	0.021 Kips	-4.476 Kips
Brace Upward forces due to Seismic	-2.044 Kips	0.015 Kips	-3.134 Kips
Lateral Primary Wind Load 1	-12.275 Kips	-8.237 Kips	-0.000 Kips
Lateral Primary Wind Load 2	-6.994 Kips	-6.551 Kips	-0.000 Kips
Lateral Primary Wind Load 3	-8.996 Kips	-3.157 Kips	-0.000 Kips
Lateral Primary Wind Load 4	-3.715 Kips	-1.471 Kips	-0.000 Kips
Lateral Seismic Load	-0.368 Kips	-0.787 Kips	-0.000 Kips
Longitudinal Primary Wind Load 1	-14.508 Kips	-5.068 Kips	-0.000 Kips
Longitudinal Primary Wind Load 2	-13.010 Kips	-5.400 Kips	-0.000 Kips
Longitudinal Primary Wind Load 3	-8.803 Kips	-2.300 Kips	-0.000 Kips
Longitudinal Primary Wind Load 4	-8.172 Kips	-2.439 Kips	-0.000 Kips
Roof Collateral Load	-10.018 Kips	-5.911 Kips	-0.000 Kips
Roof Dead Load	3.004 Kips	1.606 Kips	-0.000 Kips
Roof Live Load	13.357 Kips	7.881 Kips	-0.000 Kips
Roof Snow Load	14.025 Kips	8.275 Kips	-0.000 Kips
Unbalanced Roof Snow Load Left	13.817 Kips	6.941 Kips	-0.000 Kips
Unbalanced Roof Snow Load Right	8.074 Kips	6.942 Kips	-0.000 Kips
Column 2 (SWA)			
Brace Downward forces due to Longitudinal Wind	2.919 Kips	-0.003 Kips	-0.000 Kips
Brace Downward forces due to Seismic	2.044 Kips	-0.002 Kips	-0.000 Kips
Brace Upward forces due to Longitudinal Wind	-2.919 Kips	-0.021 Kips	-4.476 Kips
Brace Upward forces due to Seismic	-2.044 Kips	-0.015 Kips	-3.134 Kips
Lateral Primary Wind Load 1	-8.996 Kips	3.157 Kips	-0.000 Kips
Lateral Primary Wind Load 2	-3.715 Kips	1.471 Kips	-0.000 Kips
Lateral Primary Wind Load 3	-6.994 Kips	-8.237 Kips	-0.000 Kips
Lateral Primary Wind Load 4	-0.368 Kips	-6.551 Kips	-0.000 Kips
Lateral Seismic Load	-13.010 Kips	-0.787 Kips	-0.000 Kips
Longitudinal Primary Wind Load 1	-14.508 Kips	-5.400 Kips	-0.000 Kips
Longitudinal Primary Wind Load 2	-8.172 Kips	-5.068 Kips	-0.000 Kips
Longitudinal Primary Wind Load 3	-8.803 Kips	2.439 Kips	-0.000 Kips
Longitudinal Primary Wind Load 4	-10.018 Kips	2.300 Kips	-0.000 Kips
Roof Collateral Load	-3.004 Kips	-5.911 Kips	-0.000 Kips
Roof Dead Load	13.357 Kips	-1.606 Kips	-0.000 Kips
Roof Live Load	14.025 Kips	-7.881 Kips	-0.000 Kips
Roof Snow Load	13.817 Kips	-8.275 Kips	-0.000 Kips
Unbalanced Roof Snow Load Left	8.074 Kips	-6.941 Kips	-0.000 Kips
Unbalanced Roof Snow Load Right	13.817 Kips	-6.942 Kips	-0.000 Kips

SEE LOAD COMBO PAGES
FOR REVISED LOAD CASES & CHECKS.



Design Report
SBS 10.5B
54104

Dave Severance
Project ID:

DESIGN DATA FRAME(S): 3

Inside Clearance: 53'-1 1/2" Peak Clearance: 17'-1 3/4"
 Peak Rafter Depth: 24.06"

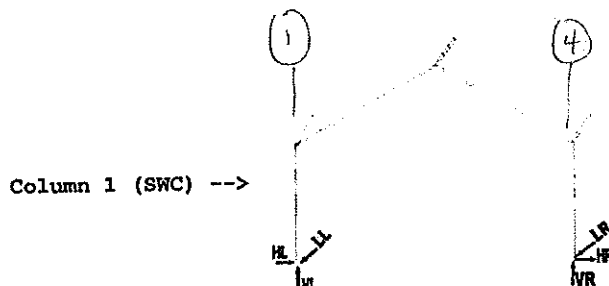
Column 1 (SWC) - S62 - COL # C-1

Column Depth		Knee	
Base:	8.63"	Rafter Depth:	24.19"
Knee:	30.50"	Clearance:	12'-8 7/16"
Anchor Rods		Base Plate:	
Quantity:	4	Length:	8.63"
Diameter:	0.75"	Width:	6.00"
Gauge:	4.00"	Thickness:	0.38"
Maximum Reactions			
Vertical:	27.33 Kips ✓ 30.06 Kips		-15.72 Kips ✓
Horizontal:	16.09 Kips ✓ 17.57 Kips		-7.33 Kips ✓
Longitudinal:	0.00 Kips ✓		-4.48 Kips ✓

Column 2 (SWA) - S62 - COL # C-4

Column Depth		Knee	
Base:	8.63"	Rafter Depth:	24.19"
Knee:	30.50"	Clearance:	12'-8 7/16"
Anchor Rods		Base Plate:	
Quantity:	4	Length:	8.63"
Diameter:	0.75"	Width:	6.00"
Gauge:	4.00"	Thickness:	0.38"
Maximum Reactions			
Vertical:	27.33 Kips ✓ 30.06 Kips		-15.72 Kips ✓
Horizontal:	7.33 Kips ✓		-16.09 Kips ✓ 17.57 Kips
Longitudinal:	0.00 Kips ✓		-4.48 Kips ✓

 * These reactions control the design of the anchor rods. The load combinations of these *
 * reactions may not be the controlling combinations required for the design of the produced *
 * foundation. It is the responsibility of the foundation engineer to determine the load *
 * combinations which are required for the design of the foundation. *
 * Anchor rods are not supplied by Manufacturer. *





Design Report
SBS 10.5B
54104

Dave Severance
Project ID:

Individual Loads - Unfactored	Vertical	Horizontal	Longitudinal
Column 1 (SWC)			
Brace Downward forces due to Longitudinal Wind	2.919 Kips	0.003 Kips	-0.000 Kips
Brace Downward forces due to Seismic	2.044 Kips	0.002 Kips	-0.000 Kips
Brace Upward forces due to Longitudinal Wind	-2.919 Kips	0.021 Kips	-4.476 Kips
Brace Upward forces due to Seismic	-2.044 Kips	0.015 Kips	-3.134 Kips
Lateral Primary Wind Load 1	-12.365 Kips	-8.297 Kips	-0.000 Kips
Lateral Primary Wind Load 2	-7.045 Kips	-6.599 Kips	-0.000 Kips
Lateral Primary Wind Load 3	-9.062 Kips	-3.180 Kips	-0.000 Kips
Lateral Primary Wind Load 4	-3.742 Kips	-1.481 Kips	-0.000 Kips
Lateral Seismic Load	-0.371 Kips	-0.793 Kips	-0.000 Kips
Longitudinal Primary Wind Load 1	-14.614 Kips	-5.105 Kips	-0.000 Kips
Longitudinal Primary Wind Load 2	-13.105 Kips	-5.439 Kips	-0.000 Kips
Longitudinal Primary Wind Load 3	-8.868 Kips	-2.316 Kips	-0.000 Kips
Longitudinal Primary Wind Load 4	-8.232 Kips	-2.457 Kips	-0.000 Kips
Roof Collateral Load	10.091 Kips	5.954 Kips	-0.000 Kips
Roof Dead Load	3.018 Kips	1.614 Kips	-0.000 Kips
Roof Live Load	13.455 Kips	7.939 Kips	-0.000 Kips
Roof Snow Load	14.128 Kips	8.336 Kips	-0.000 Kips
Unbalanced Roof Snow Load Left	13.918 Kips	6.991 Kips	-0.000 Kips
Unbalanced Roof Snow Load Right	8.133 Kips	6.993 Kips	-0.000 Kips
Column 2 (SWA)			
Brace Downward forces due to Longitudinal Wind	2.919 Kips	-0.003 Kips	-0.000 Kips
Brace Downward forces due to Seismic	2.044 Kips	-0.002 Kips	-0.000 Kips
Brace Upward forces due to Longitudinal Wind	-2.919 Kips	-0.021 Kips	-4.476 Kips
Brace Upward forces due to Seismic	-2.044 Kips	-0.015 Kips	-3.134 Kips
Lateral Primary Wind Load 1	-9.062 Kips	3.180 Kips	-0.000 Kips
Lateral Primary Wind Load 2	-3.742 Kips	1.481 Kips	-0.000 Kips
Lateral Primary Wind Load 3	-12.365 Kips	8.297 Kips	-0.000 Kips
Lateral Primary Wind Load 4	-7.045 Kips	6.599 Kips	-0.000 Kips
Lateral Seismic Load	0.371 Kips	-0.792 Kips	-0.000 Kips
Longitudinal Primary Wind Load 1	-13.105 Kips	5.439 Kips	-0.000 Kips
Longitudinal Primary Wind Load 2	-14.614 Kips	5.105 Kips	-0.000 Kips
Longitudinal Primary Wind Load 3	-8.232 Kips	2.457 Kips	-0.000 Kips
Longitudinal Primary Wind Load 4	-8.868 Kips	2.316 Kips	-0.000 Kips
Roof Collateral Load	10.091 Kips	-5.954 Kips	-0.000 Kips
Roof Dead Load	3.018 Kips	-1.614 Kips	-0.000 Kips
Roof Live Load	13.455 Kips	-7.939 Kips	-0.000 Kips
Roof Snow Load	14.128 Kips	-8.336 Kips	-0.000 Kips
Unbalanced Roof Snow Load Left	8.133 Kips	-6.991 Kips	-0.000 Kips
Unbalanced Roof Snow Load Right	13.918 Kips	-6.993 Kips	-0.000 Kips

SEE LOAD COMBO PAGES
FOR REVISED LOAD CASES & CHECKS



Design Report SBS 10.5B 54104

Dave Severance
Project ID:

DESIGN DATA FRAME(S): 4 (B)

Inside Clearance: 53'-1 1/2" Peak Clearance: 17'-1 3/4"
Peak Rafter Depth: 24.06"

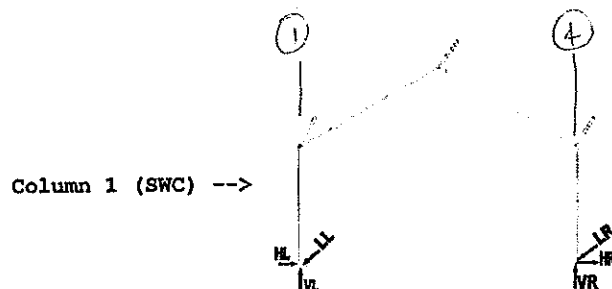
Column 1 (SWC): S102 = B-1

Column Depth		Knee	
Base:	8.63"	Rafter Depth:	24.19"
Knee:	30.50"	Clearance:	12'-8 7/16"
Anchor Rods		Base Plate:	
Quantity:	4	Length:	8.63"
Diameter:	0.75"	Width:	6.00"
Gauge:	4.00"	Thickness:	0.38"
Maximum Reactions			
Vertical:	27.13 Kips ✓	-15.62 Kips ✓	
Horizontal:	7.27 Kips ✓	-15.98 Kips ✓	
Longitudinal:	0.00 Kips ✓	-4.48 Kips ✓	

Column 2 (SWA): S102 = B-4

Column Depth		Knee	
Base:	8.63"	Rafter Depth:	24.19"
Knee:	30.50"	Clearance:	12'-8 7/16"
Anchor Rods		Base Plate:	
Quantity:	4	Length:	8.63"
Diameter:	0.75"	Width:	6.00"
Gauge:	4.00"	Thickness:	0.38"
Maximum Reactions			
Vertical:	27.13 Kips ✓	-15.62 Kips ✓	
Horizontal:	7.27 Kips ✓	-15.98 Kips ✓	
Longitudinal:	0.00 Kips ✓	-4.48 Kips ✓	

 * These reactions control the design of the anchor rods. The load combinations of these *
 * reactions may not be the controlling combinations required for the design of the produced *
 * foundation. It is the responsibility of the foundation engineer to determine the load *
 * combinations which are required for the design of the foundation. *
 * Anchor rods are not supplied by Manufacturer. *





Design Report
SBS 10.5B
54104

Dave Severance
Project ID:

Individual Loads - Unfactored	Vertical	Horizontal	Longitudinal
Column 1 (SWC)			
Brace Downward forces due to Longitudinal Wind	2.919 Kips*	0.003 Kips*	-0.000 Kips
Brace Downward forces due to Seismic	2.044 Kips	0.002 Kips	-0.000 Kips
Brace Upward forces due to Longitudinal Wind	-2.919 Kips*	0.021 Kips*	-4.476 Kips
Brace Upward forces due to Seismic	-2.044 Kips*	0.015 Kips	-3.134 Kips
Lateral Primary Wind Load 1	-12.275 Kips*	-8.237 Kips*	-0.000 Kips
Lateral Primary Wind Load 2	-6.994 Kips*	-6.551 Kips*	-0.000 Kips
Lateral Primary Wind Load 3	-8.996 Kips*	-3.157 Kips*	-0.000 Kips
Lateral Primary Wind Load 4	-3.715 Kips*	-1.471 Kips*	-0.000 Kips
Lateral Seismic Load	-0.368 Kips	-0.787 Kips*	-0.000 Kips
Longitudinal Primary Wind Load 1	-14.508 Kips*	-5.068 Kips*	-0.000 Kips
Longitudinal Primary Wind Load 2	-13.010 Kips*	-5.400 Kips*	-0.000 Kips
Longitudinal Primary Wind Load 3	-8.803 Kips*	-2.300 Kips*	-0.000 Kips
Longitudinal Primary Wind Load 4	-8.172 Kips*	-2.439 Kips*	-0.000 Kips
Roof Collateral Load	10.018 Kips	5.911 Kips	-0.000 Kips
Roof Dead Load	3.004 Kips	1.606 Kips	-0.000 Kips
Roof Live Load	13.357 Kips	7.881 Kips	-0.000 Kips
Roof Snow Load	14.025 Kips	8.275 Kips	-0.000 Kips
Unbalanced Roof Snow Load Left	13.817 Kips	6.941 Kips	-0.000 Kips
Unbalanced Roof Snow Load Right	8.074 Kips	6.942 Kips	-0.000 Kips
Column 2 (SWA)			
Brace Downward forces due to Longitudinal Wind	2.919 Kips	-0.003 Kips	-0.000 Kips
Brace Downward forces due to Seismic	2.044 Kips	-0.002 Kips	-0.000 Kips
Brace Upward forces due to Longitudinal Wind	-2.919 Kips	-0.021 Kips	-4.476 Kips
Brace Upward forces due to Seismic	-2.044 Kips	-0.015 Kips	-3.134 Kips
Lateral Primary Wind Load 1	-8.996 Kips	3.157 Kips	-0.000 Kips
Lateral Primary Wind Load 2	-3.715 Kips	1.471 Kips	-0.000 Kips
Lateral Primary Wind Load 3	-12.275 Kips	8.237 Kips	-0.000 Kips
Lateral Primary Wind Load 4	-6.994 Kips	6.551 Kips	-0.000 Kips
Lateral Seismic Load	0.368 Kips	-0.787 Kips	-0.000 Kips
Longitudinal Primary Wind Load 1	-13.010 Kips	5.400 Kips	-0.000 Kips
Longitudinal Primary Wind Load 2	-14.508 Kips	5.068 Kips	-0.000 Kips
Longitudinal Primary Wind Load 3	-8.803 Kips	2.439 Kips	-0.000 Kips
Longitudinal Primary Wind Load 4	-8.172 Kips	2.300 Kips	-0.000 Kips
Roof Collateral Load	10.018 Kips	-5.911 Kips	-0.000 Kips
Roof Dead Load	3.004 Kips	-1.606 Kips	-0.000 Kips
Roof Live Load	13.357 Kips	-7.881 Kips	-0.000 Kips
Roof Snow Load	14.025 Kips	-8.275 Kips	-0.000 Kips
Unbalanced Roof Snow Load Left	8.074 Kips	-6.941 Kips	-0.000 Kips
Unbalanced Roof Snow Load Right	13.817 Kips	-6.942 Kips	-0.000 Kips

SEE LOAD COMBO PAGES
FOR REVIEWED LOAD CASES & CHECKS



Design Report
SBS 10.5B
54104

Dave Severance
Project ID:

BUILDING A - Vehicle Storage

DESIGN DATA ENDWALL(s): EWB (COL LINE E (S102))

Column 1 (Hot Rolled)

Anchor Rods:	4	Base Plate Width:	6.00"
Anchor Rods Diameter:	0.63"	Base Plate Length:	8.00"
Column Depth:	7.89"	Base Plate Thickness:	0.38"
Flange Width:	3.94"		

Column 2 (Hot Rolled)

Anchor Rods:	4	Base Plate Width:	6.00"
Anchor Rods Diameter:	0.63"	Base Plate Length:	8.00"
Column Depth:	7.89"	Base Plate Thickness:	0.38"
Flange Width:	3.94"		

Column 3 (Hot Rolled)

Anchor Rods:	4	Base Plate Width:	6.00"
Anchor Rods Diameter:	0.63"	Base Plate Length:	8.00"
Column Depth:	7.89"	Base Plate Thickness:	0.38"
Flange Width:	3.94"		

Column 4 (Hot Rolled)

Anchor Rods:	4	Base Plate Width:	6.00"
Anchor Rods Diameter:	0.63"	Base Plate Length:	8.00"
Column Depth:	7.89"	Base Plate Thickness:	0.38"
Flange Width:	3.94"		

Individual Loads - Unfactored

Vertical Horizontal Longitudinal

Column 1 - E1

Balanced Roof Snow	0.688 Kips x1.2	0.016 Kips x1.2	0.000 Kips x1.2
Collateral Load	0.491 Kips	0.011 Kips	0.000 Kips
Dead Load	0.307 Kips	0.004 Kips	0.000 Kips
Live Load	0.655 Kips	0.015 Kips	0.000 Kips
Seismic Force Left	-0.868 Kips	-0.712 Kips	0.000 Kips
Seismic Force Right	0.749 Kips	0.000 Kips	0.000 Kips
Snow Load	0.688 Kips	0.016 Kips	0.000 Kips
SUL	-0.263 Kips	-0.006 Kips	0.000 Kips
SUR	0.537 Kips	0.012 Kips	0.000 Kips
Wind Force Left	-3.587 Kips	-1.620 Kips	0.000 Kips
Wind Force Right	0.007 Kips	-0.038 Kips	0.000 Kips
Wind Load as Inward Pressure	-1.658 Kips	-0.038 Kips	0.000 Kips
Wind Load as Outward Pressure	-1.658 Kips	-0.038 Kips	0.000 Kips

Column 2 E2

Balanced Roof Snow	6.477 Kips x1.2	0.000 Kips x1.2	0.031 Kips x1.2
Collateral Load	4.627 Kips	0.000 Kips	0.022 Kips
Dead Load	1.592 Kips	0.000 Kips	0.007 Kips
Live Load	6.169 Kips	0.000 Kips	0.029 Kips
Seismic Force Left	-0.868 Kips	0.000 Kips	0.000 Kips
Seismic Force Right	-0.749 Kips	-0.712 Kips	0.000 Kips
Snow Load	6.477 Kips	0.000 Kips	0.031 Kips
SUL	3.403 Kips	0.000 Kips	0.016 Kips
SUR	7.507 Kips	0.000 Kips	0.035 Kips
Wind Force Left	-6.300 Kips	0.000 Kips	-0.039 Kips
Wind Force Right	-9.894 Kips	1.581 Kips	-0.039 Kips
Wind Load as Inward Pressure	-8.229 Kips	0.000 Kips	3.331 Kips
Wind Load as Outward Pressure	-8.229 Kips	0.000 Kips	-3.773 Kips

Column 3 E3

Balanced Roof Snow	6.477 Kips x1.2	0.000 Kips x1.2	0.031 Kips x1.2
Collateral Load	4.627 Kips	0.000 Kips	0.022 Kips
Dead Load	1.592 Kips	0.000 Kips	0.007 Kips
Live Load	6.169 Kips	0.000 Kips	0.029 Kips



Design Report
SBS 10.5B
54104

Dave Severance
Project ID:

BUILDING A - Vehicle Storage

Individual Loads - Unfactored	Vertical	Horizontal	Longitudinal
Column 3 <i>E-3</i>			
Seismic Force Left	0.000 Kips	0.000 Kips	0.000 Kips
Seismic Force Right	0.000 Kips	0.000 Kips	0.000 Kips
Snow Load	6.477 Kips	0.000 Kips	0.031 Kips
SUL	7.507 Kips	0.000 Kips	0.035 Kips
SUR	3.403 Kips	0.000 Kips	0.016 Kips
Wind Force Left	-8.229 Kips	0.000 Kips	-0.039 Kips
Wind Force Right	-8.229 Kips	0.000 Kips	-0.039 Kips
Wind Load as Inward Pressure	-8.229 Kips	0.000 Kips	3.331 Kips
Wind Load as Outward Pressure	-8.229 Kips	0.000 Kips	-3.773 Kips
Column 4 <i>E-4</i>			
Balanced Roof Snow	0.688 Kips	-0.016 Kips	0.000 Kips
Collateral Load	0.491 Kips	-0.011 Kips	0.000 Kips
Dead Load	0.307 Kips	-0.004 Kips	0.000 Kips
Live Load	0.655 Kips	-0.015 Kips	0.000 Kips
Seismic Force Left	0.000 Kips	0.000 Kips	0.000 Kips
Seismic Force Right	0.000 Kips	0.000 Kips	0.000 Kips
Snow Load	0.688 Kips	-0.016 Kips	0.000 Kips
SUL	0.537 Kips	-0.012 Kips	0.000 Kips
SUR	-0.263 Kips	0.006 Kips	0.000 Kips
Wind Force Left	-1.658 Kips	0.038 Kips	0.000 Kips
Wind Force Right	-1.658 Kips	0.038 Kips	0.000 Kips
Wind Load as Inward Pressure	-1.658 Kips	0.038 Kips	0.000 Kips
Wind Load as Outward Pressure	-1.658 Kips	0.038 Kips	0.000 Kips

Rafter Type

Rafter Depth

1 Hot Rolled
2 Hot Rolled

11.68"
11.68"

(1) (2) (3) (4)

(SEE LOAD COMBO SHEETS FOR FULL RESULTS)



COL	VERTICAL		HORIZONTAL		LONGITUDINAL	
	MAX	MIN	MAX	MIN	MAX	MIN
E-1	1.02	-3.11	0.03	-1.01	0	0
E-2	13.99	-4.10	1.58	-0.50	0.07	-3.76
E-3	13.99	-4.50	0	0	0.07	-3.76
E-4	1.02	-1.18	0.06	0.01	0	0



Design Report
SBS 10.5B
54104

Dave Severance
Project ID:

DESIGN DATA ENDWALL(s): EWD (COL LINE A (S102))

Column 1 (Hot Rolled)

Anchor Rods: 4
Anchor Rods Diameter: 0.63"
Column Depth: 7.89"
Flange Width: 3.94"

Base Plate Width: 6.00"
Base Plate Length: 8.00"
Base Plate Thickness: 0.38"

Column 2 (Hot Rolled)

Anchor Rods: 4
Anchor Rods Diameter: 0.63"
Column Depth: 7.89"
Flange Width: 3.94"

Base Plate Width: 6.00"
Base Plate Length: 8.00"
Base Plate Thickness: 0.38"

Column 3 (Hot Rolled)

Anchor Rods: 4
Anchor Rods Diameter: 0.63"
Column Depth: 7.89"
Flange Width: 3.94"

Base Plate Width: 6.00"
Base Plate Length: 8.00"
Base Plate Thickness: 0.38"

Column 4 (Hot Rolled)

Anchor Rods: 4
Anchor Rods Diameter: 0.63"
Column Depth: 7.89"
Flange Width: 3.94"

Base Plate Width: 6.00"
Base Plate Length: 8.00"
Base Plate Thickness: 0.38"

Preliminary
(not for construction)

Individual Loads - Unfactored

Vertical

Horizontal

Longitudinal

Column 1 - A1

Balanced Roof Snow
Collateral Load
Dead Load
Live Load
Seismic Force Left
Seismic Force Right
Snow Load
SUL
SUR
Wind Force Left
Wind Force Right
Wind Load as Inward Pressure
Wind Load as Outward Pressure

(Same as E1)

0.688 Kips	0.016 Kips	0.000 Kips
0.491 Kips	0.011 Kips	0.000 Kips
0.307 Kips	0.004 Kips	0.000 Kips
0.655 Kips	0.015 Kips	0.000 Kips
0.000 Kips	0.000 Kips	0.000 Kips
0.000 Kips	0.000 Kips	0.000 Kips
0.688 Kips	0.016 Kips	0.000 Kips
-0.263 Kips	-0.006 Kips	0.000 Kips
0.537 Kips	0.012 Kips	0.000 Kips
-1.658 Kips	-0.038 Kips	0.000 Kips
-1.658 Kips	-0.038 Kips	0.000 Kips
-1.658 Kips	-0.038 Kips	0.000 Kips
-1.658 Kips	-0.038 Kips	0.000 Kips

Column 2 - A2

Balanced Roof Snow
Collateral Load
Dead Load
Live Load
Seismic Force Left
Seismic Force Right
Snow Load
SUL
SUR
Wind Force Left
Wind Force Right
Wind Load as Inward Pressure
Wind Load as Outward Pressure

(Same as E2)

6.477 Kips	0.000 Kips	0.031 Kips
4.627 Kips	0.000 Kips	0.022 Kips
1.592 Kips	0.000 Kips	0.007 Kips
6.169 Kips	0.000 Kips	0.029 Kips
0.000 Kips	0.000 Kips	0.000 Kips
0.000 Kips	0.000 Kips	0.000 Kips
6.477 Kips	0.000 Kips	0.031 Kips
3.403 Kips	0.000 Kips	0.016 Kips
7.507 Kips	0.000 Kips	0.035 Kips
-8.229 Kips	0.000 Kips	-0.039 Kips
-8.229 Kips	0.000 Kips	-0.039 Kips
-8.229 Kips	0.000 Kips	3.331 Kips
-8.229 Kips	0.000 Kips	-3.773 Kips

Column 3 - A3

Balanced Roof Snow
Collateral Load
Dead Load
Live Load

(Same as E3)

6.477 Kips	0.000 Kips	0.031 Kips
4.627 Kips	0.000 Kips	0.022 Kips
1.592 Kips	0.000 Kips	0.007 Kips
6.169 Kips	0.000 Kips	0.029 Kips



Design Report
SBS 10.5B
54104

Dave Severance
Project ID:

Individual Loads - Unfactored	Vertical	Horizontal	Longitudinal
Column 3 A3			
Seismic Force Left	-0.749 Kips	-0.712 Kips	0.000 Kips
Seismic Force Right	0.868 Kips	0.000 Kips	0.000 Kips
Snow Load	6.477 Kips	0.000 Kips	0.031 Kips
SUL	7.507 Kips	0.000 Kips	0.035 Kips
SUR	3.403 Kips	0.000 Kips	0.016 Kips
Wind Force Left	-9.894 Kips	-1.581 Kips	-0.039 Kips
Wind Force Right	-6.300 Kips	0.000 Kips	-0.039 Kips
Wind Load as Inward Pressure	-8.229 Kips	0.000 Kips	3.331 Kips
Wind Load as Outward Pressure	-8.229 Kips	0.000 Kips	-3.773 Kips
Column 4 A4			
Balanced Roof Snow	0.688 Kips	-0.016 Kips	0.000 Kips
Collateral Load	0.491 Kips	-0.011 Kips	0.000 Kips
Dead Load	0.307 Kips	-0.004 Kips	0.000 Kips
Live Load	0.655 Kips	-0.015 Kips	0.000 Kips
Seismic Force Left	0.749 Kips	0.000 Kips	0.000 Kips
Seismic Force Right	-0.868 Kips	0.712 Kips	0.000 Kips
Snow Load	0.688 Kips	-0.016 Kips	0.000 Kips
SUL	0.537 Kips	-0.012 Kips	0.000 Kips
SUR	-0.263 Kips	0.006 Kips	0.000 Kips
Wind Force Left	0.007 Kips	0.038 Kips	0.000 Kips
Wind Force Right	-3.587 Kips	1.620 Kips	0.000 Kips
Wind Load as Inward Pressure	-1.658 Kips	0.038 Kips	0.000 Kips
Wind Load as Outward Pressure	-1.658 Kips	0.038 Kips	0.000 Kips

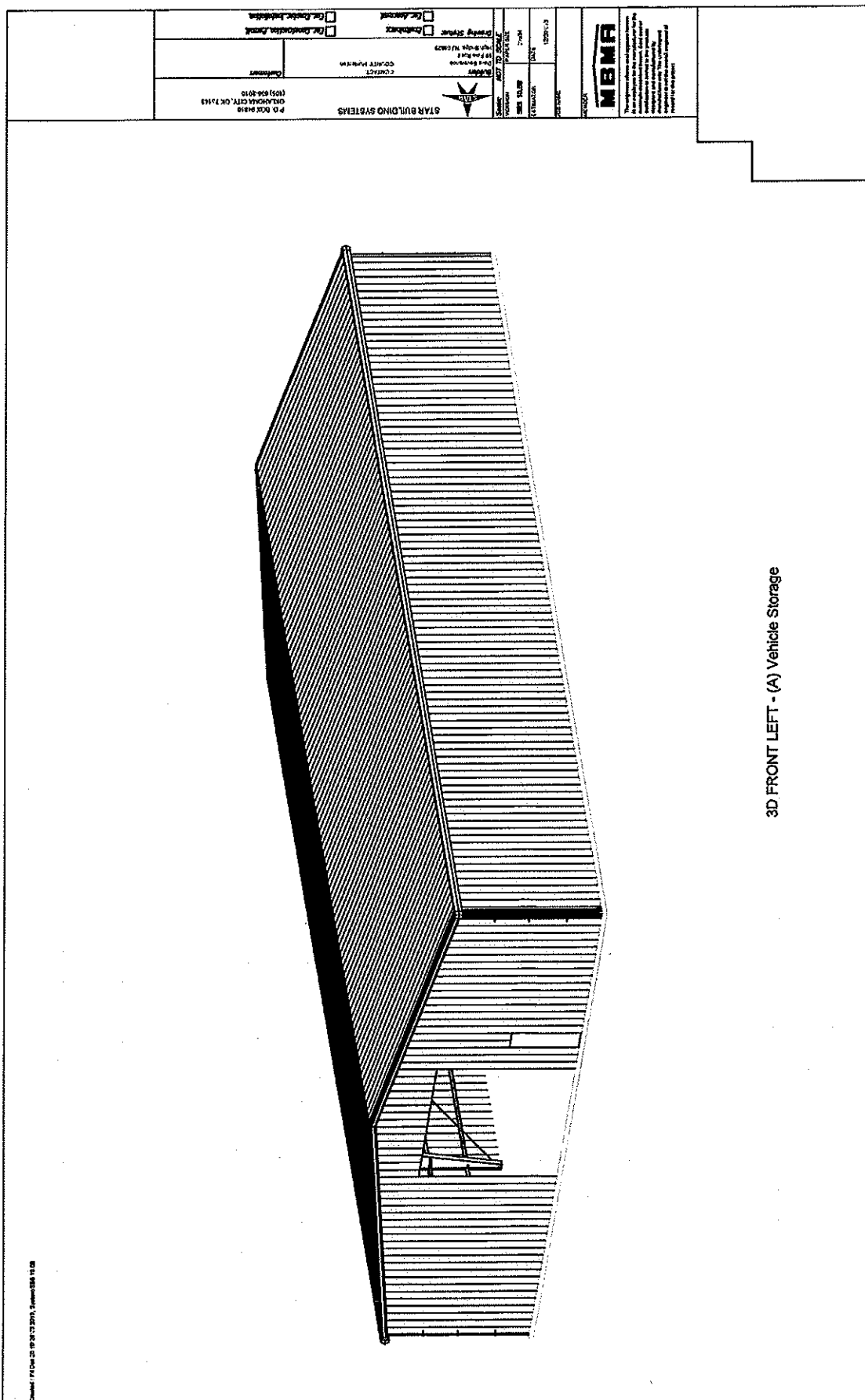
#	Rafter Type	Rafter Depth
1	Hot Rolled	11.68"
2	Hot Rolled	11.68"

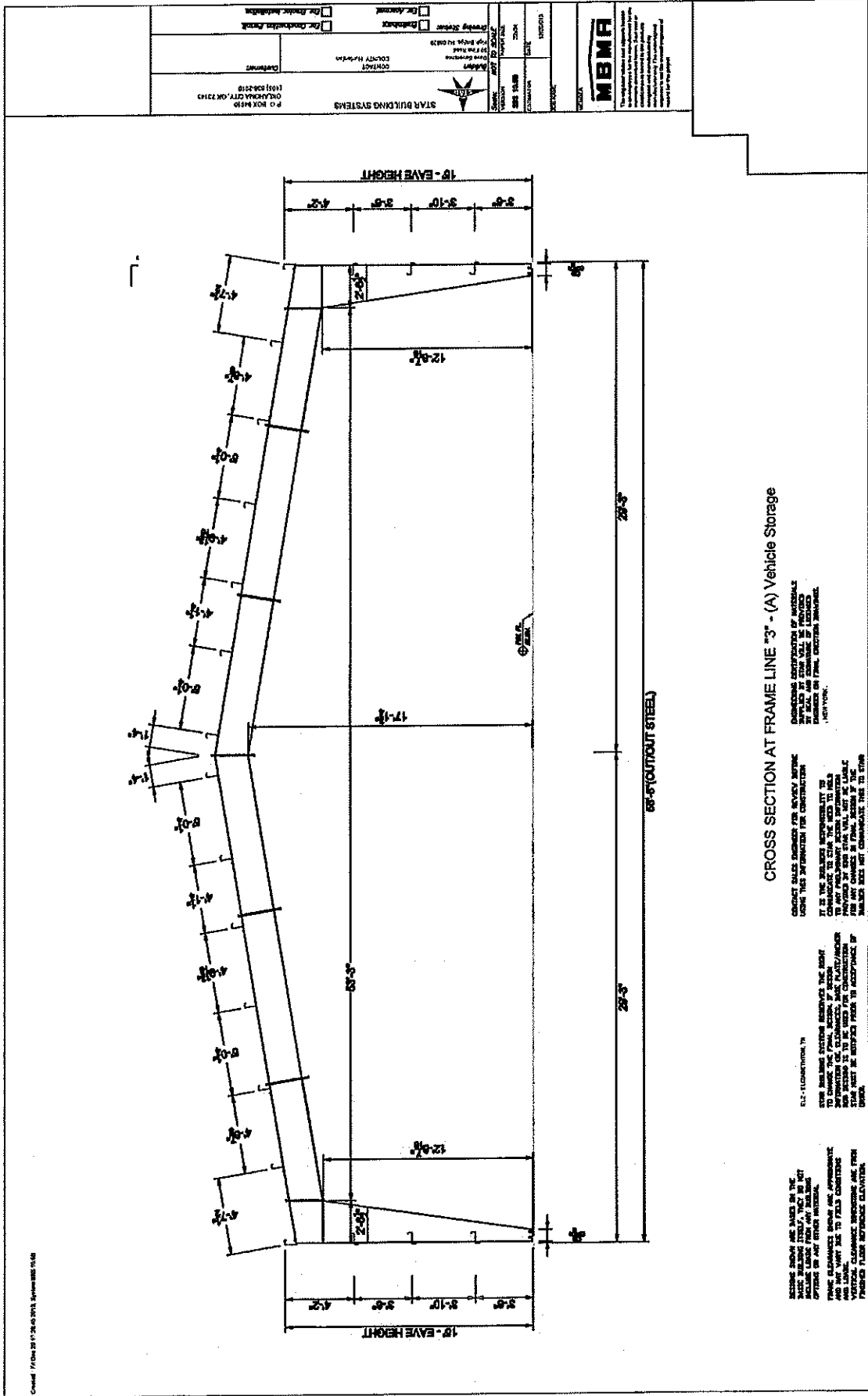


Design Report
SBS 10.5B
54104

Dave Severance
Project ID:

Design Notes







ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS
936 Ridgebrook Road • Sparks, MD 21152 • Phone 410-316-7800 • Fax 410-316-7853

PRE-ENGINEERED METAL BUILDING LOAD COMBINATION CHECK

Project Long Island NC - Equip Storage Bldg
Job No. 28133363.03A
Run Date January 5, 2014
File Name FEMB Foundation.xls
Notes Leads estimated by Star Bldg Systems for Frame 2 (SWA and SWC)

Design NDB Date 1/2/2014
Check Date

ASD Load Combinations - NY Building Code

Combination	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
D+F	13.02	7.52	0.00
D+H+F+L+T	13.02	7.52	0.00
D+H+F+Lr	26.38	15.40	0.00
D+H+F+S	29.65	17.45	0.00
D+H+F+R	13.02	7.52	0.00
D+H+F+0.75(L+T)+0.75(Lr)	23.04	13.43	0.00
D+H+F+0.75(L+T)+0.75(S)	25.64	14.96	0.00
D+H+F+0.75(L+T)+0.75(R)	13.02	7.52	0.00
D+H+F+W	-1.49	-0.72	-4.48
D+H+F+0.7E	11.59	6.97	-2.19
D+H+F+0.75W+0.75L+0.75Lr	12.16	7.25	-3.36
D+H+F+0.525E+0.75L+0.75Lr	21.97	13.01	-1.65
D+H+F+0.75W+0.75L+0.75S	14.76	8.79	-3.36
D+H+F+0.525E+0.75L+0.75S	24.57	14.55	-1.65
D+H+F+0.75W+0.75L+0.75R	2.14	1.34	-3.36
D+H+F+0.525E+0.75L+0.75R	11.95	7.10	-1.65
0.6D+W+H	-6.69	-3.73	-4.48
0.6D+0.7E+H	6.38	3.96	-2.19

Worst Case Load Combinations

Vertical Max 29.85 kips
Vertical Min -6.69 kips
Horizontal Max 17.45 kips
Horizontal Min -3.73 kips
Longitudinal Max 0.00 kips
Longitudinal Min -4.48 kips

COLUMN NAME(S) on Structural Drawings

D-1

D-4

LOAD CASES FOR THIS COLUMN

Description	Symbol	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
Dead Load	D	13.02	7.52	0.00
Earthquake Load	E	-2.04	-0.79	-3.13
Fluid Load	F	0.00	0.00	0.00
Earth Load	H	0.00	0.00	0.00
Live Load	L	0.00	0.00	0.00
Roof Live Load	Lr	13.36	7.88	0.00
Rain Load	R	0.00	0.00	0.00
Snow Load	S	16.83	9.93	0.00
Self Straining	T	0.00	0.00	0.00
Wind Load	W	-14.51	-8.24	-4.48



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PRE-ENGINEERED METAL BUILDING LOAD COMBINATION CHECK

Project Long Island NC - Equip Storage Bldg
Job No. 28133363.03A
Run Date January 5, 2014
File Name PEMB Foundation.xls
Notes Loads estimated by Star Bldg Systems for Frame 3 (SWA and SWC)

Design NOB Date 1/2/2014
Check Date

ASD Load Combinations - NY Building Code

Combination	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
D+H	13.11	7.57	0.00
D+H+F+L+T	13.11	7.57	0.00
D+H+F+Lr	26.56	15.51	0.00
D+H+F+S	30.06	17.57	0.00
D+H+F+R	13.11	7.57	0.00
D+H+F+0.75(L+T)+0.75(Lr)	23.20	13.52	0.00
D+H+F+0.75(L+T)+0.75(S)	25.82	15.07	0.00
D+H+F+0.75(L+T)+0.75(R)	13.11	7.57	0.00
D+H+F+W	-1.51	-0.73	-4.48
D+H+F+0.7E	11.68	7.01	-2.19
D+H+F+0.75W+0.75L+0.75Lr	12.24	7.30	-3.36
D+H+F+0.525E+0.75L+0.75Lr	22.13	13.11	-1.65
D+H+F+0.75W+0.75L+0.75S	14.86	8.85	-3.36
D+H+F+0.525E+0.75L+0.75S	24.75	14.65	-1.65
D+H+F+0.75W+0.75L+0.75R	2.15	1.35	-3.36
D+H+F+0.525E+0.75L+0.75R	12.04	7.15	-1.65
0.6D+W+H	-6.75	-3.76	-4.48
0.6D+0.7E+H	6.43	3.99	-2.19

Worst Case Load Combinations

Vertical Max	30.06 kips
Vertical Min	-6.75 kips
Horizontal Max	17.57 kips
Horizontal Min	-3.76 kips
Longitudinal Max	0.00 kips
Longitudinal Min	-4.48 kips

COLUMN NAME(S) on Structural Drawings

C-1

C-4

LOAD CASES FOR THIS COLUMN

Description	Symbol	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
Dead Load	D	13.11	7.57	0.00
Earthquake Load	E	-2.04	-0.79	-3.13
Fluid Load	F	0.00	0.00	0.00
Earth Load	H	0.00	0.00	0.00
Live Load	L	0.00	0.00	0.00
Roof Live Load	Lr	13.46	7.94	0.00
Rain Load	R	0.00	0.00	0.00
Snow Load	S	16.9536	10.00	0.00
Self Straining	T	0.00	0.00	0.00
Wind Load	W	-14.61	-8.30	-4.48



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PRE-ENGINEERED METAL BUILDING LOAD COMBINATION CHECK

Project Long Island NC - Equip Storage Bldg
Job No. 2-133363.03A
Run Date January 5, 2014
File Name PEMB Foundation.xls
Notes Loads estimated by Star Bldg Systems for Frame 4 (SWA and SWC)

Design NDB Date 1/2/2014
Check Date

ASD Load Combinations - NY Building Code

Combination	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
D+F	13.02	7.52	0.00
D+H+F+L+T	13.02	7.52	0.00
D+H+F+Lr	26.38	15.40	0.00
D+H+F+S	29.85	17.45	0.00
D+H+F+R	13.02	7.52	0.00
D+H+F+0.75(L+T)+0.75(Lr)	23.04	13.43	0.00
D+H+F+0.75(L+T)+0.75(S)	25.64	14.96	0.00
D+H+F+0.75(L+T)+0.75(R)	13.02	7.52	0.00
D+H+F+W	-1.49	-0.72	-4.48
D+H+F+0.7E	11.59	6.97	-2.19
D+H+F+0.75W+0.75L+0.75Lr	12.16	7.25	-3.36
D+H+F+0.525E+0.75L+0.75Lr	21.97	13.01	-1.65
D+H+F+0.75W+0.75L+0.75S	14.76	8.79	-3.36
D+H+F+0.525E+0.75L+0.75S	24.57	14.55	-1.65
D+H+F+0.75W+0.75L+0.75R	2.14	1.34	-3.36
D+H+F+0.525E+0.75L+0.75R	11.95	7.10	-1.65
0.6D+W+H	-6.69	-3.73	-4.48
0.6D+0.7E+H	6.38	3.96	-2.19

Worst Case Load Combinations

Vertical Max	29.85 kips
Vertical Min	-6.69 kips
Horizontal Max	17.45 kips
Horizontal Min	-3.73 kips
Longitudinal Max	0.00 kips
Longitudinal Min	-4.48 kips

COLUMN NAME(S) on Structural Drawings

B-1

B-4

LOAD CASES FOR THIS COLUMN

Description	Symbol	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
Dead Load	D	13.02	7.52	0.00
Earthquake Load	E	-2.04	-0.79	-3.13
Fluid Load	F	0.00	0.00	0.00
Earth Load	H	0.00	0.00	0.00
Live Load	L	0.00	0.00	0.00
Roof Live Load	Lr	13.36	7.88	0.00
Rain Load	R	0.00	0.00	0.00
Snow Load	S	16.83	9.93	0.00
Self Straining	T	0.00	0.00	0.00
Wind Load	W	-14.51	-8.24	-4.48



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PRE-ENGINEERED METAL BUILDING LOAD COMBINATION CHECK

Project Long Island NC - Equip Storage Bldg
 Job No. 28133363.03A
 Run Date January 5, 2014
 File Name FEMB Foundation.xls
 Notes Loads estimated by Star Bldg Systems for Endwalls (EWB and EWD)

Design NDB Date 1/2/2014
 Check _____ Date _____

ASD Load Combinations - NY Building Code

Combination	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
D+F	0.80	0.02	0.00
D+H+F+L+T	0.80	0.02	0.00
D+H+F+Lr	1.45	0.03	0.00
D+H+F+S	1.62	0.03	0.00
D+H+F+R	0.80	0.02	0.00
D+H+F+0.75(L+T)+0.75(Lr)	1.29	0.03	0.00
D+H+F+0.75(L+T)+0.75(S)	1.42	0.03	0.00
D+H+F+0.75(L+T)+0.75(R)	0.80	0.02	0.00
D+H+F+W	-2.79	-1.61	0.00
D+H+F+0.7E	0.19	-0.48	0.00
D+H+F+0.75W+0.75L+0.75Lr	-1.40	-1.19	0.00
D+H+F+0.525E+0.75L+0.75Lr	0.83	-0.35	0.00
D+H+F+0.75W+0.75L+0.75S	-1.27	-1.19	0.00
D+H+F+0.525E+0.75L+0.75S	0.96	-0.34	0.00
D+H+F+0.75W+0.75L+0.75R	-1.89	-1.20	0.00
D+H+F+0.525E+0.75L+0.75R	0.34	-0.36	0.00
0.6D+W+H	-3.11	-1.61	0.00
0.6D+0.7E+H	-0.13	-0.49	0.00

Worst Case Load Combinations

Vertical Max	1.62 kips
Vertical Min	-3.11 kips
Horizontal Max	0.03 kips
Horizontal Min	-1.61 kips
Longitudinal Max	0.00 kips
Longitudinal Min	0.00 kips

COLUMN NAME(S) on Structural Drawings**A-1****E-1****LOAD CASES FOR THIS COLUMN**

Description	Symbol	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
Dead Load	D	0.80	0.02	0.00
Earthquake Load	E	-0.87	-0.71	0.00
Fluid Load	F	0.00	0.00	0.00
Earth Load	H	0.00	0.00	0.00
Live Load	L	0.00	0.00	0.00
Roof Live Load	Lr	0.66	0.02	0.00
Rain Load	R	0.00	0.00	0.00
Snow Load	S	0.8256	0.02	0.00
Self Straining	T	0.00	0.00	0.00
Wind Load	W	-3.59	-1.62	0.00



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PRE-ENGINEERED METAL BUILDING LOAD COMBINATION CHECK

Project Long Island NC - Equip Storage Bldg
Job No. 28133363.03A
Run Date January 5, 2014
File Name PRMB Foundation.xls
Notes Loads estimated by Star Bldg Systems for Endwalls (EWB and EWD)

Design NDB Date 1/2/2014
Check Date

ASD Load Combinations - NY Building Code

Combination	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
D+F	6.22	0.00	0.03
D+H+F+L+T	6.22	0.00	0.03
D+H+F+Lr	12.39	0.02	0.06
D+H+F+S	13.99	0.00	0.07
D+H+F+R	6.22	0.00	0.03
D+H+F+0.75(L+T)+0.75(Lr)	10.85	0.01	0.05
D+H+F+0.75(L+T)+0.75(S)	12.05	0.00	0.06
D+H+F+0.75(L+T)+0.75(R)	6.22	0.00	0.03
D+H+F+W	-3.68	1.58	-3.74
D+H+F+0.7E	6.83	-0.50	0.03
D+H+F+0.75W+0.75L+0.75Lr	3.43	1.20	-2.78
D+H+F+0.525E+0.75L+0.75Lr	11.30	-0.36	0.05
D+H+F+0.75W+0.75L+0.75S	4.63	1.19	-2.77
D+H+F+0.525E+0.75L+0.75S	12.50	-0.37	0.06
D+H+F+0.75W+0.75L+0.75R	-1.20	1.19	-2.80
D+H+F+0.525E+0.75L+0.75R	6.67	-0.37	0.03
0.6D+W+H	-6.16	1.58	-3.76
0.6D+0.7E+H	4.34	-0.50	0.02

Worst Case Load Combinations

Vertical Max	13.99 kips
Vertical Min	-6.16 kips
Horizontal Max	1.58 kips
Horizontal Min	-0.50 kips
Longitudinal Max	0.07 kips
Longitudinal Min	-3.76 kips

COLUMN NAME(S) on Structural Drawings

A-2

E-2

LOAD CASES FOR THIS COLUMN

Description	Symbol	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
Dead Load	D	6.22	0.00	0.03
Earthquake Load	E	0.87	-0.71	0.00
Fluid Load	F	0.00	0.00	0.00
Earth Load	H	0.00	0.00	0.00
Live Load	L	0.00	0.00	0.00
Roof Live Load	Lr	6.17	0.02	0.03
Rain Load	R	0.00	0.00	0.00
Snow Load	S	7.7724	0.00	0.04
Self Straining	T	0.00	0.00	0.00
Wind Load	W	-9.89	1.58	-3.77



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PRE-ENGINEERED METAL BUILDING LOAD COMBINATION CHECK

Project Long Island NC - Equip Storage Bldg
Job No. 28133363.03A
Run Date January 6, 2014
File Name FEMB Foundation.xls
Notes Loads estimated by Star Bldg Systems for Endwalls (EWB and EWD)

Design NDH Date 1/2/2014
Check Date

ASD Load Combinations - NY Building Code

Combination	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
D+F	6.22	0.00	0.03
D+H+F+L+T	6.22	0.00	0.03
D+H+F+Lr	12.39	0.00	0.06
D+H+F+S	13.99	0.00	0.07
D+H+F+R	6.22	0.00	0.03
D+H+F+0.75(L+T)+0.75(Lr)	10.85	0.00	0.05
D+H+F+0.75(L+T)+0.75(S)	12.05	0.00	0.06
D+H+F+0.75(L+T)+0.75(R)	6.22	0.00	0.03
D+H+F+W	-2.01	0.00	-3.74
D+H+F+0.7E	6.22	0.00	0.03
D+H+F+0.75W+0.75L+0.75Lr	4.67	0.00	-2.78
D+H+F+0.525E+0.75L+0.75Lr	10.85	0.00	0.05
D+H+F+0.75W+0.75L+0.75S	5.88	0.00	-2.77
D+H+F+0.525E+0.75L+0.75S	12.05	0.00	0.06
D+H+F+0.75W+0.75L+0.75R	0.05	0.00	-2.80
D+H+F+0.525E+0.75L+0.75R	6.22	0.00	0.03
0.6D+W+H	-4.50	0.00	-3.76
0.6D+0.7E+H	3.73	0.00	0.02

Worst Case Load Combinations

Vertical Max	13.99 kips
Vertical Min	-4.50 kips
Horizontal Max	0.00 kips
Horizontal Min	0.00 kips
Longitudinal Max	0.07 kips
Longitudinal Min	-3.76 kips

COLUMN NAME(S) on Structural Drawings

A-3

E-3

LOAD CASES FOR THIS COLUMN

Description	Symbol	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
Dead Load	D	6.22	0.00	0.03
Earthquake Load	E	0.00	0.00	0.00
Fluid Load	F	0.00	0.00	0.00
Earth Load	H	0.00	0.00	0.00
Live Load	L	0.00	0.00	0.00
Roof Live Load	Lr	6.17	0.00	0.03
Rain Load	R	0.00	0.00	0.00
Snow Load	S	7.7724	0.00	0.04
Self Straining	T	0.00	0.00	0.00
Wind Load	W	-8.23	0.00	-3.77



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PRE-ENGINEERED METAL BUILDING LOAD COMBINATION CHECK

Project Long Island NC - Equip Storage Bldg
Job No. 28133363.03A
Run Date January 5, 2014
File Name PEMB Foundation.xls
Notes Loads estimated by Star Bldg Systems for Endwalls (EWB and EWD)

Design NDB Date 1/2/2014
Check _____ Date _____

A9D Load Combinations - NY Building Code

Combination	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
D+F	0.80	0.02	0.00
D+H+F+L+T	0.80	0.02	0.00
D+H+F+Lr	1.45	0.03	0.00
D+H+F+S	1.62	0.03	0.00
D+H+F+R	0.80	0.02	0.00
D+H+F+0.75(L+T)+0.75(Lr)	1.29	0.03	0.00
D+H+F+0.75(L+T)+0.75(S)	1.42	0.03	0.00
D+H+F+0.75(L+T)+0.75(R)	0.80	0.02	0.00
D+H+F+W	-0.86	0.05	0.00
D+H+F+0.7E	0.80	0.02	0.00
D+H+F+0.75W+0.75L+0.75Lr	0.05	0.05	0.00
D+H+F+0.525E+0.75L+0.75Lr	1.29	0.03	0.00
D+H+F+0.75W+0.75L+0.75S	0.17	0.06	0.00
D+H+F+0.525E+0.75L+0.75S	1.42	0.03	0.00
D+H+F+0.75W+0.75L+0.75R	-0.45	0.04	0.00
D+H+F+0.525E+0.75L+0.75R	0.80	0.02	0.00
0.6D+W+H	-1.18	0.05	0.00
0.6D+0.7E+H	0.48	0.01	0.00

Worst Case Load Combinations

Vertical Max	1.62 kips
Vertical Min	-1.18 kips
Horizontal Max	0.06 kips
Horizontal Min	0.01 kips
Longitudinal Max	0.00 kips
Longitudinal Min	0.00 kips

COLUMN NAME(S) on Structural Drawings

A-4

E-4

LOAD CASES FOR THIS COLUMN

Description	Symbol	Vertical (kip)	Horizontal (kip)	Longitudinal (kip)
Dead Load	D	0.80	0.02	0.00
Earthquake Load	E	0.00	0.00	0.00
Fluid Load	F	0.00	0.00	0.00
Earth Load	H	0.00	0.00	0.00
Live Load	L	0.00	0.00	0.00
Roof Live Load	Lr	0.66	0.02	0.00
Rain Load	R	0.00	0.00	0.00
Snow Load	S	0.8256	0.02	0.00
Self Straining	T	0.00	0.00	0.00
Wind Load	W	-1.66	0.04	0.00

KCI TECHNOLOGIES, INC.
936 Ridgebrook Rd
Sparks, MD 21152
(410)316-7800

Title : Long Island NC
Engineer: NDB
Project Desc.:

Job # 28133363.03A

✓✓✓ 1-8-14

✓ 4

General Footing

File: m:\2013\28133363.03A\Eng\Structural\28133363.03a.ec6
ENERCALC, INC. 1983-2011, Build 6.12.5.30, Ver 6.12.12.31

Lic #: KW-06007602

Licensee: KCI

Description : Footing F-1 Frame Columns (D1, D4, C1, C4, B1, B4)

General Information

Calculations per ACI 318-08, IBC 2009, CBC 2010, ASCE 7-05

Material Properties

f'_c : Concrete 28 day strength	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	0.00140
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Include Pedestal Weight as DL	:	Yes

Soil Design Values

Allowable Soil Bearing	=	3.0 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

Footing base depth below soil surface	=	4.0 ft
Allowable pressure increase per foot of dept=	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of dept=	=	ksf
when maximum length or width is greater4	=	ft

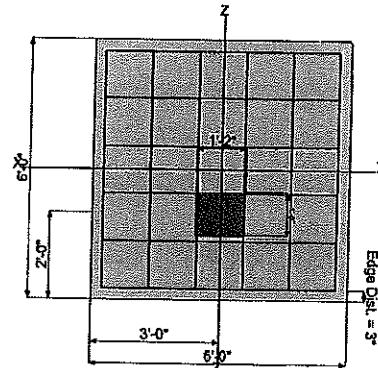
Dimensions

Width parallel to X-X Axis	=	6.0 ft
Length parallel to Z-Z Axis	=	6.0 ft
Footing Thickness	=	12.0 in

Load location offset from footing center...
ez : Pftl to Z-Z Axis = -12 in

Pedestal dimensions...

px : parallel to X-X Axis	=	14.0 in
pz : parallel to Z-Z Axis	=	12.0 in
Height	=	48.0 in
Rebar Centerline to Edge of Concrete.. at Bottom of footing	=	3.0 in



Reinforcing

Bars parallel to X-X Axis	=	6.0
Number of Bars	=	# 5
Reinforcing Bar Size	=	# 5
Bars parallel to Z-Z Axis	=	6.0
Number of Bars	=	# 5
Reinforcing Bar Size	=	# 5

Bandwidth Distribution Check (ACI 15.4.4.2)

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	=	13.110	13.460		16.950	-14.810	-2.040
OB : Overburden	=	0.0					0.60 ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=	7.570		0.0	-8.30		k