MECHANICAL COMPLIANCE SUMMARY

2018 WSEC Compliance Forms for Commercial Buildings including Group R2, R3 & R4 over 3 stories and all R1

Project & Applicant Information	**Project Title**	South Hill Mall Leasing Office - 2018 WSEC	For Building Department Use: **Date: Oct 19, 2021**
	Project Address	3500 S MERIDIAN ST 902 PUYALLUP, WA 98373	
	Applicant Name	Brian Pritchard	
	Applicant Phone	253-329-0512	
	Applicant Email	BPRITCHARD@COOLSYS.COM	

For questions about this report, contact WSEC Commercial Technical Support at 360-539-5300 or via email at com.techsupport@waenergycodes.com

General Occupancy	All Commercial		**General Building Use Type**	Office, Other		**Building Cond. Floor Area**	1,680
General Project Types	Alteration	**New Building or Addition Mechanical Scope**		**Alteration Mechanical Scope**	Single Zone Systems & Equipment	**Project Cond. Floor Area**	1,640
						Floors Above Grade	1
						Compliance Method	Not Selected
Mechanical Project Description	REMOVE AND REPLACE LIKE FOR LIKE 36000 BTU ROOF TOP UNIT. OLD UNIT IS FACTORY SPEC'D AT 564LBS AND NEW UNIT IS 602LBS. NEW UNIT HAS DEHUMIDIFICATION AND ECONOMIZED MIXED AIR.						

Mechanical Compliance Scope and Method	**Project Type**	**Mechanical Scope**	**Economizer Exception(s) Applied?**	**DOAS Ventilation Provided?**	**Higher Equipment Efficiency Option Applied?**	**Equipment Efficiency Compliance Verification**
	Alteration	Single Zone Systems & Equipment	Yes	No	NA	**COMPLIES**
Additional Efficiency Credits Included (AEC)	**Higher equipment efficiency and fan FEG**					
Does building include occupancy classifications requiring DOAS?	No		**Does project include DOAS equipment?**			No
Based on project scope do TSPR requirements apply?	No		**Do all systems comply with Appendix D standard reference design or qualify for an exception to TSPR?**			No

Scope & Space Conditioning	**ALTERATION - SINGLE ZONE SYSTEMS & EQUIPMENT**	**Compliance Verification**	**COMPLIES**

Single Zone Air Systems Category - Heat pump, packaged (PTHP, SPVHP, room)

Air Systems Summary Information

System/Equip ID	Quantity of Items	Supply Airflow Control	Ventilation Standard	Ventilation CFM (Total if Multiple Items)	Ventilation Air Source	Paired with DOAS	Ventilation energy recovery	Energy Recovery Efficiency (%)
WSC036H4R0A		Constant volume	IMC Natural Ventilation	1,200	Integral			

Air Systems & Equipment - Cooling

System/ Equip ID	Cooling System/Equip Type	Specific Type	Cooling Capacity per item (Btu/h)	AEC Efficiency Multiplier	Econo Exception Multiplier (FL & PL)	Combined Efficiency Multiplier (AEC & Econo)	Proposed Cooling Efficiency	CE Units	Proposed Part Load Efficiency	PL Units	Efficiency Compliance Verification
WSC036H4R0A	Heat pump, vertical (SPVHP)	Single package, vertical	39,000	1	0	1	12.1	EER			COMPLIES

Air Systems & Equipment - Heating

System /Equip ID	Heating System/Equip Type	Specific Type	Heat Pump Heating Capacity (Btu/h)	Cooling Capacity (Btu/h)	AEC Efficiency Multiplier	Proposed Heat Pump Heating Efficiency	HPH Units	Proposed Low OSA Temp Efficiency	LTH Units	Efficiency Compliance Verification
WSC036H4R0A	Heat pump, vertical (SPVHP), heating	Single package, vertical heat pump	35,500	39,000	1	3.5	COP			COMPLIES

Air Systems & Equipment Details

System/Equip ID	Area(s) Served	Location In Project Documents - Plan/Detail #	
WSC036H4R0A	LEASING OFFICE	HIGHLIGHTED ALL PAGES	
	System/Equip ID for a single or multiple items?: Single item		
	Economizer Compliance Method: Air-side economizer provided		WSEC Equip Efficiency Reference Table - Cooling: Table C403.3.2(3) - Packaged Terminal and Vertical AC and HP
	WSEC Equip Efficiency Reference Table - Heating: Table C403.3.2(3) - Packaged Terminal and Vertical AC and HP		

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Building	Planning
Engineering	Public Works
Fire	Traffic

PRMH20221213

FULL SIZED PLANS, SPECIFICATIONS FOR UNITS OLD AND NEW AND ENGINEERING PACKET ALL PART OF THIS 37 PAGE DOCUMENT FOR THIS PROJECT FOR INSPECTORS AND CONTRACTOR.

STRUCTURAL ABBREVIATIONS

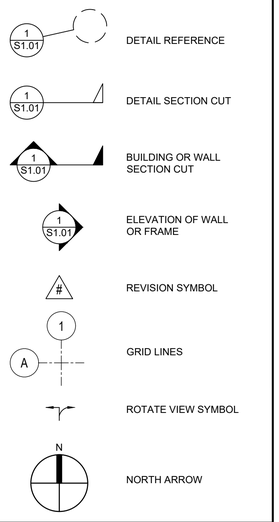
#	NUMBER OR POUNDS
AB	ANCHOR BOLT
ACI	AMERICAN CONCRETE INSTITUTE
ADDL	ADDITIONAL
ADJ	ADJACENT
AESS	ARCHITECTURALLY EXPOSED STRUCTURAL STEEL
AFF	ABOVE FINISH FLOOR
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALT	ALTERNATE
ALUM	ALUMINUM
APA	AMERICAN PLYWOOD ASSOCIATION
ARCH	ARCHITECTURAL
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ASSY	ASSEMBLY
ATR	ALL THREAD ROD
ATR/A	ALL THREAD ROD WITH ADHESIVE
AWS	AMERICAN WELDING SOCIETY
B/	BOTTOM OF
BF	BRACED FRAME
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM
BN	BOUNDARY NAIL
BOT	BOTTOM
BRBF	BUCKLING RESTRAINED BRACED FRAME
BRNG	BEARING
BSMT	BASEMENT
BTWN	BETWEEN
BU	BUILT-UP
C	CAMBER OR CHANNEL (AMERICAN STANDARD)
CANT	CANTILEVER
CIP	CAST IN PLACE
CG	CENTER OF GRAVITY
CGS	CENTER OF GRAVITY OF (PRESTRESSING) STEEL
CJ	CONTROL OR CONSTRUCTION JOINT
CJP	COMPLETE JOINT PENETRATION
CL	CENTERLINE
CLG	CEILING
CLR	CLEARANCE; CLEAR
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
COORD	COORDINATE
CSA	CONCRETE SCREW ANCHOR
d	PENNY (NAIL)
db	NOMINAL BAR DIAMETER
DBA	DEFORMED BAR ANCHOR
DBL	DOUBLE
DBO	DESIGNED BY OTHERS
DEG	DEGREE
DEMO	DEMOLISH; DEMOLITION
DF/L	DOUGLAS FIR-LARCH
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIST	DISTANCE
DL	DEAD LOAD
DN	DOWN
DTL	DETAIL
DWG	DRAWING
(E)	EXISTING
EA	EACH
EB	EXPANSION BOLT
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
EN	EDGE NAIL
EQ	EQUAL; EARTHQUAKE
EW	EACH WAY
EXT	EXTERIOR
EXTD	EXTEND; EXTENDED
f'c	28 DAY CONC COMPRESSIVE STRENGTH
FF	FINISH FLOOR
FN	FIELD NAIL
FLR	FLOOR
FDN	FOUNDATION
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FT	FEET
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GLB	GLUE LAMINATED BEAM
GWB	GYPSUM WALL BOARD
HDG	HOT-DIP GALVANIZED
HDR	HEADER
HF	HEM-FIR
HORIZ	HORIZONTAL
HSA	HEADED STUD ANCHOR
HSS	HOLLOW STRUCTURAL SECTION
HT	HEIGHT
ID	INSIDE DIAMETER
IN	INCH
INT	INTERIOR
JST	JOIST
JT	JOINT
K	KIP(S) (1,000 POUNDS)
KSI	KIPS PER SQUARE INCH
L OR 2L	ANGLE OR DOUBLE ANGLE
LF	LINEAR FOOT
LL	LIVE LOAD
LLBB	LONG LEGS BACK TO BACK
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
LVL	LAMINATED VENEER LUMBER
LWC	LIGHT WEIGHT CONCRETE

MAX	MAXIMUM
MC	MISCELLANEOUS CHANNEL
MECH	MECHANICAL
MF	MOMENT FRAME
MFR	MANUFACTURER
MEP	MECHANICAL, ELECTRICAL, PLUMBING
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
MSA	MASONRY SCREW ANCHOR
(N)	NEW
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTE	NOT TO EXCEED
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPP	OPPOSITE
OWJ	OPEN WEB JOIST
PAF	POWER-ACTUATED FASTENER
PC	PRECAST
PCF	POUNDS PER CUBIC FOOT
PERP	PERPENDICULAR
PJP	PARTIAL JOINT PENETRATION
PL	PLATE
PLF	POUNDS PER LINEAL FOOT
PLYWD	PLYWOOD
PSI	POUNDS PER SQUARE INCH
PSF	POUNDS PER SQUARE FOOT
PT	PRESSURE TREATED OR POST TENSIONED
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RAD	RADIUS
REF	REFERENCE
RAD	REFERENCE ARCH DOCUMENTS
REINF	REINFORCING
REQD	REQUIRED
REV	REVISED, REVISION
RO	ROUGH OPENING
SC	SLIP CRITICAL
SER	STRUCTURAL ENGINEER OF RECORD
SHT	SHEET
SHTG	SHEATHING
SIM	SIMILAR
SLBB	SHORT LEGS BACK TO BACK
SMS	SHEET METAL SCREW
SOG	SLAB ON GRADE
SQ	SQUARE
SS	STAINLESS STEEL
SSL	SHORT SLOTTED (HOLES)
STD	STANDARD
STL	STEEL
SQ	SQUARE
SYM	SYMMETRICAL
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
T/	TOP OF
TRANS	TRANSVERSE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
URM	UNREINFORCED MASONRY
UT	ULTRASONIC TEST
VERT	VERTICAL
VIF	VERIFY IN FIELD
W/	WITH
W/O	WITHOUT
WD	WOOD
WF	WIDE FLANGE
WP	WORK POINT
WTS	WELDED THREADED STUDS
WWR	WELDED WIRE REINFORCING

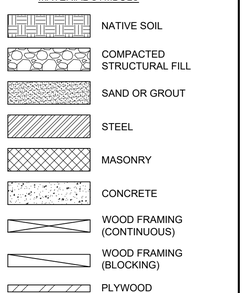
STRUCTURAL DRAWING INDEX

SHEET	DRAWING TITLE	PERMIT SET
S0.01	COVER SHEET	●
S0.02	BUILDING PLAN	●
S1.01	ROOF FRAMING PLAN	●
S8.01	MECHANICAL UNIT DETAILS	●

STRUCTURAL DRAWING SYMBOLS



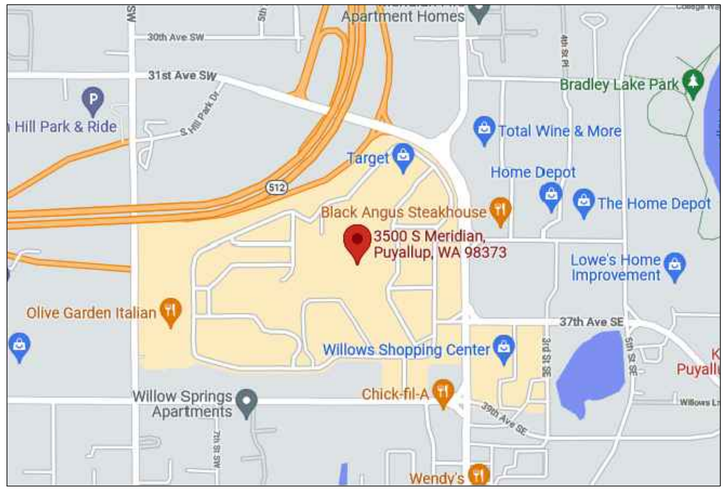
MATERIAL SYMBOLS



Approval of submitted plans is not an approval of omissions or oversight by this office or noncompliance with any applicable regulations of local government. The contractor is responsible for making sure that the building complies with all applicable building codes and regulations of the local government.

THE APPROVED CONSTRUCTION PLANS AND ALL ENGINEERING DOCUMENTS MUST BE POSTED ON THE JOB AT ALL INSPECTIONS IN A VISIBLE AND READILY ACCESSIBLE LOCATION.

FULL SIZED LEDGIBLE COLOR PLANS ARE REQUIRED TO BE PROVIDE BY THE PERMITTEE ON SITE FOR ALL INSPECTIONS MIN. PLAN SIZE 22 X 34



N 1 S0.01 VICINITY MAP N.T.S.

STRUCTURAL NOTES:

GENERAL NOTES

THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION AND CORRELATION OF ALL ITEMS AND WORK NECESSARY FOR COMPLETION OF THE PROJECT AS INDICATED BY THE CONTRACT DOCUMENTS. SHOULD ANY QUESTION ARISE REGARDING THE CONTRACT DOCUMENTS OR SITE CONDITIONS, THE CONTRACTOR SHALL REQUEST INTERPRETATION AND CLARIFICATION FROM THE ENGINEER BEFORE BEGINNING THE PROJECT. THE ABSENCE OF SUCH REQUEST SHALL SIGNIFY THAT THE CONTRACTOR HAS REVIEWED AND FAMILIARIZED HIMSELF WITH ALL ASPECTS OF THE PROJECT AND HAS COMPLETE COMPREHENSION THEREOF. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE TO ALL SAFETY REGULATIONS DURING CONSTRUCTION.

THE CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. UNLESS OTHERWISE SPECIFICALLY NOTED, THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION OR CONSTRUCTION LOADS. ONLY THE CONTRACTOR SHALL PROVIDE ALL METHODS, DIRECTION AND RELATED EQUIPMENT NECESSARY TO PROTECT THE STRUCTURE, WORKMEN AND OTHER PERSONS AND PROPERTY DURING CONSTRUCTION. THE CONTRACTOR SHALL, AT THEIR OWN EXPENSE, ENGAGE PROPERLY QUALIFIED PERSONS TO DETERMINE WHERE AND HOW TEMPORARY PRECAUTIONARY MEASURES SHALL BE USED AND INSPECT SAME IN THE FIELD. ANY MATERIAL NOT AS SPECIFIED OR IMPROPER MATERIAL INSTALLATION OR WORKMANSHIP SHALL BE REMOVED AND REPLACED WITH SPECIFIED MATERIAL IN A WORKMANLIKE MANNER AT THE CONTRACTOR'S EXPENSE.

THESE PLANS, SPECIFICATIONS, ENGINEERING AND DESIGN WORK ARE INTENDED SOLELY FOR THE PROJECT SPECIFIED HEREIN. MILLER CONSULTING ENGINEERS DISCLAIMS ALL LIABILITY IF THESE PLANS AND SPECIFICATIONS OR THE DESIGN, ADVICE AND INSTRUCTIONS ATTENDANT THERETO ARE USED ON ANY PROJECT OR AT ANY LOCATION OTHER THAN THE PROJECT AND LOCATION SPECIFIED HEREIN. OBSERVATION VISITS TO THE JOB SITE AND SPECIAL INSPECTIONS ARE NOT PART OF THE STRUCTURAL ENGINEER'S RESPONSIBILITY UNLESS THE CONTRACT DOCUMENTS SPECIFY OTHERWISE.

NON-STRUCTURAL PORTIONS OF PROJECT INCLUDING, BUT NOT LIMITED TO, PLUMBING, FIRE SUPPRESSION, ELECTRICAL, MECHANICAL, LAND USE, SITE PLANNING, EROSION CONTROL FLASHING AND WATER-PROOFING ARE BEYOND THE SCOPE OF THESE DRAWINGS AND ARE PROVIDED BY OTHERS.

BUILDING CODE

ALL PHASES OF THE WORK SHALL CONFORM TO THE 2019 OREGON STRUCTURAL SPECIALTY CODE (OSSC), BASED ON THE 2018 INTERNATIONAL BUILDING CODE (IBC), INCLUDING ALL REFERENCE STANDARDS, UNLESS NOTED OTHERWISE.

STRUCTURAL DESIGN CRITERIA

LIVE LOAD REDUCTION FOR BEAMS AND COLUMNS WAS NOT USED. DESIGN FOR MECHANICAL LOADS INCLUDES ONLY THOSE INDICATED ON STRUCTURAL DRAWINGS. THE FOLLOWING ARE THE DESIGN REQUIREMENTS:

STRUCTURAL DESIGN CRITERIA	
RISK CATEGORY	II
WIND DESIGN DATA	
BASIC DESIGN WIND SPEED (3 SEC GUST)	V = 97 MPH
EXPOSURE	B
SEISMIC DESIGN DATA	
IMPORTANCE FACTOR	Ie = 1.0
SPECTRAL RESPONSE ACCELERATIONS	SS = 1.264, S1 = 0.436
SITE CLASS	D
SPECTRAL RESPONSE COEFFICIENT	SDS = 1.011

City of Puyallup
Building
REVIEWED FOR COMPLIANCE
DLeahy
08/24/2022
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11/15/21
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STATE OF WASHINGTON
44007
STRUCTURAL ENGINEER
PROFESSIONAL ENGINEER

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Portland, OR | 97223
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MECH UNIT REPLACEMENT

SOUTH HILL MALL
COOLSYS COMMERCIAL & INDUSTRIAL SOLUTIONS
3500 S MERIDIAN STREET
PUYALLUP, WASHINGTON

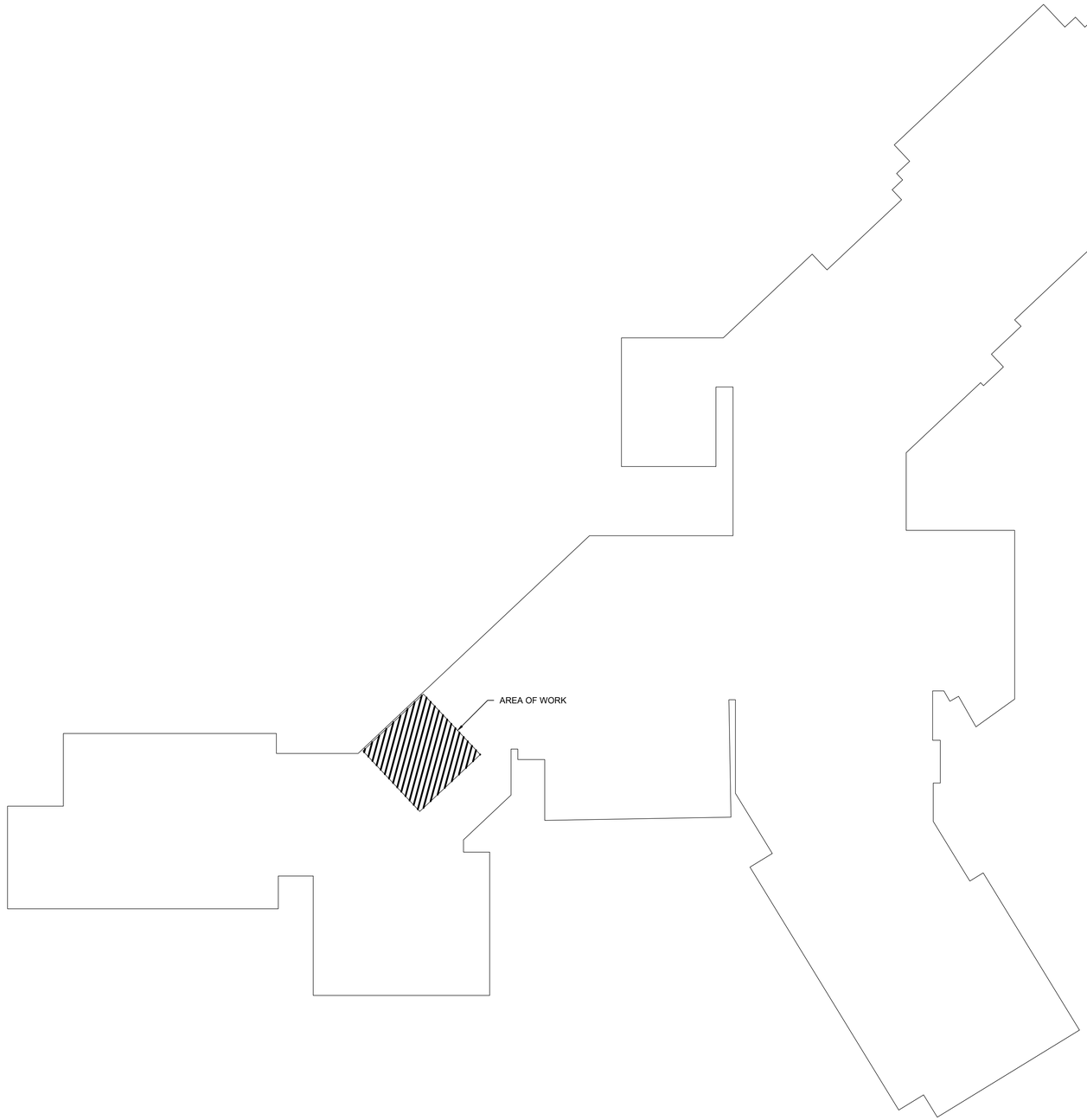
LINE IS 2 INCHES AT FULL SCALE (IF NOT 2" - SCALE ACCORDINGLY)

DRAWN BY: BCH
CHECKED BY: PRA
MCE PROJECT NO: 211478
ISSUE DATE: 11.15.21

REV.	DATE	DESCRIPTION

SHEET CONTENT
COVER SHEET

SHEET
S0.01



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S0.02

BUILDING PLAN

NTS

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MCE PROJECT NO: 211478

ISSUE DATE: 11.15.21

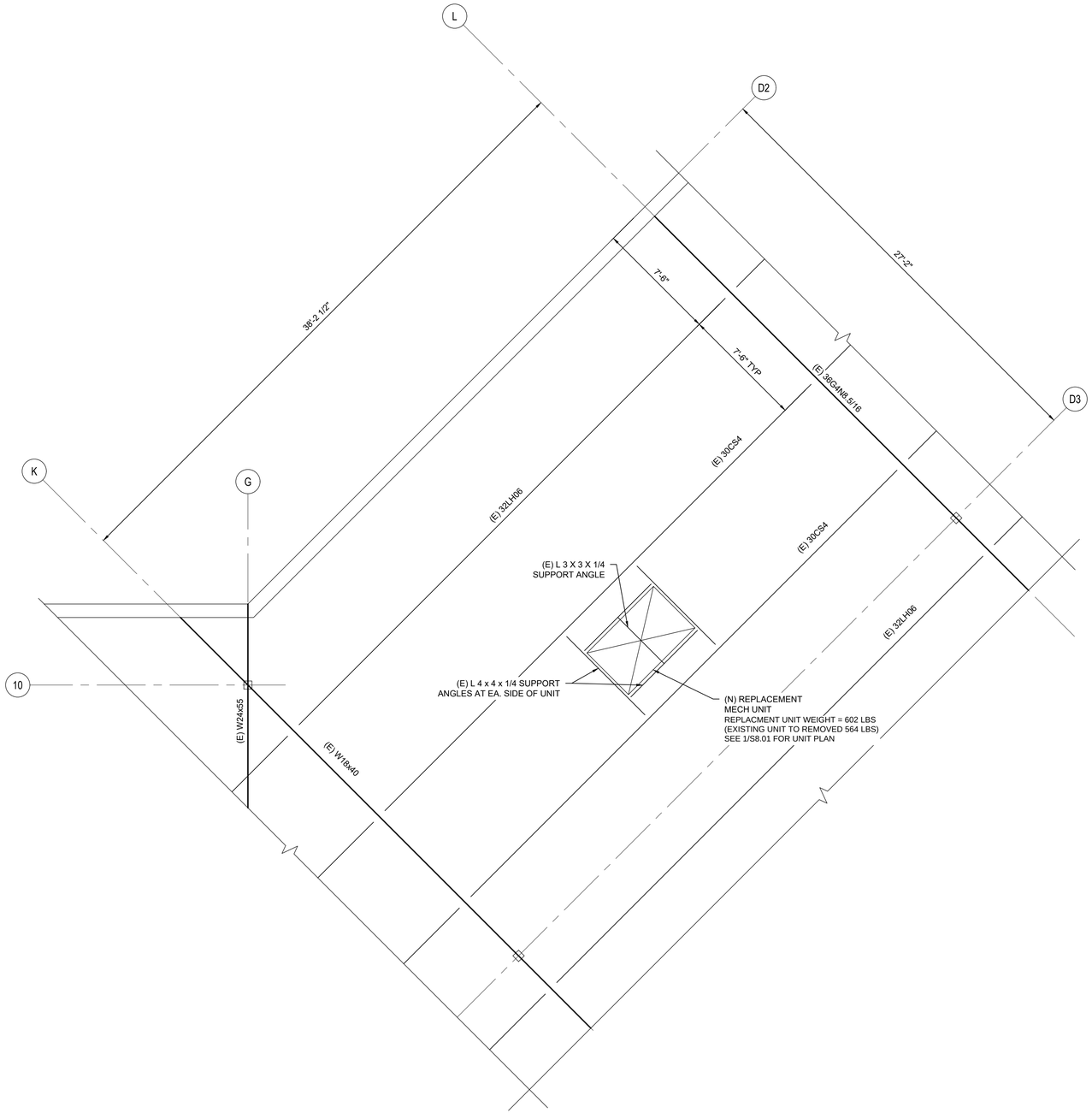
REV.	DATE	DESCRIPTION

SHEET CONTENT

BUILDING PLAN

SHEET

S0.02



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S1.01

ROOF FRAMING PLAN

1/4" = 1'-0"

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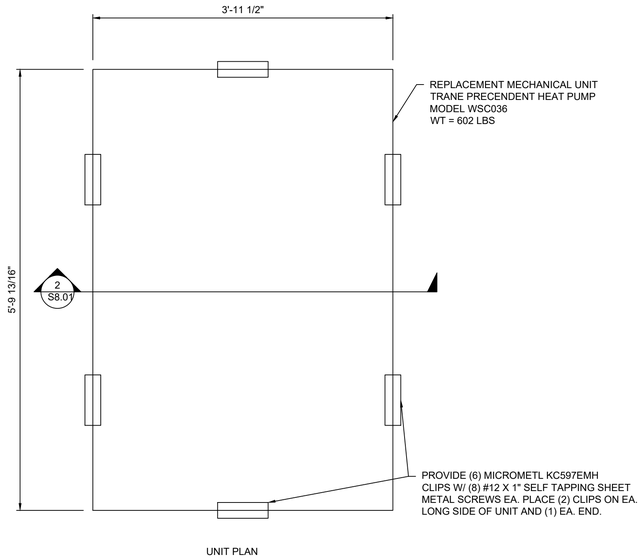
REV.	DATE	DESCRIPTION

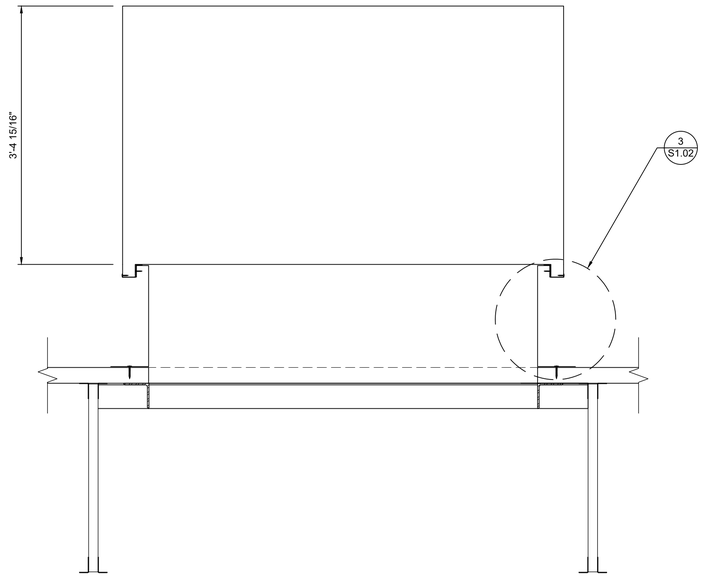
SHEET CONTENT
FRAMING PLAN

SHEET
S1.01



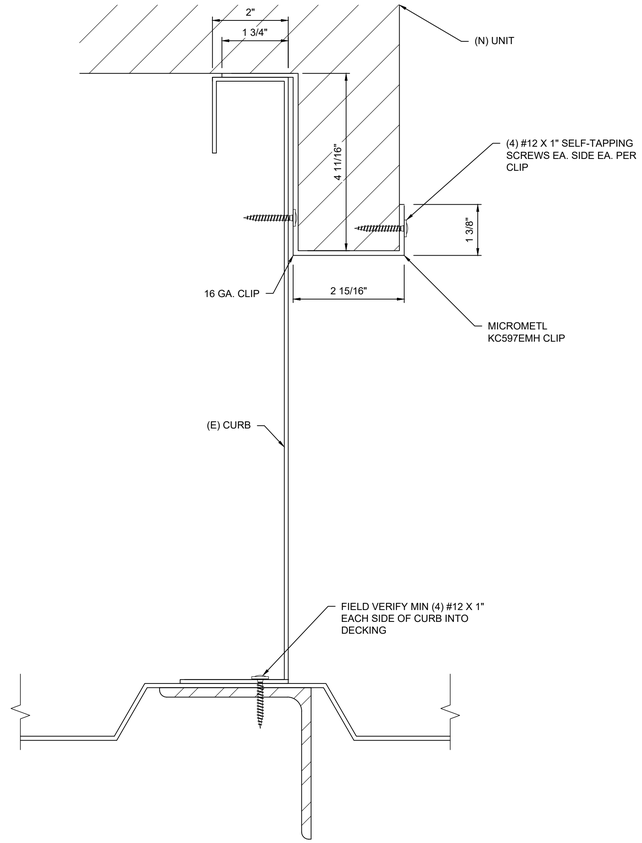
1 S8.01 MECHANICAL UNIT - CURB ANCHORAGE

1" = 1'-0"



2 S8.01 MECHANICAL UNIT CROSS SECTION

1" = 1'-0"



3 S8.01 CLIP CONNECTION DETAIL

6" = 1'-0"

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REV.	DATE	DESCRIPTION

SHEET CONTENT

MECHANICAL UNIT DETAILS

SHEET

S8.01

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STRUCTURAL CALCULATIONS

South Hill Mall Replacement Mechanical Units
3500 S Meridian Street, Puyallup, WA
Coolsys Commercial & Industrial Solutions

November 15, 2021
Project No. 211478
18 pages

Principal Checked: PRA

11/15/21

***** LIMITATIONS *****

Miller Consulting Engineers, Inc. was retained in a limited capacity for this project. This design is based upon information provided by the client, who is solely responsible for accuracy of same. No responsibility and or liability is assumed by or is to be assigned to the engineer for items beyond that shown on these sheets.

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Building Code:	2018 International Building Code								
Soils Report:	No	**Soils Report by:**				**Dated:**			
Soil Bearing:	1500	PSF			**Retaining Walls:**	No			
Equivalent Fluid Pressure (active):	N/A	PCF	**Passive bearing:**		PCF	**Friction:**			
Structural System:	Building Structure								
Vertical System:	Wood framed Construction			**Lateral Sys:**	Flexible Diaphragm / Wood shearwalls				

Basic Design Loads:	**Element**	Roof			
	Load Type	Dead			
	Value (PSF)	15			
	Load Type	Snow			
	Value (PSF)	25			
	Deflection Criteria	L/240			

Lateral Design Parameters:

Wind Design: ASCE 7-16 **Wind Speed (3 sec Gust):** 104 MPH

Exposure B

Importance Factors	I_W =	I_E =	I_S =	I_i =	**Risk Cat:**
	1.00 (ice)	1.25 (seismic)	1.10 (snow)	1.10 (ice)	III

Seismic Design

Seismic design parameters are based on published values from the USGS web site.

Latitude:	
Longitude:	

2% PE in 50 years, 0.2 sec SA = Ss

2% PE in 50 years, 1.0 sec SA = S1

(Site class B parameters are indicated on this page, for actual site class used in design, refer to seismic design summary)

Design Summary:

The scope of these structural calculations includes verification of structural systems to support a replacement mechanical unit and related anchorage

Replacement Unit Weight: = 602 lbs
Old Unit weight = 564 lbs (To be removed)

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Fire	Traffic

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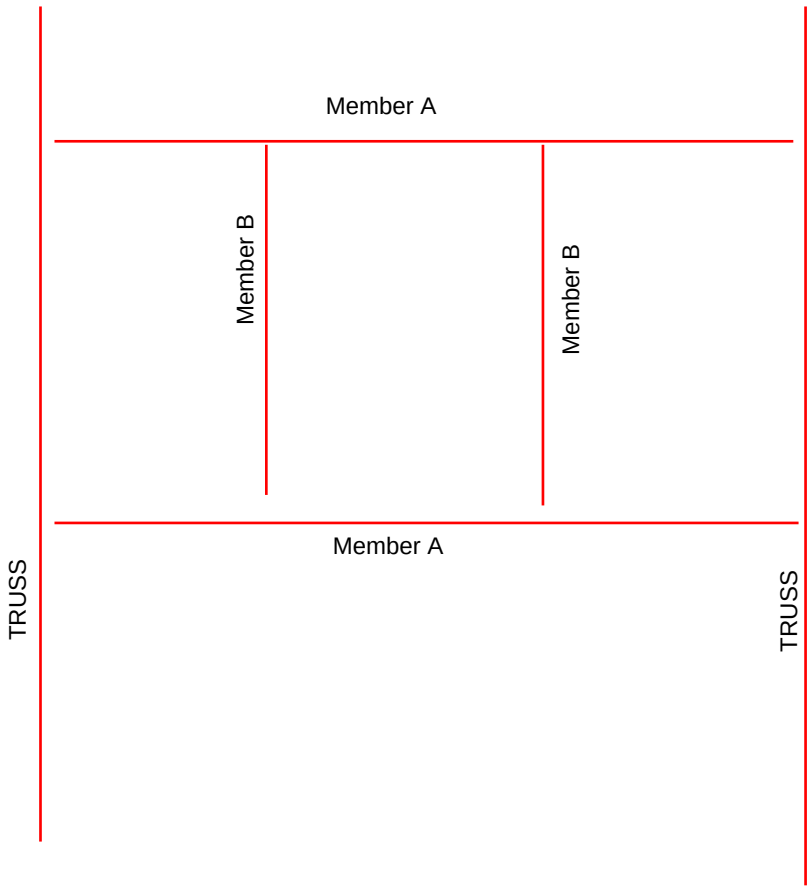
Project Name South Hill Mall Mechanical Unit Replacement Project # 211478

Location 3500 S Meridian Street, Puyallup, WA

Client Coolsys Commercial & IND Solutions

By ADJ Ck'd PRA Date 11/12/2021



Member B

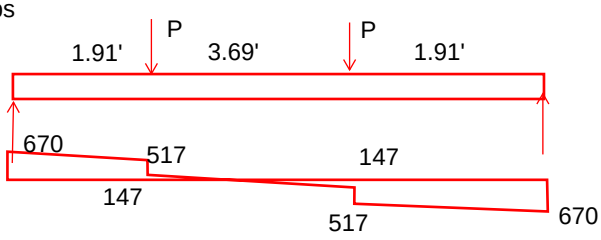
W = 602 lbs /(5.82)(2) + (25 psf + 15 psf)(7.5/4) = 52 plf + 75 plf = 127 plf

M = wL^2/8 = (127)(5.82^2)/8 = 538 ft lbs
V = 127(5.82/2) = 370 lbs

Member A

P = 370 lbs

w = 40(2') = 80 plf



R1=R2 = V = 370 + 80(7.5/2) = 670 lbs
M = (670+517)(1.91/2) + 147(3.69/2)(1/2) = 1270 ft lbs

(see following pages for angle design)

(E) L4 x 4 x 1/4 angles each side of unit

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Fire	Traffic

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Client Coolsys Commercial & IND Solutions

By ADJ Ck'd PRA Date 11/12/2021

Steel Column/Beam Design - AISC 13th Addition **Member A**

Shape: L **Shape Capacity = 0.66 < 1.0**

Size: L4X4X1/4

ASD

Pr =	0.00	k, axial compression load
Mr_x =	1.27	ft-k, strong axis moment
Mr_y =	0.00	ft-k, weak axis moment
Vr_x =	0.67	k, strong axis shear
Vr_y =	0.00	k, weak axis shear
Tr =	0.00	in-k, torsion
Vt =	0.00	k, shear due to torsion
K =	1.00	*(Table C-C2.2, pg 16.1-240)*
Lb_x =	3.69	ft
Lb_y =	3.69	ft
E =	29000	ksi
Fy =	36	ksi
Fu =	58	ksi
Ag =	1.94	in^2
Ix =	3	in^4
Iy =	3	in^4
r_x =	1.25	in
r_y =	1.25	in
r_z =	0.783	in
b =	4	in
d =	4	in
t =	0.25	in
S_x =	1.03	in^3
J =	0.0438	in^4
bl =	4	in
bs =	4	in
bl/bs =	1.00	leg length ratio
bl/t =	16.00	
bs/t =	16.00	
Ω_c =	1.67	*(Section E1, pg 16.1-32)*
Ω_b =	1.67	*(Section F1, pg 16.1-46)*
Ω_v =	1.67	*(Section F1, pg 16.1-46)*
Φ_c =	0.9	*(Section E1, pg 16.1-32)*
Φ_b =	0.9	*(Section F1, pg 16.1-46)*
Φ_v =	0.9	*(Section F1, pg 16.1-46)*

Section is Compact in the leg for flexure

Section is Noncompact in the long leg for compression

Section is Noncompact in the short leg for compression

Axial Capacities, Chapters D and E

Equal Legged Angle **N/A**

Tension Capacity, Chapter D **N/A**

Connection: Welded connnection

U =	0.64	*Table D3.1, pg 16.1-29*
Ae =	1.24	in^2
Pn =	69.84	k

Comp. Capacity, Chapter E **N/A**

KL/r =	56.6	
L/r =	35	
Fcr =	30.42	ksi
Pn =	59.02	k, *(Section E3 pg 16.1-33)*

Flexural Capacity, Chapter F

Strong Axis:

Max. compression at toe

Mnx = 3.23 ft-k

Weak Axis:

Max. compression at toe

Mny = 3.23 ft-k

Shear Capacity, Chapter G

Cv =	1	
Awx =	1.00	in^2
Awy =	1.00	in^2
kv =	1.2	
Vnx =	21.60	k equation G2-1
Vny =	21.60	k

Allowable Capacties Rn / Ω (ASD); Rn * Φ (LRFD)

(LRFD)	Pc, k	Pc, k	Mc, ft-k	Vc, k
x-axis	**35.34**	**41.82**	**1.93**	**12.9**
y-axis	(compression)	(tension)	**1.93**	**12.9**

Interaction Equations:

Shear capacity = 0.05 < 1.0 OK

Pr/Pc = 0.00 < 0.2, Equation H1-1b controls

0.66 < 1.0 OK

Equation H1-1b, AISC 13 ed., pg 16.1-70

Use L4X4X1/4

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PRMH20221213

MILLER CONSULTING ENGINEERS
9600 SW Oak St #400 Portland, OR 97223
503.246.1250 miller-se.com

Project Name South Hill Mall Mechanical Unit Replacement Project # 211478

Location 3500 S Meridian Street, Puyallup, WA

Client Coolsys Commercial & IND Solutions

By ADJ Ck'd PRA Date 11/12/2021

Steel Column/Beam Design - AISC 13th Addition **Member B**

Shape: L **Shape Capacity = 0.29 < 1.0**

Size: L4X4X1/4

ASD

Pr =	0.00	k, axial compression load
Mr_x =	0.54	ft-k, strong axis moment
Mr_y =	0.00	ft-k, weak axis moment
Vr_x =	0.37	k, strong axis shear
Vr_y =	0.00	k, weak axis shear
Tr =	0.00	in-k, torsion
Vt =	0.00	k, shear due to torsion
K =	1.00	*(Table C-C2.2, pg 16.1-240)*
Lb_x =	5.82	ft
Lb_y =	5.82	ft
E =	29000	ksi
Fy =	36	ksi
Fu =	58	ksi
Ag =	1.94	in^2
Ix =	3	in^4
Iy =	3	in^4
r_x =	1.25	in
r_y =	1.25	in
r_z =	0.783	in
b =	4	in
d =	4	in
t =	0.25	in
S_x =	1.03	in^3
J =	0.0438	in^4
bl =	4	in
bs =	4	in
bl/bs =	1.00	leg length ratio
bl/t =	16.00	
bs/t =	16.00	
Ω_c =	1.67	*(Section E1, pg 16.1-32)*
Ω_b =	1.67	*(Section F1, pg 16.1-46)*
Ω_v =	1.67	*(Section F1, pg 16.1-46)*
Φ_c =	0.9	*(Section E1, pg 16.1-32)*
Φ_b =	0.9	*(Section F1, pg 16.1-46)*
Φ_v =	0.9	*(Section F1, pg 16.1-46)*

Section is Compact in the leg for flexure

Section is Noncompact in the long leg for compression

Section is Noncompact in the short leg for compression

Axial Capacities, Chapters D and E

Equal Legged Angle **N/A**

Tension Capacity, Chapter D **N/A**

Connection: Welded connnection

U =	0.64	*Table D3.1, pg 16.1-29*
Ae =	1.24	in^2
Pn =	69.84	k

Comp. Capacity, Chapter E **N/A**

KL/r =	89.2	
L/r =	56	
Fcr =	23.68	ksi
Pn =	45.94	k, *(Section E3 pg 16.1-33)*

Flexural Capacity, Chapter F

Strong Axis:

Max. compression at toe

Mnx = 3.15 ft-k

Weak Axis:

Max. compression at toe

Mny = 3.15 ft-k

Shear Capacity, Chapter G

Cv =	1		
Awx =	1.00	in^2	
Awy =	1.00	in^2	
kv =	1.2		
Vnx =	21.60	k	equation G2-1
Vny =	21.60	k	

Allowable Capacties Rn / Ω (ASD); Rn * Φ (LRFD)

(LRFD)	Pc, k	Pc, k	Mc, ft-k	Vc, k
x-axis	**27.51**	**41.82**	**1.89**	**12.9**
y-axis	(compression)	(tension)	**1.89**	**12.9**

Interaction Equations:

Shear capacity = 0.03 < 1.0 OK

Pr/Pc = 0.00 < 0.2, Equation H1-1b controls

0.29 < 1.0 OK

Equation H1-1b, AISC 13 ed., pg 16.1-70

Use L4X4X1/4

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503.246.1250 miller-se.com

Project Name South Hill Mall Mechanical Unit Replacement Project # 211478

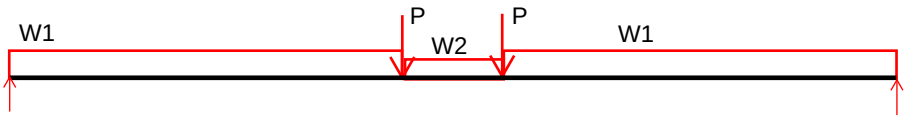
Location 3500 S Meridian Street, Puyallup, WA

Client Coolsys Commercial & IND Solutions

By ADJ Ck'd PRA Date 11/12/2021

Check existing Trusses

Loads to trusses at mechanical unit



Truss loads with Old Unit:

P = (564/4)+40(7.5/4)(5.82/2)+80(7.5/2) = 519 lbs

W1 = 7.5(40 psf) = 300 plf

W2 = 40(7.5/2+7.5/4) = 225 plf

Truss loads with New Unit:

P = (602/4)+40(7.5/4)(5.82/2)+80(7.5/2) = 670 lbs

W1 = 7.5(40 psf) = 300 plf

W2 = 40(7.5/2+7.5/4) = 225 plf

(see pages 6-9 for truss analysis estimating max moment and shear)

Mmax = 59297 ft lbs
Vmax = 6032 lbs
Δmax = 0.0669 in

Mmax = 61742 ft lbs
Vmax = 6183 lbs
Δmax = 0.0695 in

Increase in load:

ΔMoment = 61742-59297 / 59297 = 4.12% < 5% increase ok

ΔShear = 6183-6032 / 6032 = 2.50% < 5% increase ok

Ddef = .0695 - 0.0669 / 0.0669 = 3.89% < 5% increase ok

(E) 30CS 4 Trusses at 7'-6" oc ok

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9600 SW Oak St #400
Portland, OR 97223
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Project Name South Hill Mall Mechanical Unit Replacement Project # 211478

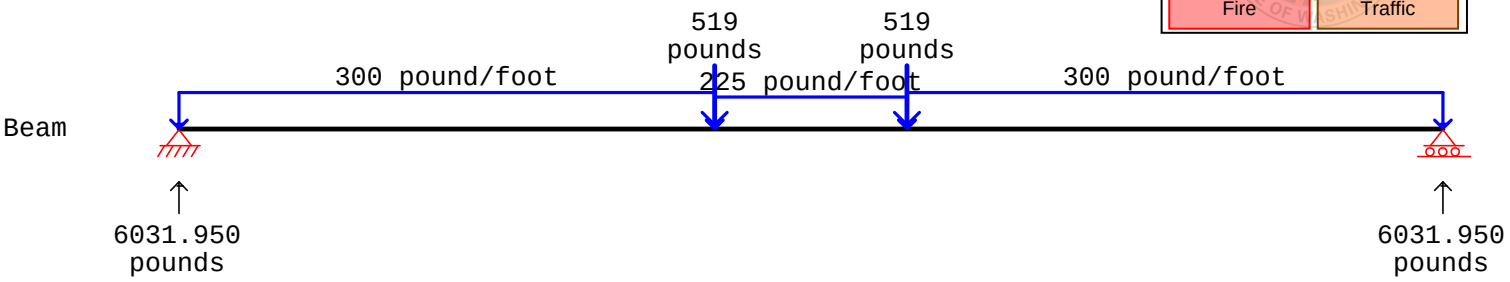
Location 3500 S Meridian Street, Puyallup, WA

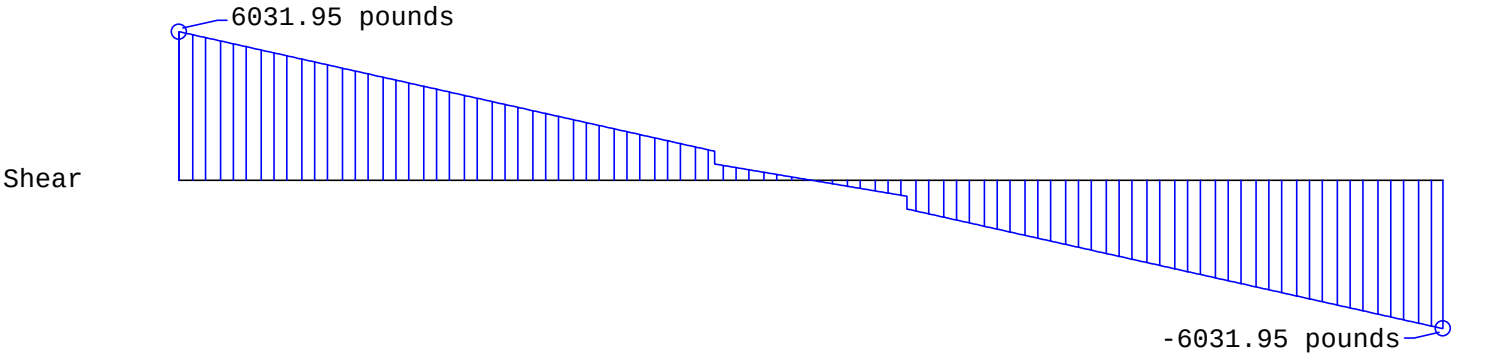
Client Coolsys Commercial & IND Solutions

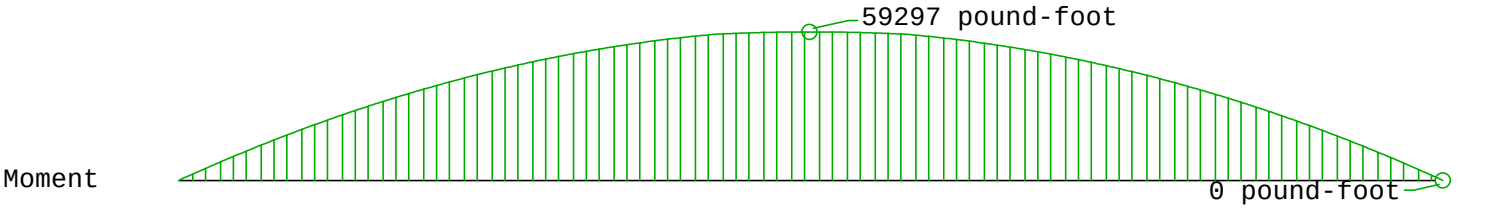
By ADJ Ck'd PRA Date 11/12/2021 Page 5 of 18

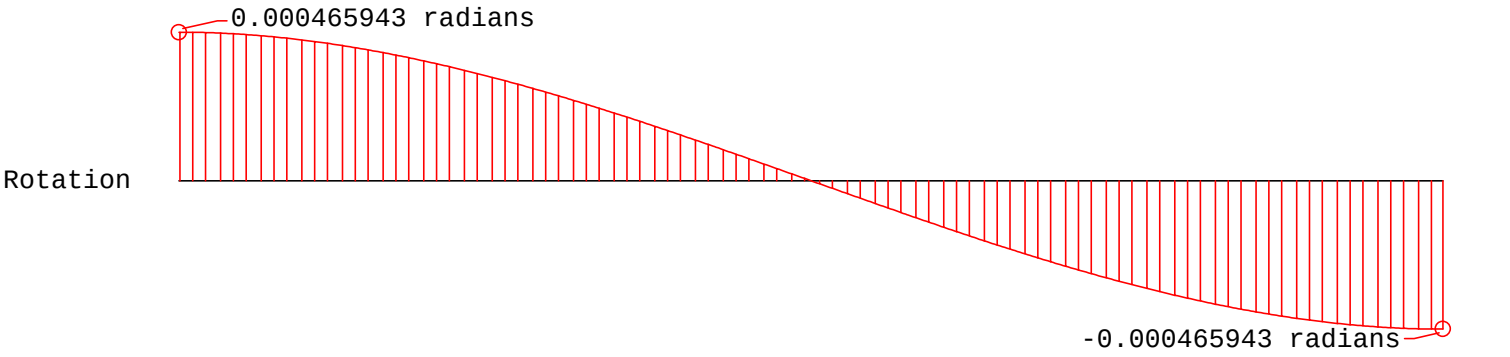
Beam length = 38.208 feet, E = 29000 ksi, I = 7995 inches^4

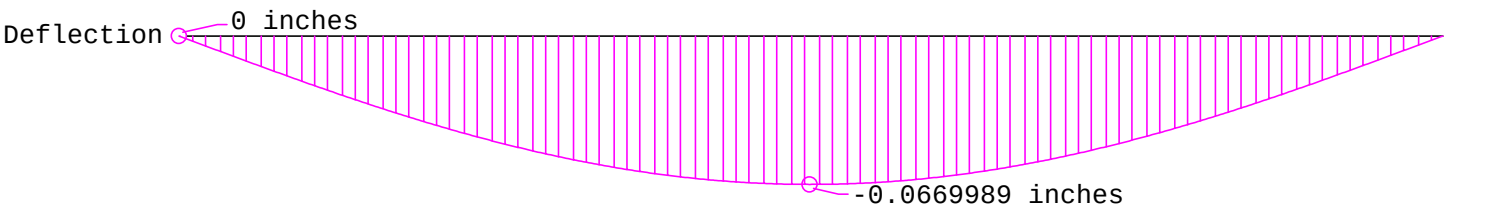
EXISTING CONDITIONS











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Input:

Beam Element: Length = 38.208 feet; E = 29000 ksi; I = 7995 inches^4;
Pin Support: X = 0 feet;
Roller Support: X = 38.208 feet;

Point Load: X = 16.194 feet; P = -519 pounds;

Point Load: X = 22.014 feet; P = -519 pounds;

Analysis Data:

Beam Length = 38.208 feet
502 Nodes, 501 Beam Elements, 1004 Degrees of Freedom

Reactions:

X	Vert	Rot
feet	pounds	pound-foot
0	6031.950	
38.208	6031.950	

Equilibrium:

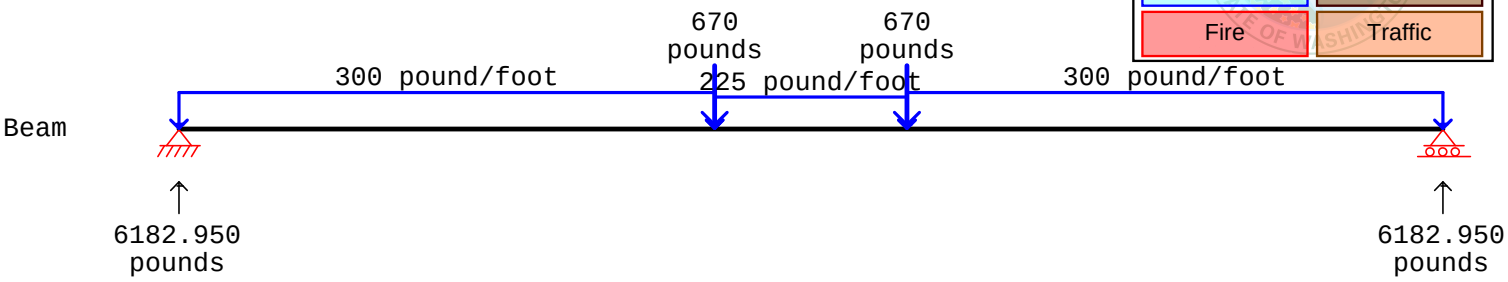
	Force	Reaction	Error	
Vert	-12063.900	12063.900	-0.000	pounds
Rot	230468.746	-230468.743	0.003	pound-foot

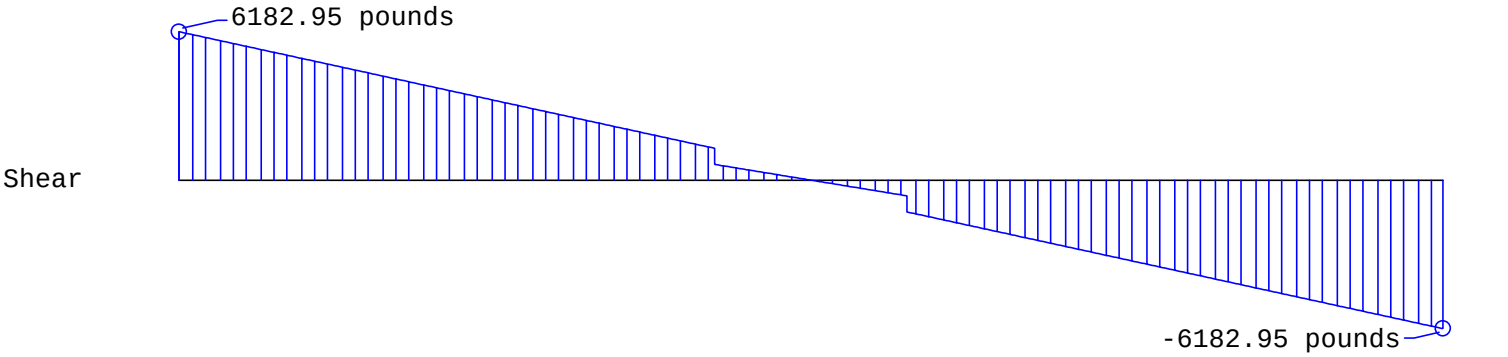
Min & Max values:

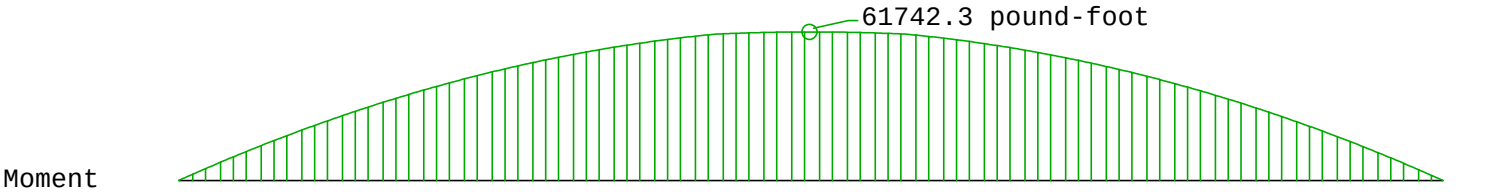
Min Shear	=	-6031.950 pounds	at	38.208 feet
Max Shear	=	6031.950 pounds	at	0 feet
Min Moment	=	-1.03e-08 pound-foot	at	38.208 feet
Max Moment	=	59297.048 pound-foot	at	19.066 feet
Min Rotation	=	-0.0004659 radians	at	38.208 feet
Max Rotation	=	0.0004659 radians	at	0 feet
Min Deflection	=	-0.066999 inches	at	19.066 feet
Max Deflection	=	0 inches	at	0 feet

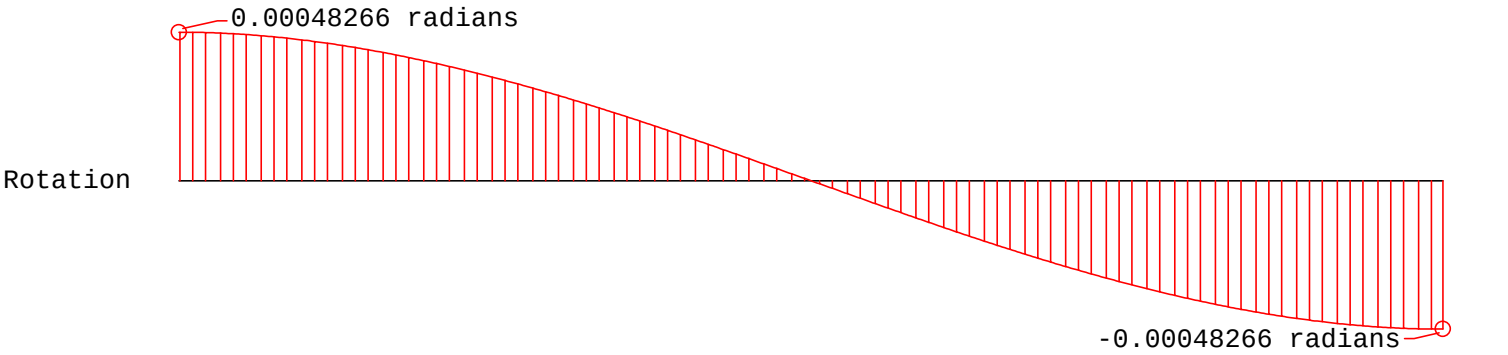
Beam length = 38.208 feet, E = 29000 ksi, I = 7995 inches^4

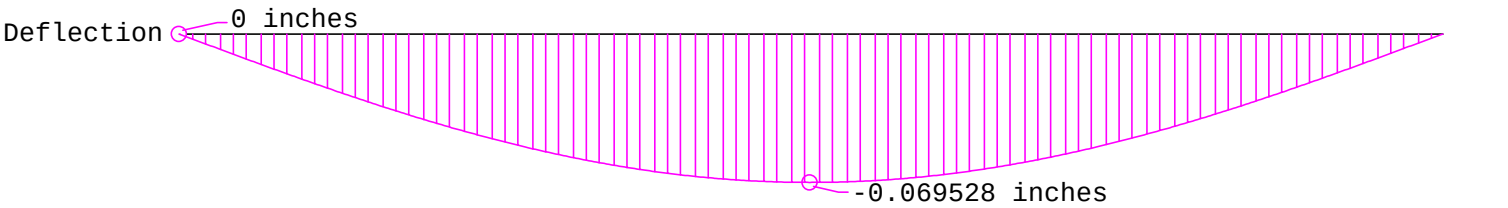
CONDITIONS WITH REPLACEMENT MECHANICAL UNIT











DSNWinbeam V5.3 11/12/2021 5:02 PM

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Input:

Beam Element: Length = 38.208 feet; E = 29000 ksi; I = 7995 inches^4;
Pin Support: X = 0 feet;
Roller Support: X = 38.208 feet;

Point Load: X = 16.194 feet; P = -670 pounds;

Point Load: X = 22.014 feet; P = -670 pounds;

Analysis Data:

Beam Length = 38.208 feet
502 Nodes, 501 Beam Elements, 1004 Degrees of Freedom

Reactions:

X	Vert	Rot
feet	pounds	pound-foot
0	6182.950	
38.208	6182.950	

Equilibrium:

	Force	Reaction	Error	
Vert	-12365.900	12365.900	-0.000	pounds
Rot	236238.154	-236238.151	0.003	pound-foot

Min & Max values:

Min Shear	=	-6182.950 pounds	at	38.208 feet
Max Shear	=	6182.950 pounds	at	0 feet
Min Moment	=	4.254e-09 pound-foot	at	0 feet
Max Moment	=	61742.342 pound-foot	at	19.066 feet
Min Rotation	=	-0.0004827 radians	at	38.208 feet
Max Rotation	=	0.0004827 radians	at	0 feet
Min Deflection	=	-0.069528 inches	at	19.066 feet
Max Deflection	=	0 inches	at	0 feet

Hazards by Location

Search Information

Address: 3500 S Meridian, Puyallup, WA 98373, USA

Coordinates: 47.15796110000001, -122.2965855

Elevation: 433 ft

Timestamp: 2021-11-01T21:03:38.758Z

Hazard Type: Wind

ASCE 7-16

MRI 10-Year	67 mph
MRI 25-Year	73 mph
MRI 50-Year	78 mph
MRI 100-Year	82 mph
Risk Category I	92 mph
Risk Category II	97 mph
Risk Category III	104 mph
Risk Category IV	108 mph

ASCE 7-10

MRI 10-Year	72 mph
MRI 25-Year	79 mph
MRI 50-Year	85 mph
MRI 100-Year	91 mph
Risk Category I	100 mph
Risk Category II	110 mph
Risk Category III-IV	115 mph

ASCE 7-05

ASCE 7-05 Wind Speed	85 mph

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

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

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PRMH20221213

Hazards by Location

Search Information

Address: 3500 S Meridian, Puyallup, WA 98373, USA

Coordinates: 47.15796110000001, -122.2965855

Elevation: 433 ft

Timestamp: 2021-11-01T21:04:20.581Z

Hazard Type: Seismic

Reference Document: ASCE7-16

Risk Category: III

Site Class: D-default

Basic Parameters

Name	Value	Description
S_S	1.264	MCE_R ground motion (period=0.2s)
S_1	0.436	MCE_R ground motion (period=1.0s)
S_{MS}	1.516	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.011	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.914	Coefficient of risk (0.2s)
CR_1	0.898	Coefficient of risk (1.0s)
PGA	0.5	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.6	Site modified peak ground acceleration

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T_L	6	Long-period transition period (s)
SsRT	1.264	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.383	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.436	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.485	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

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

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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Mechanichal Unit Curb

Geometry	Mech. Unit		
Unit Length, L_U =	69.84	in	Long Direction
Unit Width, W_U =	47.52	in	Short Direction
Unit Height, H_U =	40.92	in	
Unit CoG, CoG_U =	20.46	in	
	Curb		
Curb Length, L_C =	65.84	in	Long Direction
Curb Width, W_C =	43.52	in	Short Direction
Curb Height, H_C =	16	in	
Curb Gauge =	18	Ga. = 0.0478''	
	Location		
Location =	Outdoors		
Location =	Roof		
Roof Height =	28	ft	
z =	28	ft	Unit Base Elevation
Building Height, h =	28	ft	
Building Length, L =	180	ft	
Building Width, B =	250	ft	

Forces	Gravity		
Unit Weight, M_U =	785	lbs	(NOTE: Actual unit weight reported by the client is 602 lbs)
Curb Weight, M_C =	47	lbs	
	Seismic		
Life Safety?	No		ASCE 7-16 Section 13.1.3
S_{DS} =	1.011	g	
a_P =	2.5		ASCE 7-16 Table 13.6-1
R_P =	6		ASCE 7-16 Table 13.6-1
Ω_o =	2		ASCE 7-16 Table 13.6-1
	Wind		
Site Elevation =	433	ft	
Wind Speed =	97	mph	ASCE 7-16 Figure 26.5-1
Wind Exposure =	B		ASCE 7-16 Section 26.7.36

785

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503.246.1250 miller-se.com

Project Name South Hill Mall Mechanical Unit Replacement Project # 211478

Location 3500 S Meridian Street, Puyallup, WA

Client Coolsys Commercial & IND Solutions

By ADJ Ck'd PRA Date 11/12/2021

Seismic ASCE 7-16 Chapter 13 **(LRFD)**

I_P =	1.0		
F_P =	0.607	W_P	ASCE 7-16 Equation 13.3-1
$F_{P,MAX}$ =	1.618	W_P	ASCE 7-16 Equation 13.3-2
$F_{P,MIN}$ =	0.303	W_P	ASCE 7-16 Equation 13.3-3
e_H =	**0.607**	**W_P**	
e_V =	**0.202**	**W_P**	$= 0.2S_{DS}$

Wind ASCE 7-16 Chapter 29

K_z =	0.69		ASCE 7-16 Table 26.10-1
K_d =	0.85		ASCE 7-16 Table 26.6-1
K_1 =	0		ASCE 7-16 Table 26.8-1
K_2 =	1		ASCE 7-16 Table 26.8-1
K_3 =	1		ASCE 7-16 Table 26.8-1
K_{zt} =	1		ASCE 7-16 Table 26.8-1
K_e =	0.984		ASCE 7-16 Table 26.9-1
q_z =	13.85	psf	ASCE 7-16 Equation 26.10-1
Unit Side Area, A_r =	14	ft²	
Building Roof Area, Bh =	784	ft²	
GC_r =	1.900	Horiz.	ASCE 7-16 Section 29.4
Unit Plan Area, A_r =	23	ft²	
Building Roof Area, BL =	45000	ft²	
GC_r =	1.500	Vertical	ASCE 7-16 Section 29.4
w_H =	**26.31**	psf	$= q_z GC_f$
w_V =	**20.77**	psf	$= q_z GC_r$

Mechanical Unit Forces: **(ASD)**

$V_{SEISMIC} = 0.7e_H M_u$
$= 0.7(0.607)(785 \text{ lbs})$
$= 333 \text{ lbs}$

$V_{WIND,LONG} = 0.6w_H W_U H_U$
$= 0.6(26.31 \text{ psf})(47.52'')(40.92'')$
$= 213 \text{ lbs}$

$Uplift_{WIND} = 0.6w_V L_U W_U$
$= 0.6(20.77 \text{ psf})(70'')(47.52'')$
$= 287 \text{ lbs}$

$V_{WIND,SHORT} = 0.6w_H L_U H_U$
$= 0.6(26.31 \text{ psf})(70'')(40.92'')$
$= 313 \text{ lbs}$

Curb Forces:

$V_{SEISMIC} = 0.7e_H M_C$
$= 0.7(0.607)(47 \text{ lbs})$
$= 20 \text{ lbs}$

$V_{WIND,LONG} = 0.6w_H H_C W_C$
$= 0.6(26.31 \text{ psf})(16'')(43.52'')$
$= 76 \text{ lbs}$

$V_{WIND,SHORT} = 0.6w_H H_C L_C$
$= 0.6(26.31 \text{ psf})(16'')(65.84'')$
$= 115 \text{ lbs}$

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PRMH20221213

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9600 SW Oak St #400 Portland, OR 97223
503.246.1250 miller-se.com

Project Name South Hill Mall Mechanical Unit Replacement Project # 211478
Location 3500 S Meridian Street, Puyallup, WA
Client Coolsys Commercial & IND Solutions
By ADJ Ck'd PRA Date 11/12/2021

Unit to Curb **(ASD)**

Seismic M_{OT} = (Unit $V_{SEISMIC}$)CoG_U
= (333 lbs)(20.46'')
= 568 lbs-ft

Long Direction
M_R = $M_U L_U/2$
= (785 lbs)(69.84'')/2
= 2284 lbs-ft

Wind M_{OT} = (Unit $V_{WIND,LONG}$)$H_U/2$
= (213 lbs)(40.92''/2)
= 363 lbs-ft

Short Direction
M_R = $M_U W_U/2$
= (785 lbs)(47.52'')/2
= 1554 lbs-ft

Wind M_{OT} = (Unit $V_{WIND,SHORT}$)$H_U/2$
= (313 lbs)(40.92''/2)
= 534 lbs-ft

Curb to Structure **(ASD)**

Seismic M_{OT} = (Unit $V_{SEISMIC}$)(CoG_U+H_C)+(Curb $V_{SEISMIC}$)($H_C/2$)
= (333 lbs)(20.46''+16'')+16'')+(20 lbs)(16''/2)
= 1026 lbs-ft

Long Direction
M_R = (M_U+M_C)$L_C/2$
= (785 lbs+47 lbs)(65.84'')/2
= 2284 lbs-ft

Wind M_{OT} = (Unit $V_{WIND,LONG}$)($H_U/2$+H_C)+(Curb $V_{WIND,LONG}$)(HC/2)
= (213 lbs)(40.92''/2+16'')+(76 lbs)(16''/2)
= 698 lbs-ft

Short Direction
M_R = (M_U+M_C)$L_C/2$
= (785 lbs+47 lbs)(43.52'')/2
= 1509 lbs-ft

Wind M_{OT} = (Unit $V_{WIND,SHORT}$)($H_U/2$+H_C)+(Curb $V_{WIND,SHORT}$)($H_C/2$)
= (313 lbs)(40.92''/2+16'')+(115 lbs)(16''/2)
= 1029 lbs-ft

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Load Summary

(ASD)

Wind Uplift = 287 lbs

Unit to Curb:

Direction	Long Dir.	Short Dir.	
Seismic	333	333	lbs
Wind	213	313	lbs
Unit M_R	2284	1554	lbs-ft
Seismic M_{OT}	568	568	lbs-ft
Wind M_{OT}	363	534	lbs-ft

Curb to Roof:

Direction	Long Dir.	Short Dir.	
Seismic	353	353	lbs
Wind	289	429	lbs
Unit M_R	2284	1509	lbs-ft
Seismic M_{OT}	1026	1026	lbs-ft
Wind M_{OT}	698	1029	lbs-ft

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Project Name South Hill Mall Mechanical Unit Replacement Project # 211478

Location 3500 S Meridian Street, Puyallup, WA

Client Coolsys Commercial & IND Solutions

By ADJ Ck'd PRA Date 11/12/2021

Unit to Curb Anchorage

(ASD)

Short Direction Anchorage Forces

Seismic

Anchors Resisting Shear = 2 anchors

V = (278 lbs)/(2 anchors)

V = 139 lbs/anchor

Anchors Resisting Overturning Tension = 2 anchors

Overturning Arm = 47.52 in

T = [(0.6-0.202)(1554 lbs-ft)-(474 lbs-ft)]/(47.52'')/2 anchors

T = 0 lbs/anchor, No Uplift

Wind

Anchors Resisting Shear = 2 anchors

V = (313 lbs)/(2 anchors)

V = 157 lbs/anchor

Anchors Resisting Overturning Tension = 2 anchors

Overturning Arm = 47.52 in

T = [0.6(1554 lbs-ft)-(534 lbs-ft)]/(47.52'')/(2 anchors)-(287 lbs)/2(2 anchors)

T = 21 lbs/anchor, No Uplift

Long Direction Anchorage Forces

Seismic

Anchors Resisting Shear = 4 anchors

V = (278 lbs)/(4 anchors)

V = 139 lbs/anchor

Anchors Resisting Overturning Tension = 1 anchors

Overturning Arm = 69.84 in

T = [(0.6-0.202)(2284 lbs-ft)-(474 lbs-ft)]/(69.84'')/1 anchors

T = 0 lbs/anchor, No Uplift

Wind

Anchors Resisting Shear = 4 anchors

V = (213 lbs)/(4 anchors)

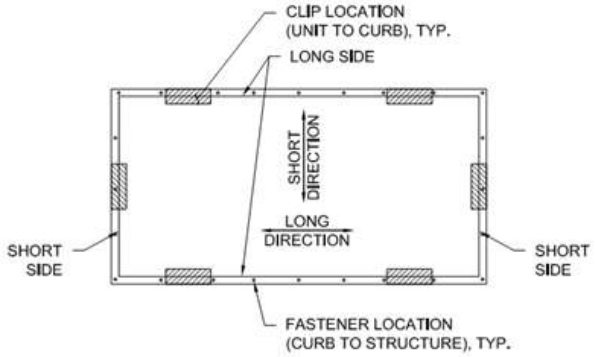
V = 53 lbs/anchor

Anchors Resisting Overturning Tension = 1 anchors

Overturning Arm = 69.84 in

T = [0.6)(1554 lbs-ft)-(534 lbs-ft)]/(69.84'')/(1 anchors)-(287 lbs)/2(1 anchors)

T = 0 lbs/anchor, No Uplift



Summary

Max T = 21 lbs/anchor

Max V = 157 lbs/anchor

See page 14 for anchorage design.

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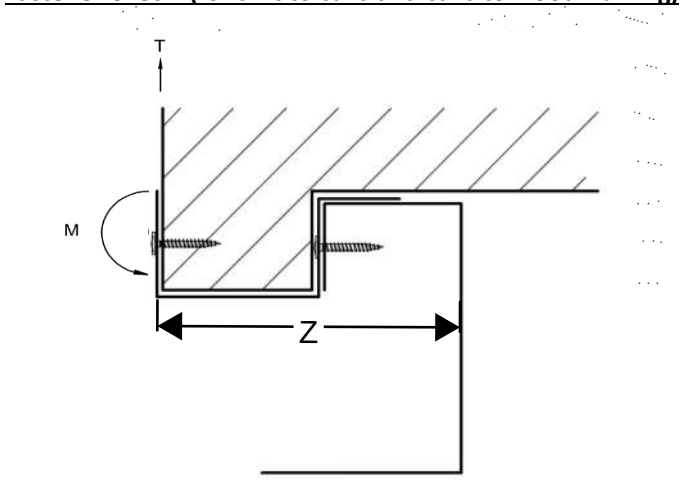
Project Name South Hill Mall Mechanical Unit Replacement Project # 211478

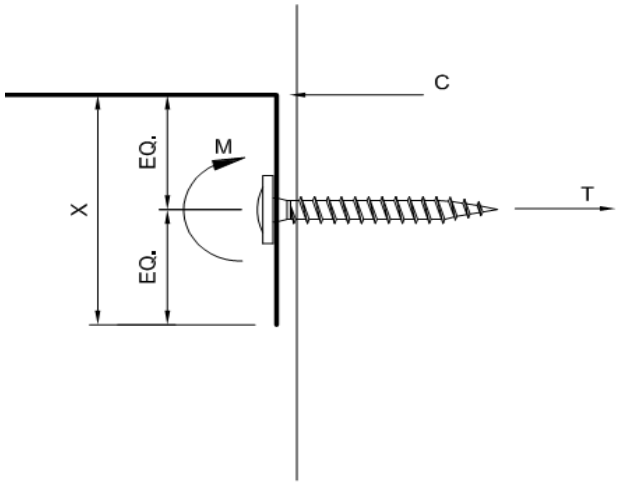
Location 3500 S Meridian Street, Puyallup, WA

Client Coolsys Commercial & IND Solutions

By ADJ Ck'd PRA Date 11/12/2021

Fastener Check: (for unit to curb and curb to wood framing) **(ASD)**





Bending in clip due to uplift

Tension =	21	lbs
Shear =	167	lbs
Clip Offset, Z =	2.5	in
Mreq =	54	lbs-in (assuming fixity at ea. end)
Clip Length =	8	in
Clip Gage =	16	No.
Clip Thickness =	0.0566	in
Plastic Section Modulus	0.00641	in^3
Clip Yield Strength =	50	ksi
Mallow =	192	lbs-in OK

Clip Gauge:	16	= 0.0566 in
Adapter Curb Gauge:	18	= 0.0451 in

Screws ea. Leg of clip

n =	3	screws/leg
Clip Leg Length, X =	1.5	in
Tpry =	24	lbs/screw
Shear load per screw =	56	lbs/screw
T_{CAP} =	124	lbs/screw
V_{CAP} =	280	lbs/screw
Interaction =	0.39	OK

Screw Type:	Generic Fasteners
Screw Size:	#12

Use 16 ga. Clips w/ (3) #12 self tapping screws ea. leg of bent clip

16 GA. Micrometl clip

Curb to Structure Anchorage

Use TEKS 3 HWH CL 1/4-14 X 1-1/2" Self-Drilling screws from curb into metal decking.

T_{cap}= 880 lbs/FS=4.0 = 220 lbs > 89 lbs OK

V_{cap}= 2100 lbs/FS = 2.5 = 840 lbs > 214 lbs OK

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Project Name South Hill Mall Mechanical Unit Replacement Project # 211478

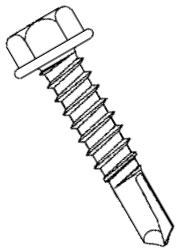
Location 3500 S Meridian Street, Puyallup, WA

Client Coolsys Commercial & IND Solutions

By ADJ Ck'd PRA Date 11/12/2021

TEKS® Self-Drilling Fasteners

Selector Guide



Part Number	Description	Head Style	Drill Point	Drill & Tap Capacity	Max. Material Attachment	Box Qty	Applications
1134000	12-14 x 3/4''	HWH	#3	.036-.210	.270	5,000	• Roof deck to steel framing • Wall panel to girt • Duct work to steel framing • Accessories to steel framing • Clip to steel framing • Retrofit framing
1136000	12-14 x 1''	HWH	#3	.036-.210	.520	4,000	
1120000	12-14 x 1-1/4''	HWH	#2	.036-.210	.550	4,000	
1123000	12-14 x 1-1/2''	HWH	#2	.036-.210	.800	2,500	
1140000	12-14 x 2''	HWH	#3	.036-.210	1.450	2,000	
1553000	12-14 X 2-1/2''	HWH	#3	.036-.210	1.950	1,000	
1143000	12-14 x 3''	HWH	#3	.036-.210	2.450	1,000	
1146000	12-14 x 4''	HWH	#3	.036-.210	3.450	500	
1147000	1/4-14 x 3/4''	HWH	#3	.036-.210	.210	3,000	
1149000	1/4-14 x 1''	HWH	#3	.036-.210	.400	2,500	
1150000	1/4-14 x 1-1/4''	HWH	#3	.036-.210	.650	2,000	
1152000	1/4-14 x 1-1/2''	HWH	#3	.036-.210	.900	2,000	
1155000	1/4-14 x 2''	HWH	#3	.036-.210	1.400	1,500	
1554000	1/4-14 x 2-1/2''	HWH	#3	.036-.210	1.900	1,000	
1157000	1/4-14 x 3''	HWH	#3	.036-.210	2.400	1,000	
1304000	1/4-14 x 4''	HWH	#3	.036-.210	3.400	500	
1587000	1/4-14 x 1''	*HWH	#3	.036-.210	.500	2,500	• Commercial overhead steel doors, hinges & latches.

** 7/16" Across Flats HWH with serrations under head.*

Performance Data

PULLOUT VALUES (average lbs. ultimate)

Fastener		Steel Gauge								
Dia.	Pt.	26	24	22	20	18	16	14	12	3/16
12	2	156	243	283	375	605	848	1181	1856	3520
	3	142	211	289	341	551	757	1063	1631	2998
1/4	3	141	231	293	346	613	880	1145	1858	4550

SHEAR VALUES (average lbs. ultimate)

Fastener		Steel Gauge (lapped)							
Dia.	Pt.	26	24	22	20	18	16	14	12
12	2	365	600	623	898	1370	1758	2138	2202
	3	-	-	-	769	1358	1620	1970	1986
1/4	3	-	-	-	930	1442	2100	2584	2650

FASTENER VALUES

Fastener (dia-tpi)	Tensile (lbs. min.)	Shear (avg. lbs. ult.)	Torque (min. in. lbs.)
12-14	2778	2000	92
1/4-14	4060	2600	150

SHEET STEEL GAUGES

Gauge No.	26	24	22	20	18	16	14	12
Decimal Equivalent	.018''	.024''	.030''	.036''	.048''	.060''	.075''	.105''

The values listed are ultimate averages achieved under laboratory conditions and apply to Buildex manufactured fasteners only. Appropriate safety factors should be applied to these values for design purposes.

Installation Guidelines

- A standard screwgun with a depth sensitive nosepiece should be used to install Teks. For optimal fastener performance, the screwgun should be a minimum of 6 amps and have an RPM range of 0-2500.
- Adjust the screwgun nosepiece to properly seat the fastener.
- New magnetic sockets must be correctly set before use. Remove chip build-up as needed.
- The fastener is fully seated when the head is flush with the work surface.
- Overdriving may result in torsional failure of the fastener or stripout of the substrate.
- The fastener must penetrate beyond the metal structure a minimum of 3 pitches of thread.

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ITW Buildex
700 High Grove Blvd
Glendale Heights, Illinois 60139
800-848-5611 Fax: 630-595-3549
www.itwbuildex.com

PRMH20221213

Job Name: South Hill Mall 14361088L Replace
Prepared By:
Unit Tag: W4C-1
Quantity: 1

REPLACEMENT UNIT

For Reference Only

Trane Precedent Heat Pump Packaged Rooftop

Unit Overview - WSC036H4R0A**E0C00000000000000000000000

Application	Unit Size	Supply Fan		External Dimensions (in.)			Operating Weight		EER	IEER/SEER	Elevation
		Airflow	External Static Pressure	Height	Width	Length	Minimum	Maximum			
DX cooling	3 Ton	1200 cfm	0.800 in H2O	3.41 ft	3.69 ft	5.82 ft	507.0 lb	785.0 lb	12.1 EER	14.30	0.00 ft

Unit Features

Fresh Air Selection	Econ, ref enth 0-100% w/o baro rel 3 ph
Panels/Filters	Hinged pnl/2 in pltd filters MERV 8-3 ph

Unit Electrical

Voltage/phase/hertz	460/60/3
MCA	11.00 A
MOP	15.00 A
MCA (230 w/ Elec Heat)	0.00 A
MOP (230 w/ Elec Heat)	0.00 A

Cooling Section

		Capacity	
Entering Dry Bulb	80.00 F	**Gross Total**	39.43 MBh
Entering Wet Bulb	67.00 F	**Gross Sensible**	29.42 MBh
Ambient Temp	95.00 F	**Net Total**	38.12 MBh
Leaving Coil Dry Bulb	55.64 F	**Net Sensible**	28.12 MBh
Leaving Coil Wet Bulb	55.55 F	**Fan Motor Heat**	0.51 MBh
Leaving Unit Dry Bulb	58.34 F	**Refrig Charge-circuit 1**	7.7 lb
Leaving Unit Wet Bulb	56.88 F		

Heating Section

Heat Pump Mode	
Output Heating Capacity	35.50 MBh
Output Heating Capacity with Fan	36.01 MBh
Heating Delta T	27.39 F
Heating EAT	70.00 F
Heating Ambient Temp	47.00 F
Heating Ambient WB	42.00 F
Heating Ambient Relative Humidity	70.00 %

AS ORDERED, W/ DEHUMID AND MIXED INSIDE/OUSIDE AIR ECONOMIZER: 602LBS

Fan Section

Indoor Fan Data		Outdoor Fan Data	
Type	FC Centrifugal	**Type**	Propeller
Drive Type	Direct	**Fan Quantity**	1
Evap Fan FLA	1.70 A	**Drive Type**	Direct
Indoor Fan Performance		**Outdoor Fan Performance**	
Airflow	1200 cfm	**Outdoor Motor Power**	0.26 kW
Design ESP	0.800 in H2O	**Condenser Fan FLA**	0.55 A
Component SP	0.120 in H2O		
Total SP	0.937 in H2O		
Supply Motor Horsepower	0.750 hp		
Indoor Motor Power	0.36 kW		
Indoor RPM	966 rpm		

Compressor Section

Power	2.93 kW
Circuit 1 RLA	6.60 A
Circuit 2 RLA	0.00 A

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Ref-2

For Reference Only

Acoustics

Sound Path	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Ducted Discharge	84 dB	76 dB	69 dB	67 dB	61 dB	57 dB	57 dB	50 dB
Ducted Inlet	81 dB	74 dB	64 dB	58 dB	54 dB	48 dB	46 dB	40 dB
Outdoor Noise	84 dB	85 dB	80 dB	80 dB	77 dB	74 dB	70 dB	64 dB

Model Number Description - 3-10 Ton R-410A

Digit 1 - Unit Type
W Packaged Heat Pump[3]

Digit 2 - Efficiency
S Standard Efficiency

Digit 3 - Airflow
C Convertible

Digit 4,5,6 - Nominal Gross Cooling Capacity (MBh)
036 3 Tons
048 4 Tons
060 5 Tons
072 6 Ton
090 7½ Ton, Single Compressor
120 10 Ton

Digit 7 - Major Design Sequence
E R-410A Refrigerant

Digit 8 - Voltage Selection
1 208/230/60/1
3 208-230/60/3
4 460/60/3
W 575/60/3

Digit 9 - Unit Controls
R ReliaTel™ Microprocessor

Digit 10 - Heating Capacity

0=No Electric Heat	F=14 kW (1 phase)[1]
A=5 kW (1 phase)[1]	G=18 kW (1&3 phase)
B=6 kW (3 phase)	J=23 kW (3 phase)
C=9 kW (3 phase)	K= 27 kW (3 phase)
D=10 kW (1 phase)[1]	N = 36 kW (3 phase)
E=12 kW (3 phase)	P = 54 kW (3 phase)

Digit 11 - Minor Design Sequence
A First Sequence

Digit 12,13 - Service Sequence
** Factory Assigned

Digit 14 - Fresh Air Selection
0 No Fresh Air
A Manual Outside Air Damper 0-50%[2]
B Motorized Outside Air Damper 0-50%
C Economizer, Dry Bulb 0-100% without Barometric Relief[5]
D Economizer, Dry Bulb 0-100% with Barometric Relief[5]
E Economizer, Reference Enthalpy 0-100% without Barometric Relief[5]
F Economizer, Reference Enthalpy 0-100% with Barometric Relief[5]
G Economizer, Comparative Enthalpy 0-100% without Barometric Relief[5]
H Economizer, Comparative Enthalpy 0-100% with Barometric Relief[5]

Digit 15 - Supply Fan/Drive Type/ Motor
0 Standard Drive[4]
1 Oversized Motor
2 Optional Belt Drive Motor

Digit 16 - Hinged Service Access/ Filters
0 Standard Panels/Standard Filters
A Hinged Access Panels/Standard Filters
B Standard Panels/2" MERV 7 Filters
C Hinged Access Panels/2" MERV 7 Filters
D Standard Panels/2" MERV 13 Filters
E Hinged Access Panels/2" MERV 13 Filters

Digit 17 - Condenser Coil Protection
0 Standard Coil
1 Standard Coil with Hail Guard
2 Black Epoxy Pre-Coated Condenser Coil
3 Black Epoxy Pre-Coated Condenser Coil with Hail Guard
4 CompleteCoat™ Condenser Coil
5 CompleteCoat™ Condenser Coil with Hail Guard

Digit 18 - Through the Base Provisions
0 No Through the Base Provisions
A Through the Base Electric[6]

Digit 19 - Disconnect/Circuit Breaker (three-phase only)
0 No Disconnect/No Circuit Breaker
1 Unit Mounted Non-Fused Disconnect[6]
2 Unit Mounted Circuit Breaker[6]

Digit 20 - Convenience Outlet
0 No Convenience Outlet
A Unpowered Convenience Outlet
B Powered Convenience Outlet (three-phase only)[7]

Digit 21 - Communications Options
0 No Communications Interface

Digit 22 - Refrigeration System Option
0 Standard Refrigeration System[8]

Digit 23 - Refrigeration Controls
0 No Refrigeration Control[3]
1 Frostat
2 Crankcase Heater[11]
3 Frostat and Crankcase Heater[11]

Digit 24 - Smoke Detector
0 No Smoke Detector
A Return Air Smoke Detector[9]
B Supply Air Smoke Detector
C Supply and Return Air Smoke Detectors[9]

Digit 25 - Monitoring Controls
0 No Monitoring Control
1 Clogged Filter Switch
2 Fan Failure Switch
3 Discharge Air Sensing Tube
4 Clogged Filter Switch and Fan Fail Switch
5 Clogged Filter Switch and Discharge Air Sensing Tube
6 Fan Fail Switch and Discharge Air Sensing Tube
7 Clogged Filter and Fan Fail Switches and Discharge Air Sensing Tube

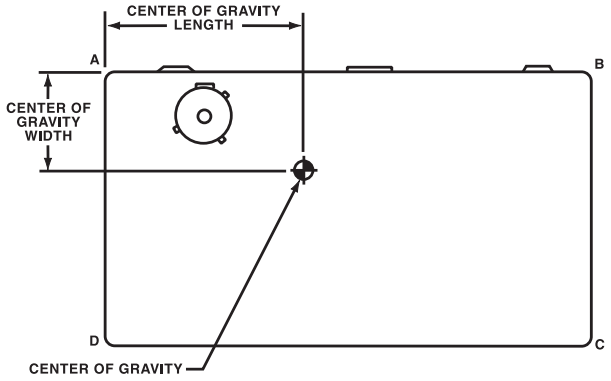
WSC036E
564LBS WITH STATED ACC

Weights

Table 53. Maximum unit & corner weights (lbs) and center of gravity dimensions (in.)

Unit		Maximum Model Weights[a]		Corner Weights[b]				Center of Gravity (in.)	
Tons	Model No.	Shipping	Net	A	B	C	D	Length	Width
3	WSC036E	589	514	177	107	113	117	29	20
4	WSC048E	600	525	181	109	115	119	29	20
5	WSC060E	825	682	228	177	114	163	38	24
6	WSC072E	835	740	235	196	140	168	40	22
7½	WSC090E	902	804	255	217	153	180	41	22
10	WSC120E	1388	1199	342	328	259	270	49	28

(a) Weights are approximate.
(b) Corner weights are given for information only.



Weights

Table 54. Factory installed options (fiops)/accessory net weights (lbs)[a],[b]

Accessory	WSC036E-048E Net Weight 3-4 Tons	WSC***E Net Weight 5 Tons	WSC072E-090E Net Weight 6-7½ Tons	WSC120E Net Weight 10 Tons
460 V IDM Transformer[c]	29	29	—	—
Barometric Relief	7	10	10	10
Belt Drive Option (3 phase only)	31	31	—	—
Coil Guards	12	20	20	30
Economizer	26	36	36	36
Electric Heaters[d]	15	30	30	40
Hinged Doors	10	12	12	12
Manual Outside Air Damper	16	26	26	26
Motorized Outside Air Damper	20	30	30	30
Oversized Motor	5	8	8	—
Powered Convenience Outlet	38	38	38	50
Powered Exhaust	—	80	80	80
Roof Curb	61	78	78	89
Smoke Detector, Supply	5	5	5	5
Smoke Detector, Return	7	7	7	7
Through the Base Electrical	8	13	8	13
Unit Mounted Circuit Breaker	5	5	5	5
Unit Mounted Disconnect	5	5	5	5

(a) Weights for options not listed are <5 lbs.
(b) Net weight should be added to unit weight when ordering factory-installed accessories.
(c) Apply weight with all 460V units with the Standard Direct Drive Motor.
(d) Applicable to Heat Pump units only.

Job Name: South Hill Mall 14361088L Replace
Prepared By:
Unit Tag: W4C-1
Quantity: 1

Trane Precedent Heat Pump Packaged Rooftop

Unit Overview - WSC036H4R0A**E0C00000000000000000000000

Application	Unit Size	Supply Fan		External Dimensions (in.)			Operating Weight		EER	IEER/SEER	Elevation
		Airflow	External Static Pressure	Height	Width	Length	Minimum	Maximum			
DX cooling	3 Ton	1200 cfm	0.800 in H2O	3.41 ft	3.69 ft	5.82 ft	507.0 lb	785.0 lb	12.1 EER	14.30	0.00 ft

Unit Features

Fresh Air Selection	Econ, ref enth 0-100% w/o baro rel 3 ph
Panels/Filters	Hinged pnl/2 in pltd filters MERV 8-3 ph

Unit Electrical

Voltage/phase/hertz	460/60/3
MCA	11.00 A
MOP	15.00 A
MCA (230 w/ Elec Heat)	0.00 A
MOP (230 w/ Elec Heat)	0.00 A

Cooling Section

		Capacity	
Entering Dry Bulb	80.00 F	**Gross Total**	39.43 MBh
Entering Wet Bulb	67.00 F	**Gross Sensible**	29.42 MBh
Ambient Temp	95.00 F	**Net Total**	38.12 MBh
Leaving Coil Dry Bulb	55.64 F	**Net Sensible**	28.12 MBh
Leaving Coil Wet Bulb	55.55 F	**Fan Motor Heat**	0.51 MBh
Leaving Unit Dry Bulb	58.34 F	**Refrig Charge-circuit 1**	7.7 lb
Leaving Unit Wet Bulb	56.88 F		

Heating Section

Heat Pump Mode	
Output Heating Capacity	35.50 MBh
Output Heating Capacity with Fan	36.01 MBh
Heating Delta T	27.39 F
Heating EAT	70.00 F
Heating Ambient Temp	47.00 F
Heating Ambient WB	42.00 F
Heating Ambient Relative Humidity	70.00 %

AS ORDERED, W/ DEHUMID AND MIXED INSIDE/OUSIDE AIR ECONOMIZER: 602LBS

Fan Section

Indoor Fan Data		Outdoor Fan Data	
Type	FC Centrifugal	**Type**	Propeller
Drive Type	Direct	**Fan Quantity**	1
Evap Fan FLA	1.70 A	**Drive Type**	Direct
Indoor Fan Performance		**Outdoor Fan Performance**	
Airflow	1200 cfm	**Outdoor Motor Power**	0.26 kW
Design ESP	0.800 in H2O	**Condenser Fan FLA**	0.55 A
Component SP	0.120 in H2O		
Total SP	0.937 in H2O		
Supply Motor Horsepower	0.750 hp		
Indoor Motor Power	0.36 kW		
Indoor RPM	966 rpm		

Compressor Section

Power	2.93 kW
Circuit 1 RLA	6.60 A
Circuit 2 RLA	0.00 A

City of Puyallup
Development & Permitting Services
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Fire	Traffic

PRMH20221213

Acoustics

Sound Path	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Ducted Discharge	84 dB	76 dB	69 dB	67 dB	61 dB	57 dB	57 dB	50 dB
Ducted Inlet	81 dB	74 dB	64 dB	58 dB	54 dB	48 dB	46 dB	40 dB
Outdoor Noise	84 dB	85 dB	80 dB	80 dB	77 dB	74 dB	70 dB	64 dB

Model Number Description - 3-10 Ton R-410A

Digit 1 - Unit Type
W Packaged Heat Pump[3]

Digit 2 - Efficiency
S Standard Efficiency

Digit 3 - Airflow
C Convertible

Digit 4,5,6 - Nominal Gross Cooling Capacity (MBh)
036 3 Tons
048 4 Tons
060 5 Tons
072 6 Ton
090 7½ Ton, Single Compressor
120 10 Ton

Digit 7 - Major Design Sequence
E R-410A Refrigerant

Digit 8 - Voltage Selection
1 208/230/60/1
3 208-230/60/3
4 460/60/3
W 575/60/3

Digit 9 - Unit Controls
R ReliaTel™ Microprocessor

Digit 10 - Heating Capacity

0=No Electric Heat	F=14 kW (1 phase)[1]
A=5 kW (1 phase)[1]	G=18 kW (1&3 phase)
B=6 kW (3 phase)	J=23 kW (3 phase)
C=9 kW (3 phase)	K= 27 kW (3 phase)
D=10 kW (1 phase)[1]	N = 36 kW (3 phase)
E=12 kW (3 phase)	P = 54 kW (3 phase)

Digit 11 - Minor Design Sequence
A First Sequence

Digit 12,13 - Service Sequence
** Factory Assigned

Digit 14 - Fresh Air Selection
0 No Fresh Air
A Manual Outside Air Damper 0-50%[2]
B Motorized Outside Air Damper 0-50%
C Economizer, Dry Bulb 0-100% without Barometric Relief[5]
D Economizer, Dry Bulb 0-100% with Barometric Relief[5]
E Economizer, Reference Enthalpy 0-100% without Barometric Relief[5]
F Economizer, Reference Enthalpy 0-100% with Barometric Relief[5]
G Economizer, Comparative Enthalpy 0-100% without Barometric Relief[5]
H Economizer, Comparative Enthalpy 0-100% with Barometric Relief[5]

Digit 15 - Supply Fan/Drive Type/ Motor
0 Standard Drive[4]
1 Oversized Motor
2 Optional Belt Drive Motor

Digit 16 - Hinged Service Access/ Filters
0 Standard Panels/Standard Filters
A Hinged Access Panels/Standard Filters
B Standard Panels/2" MERV 7 Filters
C Hinged Access Panels/2" MERV 7 Filters
D Standard Panels/2" MERV 13 Filters
E Hinged Access Panels/2" MERV 13 Filters

Digit 17 - Condenser Coil Protection
0 Standard Coil
1 Standard Coil with Hail Guard
2 Black Epoxy Pre-Coated Condenser Coil
3 Black Epoxy Pre-Coated Condenser Coil with Hail Guard
4 CompleteCoat™ Condenser Coil
5 CompleteCoat™ Condenser Coil with Hail Guard

Digit 18 - Through the Base Provisions
0 No Through the Base Provisions
A Through the Base Electric[6]

Digit 19 - Disconnect/Circuit Breaker (three-phase only)
0 No Disconnect/No Circuit Breaker
1 Unit Mounted Non-Fused Disconnect[6]
2 Unit Mounted Circuit Breaker[6]

Digit 20 - Convenience Outlet
0 No Convenience Outlet
A Unpowered Convenience Outlet
B Powered Convenience Outlet (three-phase only)[7]

Digit 21 - Communications Options
0 No Communications Interface

Digit 22 - Refrigeration System Option
0 Standard Refrigeration System[8]

Digit 23 - Refrigeration Controls
0 No Refrigeration Control[3]
1 Frostat
2 Crankcase Heater[11]
3 Frostat and Crankcase Heater[11]

Digit 24 - Smoke Detector
0 No Smoke Detector
A Return Air Smoke Detector[9]
B Supply Air Smoke Detector
C Supply and Return Air Smoke Detectors[9]

Digit 25 - Monitoring Controls
0 No Monitoring Control
1 Clogged Filter Switch
2 Fan Failure Switch
3 Discharge Air Sensing Tube
4 Clogged Filter Switch and Fan Fail Switch
5 Clogged Filter Switch and Discharge Air Sensing Tube
6 Fan Fail Switch and Discharge Air Sensing Tube
7 Clogged Filter and Fan Fail Switches and Discharge Air Sensing Tube

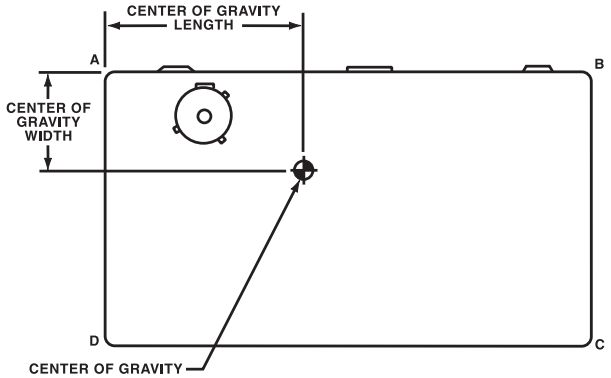
WSC036E
564LBS WITH STATED ACC

Weights

Table 53. Maximum unit & corner weights (lbs) and center of gravity dimensions (in.)

Unit		Maximum Model Weights[a]		Corner Weights[b]				Center of Gravity (in.)	
Tons	Model No.	Shipping	Net	A	B	C	D	Length	Width
3	WSC036E	589	514	177	107	113	117	29	20
4	WSC048E	600	525	181	109	115	119	29	20
5	WSC060E	825	682	228	177	114	163	38	24
6	WSC072E	835	740	235	196	140	168	40	22
7½	WSC090E	902	804	255	217	153	180	41	22
10	WSC120E	1388	1199	342	328	259	270	49	28

(a) Weights are approximate.
(b) Corner weights are given for information only.



Weights

Table 54. Factory installed options (fiops)/accessory net weights (lbs)[a],[b]

Accessory	WSC036E-048E Net Weight 3-4 Tons	WSC***E Net Weight 5 Tons	WSC072E-090E Net Weight 6-7½ Tons	WSC120E Net Weight 10 Tons
460 V IDM Transformer[c]	29	29	—	—
Barometric Relief	7	10	10	10
Belt Drive Option (3 phase only)	31	31	—	—
Coil Guards	12	20	20	30
Economizer	26	36	36	36
Electric Heaters[d]	15	30	30	40
Hinged Doors	10	12	12	12
Manual Outside Air Damper	16	26	26	26
Motorized Outside Air Damper	20	30	30	30
Oversized Motor	5	8	8	—
Powered Convenience Outlet	38	38	38	50
Powered Exhaust	—	80	80	80
Roof Curb	61	78	78	89
Smoke Detector, Supply	5	5	5	5
Smoke Detector, Return	7	7	7	7
Through the Base Electrical	8	13	8	13
Unit Mounted Circuit Breaker	5	5	5	5
Unit Mounted Disconnect	5	5	5	5

(a) Weights for options not listed are <5 lbs.
(b) Net weight should be added to unit weight when ordering factory-installed accessories.
(c) Apply weight with all 460V units with the Standard Direct Drive Motor.
(d) Applicable to Heat Pump units only.

Weights

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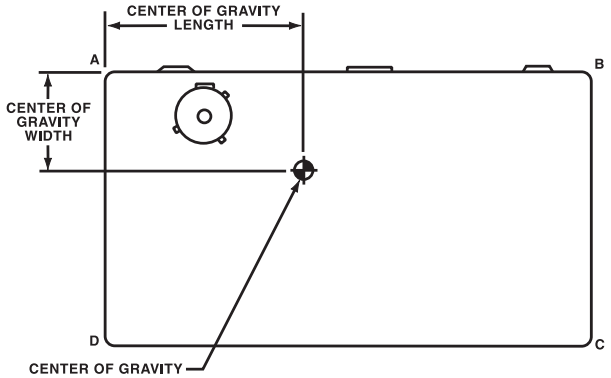

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