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

PRMU20241695

PROJECT: 2ND STREET APTS		SHEET NO. 1/14
BY: CF	DATE: 10/18/24	JOB NO. 24-12

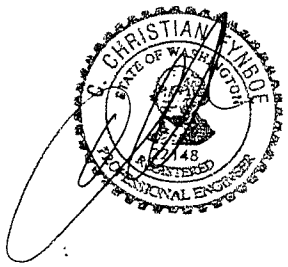
Calculations required to be provided by the Permittee on site for all Inspections

STRUCTURAL CALCULATIONS FOR THE 2ND STREET APARTMENTS

(2ND STREET PUYALLUP)

-JAMES GUERRERO ARCHITECT

DESIGN PARAMETERS - 2021 IBC
SEE NOTES ON "S1.1"



City of Puyallup
Building
REVIEWED
FOR
COMPLIANCE
BSnowden
01/13/2025
11:04:42 AM
CITY OF PUYALLUP
STATE OF WASHINGTON

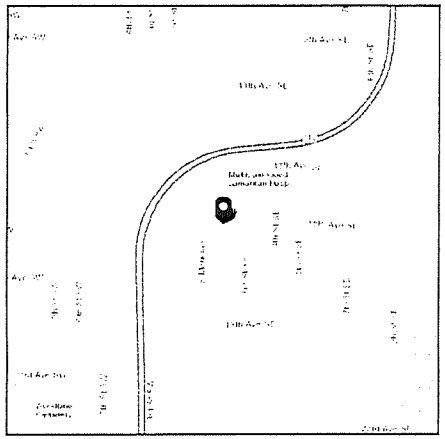
#2411 2/4

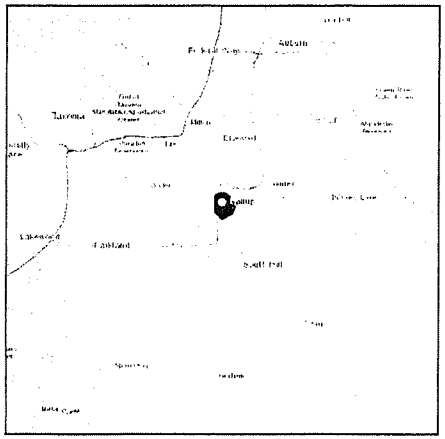
ASCE Hazards Report

Address:
Puyallup
Washington,

Standard: ASCE/SEI 7-22
Risk Category: II
Soil Class: Default

Latitude: 47.177438
Longitude: -122.292318
Elevation: 114.73208016092777 ft (NAVD 88)





Wind

Results:

Wind Speed	97 Vmph
10-year MRI	67 Vmph
25-year MRI	73 Vmph
50-year MRI	78 Vmph
100-year MRI	83 Vmph
300-year MRI	92 Vmph
700-year MRI	97 Vmph
1,700-year MRI	104 Vmph
3,000-year MRI	108 Vmph
10,000-year MRI	118 Vmph
100,000-year MRI	136 Vmph
1,000,000-year MRI	154 Vmph

Data Source: ASCE/SEI 7-22, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Mon Apr 15 2024

#24112 3/14

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-22 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years). Values for 10-year MRI, 25-year MRI, 50-year MRI and 100-year MRI are Service Level wind speeds, all other wind speeds are Ultimate wind speeds.

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-22 Section 26.2.

#25412

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Seismic

Site Soil Class: Default

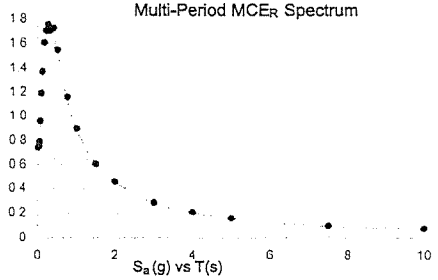
Results:

PGA_M :	0.56	T_L :	6
S_{MS} :	1.59	S_S :	1.44
S_{M1} :	0.9	S_1 :	0.42
S_{DS} :	1.06	V_{S30} :	260
S_{D1} :	0.6		

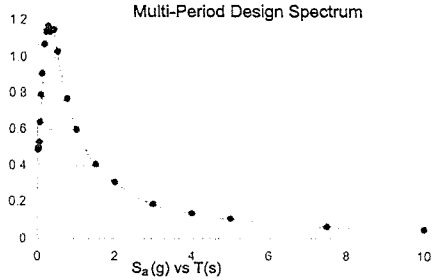
$V = 1.06/60(14) = 1.24$ (ASD)

Seismic Design Category: D

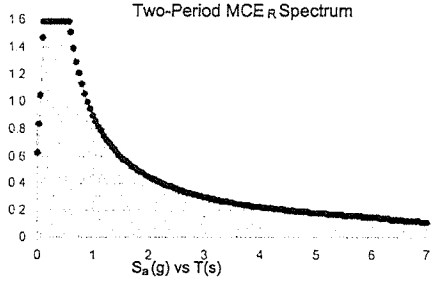
Multi-Period MCE_R Spectrum



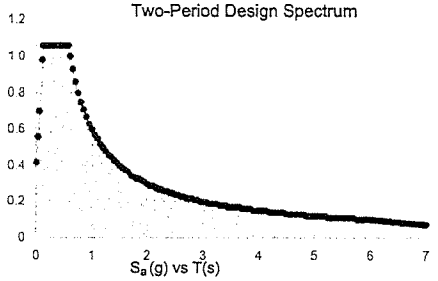
Multi-Period Design Spectrum



Two-Period MCE_R Spectrum



Two-Period Design Spectrum



MCE_R Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

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PROJECT:			SHEET NO.
BY:	DATE:	JOB NO. 2412	5/14

$W_{ROOF} = .102(182)(42) = 153k$

$W_{3rd} = .130(182)42 = 229k$

$W_{2ND} = .130(182)42 = 229$

$\Sigma = 612k$

$V_{SEIS} = 1.0g/65(1.4)\ W = .112W$

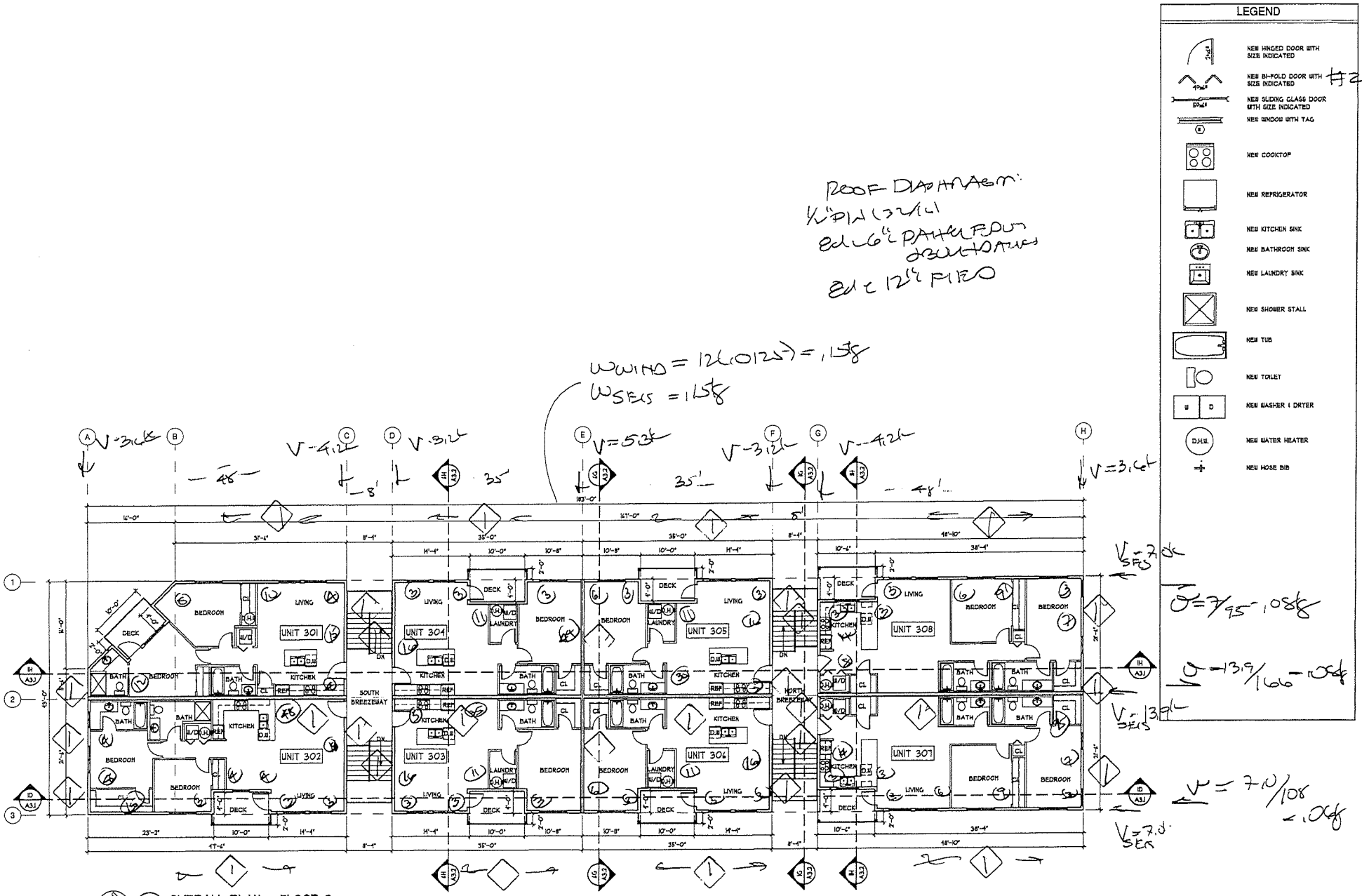
$V_{SEIS} = .112(612) = 71.3k$

$V_{ROOF} = \dfrac{27.5(153)}{\underbrace{27.5(153)+19(229)+9.5(229)}_{10734}}(71.3) = 27.9k$

$V_{3rd} = \dfrac{19(229)}{10734}(71.3) = 28.9k$

$V_{2nd} = \dfrac{9.5(229)}{10734}(71.3) = 14.5k$

$\Sigma = 71.3k$ — OK



ROOF DIAPHRAGM:
15/32" PLYWOOD
ED 6" PANEL EDGE
BLOCKING
ED & 12" FIELD

W WIND = 12(.0125) = .15#
W SEIS = .15#

V = 3.1k
V = 4.1k
V = 5.2k
V = 3.1k
V = 4.1k
V = 3.1k
V SEIS = 7.2k
V = 7/95 - .08#
V = 13.9/166 - .05#
V SEIS = 13.9k
V = 7.0/108 - .06#
V SEIS = 7.0k

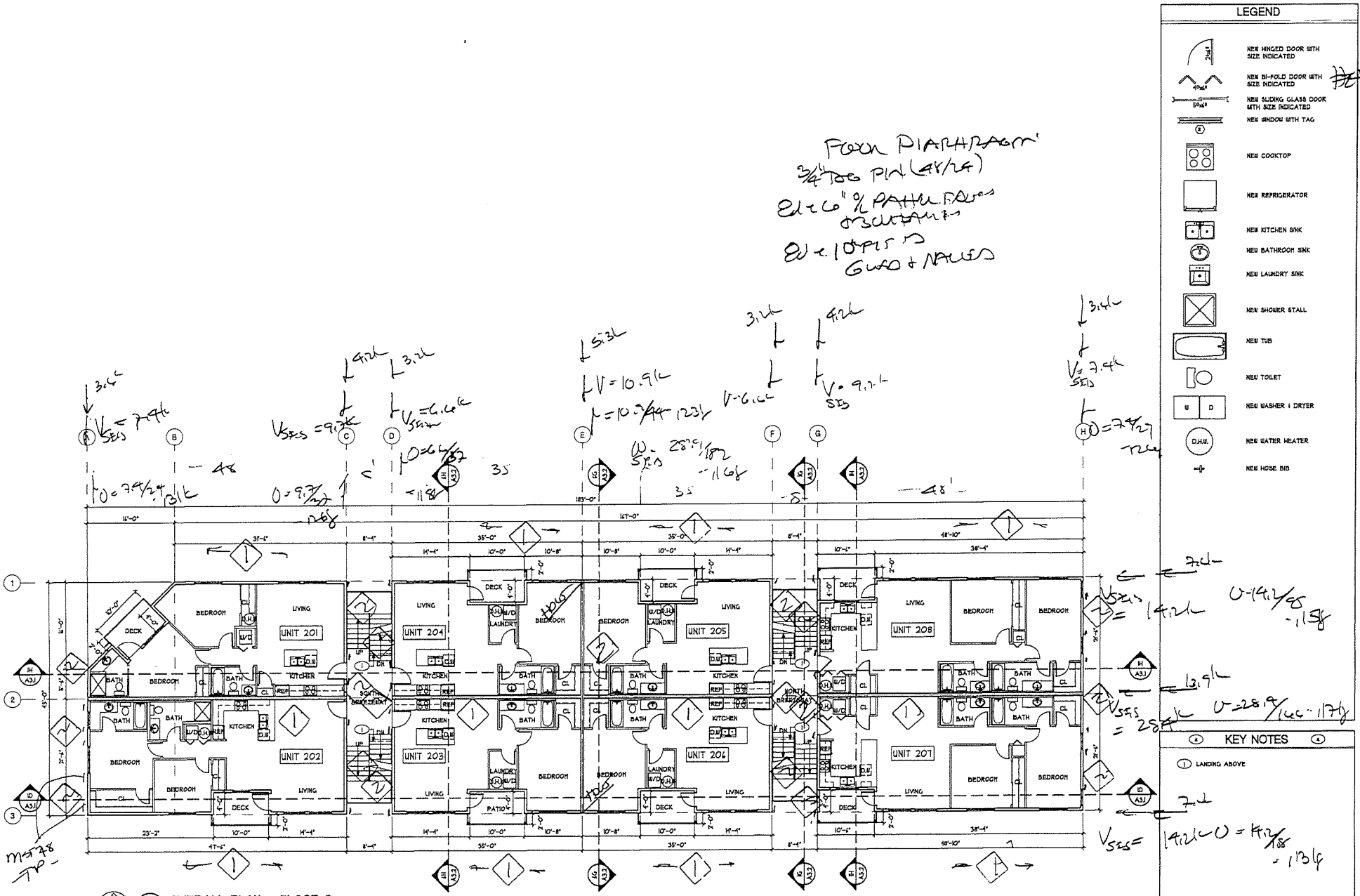
PRELIMINARY

PROJECT
2ND STREET APARTMENTS
000 2ND STREET NE, PUYALLUP, WA 98372

DATE 09-13
REVISED

SHEET NO.
A1.3

7520 Bridgeport Way West
Lakewood, WA 98499
Phone: (253) 581-6000



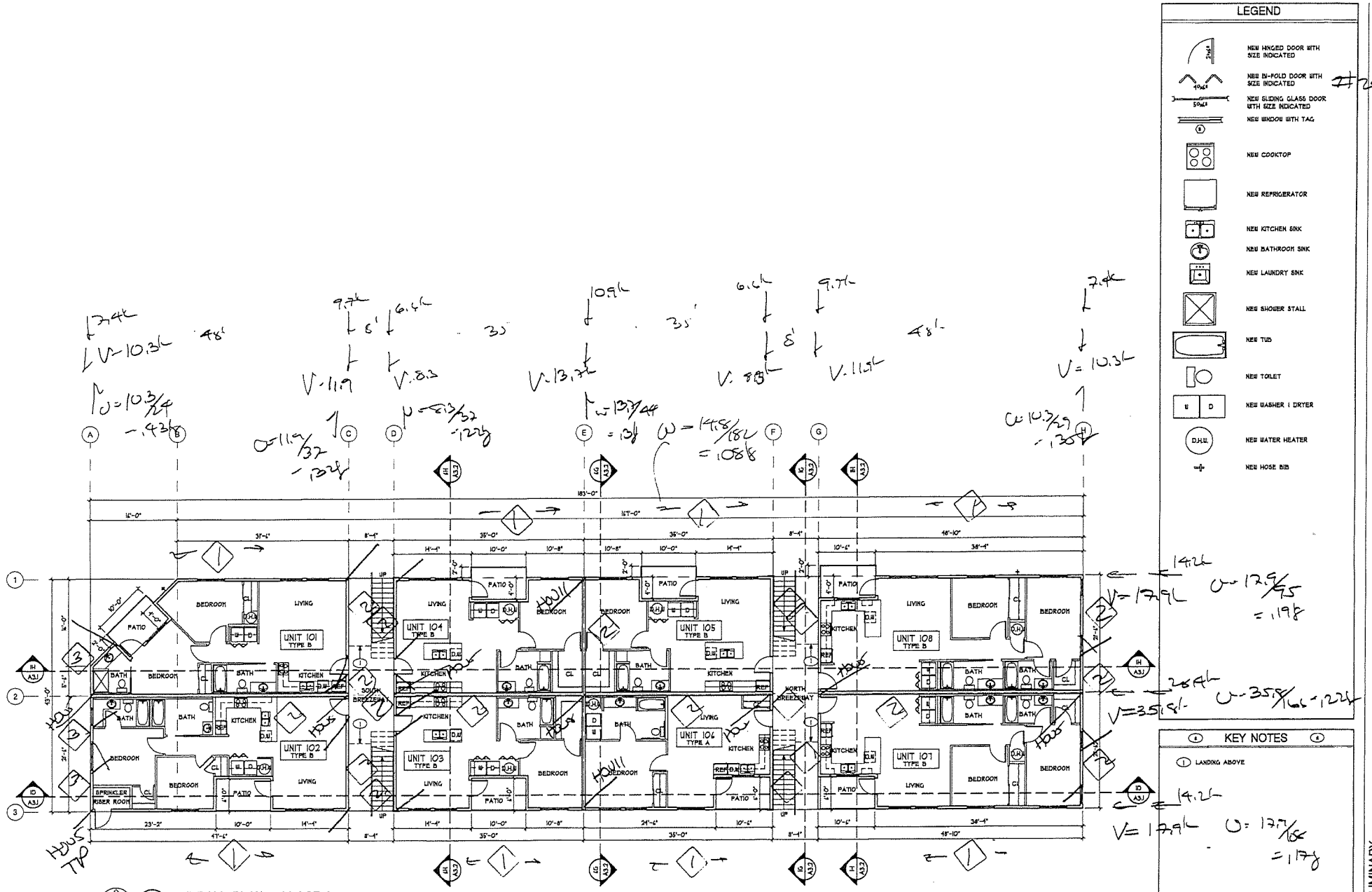
PRELIMINARY

PROJECT
2ND STREET APARTMENTS
000 2ND STREET NE, PUYALLUP, WA 98372

DATE 09-13
REVISED

SHEET NO.
A1.

7520 Bridgeport Way West
Lakewood, WA 98499
Phone: (253) 581-6000



8/14

#24112

7520 Bridgeport Way West
Lakewood, WA 98499
Phone: (253) 581-6000

PROJECT
2ND STREET APARTMENTS
000 2ND STREET NE, PUYALLUP, WA 98372

DRAWING TITLE

DATE 09-13-
REVISED

SHEET NO.
A1.

PRELIMINARY

christian fynboe DC
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12202 PACIFIC AVE. S. • TACOMA, WA 98444 • (253) 537-8128 • FAX 531-1285

PROJECT:			SHEET NO.
BY:	DATE:	JOB NO. 2412	9/14

Mark (shear capacity)	Wall Type (3)	Panel Edge Nailing (1), (2)	Intermediate Nailing (2)	Bottom Plate Anchor Bolting or Nailing (5)
1 (200 lb/ft.)	½" CDX Plywood or OSB, one side	8d @ 6" o.c.	8d @ 12" o.c.	½" A.B. @ 4'-0" o.c. or 16d @ 7½ o.c.
2 (350 lb/ft.)	½" CDX Plywood or OSB, one side	8d @ 4" o.c.	8d @ 12" o.c.	5/8" A.B. @ 3'-4" o.c. or 16d @ 4" o.c.
3 (870 lb/ft.)	½" CDX Plywood (ONE SIDE)	10d @ 2" o.c. (4)	10d @ 12" o.c.	3/4" A.B. @ 18" ℄ OR SPS2514 @ 4" ℄
4 (1200 lb/ft.)	1/2" CDX PLYWOOD (BOTH SIDES)	10d @ 3" ℄ (4)	10d @ 12" ℄	3/4" A.B. @ 12" ℄ OR SPS2514 @ 2" ℄

Notes:
1. Block all panel edges.
2. Common or box nails.
3. 2x studs shall be H.F. #2 or better, kiln-dried.
4. Use 3x studs and plates @ panel edges, wall type 3 only.
5. Anchor bolts shall have minimum 3" by 3" by ¼" thick plate washers.

CHRISTIAN FUNDOC DC
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PROJECT:			SHEET NO.
BY:	DATE:	JOB NO. 2412	10/14

SHEAR WALL (HEM FIR VALUES)

(1) $15/32$" STRUCT I 8d @ 6" o/c 280(.82) = 230 lb/ft
$1/2$" ø AB @ 4'0" o/c 600(1.6/4) = 240 lb/ft
16d @ 4" o/c 91(1.6) 12/7.5 = 233 lb/ft

200 lb/ft

(2) $5/32$ STRUCT I 8d @ 4" o/c 430(.82) = 353 lb
$5/8$" ø AB @ 3'4" 860(1.6)/3.33 = 413 lb/ft
16d @ 4" o/c 91(1.6) 12/4 = 437 lb/ft

350 lb/ft

(3) $15/32$ STRUCT I 10d @ 2" o/c 870 = 870 lb/ft
$3/4$" ø AB @ 1'6" - 1460 (1.6)/1.5 = 1557 lb/ft
$1/4$" ø SDS @ 4" o/c 250(1.6) 12/4 = 1200 lb/ft

870 lb/ft

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PROJECT:			SHEET NO.
BY:	DATE:	JOB NO. 2A112	11/14

ROOF FRAMING

$l = 5'$

$w = .104(12) = .148^{\#}$

$M = \frac{.148(5)^2}{8} 12 = 18^{k'}$

$S_{REQ'D} = 18/1.965(1.15) = 16.2^{in^3}$

4X12 DF#2

$l = 8'$

$w = .104(21) = .184^{\#}$

$M = \frac{.184(8)^2}{8} 12 = 80.6^{k'}$

$S_{REQ'D} = 80.6/1.965(1.15) = 72.7^{in^3}$

6X10 DF#2

UPPER FLOOR

$l = 16'$

$w = (.104 + .013 + .01)\,11 = 0.176$

$M = \frac{0.176(16)^2}{8} 12 = 266^{k''}$

$S_{REQ'D} = 266/24 = 111^{in^3}$

7"x11 7/8" LVL

$\Delta = \frac{5}{384} \frac{(.176)(16)^4(1728)}{1800(937)} = .59''$ $\ell/325$

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PROJECT:			SHEET NO.
BY:	DATE:	JOB NO. 24112	12/14

$\ell = 14'$

$w = 0.7\,k$

$M = \frac{0.7(14)^2}{12} = 20.6\,k'$

$S_{REQ'D} = 20.6/24 = 86\text{ in}^3$

$5\tfrac{1}{4}\text{" x } 17\tfrac{7}{8}\text{" LVL}$

$\Delta = \frac{5}{384}\frac{(.7)(14)^4(1728)}{1800\,(933)} = .39''$

$L/424$ OK

$P = .7(14)2 = 19.6^k$

$L = \sqrt{19.6/.15} = 3.6\,ft^2$

USE 40" D x 12" CONC FTG W/ #4 @ 4' o.c.

EXT

$\ell = 8'$

$w = (.1 + .01 + .04)19.2 = .12\,k$

$M = \frac{0.12(8)^2}{12} = 1.92\,k'$

$S_{REQ'D} = 19.2/1.98(18) = 2.4\text{ in}^3$

2x12 @ 16" o.c. OK

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PROJECT:			SHEET NO.
BY:	DATE:	JOB NO. 2511	13/14

$\ell = 12'$

$w = .125(2) = .25^{k}$

$M = \frac{.125(12)^2}{8}12 = 54^{k'}$

$S_{req} = 54/.925(18) = 7.2^{in}$

USE 4X12 STRUCTURAL

$\ell = 17'$

$w = (.094 + .013 + .01)14\frac{1}{2} = .084^{k}$

$M = \frac{.084(17)^2}{8} = 3.0^{k'}$

11 7/8" TJI 360 @ 16"

Design Properties (100% Load Duration)

Depth	TJI®	Basic Properties: Joist Weight (lbs/ft)	Basic Properties: Maximum Resistive Moment(1) (ft-lbs)	Basic Properties: Joist Only EI x 10⁶ (in.²-lbs)	Basic Properties: Maximum Vertical Shear (lbs)	Reaction Properties: 1¾" End Reaction (lbs)	Reaction Properties: 3½" Intermediate Reaction (lbs): No Web Stiffeners	Reaction Properties: 3½" Intermediate Reaction (lbs): With Web Stiffeners
9½"	110	2.3	2,380	140	1,220	865	1,935	N.A.
	210	2.6	2,860	167	1,330	980	2,145	N.A.
	230	2.7	3,175	183	1,330	1,035	2,410	N.A.
11¼"	110	2.5	3,015	238	1,560	865	1,935	2,295
	210	2.8	3,620	283	1,655	980	2,145	2,505
	230	3.0	4,015	310	1,655	1,035	2,410	2,765
	360	3.0	6,180	419	1,705	1,080	2,460	2,815
	560	4.0	9,500	636	2,050	1,265	3,000	3,475
14"	110	2.8	3,565	351	1,880	865	1,935	2,295
	210	3.1	4,280	415	1,945	980	2,145	2,505
	230	3.3	4,755	454	1,945	1,035	2,410	2,765
	360	3.3	7,335	612	1,955	1,080	2,460	2,815
	560	4.2	11,275	926	2,390	1,265	3,000	3,475
16"	210	3.3	4,895	566	2,190	980	2,145	2,505
	230	3.5	5,440	618	2,190	1,035	2,410	2,765
	360	3.5	8,405	830	2,190	1,080	2,460	2,815
	560	4.5	12,925	1,252	2,710	1,265	3,000	3,475

(1) Caution: Do not increase joist moment design properties by a repetitive member use factor.

General Notes

TJI® joists are intended for dry-use applications

- Design reaction includes all loads on the joist. Design shear is computed at the inside face of supports and includes loads on the span(s). Allowable shear may sometimes be increased at interior supports in accordance with ICC ES ESR-1153, and these increases are reflected in span tables.
- The following formulas approximate the uniform load deflection of Δ (inches):

For TJI® 110, 210, 230, and 360 Joists

$$\Delta = \frac{22.5\ wL^4}{EI} + \frac{2.67\ wL^2}{d \times 10^5}$$

For TJI® 560 Joists

$$\Delta = \frac{22.5\ wL^4}{EI} + \frac{2.29\ wL^2}{d \times 10^5}$$

w = uniform load in pounds per linear foot
L = span in feet
d = out-to-out depth of the joist in inches
EI = value from table above

Material Weights

(Include TJI® weights in dead load calculations—see **Design Properties** table at left for joist weights)

Floor Panels

Southern Pine

- ½" plywood .....1.7 psf
- ⅝" plywood .....2.0 psf
- ¾" plywood .....2.5 psf
- 1⅛" plywood .....3.8 psf
- ½" OSB .....1.8 psf
- ⅝" OSB .....2.2 psf
- ¾" OSB .....2.7 psf
- ⅞" OSB .....3.1 psf
- 1⅛" OSB .....4.1 psf

Based on: Southern pine – 40 pcf for plywood, 44 pcf for OSB

Roofing

- Asphalt shingles .....2.5 psf
- Wood shingles .....2.0 psf
- Clay tile .....9.0 to 14.0 psf
- Slate (⅛" thick) .....15.0 psf

Roll or Batt Insulation (1" thick):

- Rock wool .....0.2 psf
- Glass wool .....0.1 psf

Floor Finishes

- Hardwood (nominal 1") .....4.0 psf
- Sheet vinyl .....0.5 psf
- Carpet and pad .....1.0 psf
- ¾" ceramic or quarry tile .....10.0 psf

Concrete:

- Regular (1") .....12.0 psf
- Lightweight (1") .....8.0 to 10.0 psf
- Gypsum concrete (¾") .....6.5 psf

Ceilings

- Acoustical fiber tile .....1.0 psf
- ½" gypsum board .....2.2 psf
- ⅝" gypsum board .....2.8 psf
- Plaster (1" thick) .....8.0 psf

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