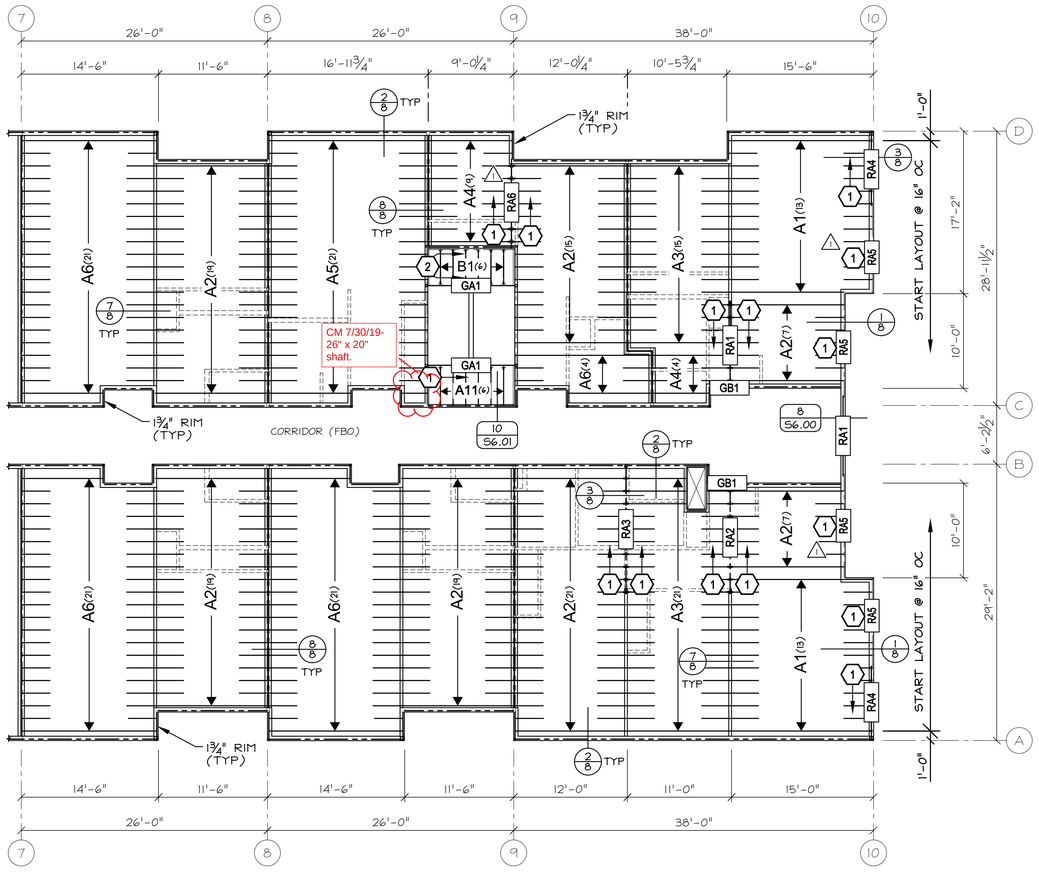


N

5TH FLOOR - GRIDS 7 TO 10 FRAMING LOCATION PLAN

SCALE ⅛"=1'-0"

KEY NOTES

1. JOIST LAYOUT SHOWN DOES NOT ACCOUNT FOR CLEARANCE TO ANY FLOOR DRAINS. THE CONTRACTOR IS RESPONSIBLE FOR DRAIN LAYOUT. (NOTE: LIVING UNIT FLOOR JOISTS MAY BE OVERSPACED UP TO 2" FOR DRAIN CLEARANCE, THIS ALLOWS MOVING ANY ONE JOIST 4" MAX)

Hangers						
Quantity	Type	Model	Nailing			Web Stiffeners Required
			Top	Face	Member	
100	1	ITS1.81/11.88	4-N10	2-N10		
12	2	ITS1.81/9.5	4-N10	2-N10		

- REFER TO CURRENT SIMPSON STRONG TIE® LITERATURE FOR HANGER SPECIFIC INSTALLATION INSTRUCTIONS.
- WEB STIFFENERS IF REQUIRED MUST BE ATTACHED BEFORE PLACING JOIST IN HANGER.

IN ACCORDANCE WITH IBC SECTION 1603.1, THE PRODUCTS IN THIS PACKAGE HAVE BEEN DESIGNED FOR ONLY THOSE LOADS SPECIFICALLY SHOWN ON THE CONSTRUCTION DOCUMENTS. THE CONSTRUCTION DOCUMENTS AND PLACEMENT DIAGRAMS HAVE NOT BEEN REVIEWED BY A REDBUILT ENGINEER. IF OTHER LOADS (WIND UPLIFT, SNOW DRIFT, BRACE LOADS, ETC.) ARE TO BE APPLIED, PLEASE PROVIDE THE MAGNITUDE AND LOCATION.

GENERAL NOTES & LEGEND

DESIGN CONSIDERATIONS

BUILDING CODE: 2015 IBC

FLOOR DESIGN
- RESIDENTIAL LIVE LOAD: 40 PSF
- RESIDENTIAL DEAD LOAD: 35 PSF

- STAIRS LIVE LOAD: 100 PSF
- STAIRS DEAD LOAD: 20 PSF

DRAWING NOTES & LEGEND

- FOR TYPICAL NOTES, STANDARD DETAILS, AND ABBREVIATIONS, SEE INSTALLATION COVERSHEET(S).
- ALL DIMENSIONS ARE FROM FACE-OF-STUD, FACE-OF-CONCRETE OR CENTER-OF COLUMN/BEAM UNLESS OTHERWISE NOTED

XX(##) - PRODUCT CALLOUT AND QUANTITY ON PLAN.
"XX" - STRUCTURAL MEMBER TYPE CALLOUT
"##" - QUANTITY OF STRUCTURAL MEMBERS IN BAY

- RIM BOARD/FASCIA MATERIAL WILL BE SUPPLIED @ "STANDARD" 16'-0" LENGTHS AND AS EITHER LSL OR LVL

I-JOIST NOTES & LEGEND

- ALL I-JOISTS WILL BE SENT LONG TO BE FIELD TRIMMED

(X) - CONTINUOUS HANGER TYPE. SEE HANGER INFO.

THIRD PARTY PRODUCTS SOURCED BY REDBUILT

REDBUILT WILL PROVIDE GLULAM BEAMS WITH A 5000' RADIUS CAMBER. V8 BEAMS WILL NOT BE CAMBERED.

G? - LOCATION OF GLULAM BEAM. SEE MATERIAL LIST FOR MORE INFORMATION.

- ALL GLULAM BEAMS ARE SUPPLIED BASED ON THE SPECIFICATION SHOWN IN THE CONTRACT DOCUMENTS. REDBUILT SERVICES FOR THESE ITEMS ARE LIMITED TO PLACEMENT DRAWINGS ONLY. APPLICATION AND ADEQUACY REVIEW OF GLULAM BEAMS ARE THE SOLE RESPONSIBILITY OF THE DESIGN PROFESSIONAL OF RECORD AND ARE NOT PROVIDED BY REDBUILT.

RECTANGULAR SECTIONS

R? - LOCATION OF BEAM OR COLUMN BY RB. SEE MATERIAL LIST FOR MORE INFORMATION.

- ALL REDLAM LVL MATERIAL AND ASSOCIATED HARDWARE PROVIDED BY REDBUILT IS AS SPECIFIED ON THE CONTRACT DRAWINGS. SPECIFICATIONS AND SIZE HAVE NOT BEEN VERIFIED BY REDBUILT ENGINEERING UNLESS OTHERWISE NOTED.

PRODUCT TYPE CHART	
SEE MATERIAL LIST FOR MORE INFORMATION	
CALLOUT	MEMBER
A	11⅞" RED-145 JOIST
B	9½" RED-145 JOIST
GA	5⅛"x9" GLULAM BEAM (THIRD PARTY)
GB	5⅛"x12" GLULAM BEAM (THIRD PARTY)
RA	5¼"x11⅞" REDLAM BEAM

PROJECT ASSUMPTIONS
- ALL MISCELLANEOUS ITEMS (SPRINKLER LINES, SOFFITS, DUCTWORK, ELECTRICAL CONDUITS, ETC.) ARE ASSUMED TO BE INCLUDED IN THE UNIFORM DESIGN DEAD LOAD SHOWN, UNLESS SPECIFICALLY SHOWN OTHERWISE ON THESE SHOP DRAWINGS.
- ALL OPENINGS (HATCHES, DUCTWORK, SKYLIGHTS, ETC.) ARE ASSUMED TO FIT BETWEEN REGULAR ON-CENTER SPACING AS SHOWN, UNLESS SPECIFICALLY SHOWN OTHERWISE ON THESE SHOP DRAWINGS.

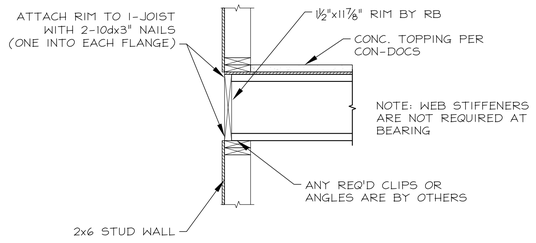
APPROVED FOR PRODUCTION

3			
2			
1	JL	5/24/19	OFA Comments
0	BY	DATE	REMARKS

RedBUILT™ Engineered Wood Products

Westman Mill
Olympia, WA
5th Floor - Grids 7 to 10

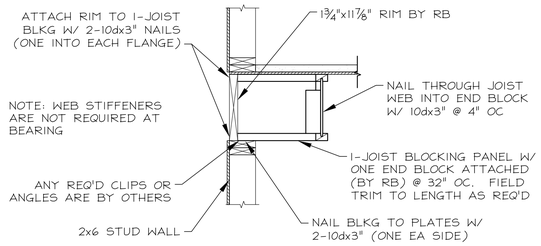
DRAWN	DATE	CHECKED	DATE	ORDER #	SHEET
JL	2/26/19	-	-	110805	7 OF 8



TYP @ GRIDS 1 & 10 AND JOISTS PERPINDICULAR TO SHAFTS (MECH, ELEVATOR & STAIRS)

1/8

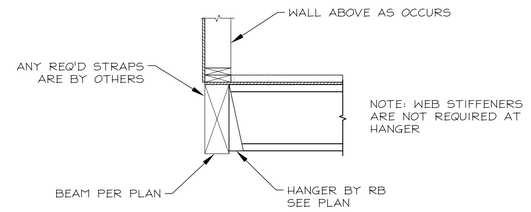
REF. 1/S6.00



TYP @ GRIDS A & D, CORRIDOR WALLS, AND JOISTS PARALLEL TO SHAFTS (MECH, ELEVATOR & STAIRS)

2/8

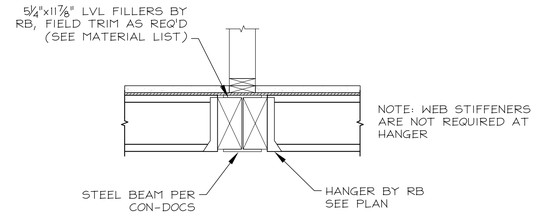
REF. 2/S6.00 & 9/S6.00



JOIST BOTH SIDES AS OCCURS

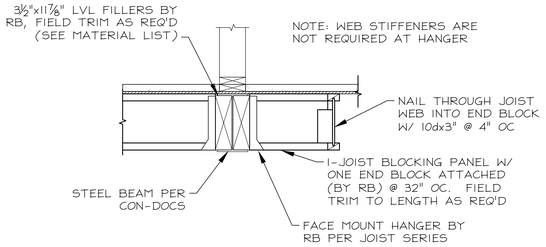
3/8

REF. 5/S6.00 & 6/S6.00



4/8

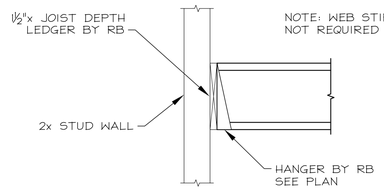
REF. 11/S6.00



NOTE: BLOCKING PANELS AND/OR FLOOR JOIST CONFIGURATION VARIES, SEE PLAN.

5/8

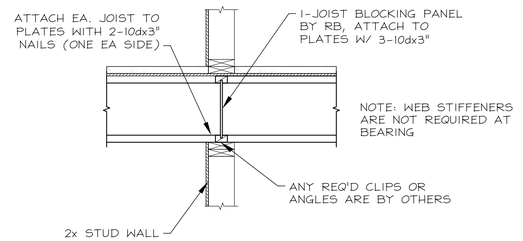
REF. 12/S6.00 & 13/S6.00



AT MID-LEVEL STAIR LANDINGS

6/8

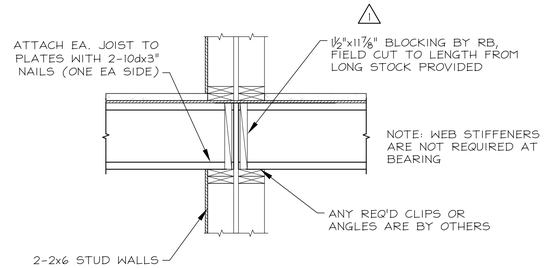
REF. 3/S6.01



AT SIM CONDITION: 2 ROWS OF BLOCKING PANELS FOR DIFFERENT JOIST SERIES BUTTING ON WALL

7/8

REF. 4/S6.00



8/8

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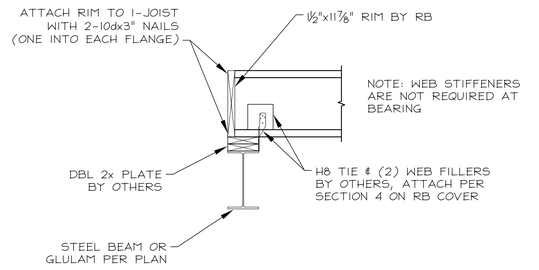


9/8

REF. 1/S6.02 & 2/S6.02

- STRAPS, ANCHORS, CLIPS, AND OTHER HARDWARE NOT SHOWN ARE TO BE PROVIDED BY OTHERS. HARDWARE SHOWN IS TO BE PROVIDED BY OTHERS UNLESS MARKED 'BY RB.' REFER TO THE CONTRACT DOCUMENTS FOR HARDWARE SPECIFICATIONS AND INSTALLATION INSTRUCTIONS.

- SEE I-JOIST INSTALLATION SHEET FOR WEB STIFFENER NAILING.

- FOR BEAMS SUPPLIED BY OTHERS, SEE CONTRACT DOCUMENTS FOR SPECIFICATIONS AND OTHER INFORMATION NOT SHOWN HEREIN.

- FOR ATTACHMENT OF SPRINKLER LINES, MECHANICAL DUCTS, ETC... TO JOISTS OR TRUSSES, PLEASE SEE "SPRINKLER SYSTEM INSTALLATION GUIDELINES". IF ADDITIONAL COPIES ARE REQUIRED, PLEASE CONTACT REDBUILT OR GO ONLINE TO: HTTP://WWW.REDBUILT.COM

APPROVED FOR PRODUCTION

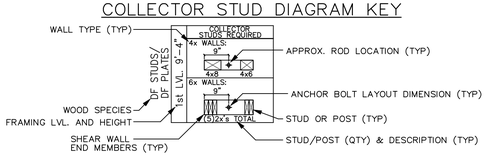
1	JL	5/23/19	Detail 8
	BY	DATE	REMARKS

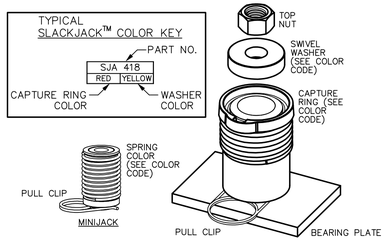
RedBUILT™ Engineered Wood Products

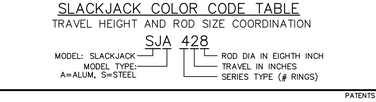
Westman Mill
Olympia, WA

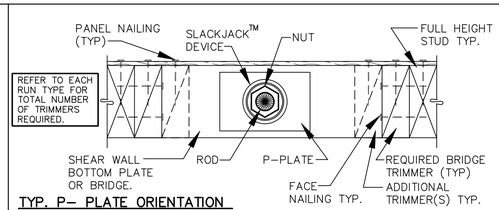
Details

DRAWN	DATE	CHECKED	DATE	ORDER #	SHEET
JL	2/26/19	-	-	110805	8 OF 8









GENERAL NOTES

1. THE <u>SLACKJACK™ DEVICE</u> COMPONENTS INCLUDE:
   A. SJA INNER AND OUTER SLEEVE CYLINDERS
   B. PRE-COMPRESSED COMPRESSION SPRING
   C. NUT: ALL NUTS TO CONFORM TO ASTM A563 GRADE "A" FOR 60 ksi AND GRADE "C" FOR 120 ksi TENSILE STRENGTH THREADED RODS.
   D. SWIVEL WASHER
2. ALL THREADED RODS SHALL CONFORM TO THE FOLLOWING SHOP DRAWING MARKS:
   1. Rx = ASTM A36 OR A307, fu = 60 ksi.
   2. RxM = ASTM F1554 GRADE 55, fu = 75 ksi.
   3. RxHS = ASTM A449 (fu = 120 ksi UP 1". fu = 105 ksi 1-1/8" THRU 2-1/2") or ASTM A193B7 (fu = 125 ksi).

   NOTES:
   a. x = ROD DIAMETER IN EIGHTS OF AN INCH. (ie. R7M = 7/8" ASTM F1554 GRADE 55)
   b. A36/A307 IS ZINC PLATED FINISH ONLY IF "M" AND "HS" ROD ARE USED ON SAME PROJECT, OTHERWISE PLAIN FINISH.
   c. "M" AND "HS" ROD ARE ALWAYS PLAIN FINISH.
3. **STANDARD RODS ARE ZINC PLATED, HIGH STRENGTH (HS) RODS ARE BLACK STEEL.**
4. ALL BEARING PLATES ARE FABRICATED FROM ASTM A36 STEEL.
5. ALL STEEL BEARING PLATES SHALL HAVE FULL BEARING CONTACT AREA ON WOOD MEMBERS.
6. COUPLING NUT CONNECTION: CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THAT AT CONNECTIONS WITH THE SAME SIZE ROD THAT EACH ROD IS THREADED HALF WAY INTO COUPLER FROM EACH SIDE. HIGH STRENGTH (HS) COUPLERS SHALL BE USED WITH HIGH STRENGTH (HS) RODS UNLESS NOTED OTHERWISE. STANDARD STRENGTH COUPLERS ARE ZINC PLATED. HIGH STRENGTH (HS) ARE NOT PLATED. WHERE REDUCING COUPLERS ARE USED, COUPLER SHALL BE FULLY SEATED ON THE LARGER DIAMETER ROD BEFORE ENGAGING THE SMALLER DIAMETER ROD. **SIGHT HOLES ARE PROVIDED ON STRAIGHT COUPLERS ONLY, SIGHT HOLES ARE NOT REQUIRED ON REDUCING COUPLERS.**
7. COLORS REFERENCED ON THIS DRAWING ARE PROVIDED FOR CONVENIENCE TO THE INSTALLER AND FOR INSPECTION PURPOSES.
8. SILICONE OR CAULKING SHALL NOT BE PLACED INTO THE SLACKJACK DEVICE OR ANY DRILLED HOLE FOR RODS AT ANY TIME. CONTRACTOR SHALL USE FIRE RATED ROCKWOOL OR NON-HARDENING FIRESTOP. (PROVIDED BY OTHERS).
9. ANCHOR BOLTS ARE SPECIFIED BY EARTHBOUND TO CONFORM TO THE LOADS REQUIRED ON THE STRUCTURAL PLANS. CONTRACTOR SHALL BE RESPONSABLE TO VERIFY AND COORDINATE SCHEDULED ANCHOR BOLTS WITH THESE ASSEMBLIES.
10. HOLDOWN RUN ELEVATION VIEWS ARE DIAGRAMS AND MAY NOT DEPICT THE CORRECT NUMBER OF COLLECTOR STUDS REQUIRED. REFER TO COLLECTOR STUD PLAN DIAGRAMS FOR REQUIRED AMOUNT OF ADDITIONAL STUDS DEPENDING ON SHEAR WALL FRAMING TYPE. ADDITIONAL COMPRESSION STUDS OR POSTS MAY BE REQUIRED BY THE STRUCTURAL PLANS FOR DEAD AND LIVE LOADS.
11. THIS DRAWING WILL BE REVIEWED BY THE ENGINEER OF RECORD. UPON APPROVAL, U.N.O. THIS DRAWING REPLACES THE HOLDOWN SYSTEM PER THE STRUCTURAL PLANS.
12. ENGINEER OF RECORD SHALL VERIFY COMPLETE LOAD TRANSFER TO FOUNDATION LEVEL INCLUDING ALL CODE REQUIRED LOAD FACTORS.
13. WOOD FLOOR LEVELS SHOWN ARE RELATIVE TO THE CONCRETE FOUNDATION AND MAY NOT REFLECT THOSE SHOWN IN THE PLANS.
14. CONTRACTOR MAY SUBSTITUTE POSTS WITH 2x MEMBERS OR VICE VERSA ONLY IF TOTAL BEARING PLATE AREA ON BOTTOM PLATE IS EQUAL.
15. REFER TO THE COLLECTOR STUD SCHEDULE FOR WOOD STUD AND FLOOR PLATE MATERIALS USED IN LOAD CALCULATION ASSUMPTIONS. THE MATERIALS SHALL MATCH STRUCTURAL DRAWING REQUIREMENTS UNLESS NOTED OTHERWISE.
16. FULL HEIGHT COLLECTOR STUD REQUIREMENTS (NOT AT BRIDGE LEVEL - SEE 17A):
   A. FULL HEIGHT BUNDLED 2x, 3x COLLECTOR/COMPRESSION STUDS, THE OUTERMOST STUD FROM EACH SIDE OF THE THREADED ROD SHALL RECEIVE EDGE NAILING PER THE SHEAR WALL SCHEDULE OF THE STRUCTURAL PLANS. EDGE NAILING MAY BE STAGGERED/DISPERSED ON (2) MEMBERS MAX. ANY REMAINING INTERIOR STUDS SHALL RECEIVE FIELD NAILING PER THE SHEAR WALL SCHEDULE OF THE STRUCTURAL PLANS.
   B. FULL HEIGHT 4x COLLECTOR/COMPRESSION AT OUTERMOST POST FROM EACH SIDE OF THE THREADED ROD SHALL RECEIVE ONE (1) ROW OF EDGE NAILING PER THE SHEAR WALL SCHEDULE OF THE STRUCTURAL PLANS. ANY REMAINING 2x, 3x, 4x INTERIOR MEMBERS SHALL RECEIVE FIELD NAILING PER THE SHEAR WALL SCHEDULE OF THE STRUCTURAL PLANS.
   C. FULL HEIGHT 6x AND LARGER COLLECTOR/COMPRESSION AT OUTERMOST POST FROM EACH SIDE OF THE THREADED ROD SHALL RECEIVE TWO (2) ROWS OF EDGE NAILING PER THE SHEAR WALL SCHEDULE OF THE STRUCTURAL PLANS. ANY REMAINING INTERIOR POSTS CAN BE FIELD NAILED PER THE SHEAR WALL SCHEDULE OF THE STRUCTURAL PLANS.
   D. WINDOW AND DOOR TRIMMERS MAY BE USED AS HOLDOWN COLLECTOR STUDS IF THE FOLLOWING CONDITIONS ARE MET:
      - A CONTINUOUS VERTICAL LOAD PATH SHALL EXIST FROM WALL TOP PLTS. TO WALL BOTTOM PLTS.
      - ALL WOOD MEMBERS IN THE CONTINUOUS VERTICAL LOAD PATH SHALL BE NAILED ACCORDING TO THE EARTHBOUND SYSTEM REQUIREMENTS.
      - THE SHEAR PANEL MUST EXTEND TO INCLUDE THE TRIMMERS USED.
   E. COMPRESSION STUDS/POSTS SHALL BE INSTALLED SYMMETRICALLY ABOUT ROD. WHERE QUANTITY OF STUDS IS GREATER THAN THE SPACE BETWEEN ROD OR BEARING PLATE AND THE END OF SHEAR WALL THE ADDITIONAL REQUIRED STUDS SHALL BE ADDED TO THE OPPOSITE SIDE OF ROD (ASYMMETRICALLY).
   F. COLLECTOR STUDS DO NOT NEED TO BE STITCH NAILED.
17. COMPRESSION BRIDGE REQUIREMENTS:
   A. ALL FULL HEIGHT 2x AND 3x MEMBERS ON EITHER END OF THE BRIDGE SHALL RECEIVE EDGE NAILING PER THE SHEAR WALL SCHEDULE OF THE STRUCTURAL PLANS.
   B. ALL FULL HEIGHT 4x COLLECTOR/COMPRESSION POSTS ON EITHER SIDE OF THE BRIDGE SHALL RECEIVE ONE (1) ROW OF EDGE NAILING PER THE SHEAR WALL SCHEDULE OF THE STRUCTURAL PLANS.
   C. ALL FULL HEIGHT 6x AND LARGER COLLECTOR/COMPRESSION POSTS ON EITHER SIDE OF THE BRIDGE SHALL RECEIVE TWO (2) ROWS OF EDGE NAILING PER THE SHEAR WALL SCHEDULE OF THE STRUCTURAL PLANS.
   D. ALL BRIDGE TRIMMERS SHALL BE 2x MEMBERS ONLY (U.N.O.) AND SHALL BE INSTALLED SYMMETRICALLY AS SHOWN (U.N.O.).
   E. ALL BRIDGE TRIMMERS SHALL RECEIVE EDGE NAILING PER THE SHEAR WALL SCHEDULE OF THE STRUCTURAL PLANS (U.N.O.).
   F. THE BRIDGE TRIMMERS ADJACENT TO THE FULL HEIGHT STUDS (ONE EACH SIDE) SHALL RECEIVE FACE (STITCH) NAILING TWO (2) ROWS AT 4" O.C. TRIMMERS IN ADDITION TO ONE EACH SIDE DO NOT REQUIRE FACE (STITCH) NAILING. FACE NAILS MAY BE NAILED FROM THE OPPOSITE DIRECTION THAN THAT SHOWN IN THE DETAIL.
   G. FACE NAILS SHALL BE 10d MINIMUM. USE 16d NAILS MINIMUM WHEN NAILING THROUGH 3x STUDS INTO 2x BRIDGE TRIMMERS.
   H. IF MULTIPLE BRIDGE TRIMMERS ON EACH SIDE ARE REQUIRED, DO NOT INSTALL THE TRIMMERS IN ADDITION TO ONE EACH SIDE UNTIL THE FACE NAILING HAS BEEN INSPECTED AND APPROVED.
   I. BRIDGE BLOCK SHALL BE 4x6 DF IN 4x WALLS, 6x6 DF IN 6x WALLS (U.N.O.). BRIDGE BLOCK SHALL ALWAYS BE 5-1/2" TALL MINIMUM. NAILING OF BRIDGE BLOCK IS PROHIBITED.
   J. BRIDGE BLOCK SHALL BE DOUGLAS FIR CONSTRUCTION GRADE WITH MINIMUM 800 PSI ALLOWABLE BENDING STRESS. TIMBERSTRAND LSL BEAM MATERIAL OF EQUAL OR GREATER DIMENSION IS AN ACCEPTABLE ALTERNATE (U.N.O.).
   K. BRIDGE HEIGHTS SHOWN ARE THE MINIMUM HEIGHT FROM SUBFLOOR TO BOTTOM OF BRIDGE MEMBER.
   L. ONLY COMMON NAILS SHALL BE USED.
18. <u>DRILLED OR BORED HOLES:</u> DRILLED HOLES THROUGH VERTICAL COMPRESSION MEMBERS SHALL NOT EXCEED 25% OF THE STUD OR POST WIDTH, FOR EXAMPLE: 7/8" DIA. HOLE IS MAXIMUM ALLOWED IN 3 1/2" WIDE STUD OR POST UNLESS APPROVED BY EOR. THE BORED HOLE SHALL BE AT LEAST 5/8" AWAY FROM EDGE OF STUD.
19. <u>CUTTING AND NOTCHING:</u> WOOD VERTICAL COMPRESSION MEMBERS ARE PERMITTED TO BE CUT OR NOTCHED TO A DEPTH NOT EXCEEDING 25% OF IT'S WIDTH PER 2308.9.10 PER IBC 2015.
20. STUD/POST/TRIMMER NOTCHING AT CONFLICTING BEARING PLATES INTERFERENCE.
   A. THE MEMBER SHALL BE NOTCHED TO THE EXACT THICKNESS AND AREA OF THE STEEL PLATE TO MAINTAIN THE FULL BEARING AREA OF THE NOTCHED COMPRESSION MEMBER.
   B. IF THE REQUIREMENTS OF ITEM "A" ABOVE ARE NOT MET, THEN ADDITIONAL COMPRESSION MEMBERS SHALL BE ADDED TO ACHIEVE THE REQUIRED TOTAL BEARING AREA. ADDITIONAL COMPRESSION MEMBERS SHALL RECEIVE SHEAR PANEL NAILING PER THE REQUIREMENTS OF THE EARTHBOUND SHOP DRAWINGS.
   C. PLYWOOD SHIMS MATCHING THE EXACT THICKNESS OF THE STEEL BEARING PLATE MAY BE USED IN LIEU OF NOTCHING. ALL ADDITIONAL REQUIREMENTS ABOVE SHALL BE MET.
21. MINIMUM REQUIREMENTS FOR BLOCKING IN THE JOIST SPACE AT HOLDOWN LOCATIONS ARE:
   A. BLOCKING SHALL SPAN THE FULL WIDTH OF THE SHEAR WALL TOP PLATE OF THE FLOOR LEVEL BELOW THE JOIST SPACE.
   B. BLOCKING SHALL EQUAL THE OUTERMOST DIMENSIONS OF THE "FOOTPRINT" OF THE TOTAL HOLDOWN WOOD COMPRESSION MEMBERS OF THE FLOOR LEVELS BELOW AND ABOVE THE JOIST SPACE.
   C. THE SPACE BETWEEN BLOCKING WHERE THE ROD IS LOCATED SHALL NOT EXCEED 3".
   D. COMPRESSION CAPACITIES OF BLOCKING MATERIALS SHALL BE EQUAL TO OR GREATER THAN THE RELATED JOISTS. THE VERTICAL DIMENSIONS SHALL BE EQUAL. SEE NOTE "E" FOR EXCEPTION.
   E. VERTICAL GRAIN BLOCKING SHALL BE TRIMMED TO ACCOUNT FOR POSSIBLE SHRINKAGE OF THE JOISTS. CONTACT JOIST MANUFACTURER FOR SHRINKAGE INFORMATION.
   F. FLOOR JOISTS SHALL NOT BE REMOVED TO ALLOW FOR THE INSTALLATION OF BLOCKING. BLOCKING IS IN ADDITION TO THE EXISTING JOISTS.
   G. WEB STIFFENERS SHALL BE ADDED TO ENGINEERED LUMBER "I" JOISTS AND "I" JOIST MATERIAL USED AS BLOCKING. SEE NOTE "B" ABOVE.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

ABBREVIATIONS

AB	ANCHOR BOLT PER ROD COMPONENT SCHEDULE
BLKG	BLOCKING
C	COUPLER
FND	FOUNDATION
G	HOT DIPPED GALVANIZED ROD OR GALV. TAPPED COMPONENT
GG	COUPLER GALV. TAPPED ON BOTH ENDS
GS	COUPLER GALV. TAPPED ON SMALL END ONLY
CB	CORROSION BARRIER
HS	HIGH STRENGTH
SJA 4XY	SLACKJACK™ COMPONENT (X) = SLACKJACK DEVICE SERIES TRAVEL 1=1 INCH (RED), 2=2 INCHES (GREEN) (Y) = ROD SIZE
JST	JOIST
MIN.	MINIMUM
O.C.	ON CENTER
P	PLATE
PG	PERPENDICULAR TO GRAIN
R	ROD
UNO	UNLESS NOTED OTHERWISE

SHOP DRAWING DISCLAIMER

THESE SHOP DRAWINGS ILLUSTRATE THE DETAILS OF THE EARTHBOUND SEISMIC HOLDOWN SYSTEM. THEY WERE PREPARED IN CONFORMANCE WITH THE STRUCTURAL DESIGN PROVIDED TO EARTHBOUND CORPORATION ("EB CORP.") BY THE PROJECT OWNER OR ITS REPRESENTATIVE.

EB CORP. TOOK NO PART IN THE PREPARATION OR REVIEW OF SAID STRUCTURAL DESIGN AND EB CORP DISCLAIMS ANY LIABILITY FOR IT. THE STAMP OR SEAL OF AN EB CORPORATION EMPLOYEE OR AGENT ON THESE SHOP DRAWINGS PERTAIN ONLY TO THE TRANSFER OF THE FORCES REQUIRED BY THE ENGINEER OF RECORD ON THE STRUCTURAL DRAWINGS AND NOT TO THE REVIEW AND ADEQUACY OF THE STRUCTURAL DESIGN.

NO WARRANTY, EXPRESSED OR IMPLIED, AS TO THE ADEQUACY OF THE STRUCTURAL DESIGN IS MADE BY ANY SUCH STAMP OR SEAL.

COLLECTOR STUD DIAGRAM KEY

1. * (ASTERISK) INDICATES 1/2 HEIGHT TRIMMER (UNLESS NOTED OTHERWISE) FOR COMPRESSION BRIDGE.
2. COLLECTOR STUDS SHOWN ARE THE MINIMUM REQUIREMENT TO EQUAL THE UPLIFT TENSION FORCES CALLED OUT BY THE STRUCTURAL DWGS. ADDITIONAL COMPRESSION STUDS OR POSTS MAY BE REQUIRED BY STRUCTURAL ENGINEER OF RECORD. APPLIES TO ALL HOLDOWN RUNS.

COMPONENT SELECTION SCHEDULES

EARTHBOUND THREADED ROD CAPACITIES (IBC 2015)

ROD SIZE	ROD SIZE (INCHES)	ALLOWABLE TENSION LOAD IBC 2015	ROD REMARKS	SLACKJACK SIZE
R4	1/2" DIA.	4,470 LBS	ASTM A 307 (UNC)	MJ100, MJ200
R5	5/8" DIA.	7,120 LBS	ASTM A 307 (UNC)	SJA 215, 225, 415, 425
R6	3/4" DIA.	10,540 LBS	ASTM A 307 (UNC)	SJA 216, 226, 416, 426, HJA 716, 726
R7	7/8" DIA.	14,540 LBS	ASTM A 307 (UNC)	SJA 217, 227, 417, 427, HJA 717, 727
R8	1" DIA.	19,080 LBS	ASTM A 307 (UNC)	SJA 218, 228, 418, 428, HJA 718, 728
R9	1 1/8" DIA.	24,040 LBS	ASTM A 307 (UNC)	SJA 219, 229, 419, 429, HJA 719, 729
R10	1 1/4" DIA.	30,530 LBS	ASTM A 307 (UNC)	SJA 4110, 4210, HJA 7110, 7210, HJS 4110, 4210
R12	1 1/2" DIA.	44,270 LBS	ASTM A 307 (UNC)	SJST 4112, 4212, HJA 7112, 7212, HJS 4112, 4212
R14	1 3/4" DIA.	59,830 LBS	ASTM A 307 (UNC)	-----
R5M	5/8" DIA.	8,900 LBS	ASTM F1554 GR55 (UNC)	SJA 215, 225, 415, 425
R6M	3/4" DIA.	13,170 LBS	ASTM F1554 GR55 (UNC)	SJA 216, 226, 416, 426, HJA 716, 726
R7M	7/8" DIA.	18,180 LBS	ASTM F1554 GR55 (UNC)	SJA 217, 227, 417, 427, HJA 717, 727
R8M	1" DIA.	23,850 LBS	ASTM F1554 GR55 (UNC)	SJA 218, 228, 418, 428, HJA 718, 728
R9M	1 1/8" DIA.	30,050 LBS	ASTM F1554 GR55 (UNC)	SJA 219, 229, 419, 429, HJA 719, 729
R10M	1 1/4" DIA.	38,160 LBS	ASTM F1554 GR55 (UNC)	SJA 4110, 4210, HJA 7110, 7210, HJS 4110, 4210
R12M	1 1/2" DIA.	55,330 LBS	ASTM F1554 GR55 (UNC)	SJST 4112, 4212, HJA 7112, 7212, HJS 4112, 4212
R14M	1 3/4" DIA.	74,790 LBS	ASTM F1554 GR55 (UNC)	-----

		ASTM A449 THREADED ROD	ASTM A193-B7 THREADED ROD	SLACKJACK SIZES
R5HS	5/8" DIA.	14,240 LBS	14,830 LBS	SJA 215, 225, 415, 425
R6HS	3/4" DIA.	21,070 LBS	21,950 LBS	SJA 216, 226, 416, 426, HJA 716, 726
R7HS	7/8" DIA.	29,090 LBS	30,300 LBS	SJA 217, 227, 417, 427, HJA 717, 727
R8HS	1" DIA.	38,160 LBS	39,750 LBS	SJA 218, 228, 418, 428, HJA 718, 728
R9HS	1 1/8" DIA.	42,080 LBS	50,090 LBS	SJA 219, 229, 419, 429, HJA 719, 729
R10HS	1 1/4" DIA.	53,420 LBS	63,600 LBS	SJA 4110, 4210, HJA 7110, 7210, HJS 4110, 4210
R12HS	1 1/2" DIA.	77,460 LBS	92,220 LBS	SJST 4112, 4212, HJA 7112, 7212, HJS 4112, 4212
R14HS	1 3/4" DIA.	104,710 LBS	124,650 LBS	-----

EARTHBOUND BEARING PLATE CAPACITIES (DF)

PLATE SIZE	DIFFERENTIAL LOAD	COLOR CODE	PLATE DIMENSIONS (INCHES)		
			WIDTH	LENGTH	THICK.
P6	6,650 LBS	GREEN	3"	3.5"	1/4"
P8	8,470 LBS	BLACK	3-1/4"	4.25"	1/4"
P10	10,510 LBS	BLUE	3-1/4"	5"	3/8"
P12	12,270 LBS	GRAY	3-1/4"	6"	5/8"
P14	14,460 LBS	RED	3-1/4"	7"	3/4"
P18	18,840 LBS	YELLOW	3-1/2"	9"	1"
P20	21,020 LBS	BROWN	3-1/2"	10"	1"
P22	23,210 LBS	WHITE	3-1/2"	11"	1 1/4"
P24	24,310 LBS	GOLD	3-1/2"	11.5"	1 1/4"
P26	26,490 LBS	ORANGE	3-1/2"	12.5"	1 1/2"

SJA ROD SIZE CODES

PART NO.	ROD DIAMETER	ROD SIZE	WASHER COLOR
MJ100 or MJ200	1/2"	R4	PURPLE
SJA 2x5 or 4x5	5/8"	R5	BLACK
SJA 2x6 or 4x6, HJA 7x6	3/4"	R6 or R6HS	GRAY
SJA 2x7 or 4x7, HJA 7x7	7/8"	R7 or R7HS	BLUE
SJA 2x8 or 4x8, HJA 7x8	1"	R8 or R8HS	YELLOW
SJA 2x9 or 4x9, HJA 7x9	1 1/8"	R9 or R9HS	WHITE
SJA 4x10, HJA 7x10, HJS 4x10	1 1/4"	R10 or R10HS	GREEN
SJST 4x12, HJA 7x12, HJS 4x12	1 1/2"	R12 or R12HS	RED

"x" = SLACKJACK TRAVEL IN "INCHES"

<u>NOTES:</u>

1. TENSION LOAD WAS CALCULATED FROM THE FOLLOWING EQUATION:
   A. ASTM A 307 Threaded Rod Capacities are F'u = 60,000 psi. UNC thread pitch
   M Rods are based on ASTM F1554GR55, F'u = 75 ksi.
   HS Rods are based on ASTM A193 B7, F'u = 125 ksi or ASTM A449, F'u = 120 ksi, 105 ksi above R8HS
   B. The IBC 2015 column is calculated in accordance to Section 1905 and ASCE 7-10.
2. PLATE STEEL SHALL BE ASTM A36: F'u = 60,000 PSI.
3. SUBSTITUTIONS OF DESIGNATED BEARING PLATE SHALL NOT BE PERMITTED, OBTAIN WRITTEN APPROVAL FROM THE ENGINEER.
4. SLACKJACK SELECTION NOTES:
   THE SIZES SHOWN ABOVE ARE FOR BOTH ONE AND TWO INCH TRAVEL ("SJA 4xy") (x = TRAVEL HEIGHT IN INCHES, y = ROD SIZE). TWO INCH TRAVEL SLACKJACKS ARE REQUIRED ON FOURTH WOOD FRAME LEVELS AND HIGHER.
5. THIS TABLE IS FOR REFERENCE OF FULL PRODUCT LINE, SOME ROD AND PLATE SIZES MAY NOT BE IN USE.THE ENGINEER OF RECORD SHALL REVIEW AND APPROVE CAPACITIES.

Olympia
Reviewed for Code Compliance
Construction Permitting Only
Building Plans Examiner
Community Planning & Development Department
601 4th Ave East
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(360) 753-8248
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SLACKJACK - IAPMO ER-0429 & LA RR 25404 LISTED CAPACITIES
COLOR CODE AND MODEL/SERIES TO PART NUMBER CROSS REFERENCE

IAPMO ER-0429/ LA RR 25404 MODEL/SERIES	SLACKJACK PART NO. ON DWGS	THREADED ROD DIAMETER	COMPRESSION CAPACITY	TRAVEL COMPENSATION AMOUNT	CAPTURE RING COLOR	SWIVEL WASHER COLOR
M 100	MJ 100	1/2"	5,000 LBS	1-INCH	N/A	RED
A 210	SJA 215	5/8"	7,360 LBS	1-INCH	BLUE	BLACK
A 210	SJA 216	3/4"	7,360 LBS	1-INCH	BLUE	GRAY
A 210	SJA 217	7/8"	7,360 LBS	1-INCH	BLUE	BLUE
A 210	SJA 218	1"	7,360 LBS	1-INCH	BLUE	YELLOW
A 210	SJA 219	1 1/8"	7,360 LBS	1-INCH	BLUE	WHITE
A 410	SJA 415	5/8"	14,000 LBS	1-INCH	RED	BLACK
A 410	SJA 416	3/4"	14,000 LBS	1-INCH	RED	GRAY
A 410	SJA 417	7/8"	14,000 LBS	1-INCH	RED	BLUE
A 410	SJA 418	1"	14,000 LBS	1-INCH	RED	YELLOW
A 410	SJA 419	1 1/8"	14,000 LBS	1-INCH	RED	WHITE
A 410	SJA 4110	1 1/4"	14,000 LBS	1-INCH	RED	GREEN
T 410	SJT 415	5/8"	9,000 LBS	1-INCH	ORANGE	BLACK
T 410	SJT 416	3/4"	9,000 LBS	1-INCH	ORANGE	GRAY
T 410	SJT 417	7/8"	9,000 LBS	1-INCH	ORANGE	BLUE
T 410	SJT 418	1"	9,000 LBS	1-INCH	ORANGE	YELLOW
T 410	SJT 419	1 1/8"	9,000 LBS	1-INCH	ORANGE	WHITE
T 410	SJT 4110	1 1/4"	9,000 LBS	1-INCH	ORANGE	GREEN
HA 710	HJA 717	7/8"	15,650 LBS	1-INCH	PURPLE	BLUE
HA 710	HJA 718	1"	15,650 LBS	1-INCH	PURPLE	YELLOW
HA 710	HJA 719	1 1/8"	15,650 LBS	1-INCH	PURPLE	WHITE
HA 710	HJA 7110	1 1/4"	15,650 LBS	1-INCH	PURPLE	GREEN
HA 710	HJA 7112	1 1/2"	15,650 LBS	1-INCH	PURPLE	RED
HA 720	HJA 727	7/8"	15,590 LBS	2-INCH	GRAY	BLUE
HA 720	HJA 728	1"	15,590 LBS	2-INCH	GRAY	YELLOW
HA 720	HJA 729	1 1/8"	15,590 LBS	2-INCH	GRAY	WHITE
HA 720	HJA 7210	1 1/4"	15,590 LBS	2-INCH	GRAY	GREEN
HA 720	HJA 7212	1 1/2"	15,590 LBS	2-INCH	GRAY	RED
HS 410	HJS 419	1 1/8"	22,000 LBS	1-INCH	BLACK	WHITE
HS 410	HJS 4110	1 1/4"	22,000 LBS	1-INCH	BLACK	GREEN
HS 410	HJS 4112	1 1/2"	22,000 LBS	1-INCH	BLACK	RED
	*SJST4210	1 1/4"	22,000 LBS	1 1/2-INCH	BLACK	GREEN
	*SJST4110	1 1/4"	22,000 LBS	1-INCH	RED	GREEN
	*SJST4112	1 1/2"	22,000 LBS	1-INCH	RED	RED

IAPMO ER-0429/ LA RR 25404 MODEL/SERIES	SLACKJACK PART NO. ON DWGS	THREADED ROD DIAMETER	COMPRESSION CAPACITY	TRAVEL COMPENSATION AMOUNT	CAPTURE RING COLOR	SWIVEL WASHER COLOR
M 200	MJ 200	1/2"	4,900 LBS	2-INCH	N/A	ORANGE
A 220	SJA 225	5/8"	7,730 LBS	2-INCH	YELLOW	BLACK
A 220	SJA 226	3/4"	7,730 LBS	2-INCH	YELLOW	GRAY
A 220	SJA 227	7/8"	7,730 LBS	2-INCH	YELLOW	BLUE
A 220	SJA 228	1"	7,730 LBS	2-INCH	YELLOW	YELLOW
A 220	SJA 229	1 1/8"	7,730 LBS	2-INCH	YELLOW	WHITE
A 420	SJA 425	5/8"	14,000 LBS	2-INCH	GREEN	BLACK
A 420	SJA 426	3/4"	14,000 LBS	2-INCH	GREEN	GRAY
A 420	SJA 427	7/8"	14,000 LBS	2-INCH	GREEN	BLUE
A 420	SJA 428	1"	14,000 LBS	2-INCH	GREEN	YELLOW
A 420	SJA 429	1 1/8"	14,000 LBS	2-INCH	GREEN	WHITE
A 420	SJA 4210	1 1/4"	14,000 LBS	2-INCH	GREEN	GREEN
A 610	SJA 616	3/4"	20,340 LBS	1-INCH	TAN	GRAY
A 610	SJA 617	7/8"	20,340 LBS	1-INCH	TAN	BLUE
A 610	SJA 618	1"	20,340 LBS	1-INCH	TAN	YELLOW
A 610	SJA 619	1 1/8"	20,340 LBS	1-INCH	TAN	WHITE
A 610	SJA 6110	1 1/4"	20,340 LBS	1-INCH	TAN	GREEN
A 620	SJA 627	7/8"	20,100 LBS	2-INCH	WHITE	BLUE
A 620	SJA 628	1"	20,100 LBS	2-INCH	WHITE	YELLOW
A 620	SJA 629	1 1/8"	20,100 LBS	2-INCH	WHITE	WHITE
A 620	SJA 6210	1 1/4"	20,100 LBS	2-INCH	WHITE	GREEN
HS 420	HJS 429	1 1/8"	22,000 LBS	2-INCH	BLACK	WHITE
HS 420	HJS 4210	1 1/4"	22,000 LBS	2-INCH	BLACK	GREEN
HS 420	HJS 4212	1 1/2"	22,000 LBS	2-INCH	BLACK	RED
HS 710	HJS 719	1 1/8"	39,190 LBS	1-INCH	BLACK	WHITE
HS 710	HJS 7110	1 1/4"	39,190 LBS	1-INCH	BLACK	GREEN
HS 710	HJS 7112	1 1/2"	39,190 LBS	1-INCH	BLACK	RED
HS 720	HJS 729	1 1/8"	37,770 LBS	2-INCH	BLACK	WHITE
HS 720	HJS 7210	1 1/4"	37,770 LBS	2-INCH	BLACK	GREEN
HS 720	HJS 7212	1 1/2"	37,770 LBS	2-INCH	BLACK	RED

* SLACKJACK TAKE UP DEVICE WITH $\Delta R = 0.003$ IN. NOT SHOWN IN ER-0429.

SLACKJACK COLOR CODE TABLE

TRAVEL HEIGHT AND ROD SIZE COORDINATION

SJA 428
MODEL: SLACKJACK
MODEL TYPE: A=ALUM, S=STEEL
ROD DIA IN EIGHTH INCH
TRAVEL IN INCHES
SERIES TYPE (# RINGS)

COLLECTOR STUD CAPACITY SCHEDULES

COLLECTOR STUD CAPACITIES FOR DOUG FIR STUDS ON DOUG FIR PLATES

TOTAL STUDS REQUIRED		9'-4" CAPACITY **						4'-6"/6'-0" CAPACITY BRIDGE TRIMMERS ONLY		
QTY.	PLAN VIEW	2x4 STUDS	2x6 STUDS	3x4 STUDS	4x4 POSTS	4x6 POSTS	4x8 POSTS	NO. OF BRIDGE TRIMMERS	2x4s	2x6s
SINGLE CAPACITY:									3,281#	5,156#
2								2*	6,563#	10,313#
3										
4								4*	13,125#	20,625#
5										
6								6*	19,688#	30,938#
7										
8								8*	26,250#	41,250#
9										
10										

POSTING PER PLAN REQUIREMENTS.

NOTES:
1) STUDS SHOWN ARE THE MINIMUM COMPRESSION MEMBERS REQUIRED FOR THE EARTHBOUND SYSTEM.
2) DOUG FIR CALCULATION NOTES: (BASED ON 2015 NDS)
   2x4s, 2x6s, 3x4s (NO. 2 GRADE): F'c PARALLEL = 1350 PSI
   4x4s, 6x6s AND LARGER (NO. 2 GRADE): F'c PARALLEL = 700 PSI
   F'c PERPENDICULAR = 625 PSI FOR DOUG FIR PLATES.
3) * DENOTES NO. OF BRIDGE TRIMMERS UNDER COMPRESSION BRIDGE.
4) ** DENOTES THAT FINAL POST HEIGHT SUBTRACTS 4 1/2" FOR 2x TOP PLATES AND 2x BOTTOM PLATE.
5) COMPRESSION POSTING SHALL BE PER THE CONTINUOUS ROD HOLDOWN SCHEDULE SHOWN ON SHEET 1-S4.02 OF THE STRUCTURAL PLANS.

<u>TYP. P- PLATE ORIENTATION</u>
<u>& SAMPLE BRIDGE TRIMMER NAILING DETAIL</u>
SCALE: NONE

ROD HOLE SCHEDULE THROUGH TOP/BOTTOM PLATES AND BRIDGES

ROD SIZE		MIN HOLE SIZE	MAX HOLE SIZE
R4	1/2"ø	1"ø	1-1/8"ø
R5	5/8"ø	1"ø	1-1/8"ø
R6	3/4"ø	1"ø	1-1/8"ø
R7	7/8"ø	1-1/8"ø	1-1/4"ø
R8	1"ø	1-1/4"ø	1-3/8"ø
R9	1-1/8"ø	1-3/8"ø	* 1-1/2"ø
R10	1-1/4"ø	* 1-1/2"ø	* 1-5/8"ø

* HOLE SIZES INTENDED FOR 6" WALL TYPES ONLY. ENGINEER OF RECORD SHALL APPROVE THE USE OF THESE HOLE SIZES FOR 4" WALL TYPES.

ALL SHEAR PANEL NAIL SPACING IS PER THE SHEAR WALL SCHEDULE

NOTE:
SEE SHOP DRAWING GENERAL NOTES FOR NAILING REQUIREMENTS WHEN POSTS ARE USED.

NAILING SAMPLE

NO.	DATE	DESCRIPTION
A	05/15/19	REVISED PER STRUCTURAL PLANS DATED 03/19/19.

REVISIONS

DRAWN: LH
DESIGNED: AD
CHECKED: AD
APPROVED: WMN

WILLIAM M. NELSON
35036

PROJECT: **WESTMAN MILL**
510 STATE AVE, OLYMPIA, WA 98501

EARTHBOUND
"Holdowns That Work"
EARTHBOUND CORPORATION
17361 Tye Street SE
Monroe, WA 98272
http://www.holdown.com
(800) 944-5669
Fax (360) 863-0722

EB CORP JOB NO:
19028

SHEET TITLE:
EARTHBOUND SEISMIC
HOLDOWN SYSTEM
INSTALLATION DRAWINGS
IAPMO ER-0429

DATE:
05/15/19

SHEET NO.
SH-1

CONTACT: EARTHBOUND 800-944-5669

WESTMAN MILL_1.dwg
May 15, 2019 at 10:36 AM

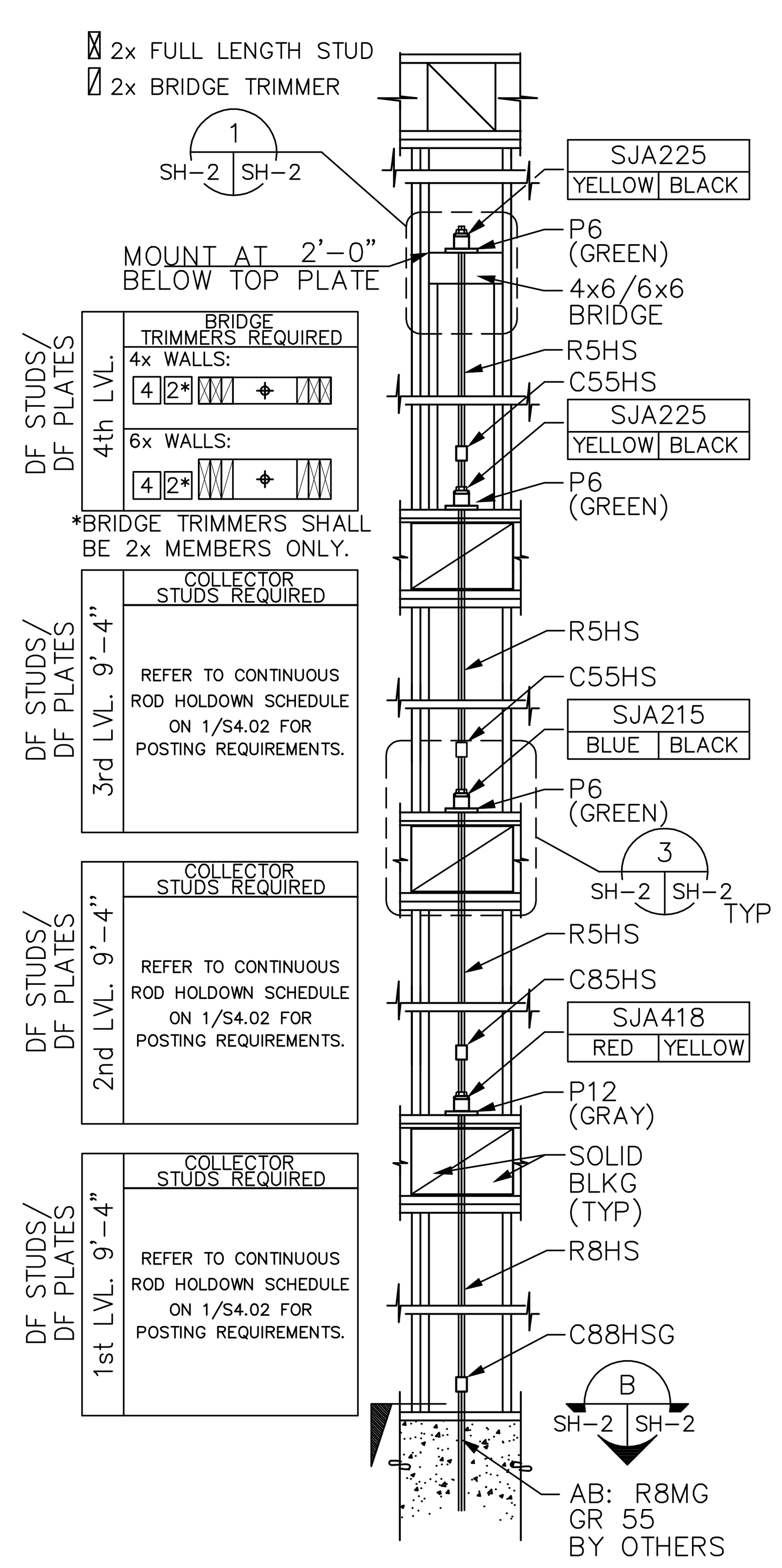
PATENTS AND PATENTS PENDING. For more information about the Earthbound Holdown System, visit http://www.holdown.com

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

HOLDOWN RUN DETAILS

RUN TYPE CRH-1

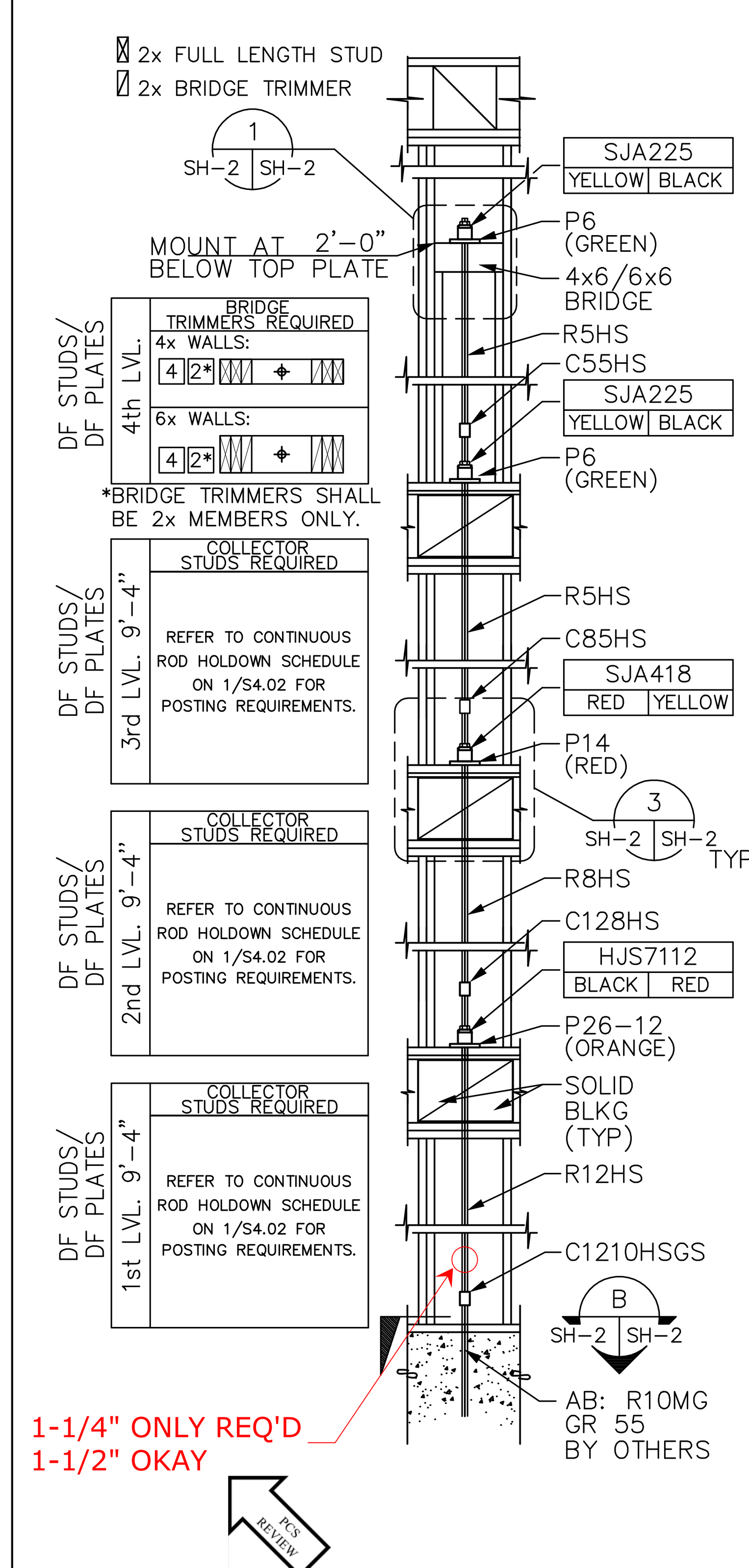
WOOD FLOOR LEVEL	UPLIFT TENSION LOADS	CALCULATED DIFFERENTIAL LOADS	COLLECTED DIFFERENTIAL LOADS	WOOD COMPRESSION DOWNLOAD
5th	-----	-----	-----	-----
4th	620 LBS	620 LBS	620 LBS	620 LBS
3rd	1,500 LBS	880 LBS	880 LBS	1,500 LBS
2nd	6,800 LBS	5,300 LBS	5,300 LBS	6,800 LBS
1st	17,470 LBS	10,670 LBS	10,670 LBS	17,470 LBS



CRH-1

RUN TYPE CRH-2

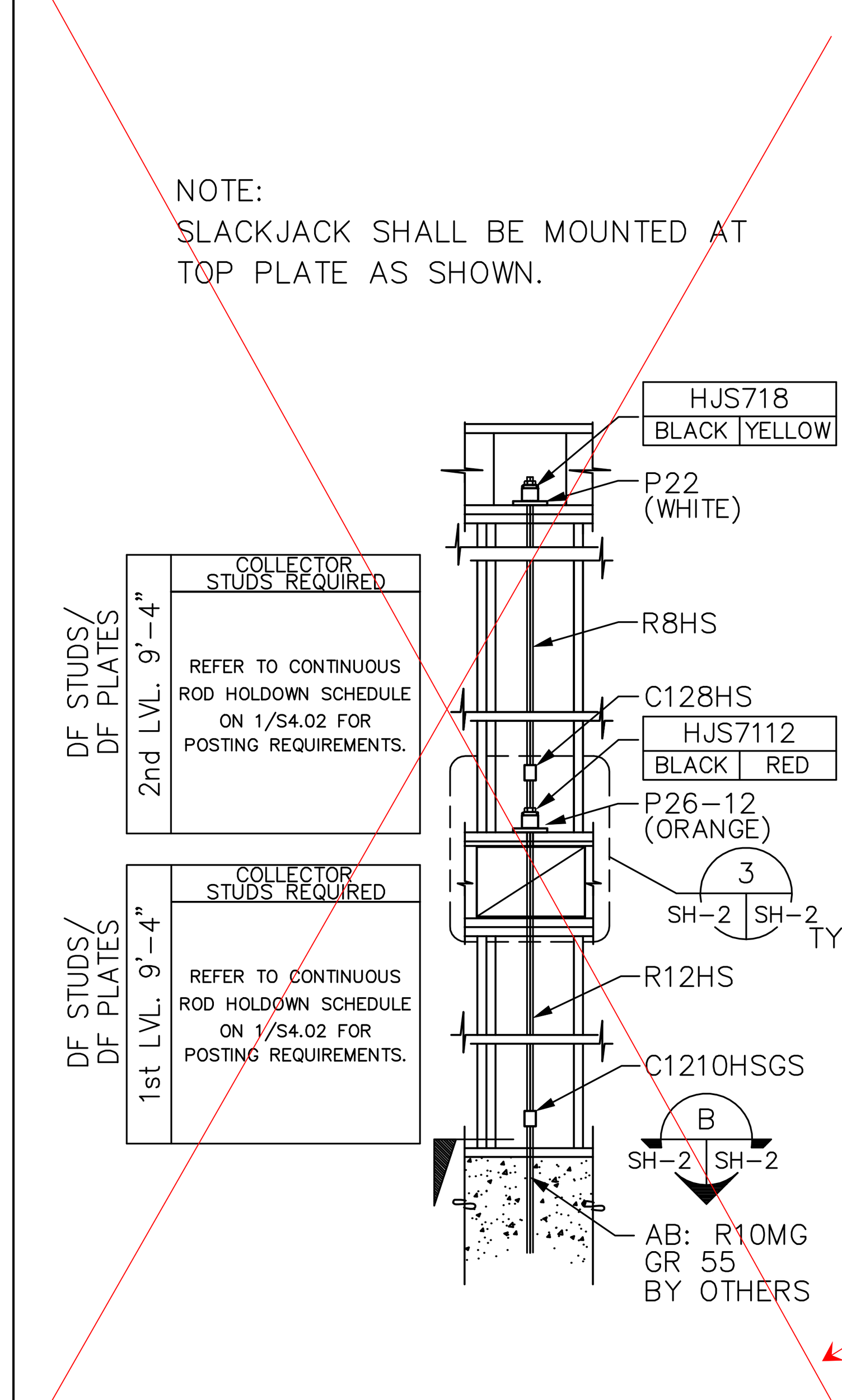
WOOD FLOOR LEVEL	UPLIFT TENSION LOADS	CALCULATED DIFFERENTIAL LOADS	COLLECTED DIFFERENTIAL LOADS	WOOD COMPRESSION DOWNLOAD
5th	-----	-----	-----	-----
4th	1,040 LBS	1,040 LBS	1,040 LBS	1,040 LBS
3rd	7,620 LBS	6,580 LBS	6,580 LBS	7,620 LBS
2nd	21,260 LBS	13,640 LBS	13,640 LBS	21,260 LBS
1st	45,790 LBS	24,530 LBS	24,530 LBS	45,790 LBS



CRH-2

RUN TYPE CRH-2-2

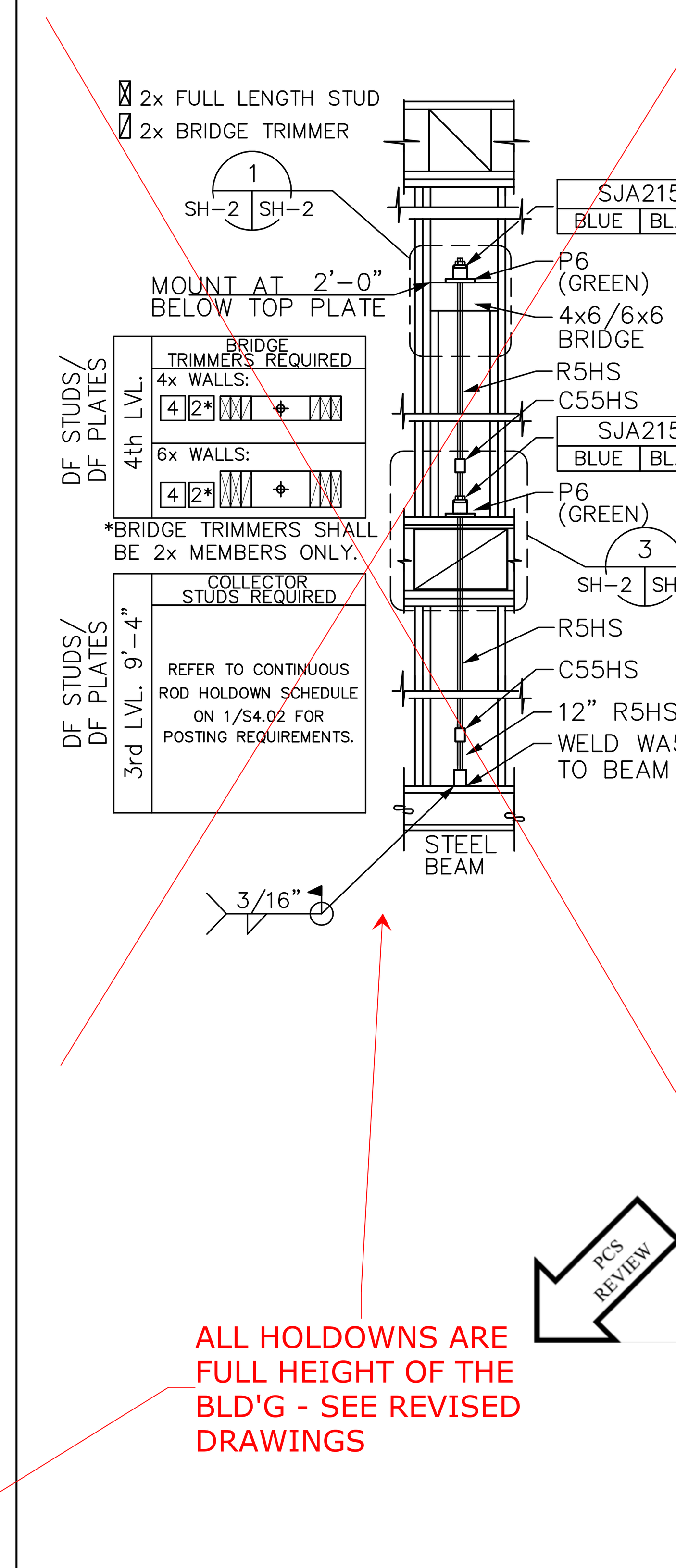
WOOD FLOOR LEVEL	UPLIFT TENSION LOADS	CALCULATED DIFFERENTIAL LOADS	COLLECTED DIFFERENTIAL LOADS	WOOD COMPRESSION DOWNLOAD
5th	-----	-----	-----	-----
4th	-----	-----	-----	-----
3rd	-----	-----	-----	-----
2nd	21,260 LBS	21,260 LBS	21,260 LBS	21,260 LBS
1st	45,790 LBS	24,530 LBS	24,530 LBS	45,790 LBS



CRH-2-2

RUN TYPE CRH-2-SB

WOOD FLOOR LEVEL	UPLIFT TENSION LOADS	CALCULATED DIFFERENTIAL LOADS	COLLECTED DIFFERENTIAL LOADS	WOOD COMPRESSION DOWNLOAD
5th	-----	-----	-----	-----
4th	1,040 LBS	1,040 LBS	1,040 LBS	1,040 LBS
3rd	7,620 LBS	6,580 LBS	6,580 LBS	7,620 LBS
2nd	-----	-----	-----	-----
1st	-----	-----	-----	-----



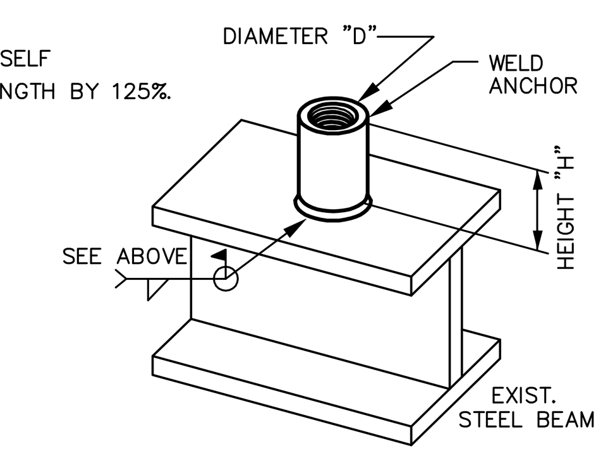
CRH-2-SB

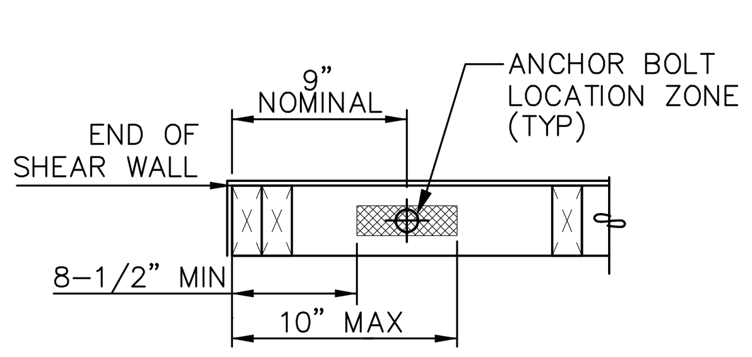
EARTHBOUND WELDED ANCHOR SPECIFICATIONS

WELD ANCHOR MATERIAL: ASTM A108, 1018 STEEL, FU = 63.8 ksi min.

PART NO	ROD DIA	THREADED ROD		WELD ANCHOR PROPERTIES			
		GRADE	IBC 2015 ASD CAPACITY	DIA "D"	HEIGHT "H"	MIN. FILLET	WELD LENGTH
WA4	1/2	ASTM A36/A307	4,470 LBS	1	1/2	3/16 IN	3.73 IN
WA5	5/8	ASTM A36/A307	7,120 LBS	1 3/8	5/8	3/16 IN	4.91 IN
WA6	3/4	ASTM A36/A307	10,540 LBS	1 3/8	3/4	1/4 IN	5.11 IN
WA7	7/8	ASTM A36/A307	14,540 LBS	2	7/8	1/4 IN	7.07 IN
WA8	1	ASTM A36/A307	19,080 LBS	2	7/8	1/4 IN	7.07 IN
WA9	1 1/8	ASTM A36/A307	24,040 LBS	2	1	1/4 IN	7.07 IN
WA10	1 1/4	ASTM A36/A307	30,530 LBS	2 1/4	1 3/8	5/16 IN	8.05 IN
WA12	1 1/2	ASTM A36/A307	44,270 LBS	2 5/8	1 3/8	3/8 IN	9.42 IN
WA6HS	3/4	ASTM A449/A193B7	21,070 / 21,950 LBS	2	1 1/4	3/16 IN	6.87 IN
WA7HS	7/8	ASTM A449/A193B7	29,090 / 30,300 LBS	2 1/4	1 1/2	1/4 IN	7.85 IN
WA8HS	1	ASTM A449/A193B7	38,160 / 39,750 LBS	2 1/4	1 3/4	1/4 IN	7.85 IN
WA9HS	1 1/8	ASTM A449/A193B7	42,080 / 50,090 LBS	2 1/2	2	5/16 IN	8.84 IN
WA10HS	1 1/4	ASTM A449/A193B7	53,420 / 63,600 LBS	3	2 1/8	5/16 IN	10.41 IN
WA12HS	1 1/2	ASTM A449/A193B7	77,460 / 92,200 LBS	3 5/8	2 3/4	3/8 IN	12.57 IN

NOTES:
1. THREADED ROD CAPACITY CALCULATED PER IBC SECTION 1905 AND ASCE 7-10.
2. COUPLER STRENGTH IS BASED ON MINIMUM MECHANCIAL PROPERTIES VALUE OF COUPLER ITSELF (higher of [100% Fu * At] or [125% Fy * At]) TO ALWAYS EXCEED THE CONNECTED ROD STRENGTH BY 125%.
3. ENGINEER OF RECORD SHALL VERIFY WELD REQUIREMENTS SHOWN ON SHOP DRAWINGS. FLANGE STIFFENERS MAY BE REQUIRED.
4. WELD REQUIREMENTS SHALL MEET OR EXCEED CONNECTED THREADED ROD CAPACITY.
5. MINIMUM FILLET SIZE CALLOUT IS BASED ON E70xx (70 ksi) ELECTRODES.
6. WELD LENGTH IS CIRCUMFERENCE BASED ON WELDED ANCHOR DIAMETER + FILLET
7. COUPLER SHALL BE ORIENTED WITH SITE HOLE CLOSEST TO THE STEEL BEAM CONNECTION.
8. HIGH STRENGTH WELDED ANCHORS (WAxHS) WILL HAVE NOTCHED GROOVE.

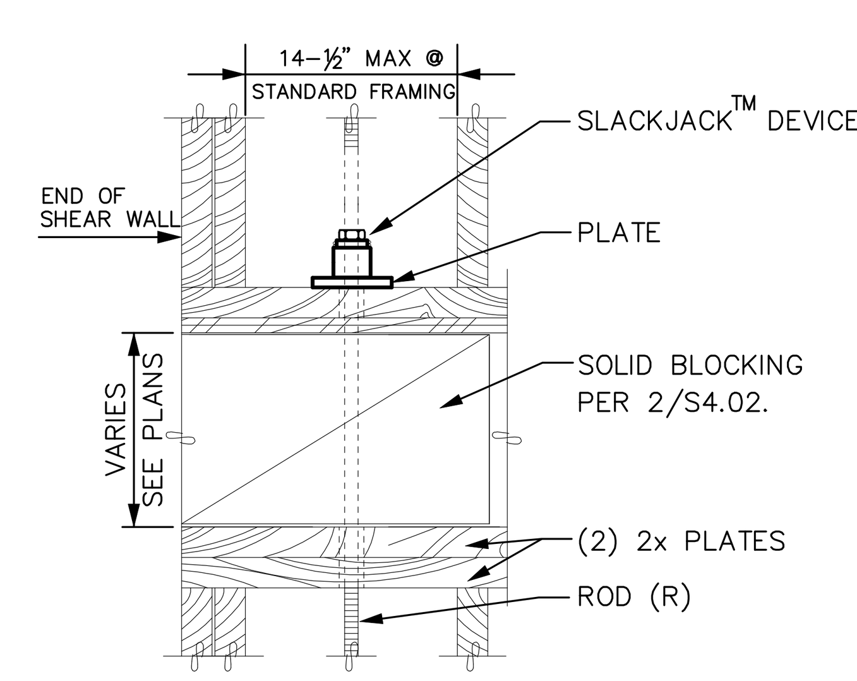




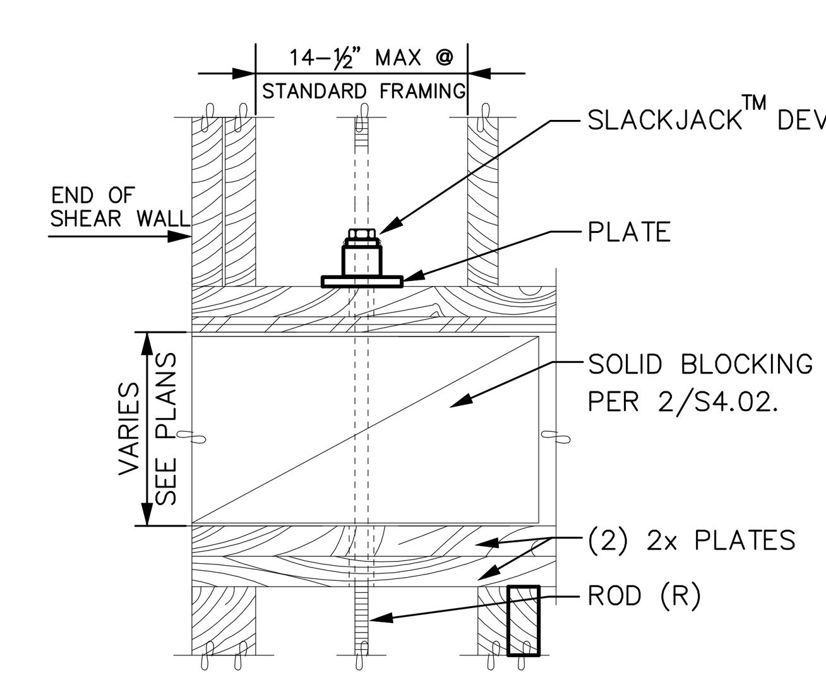
ANCHOR BOLT NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF WALL TYPE AND FRAMING LAYOUT BEFORE LOCATING ANCHOR BOLTS IN CONCRETE.
2. ALL DIMENSIONS ARE TYPICAL U.N.O.

TYP. ANCHOR BOLT PLAN
DETAIL B SH-2 SH-2
SCALE: NONE

NOTE:
SOLID BLOCKING, PROVIDE ENOUGH SOLID BLOCKING IN JOIST SPACE TO MATCH MATCH WIDTH OF ALL COMPRESSION STUDS OR POSTS OF THE WALL BELOW.

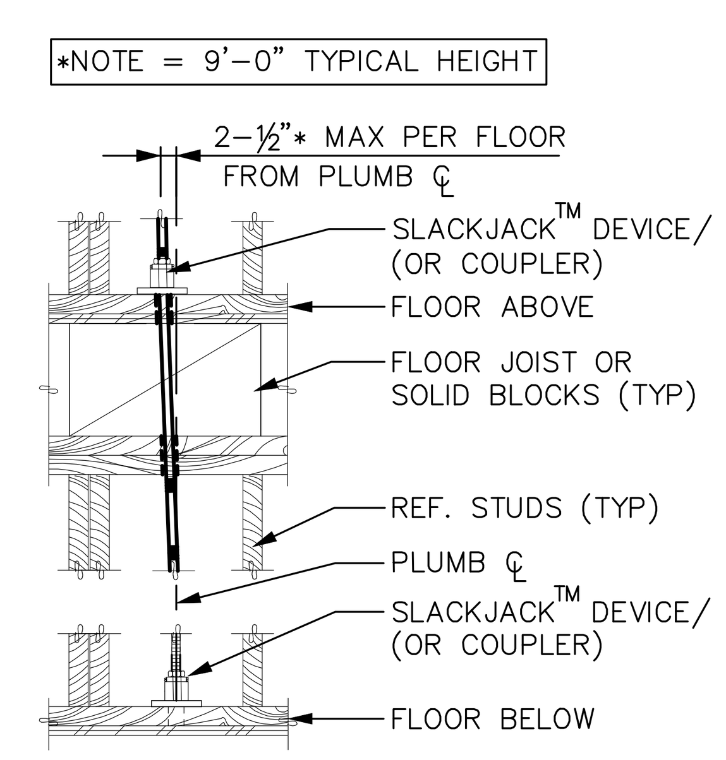


AT EQUAL NUMBER OF COMPRESSION STUDS FROM LEVEL BELOW & ABOVE

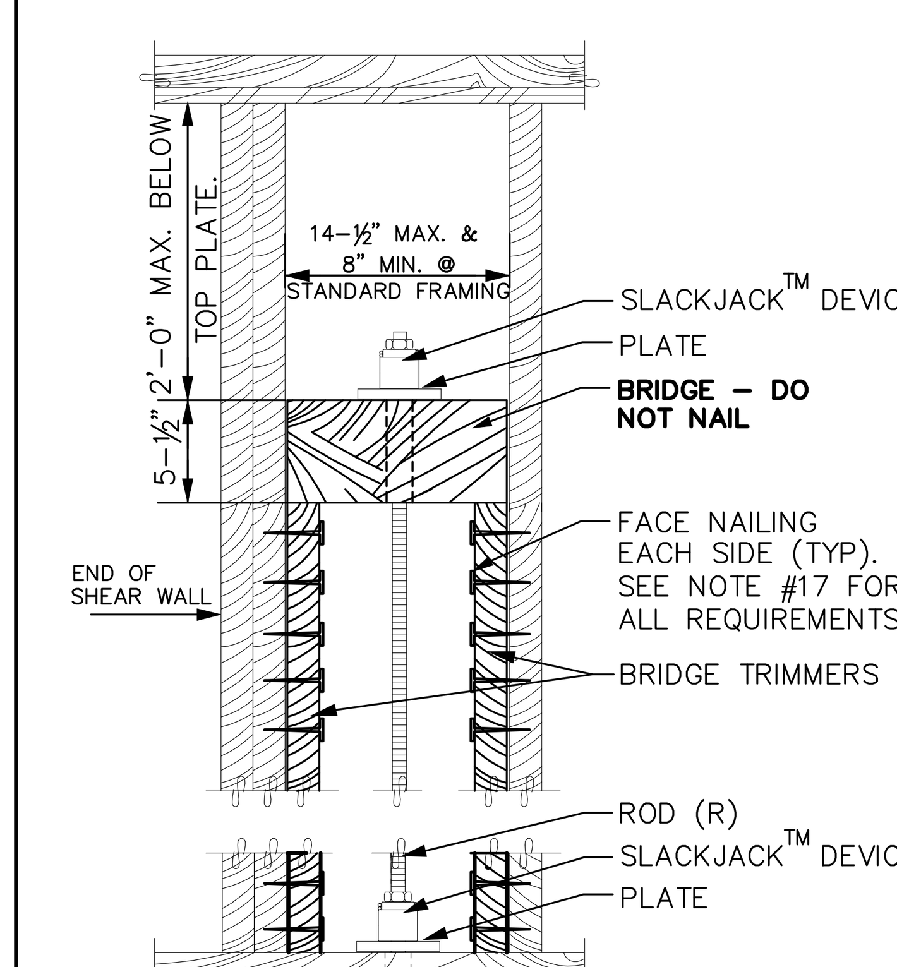


AT GREATER NUMBER OF COMPRESSION STUDS FROM LEVEL BELOW

TYP. SLACKJACK™ INSTALLATION
DETAIL 3 SH-2 SH-2
SCALE: NONE



ALLOWABLE ROD OFFSET
DETAIL 2 SH-2 SH-2
SCALE: NONE



TYP. BRIDGE INSTALLATION
DETAIL 1 SH-2 SH-2
SCALE: NONE

NO.	DATE	DESCRIPTION
1	05/15/19	REVISED PER STRUCTURAL PLANS DATED 03/19/19.

REVISIONS

DRAWN: LH
DESIGNED: AD
CHECKED: AD
APPROVED: WMN

WILLIAM M. NELSON, STATE OF WASHINGTON, STRUCTURAL ENGINEER, PROFESSIONAL ENGINEER

PROJECT: WESTMAN MILL
510 STATE AVE, OLYMPIA, WA 98501

EARTHBOUND "Holdowns That Work"

EARTHBOUND CORPORATION
17361 Tye Street SE
Monroe, WA 98272
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(800) 944-5669
Fax (360) 863-0722

EB CORP JOB NO: 19028

SHEET TITLE: EARTHBOUND SEISMIC HOLDOWN SYSTEM INSTALLATION DRAWINGS IAPMO ER-0429

DATE: 05/15/19

SHEET NO. SH-2

CONTACT. EARTHBOUND 800-944-5669

WESTMAN MILL_2.dwg
May 15, 2019 at 10:36 AM

SECOND FLOOR FRAMING PLAN - EAST

Reviewed for Code Compliance
Construction Permitting Only

Olympia
Building Plans Examiner
Community Planning & Development Department
601 4th Ave East
Olympia, WA 98501
(360) 753-8248
rbalders@ci.olympia.wa.us

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

☐ Conforms to Design Concept
☒ Conforms to Design Concept as noted
☐ Does Not Conform - Revise & Resubmit

Checking is only for conformance with the design concept of the project. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for the coordination of the work of all trades.

By SJW Date 07/18/19

PCS Structural Solutions
101 SW Main Street, Suite 280
Portland, OR 97204 503-232-3746

THIS LAYOUT SHEET IS BASED ON HOLDOWN RUN LOCATIONS SHOWN ON STRUCTURAL PLAN SHEET "S2.02C". THE CONTRACTOR SHALL NOTIFY EARTHBOUND IMMEDIATELY IF REVISED PLANS THAT MAY AFFECT THE QUANTITY AND LOCATION OF RUNS SHOWN ARE ISSUED .

EARTHBOUND SYSTEM LAYOUT DISCLAIMER

1. THIS LAYOUT SHEET IDENTIFIES EARTHBOUND SYSTEM RUNS FOR CONVENIENCE TO THE SYSTEM INSTALLER AND PROVIDED FOR REFERENCE ONLY. REFER TO THE CONSTRUCTION PLANS FOR ALL OTHER INFORMATION.
2. EARTHBOUND CORPORATION HAS NOT CONFIRMED AND IS NOT RESPONSIBLE FOR THE DESIGN, ENGINEERING, CALCULATIONS OR DERIVATION OF STRUCTURAL FORCES RELATED TO THE BUILDING. ANY DESIGN OR DEMAND LOAD INFORMATION USED OR SHOWN ON THESE DRAWINGS HAS BEEN TAKEN FROM THE CONSTRUCTION DOCUMENTS AND HAS NOT BEEN CONFIRMED BY EARTHBOUND.
3. THIS LAYOUT IS NOT FOR CONSTRUCTION WITHOUT SUBSTANTIATION OF REVIEW BY THE RESPONSIBLE ENGINEER OF RECORD AND THE GOVERNING BUILDING JURISDICTION.
4. THIS LAYOUT IS SPECIFIC TO THE EARTHBOUND SYSTEM AND IS NOT APPLICABLE TO OTHER TIEDOWN SYSTEMS.
5. REFER TO SHEETS SH-1, SH-2 FOR ADDITIONAL NOTES AND INFORMATION.

EARTHBOUND SYSTEM LOCATION LAYOUT SHEET

(X) "X" INDICATES EARTHBOUND SYSTEM HOLDOWN RUNS. ALL RUNS ALIGN WITH WALLS ABOVE.

THIS SHEET IS INTENDED FOR THE LOCATION OF THE EARTHBOUND HOLDOWNS ONLY REFER TO THE CONSTRUCTION PLANS FOR ALL . OTHER INFORMATION.

REVISIONS

NO.:	DATE:	DESCRIPTION:
1	05/15/19	REVISED PER STRUCTURAL PLANS DATED 03/19/19.

WILLIAM M. NELSON
STATE OF WASHINGTON
STRUCTURAL ENGINEER
PROFESSIONAL ENGINEER

PROJECT:
WESTMAN MILL
510 STATE AVE, OLYMPIA, WA 98501

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Fax (360) 863-0722

EB CORP JOB NO.
19028

DATE:
05/15/19

SHEET TITLE:
EARTHBOUND SEISMIC HOLDOWN SYSTEM LOCATION LAYOUT DRAWINGS.
IAPMO ER-0429

SHEET NO.
R1

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By SJW Date 07/18/19

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Portland, OR 97204 503-232-3746

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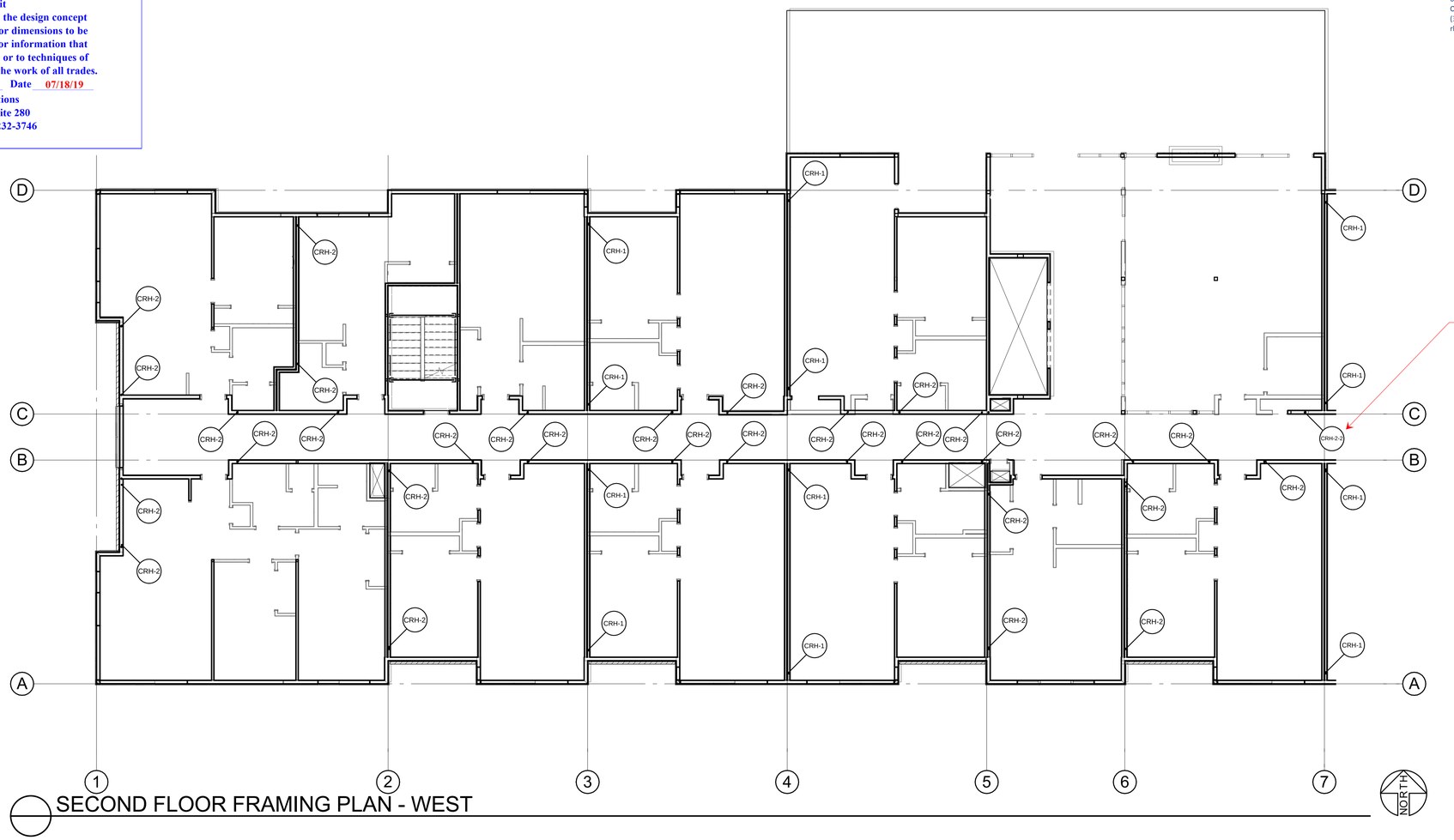

SECOND FLOOR FRAMING PLAN - WEST

HOLDOWN AS MOVED TO ACCOUNT FOR ARCH. ADJUSTMENTS.

ALL HOLDOWNS ARE TO BE FULL HEIGHT OF THE BUILDING. THERE ARE NO PARTIAL CRH'D

THIS LAYOUT SHEET IS BASED ON HOLDOWN RUN LOCATIONS SHOWN ON STRUCTURAL PLAN SHEET "S2.02C". THE CONTRACTOR SHALL NOTIFY EARTHBOUND IMMEDIATELY IF REVISED PLANS THAT MAY AFFECT THE QUANTITY AND LOCATION OF RUNS SHOWN ARE ISSUED .

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EARTHBOUND SYSTEM LOCATION LAYOUT SHEET

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NO.	DATE:	DESCRIPTION:
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WILLIAM M. NELSON
STATE OF WASHINGTON
STRUCTURAL ENGINEER
PROFESSIONAL ENGINEER

PROJECT:
WESTMAN MILL
510 STATE AVE, OLYMPIA, WA 98501

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EB CORP JOB NO.
19028

DATE: 05/15/19

SHEET TITLE:
EARTHBOUND SEISMIC HOLDOWN SYSTEM LOCATION LAYOUT DRAWINGS.
IAPMO ER-0429

SHEET NO.
R2

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By SJW Date 07/18/19

PCS Structural Solutions
101 SW Main Street, Suite 280
Portland, OR 97204 503-232-3746

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Olympia
Building Plans Examiner
Community Planning & Development Department
601 4th Ave East
Olympia, WA 98501
(360) 753-8248
rbalders@ci.olympia.wa.us

FOURTH FLOOR FRAMING PLAN - WEST

THIS LAYOUT SHEET IS BASED ON HOLDOWN RUN LOCATIONS SHOWN ON STRUCTURAL PLAN SHEET "S2.04". THE CONTRACTOR SHALL NOTIFY EARTHBOUND IMMEDIATELY IF REVISED PLANS THAT MAY AFFECT THE QUANTITY AND LOCATION OF RUNS SHOWN ARE ISSUED .

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EARTHBOUND SYSTEM LOCATION LAYOUT SHEET

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REVISIONS

NO.	DATE	DESCRIPTION
1	05/15/19	REVISED PER STRUCTURAL PLANS DATED 03/19/19.

WILLIAM M. NELSON
STATE OF WASHINGTON
19008
STRUCTURAL ENGINEER
PROFESSIONAL ENGINEER

PROJECT:
WESTMAN MILL
510 STATE AVE, OLYMPIA, WA 98501

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Monroe, WA 98272
http://www.holdown.com
(800) 944-5569
Fax (360) 863-0722

EB CORP JOB NO.
19028

DATE: 05/15/19

SHEET TITLE:
EARTHBOUND SEISMIC HOLDOWN SYSTEM LOCATION LAYOUT DRAWINGS.
IAPMO ER-0429

SHEET NO.
R3

EARTHBOUND tm
"Holdowns That Work"

Earthbound System Submittal Package for:

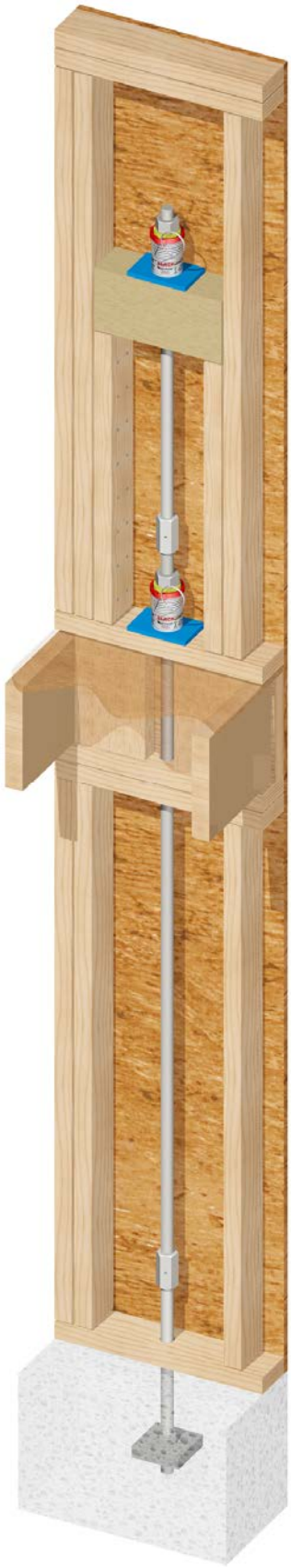
Westman Mill
510 State Ave
Olympia, WA 98501

EB Corp. Job: 19028

Rev A

May 15, 2019

Contains:
1) Run Type Analysis
2) IAPMO ER0429
3) Bridge and Nailing Calculations



Prepared by:
Earthbound Corporation
17361 Tye Street SE
Monroe, WA 98272
800-944-5669
360-863-0724
http://www.holdown.com

Olympia

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Construction Permitting Only

Building Plans Examiner
Community Planning & Development Department
601 4th Ave East
Olympia, WA 98501
(360) 753-8248
rbalders@ci.olympia.wa.us

DATE: May 15, 2019

PROJECT: Westman Mill
510 State Ave
Olympia, WA 98501

SUBJECT: Calculations Package

The following package is submitted for review:

1) Earthbound Run Analysis
2) IAPMO ER-0429 (“Earthbound Corporation”)
3) Sample Bridge Calculations

Calculation Assumptions:

1) Earthbound Corporation took no part in the preparation or review of the project structural design and disclaims any liability regarding shear wall design, determination of holdown locations in the structure and/or magnitude of the holdown forces.
2) The specified uplift loads were based from the structural drawings.
3) Slackjack Devices are referenced from IAPMO ER-0429. This report is included in this submittal.
4) All full height member and compression capacities are referenced back to the required posting per structural plans. Wood Buckling and compression perpendicular to grain calculations are not required by Earthbound.

Earthbound Corporation
17361 Tye Street SE
Monroe, WA 98272

www.holdown.com
Phone: (360) 863-0722
Fax: (360) 863-0724

EARTHBOUND CORPORATION

17361 Tye Street, SE
Monroe, WA 98272

Project #	**19028**	***CALCULATION SUMMARY***
Project:	**Westman Mill**	***OF ASSIGNED RUN TYPES***
Date:	**5/15/2019**	

A	B	C	D	E	F	G	H			I	J	K	L	M	N	O

Plans Date: **3/19/2019**

CALCULATION NOTES ON COLUMNS:

A	Tension load provided by the structural plans.
B	Floor to floor differential loads.
C	Collected differential loads, if tiedowns on floors are skipped, the loads are brought up to the next level.
D	Assigned rod loads may be increased over column A if tiedowns are skipped on lower stories.
E	Final rod selection in accordance to specified design code (ASD)
F	Earthbound Shrinkage Fastener assigned to differential load (Column C) and travel required.
G	Bearing plate assigned to differential loads of Column C. Actual size shown.
H	Bearing plate is sized for both net area perpendicular to wood grain and bending thickness
I	Rod elongation based on PL/AE where A = nominal area and E = 29,000,000 psi.
J	Column Not Used
K	Device looseness is stated values of travel increments per IAPMO ER-0429.
L	Device capacity as stated in IAPMO ER-0429.
M	Device deflection is linear ratio of (applied load / rated load capacity of shrinkage fastener) x (displacement at rated load capacity) (M = C / L * Device Deflection at Rated Load)
N	Deflection total of Columns I thru M.
O	Quick check results if total system elongation is greater than required by the plans or local jurisdiction.

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A	B	C	D	E	F	G	H			I	J	K	L	M	N	O

RUN TYPE CRH-1

WOOD FLOOR LEVEL	UPLIFT TENSION LOADS	CALCULATED DIFFERENTIAL LOADS	COLLECTED DIFFERENTIAL LOADS	ASSIGNED ROD TENSION LOADS	FINAL ROD SIZE	SHRINKAGE FASTENER SIZE	EBOUND PLATE PART NO.	ACTUAL PLATE DIMENSIONS	RATED PLATE CAPACITY	DEFLECTION CHECK								
										THREADED ROD DIA. (IN)	THREADED ROD LENGTH (FT)	NOMINAL AREA	ROD ELONG.		DEVICE LOOSENESS	DEVICE CAPACITY	DEVICE DEFLECTION	SYSTEM EL/DEFL.	0.200 LIMIT?
5th																		
4th	**620 #**	620 #	620 #	620 #	R5HS	SJA225	P6	3.00 x 3.50 x 1/4	6,650 lbs	0.625 in	7.5 FT	0.307 in^2	0.006 in		0.050 in	7,730 #	0.001 in	0.058 in	OK
3rd	**1,500 #**	880 #	880 #	1,500 #	R5HS	SJA225	P6	3.00 x 3.50 x 1/4	6,650 lbs	0.625 in	10.3 FT	0.307 in^2	0.021 in		0.050 in	7,730 #	0.002 in	0.073 in	OK
2nd	**6,800 #**	5,300 #	5,300 #	6,800 #	R5HS	SJA215	P6	3.00 x 3.50 x 1/4	6,650 lbs	0.625 in	10.3 FT	0.307 in^2	0.095 in		0.045 in	7,360 #	0.009 in	0.149 in	OK
1st	**17,470 #**	10,670 #	10,670 #	17,470 #	R8HS	SJA418	P12	3.25 x 6 x 5/8	12,270 lbs	1.000 in	10.3 FT	0.785 in^2	0.095 in		0.051 in	14,000 #	0.017 in	0.163 in	OK

RUN TYPE CRH-2

WOOD FLOOR LEVEL	UPLIFT TENSION LOADS	CALCULATED DIFFERENTIAL LOADS	COLLECTED DIFFERENTIAL LOADS	ASSIGNED ROD TENSION LOADS	FINAL ROD SIZE	SHRINKAGE FASTENER SIZE	EBOUND PLATE PART NO.	ACTUAL PLATE DIMENSIONS	RATED PLATE CAPACITY	DEFLECTION CHECK								
										THREADED ROD DIA. (IN)	THREADED ROD LENGTH (FT)	NOMINAL AREA	ROD ELONG.		DEVICE LOOSENESS	DEVICE CAPACITY	DEVICE DEFLECTION	SYSTEM EL/DEFL.	0.200 LIMIT?
5th																		
4th	**1,040 #**	1,040 #	1,040 #	1,040 #	R5HS	SJA225	P6	3.00 x 3.50 x 1/4	6,650 lbs	0.625 in	7.5 FT	0.307 in^2	0.011 in		0.050 in	7,730 #	0.002 in	0.063 in	OK
3rd	**7,620 #**	6,580 #	6,580 #	7,620 #	R5HS	SJA225	P6	3.00 x 3.50 x 1/4	6,650 lbs	0.625 in	10.3 FT	0.307 in^2	0.106 in		0.050 in	7,730 #	0.015 in	0.172 in	OK
2nd	**21,260 #**	13,640 #	13,640 #	21,260 #	R8HS	SJA418	P14	3.25 x 7 x 3/4	14,460 lbs	1.000 in	10.3 FT	0.785 in^2	0.116 in		0.051 in	14,000 #	0.021 in	0.188 in	OK
1st	**45,790 #**	24,530 #	24,530 #	45,790 #	R12HS	HJS7112	P26-12	3.5 x 12.5 x 1 1/4	26,490 lbs	1.500 in	10.3 FT	1.767 in^2	0.111 in		0.012 in	39,190 #	0.018 in	0.141 in	OK

EARTHBOUND CORPORATION
17361 Tye Street, SE
Monroe, WA 98272

Project #	**19028**
Project:	**Westman Mill**
Date:	**5/15/2019**

CALCULATION SUMMARY
OF ASSIGNED RUN TYPES

A	B	C	D	E	F	G	H			I	J	K	L	M	N	O

RUN TYPE CRH-2-2

WOOD FLOOR LEVEL	UPLIFT TENSION LOADS	CALCULATED DIFFERENTIAL LOADS	COLLECTED DIFFERENTIAL LOADS	ASSIGNED ROD TENSION LOADS	FINAL ROD SIZE	SHRINKAGE FASTENER SIZE	EBOUND PLATE PART NO.	ACTUAL PLATE DIMENSIONS	RATED PLATE CAPACITY	DEFLECTION CHECK								
										THREADED ROD		NOMINAL AREA	ROD ELONG.		DEVICE LOOSENESS	DEVICE CAPACITY	DEVICE DEFLECTION	SYSTEM EL/DEFL.	0.200 LIMIT?
										DIA. (IN)	LENGTH (FT)								
5th																			
4th																			
3rd																			
2nd	**21,260 #**	21,260 #	21,260 #	21,260 #	R8HS	HJS718	P22	3.5 x 11 x 1 1/4	23,210 lbs	1.000 in	10.3 FT	0.785 in^2	0.116 in		0.012 in	39,190 #	0.016 in	0.143 in	OK
1st	**45,790 #**	24,530 #	24,530 #	45,790 #	R12HS	HJS7112	P26-12	3.5 x 12.5 x 1 1/4	26,490 lbs	1.500 in	10.3 FT	1.767 in^2	0.111 in		0.012 in	39,190 #	0.018 in	0.141 in	OK

RUN TYPE CRH-2-SB

WOOD FLOOR LEVEL	UPLIFT TENSION LOADS	CALCULATED DIFFERENTIAL LOADS	COLLECTED DIFFERENTIAL LOADS	ASSIGNED ROD TENSION LOADS	FINAL ROD SIZE	SHRINKAGE FASTENER SIZE	EBOUND PLATE PART NO.	ACTUAL PLATE DIMENSIONS	RATED PLATE CAPACITY	DEFLECTION CHECK								
										THREADED ROD		NOMINAL AREA	ROD ELONG.		DEVICE LOOSENESS	DEVICE CAPACITY	DEVICE DEFLECTION	SYSTEM EL/DEFL.	0.200 LIMIT?
										DIA. (IN)	LENGTH (FT)								
5th																			
4th	**1,040 #**	1,040 #	1,040 #	1,040 #	R5HS	SJA215	P6	3.00 x 3.50 x 1/4	6,650 lbs	0.625 in	7.5 FT	0.307 in^2	0.011 in		0.045 in	7,360 #	0.002 in	0.057 in	OK
3rd	**7,620 #**	6,580 #	6,580 #	7,620 #	R5HS	SJA215	P6	3.00 x 3.50 x 1/4	6,650 lbs	0.625 in	10.3 FT	0.307 in^2	0.106 in		0.045 in	7,360 #	0.012 in	0.163 in	OK
2nd										0.625 in		0.307 in^2							
1st																			

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EARTHBOUND CORPORATION
17361 Tye Street, SE
Monroe, WA 98272
Phone: (360) 863-0722
Fax: (360) 863-0724

Project:	**Westman Mill**
Project #	**19028**
Date:	**5/15/2019**

EARTHBOUND THREADED ROD CAPACITIES (IBC 2015)

ROD SIZE	ROD SIZE (INCHES)	ALLOWABLE TENSION LOAD IBC 2015	ROD REMARKS	SLACKJACK SIZE
R4	1/2" DIA.	4,470 LBS	ASTM A 307 (UNC)	MJ100, MJ200
R5	5/8" DIA.	7,120 LBS	ASTM A 307 (UNC)	SJA 215, 225, 415, 425
R6	3/4" DIA.	10,540 LBS	ASTM A 307 (UNC)	SJA 216, 226, 416, 426, HJA 716, 726
R7	7/8" DIA.	14,540 LBS	ASTM A 307 (UNC)	SJA 217, 227, 417, 427, HJA 717, 727
R8	1" DIA.	19,080 LBS	ASTM A 307 (UNC)	SJA 218, 228, 418, 428, HJA 718, 728
R9	1 1/8" DIA.	24,040 LBS	ASTM A 307 (UNC)	SJA 219, 229, 419, 429, HJA 719, 729
R10	1 1/4" DIA.	30,530 LBS	ASTM A 307 (UNC)	SJA 4110, 4210, HJA 7110, 7210, HJS 4110, 4210
R12	1 1/2" DIA.	44,270 LBS	ASTM A 307 (UNC)	SJST 4112, 4212, HJA 7112, 7212, HJS 4112, 4212
R14	1 3/4" DIA.	59,830 LBS	ASTM A 307 (UNC)	-----
R5M	5/8" DIA.	8,900 LBS	ASTM F1554 GR55 (UNC)	SJA 215, 225, 415, 425
R6M	3/4" DIA.	13,170 LBS	ASTM F1554 GR55 (UNC)	SJA 216, 226, 416, 426, HJA 716, 726
R7M	7/8" DIA.	18,180 LBS	ASTM F1554 GR55 (UNC)	SJA 217, 227, 417, 427, HJA 717, 727
R8M	1" DIA.	23,850 LBS	ASTM F1554 GR55 (UNC)	SJA 218, 228, 418, 428, HJA 718, 728
R9M	1 1/8" DIA.	30,050 LBS	ASTM F1554 GR55 (UNC)	SJA 219, 229, 419, 429, HJA 719, 729
R10M	1 1/4" DIA.	38,160 LBS	ASTM F1554 GR55 (UNC)	SJA 4110, 4210, HJA 7110, 7210, HJS 4110, 4210
R12M	1 1/2" DIA.	55,330 LBS	ASTM F1554 GR55 (UNC)	SJST 4112, 4212, HJA 7112, 7212, HJS 4112, 4212
R14M	1 3/4" DIA.	74,790 LBS	ASTM F1554 GR55 (UNC)	-----

		ASTM A449 THREADED ROD	ASTM A 193-B7 THREADED ROD	SLACKJACK SIZES
R5HS	5/8" DIA.	14,240 LBS	14,830 LBS	SJA 215, 225, 415, 425
R6HS	3/4" DIA.	21,070 LBS	21,950 LBS	SJA 216, 226, 416, 426, HJA 716, 726
R7HS	7/8" DIA.	29,090 LBS	30,300 LBS	SJA 217, 227, 417, 427, HJA 717, 727
R8HS	1" DIA.	38,160 LBS	39,750 LBS	SJA 218, 228, 418, 428, HJA 718, 728
R9HS	1 1/8" DIA.	42,080 LBS	50,090 LBS	SJA 219, 229, 419, 429, HJA 719, 729
R10HS	1 1/4" DIA.	53,420 LBS	63,600 LBS	SJA 4110, 4210, HJA 7110, 7210, HJS 4110, 4210
R12HS	1 1/2" DIA.	77,460 LBS	92,220 LBS	SJST 4112, 4212, HJA 7112, 7212, HJS 4112, 4212
R14HS	1 3/4" DIA.	104,710 LBS	124,650 LBS	-----

EARTHBOUND BEARING PLATE CAPACITIES (DF)

PLATE SIZE	DIFFERENTIAL LOAD	COLOR CODE	PLATE DIMENSIONS (INCHES)		
			WIDTH	LENGTH	THICK.
P6	6,650 LBS	GREEN	3"	3.5"	1/4"
P8	8,470 LBS	BLACK	3-1/4"	4.25"	1/4"
P10	10,510 LBS	BLUE	3-1/4"	5"	3/8"
P12	12,270 LBS	GRAY	3-1/4"	6"	5/8"
P14	14,460 LBS	RED	3-1/4"	7"	3/4"
P18	18,840 LBS	YELLOW	3-1/2"	9"	1"
P20	21,020 LBS	BROWN	3-1/2"	10"	1"
P22	23,210 LBS	WHITE	3-1/2"	11"	1 1/4"
P24	24,310 LBS	GOLD	3-1/2"	11.5"	1 1/4"
P26	26,490 LBS	ORANGE	3-1/2"	12.5"	1 1/2"

SJA ROD SIZE CODES

PART NO.	ROD DIAMETER	ROD SIZE	WASHER COLOR
MJ100 or MJ200	1/2"	R4	PURPLE
SJA 2x5 or 4x5	5/8"	R5	BLACK
SJA 2x6 or 4x6, HJA 7x6	3/4"	R6 or R6HS	GRAY
SJA 2x7 or 4x7, HJA 7x7	7/8"	R7 or R7HS	BLUE
SJA 2x8 or 4x8, HJA 7x8	1"	R8 or R8HS	YELLOW
SJA 2x9 or 4x9, HJA 7x9	1 1/8"	R9 or R9HS	WHITE
SJA 4x10, HJA 7x10, HJS 4x10	1 1/4"	R10 or R10HS	GREEN
SJST 4x12, HJA 7x12, HJS 4x12	1 1/2"	R12 or R12HS	RED
"x" = SLACKJACK TRAVEL IN "INCHES"			

NOTES:

1. TENSION LOAD WAS CALCULATED FROM THE FOLLOWING EQUATION:
   - **A. ASTM A 307 Threaded Rod Capacities are F'u = 60,000 psi. UNC thread pitch**
     M Rods are based on ASTM F1554 GR55, F'u = 75 ksi.
     HS Rods are based on ASTM A193 B7, F'u = 125 ksi or ASTM A449, F'u = 120 ksi, 105 ksi above R8HS
   - **B. The IBC 2015 column is calculated in accordance to Section 1905 and ASCE 7-10.**
2. PLATE STEEL SHALL BE ASTM A36: F'u = 60,000 PSI.
3. SUBSTITUTIONS OF DESIGNATED BEARING PLATE SHALL NOT BE PERMITTED, OBTAIN WRITTEN APPROVAL FROM THE ENGINEER.
4. SLACKJACK SELECTION NOTES:
   THE SIZES SHOWN ABOVE ARE FOR BOTH ONE AND TWO INCH TRAVEL ("SJA 4xy")
   (x = TRAVEL HEIGHT IN INCHES, y = ROD SIZE). TWO INCH TRAVEL SLACKJACKS ARE REQUIRED ON FOURTH WOOD FRAME LEVELS AND HIGHER.
5. THIS TABLE IS FOR REFERENCE OF FULL PRODUCT LINE, SOME ROD AND PLATE SIZES MAY NOT BE IN USE. THE ENGINEER OF RECORD SHALL REVIEW AND APPROVE CAPACITIES.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

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SLACKJACK®, HEAVYJACK™ AND MINIJACK® SHRINKAGE COMPENSATION DEVICES

CSI Section:
06 05 23 Wood, Plastic and Composite Fastenings

1.0 RECOGNITION

SlackJack®, HeavyJack™ and MiniJack®, manufactured by Earthbound Corporation, were evaluated for use as compression-controlled shrinkage compensation devices in wood-framed construction. The structural properties of the devices were evaluated for compliance with the following codes and regulations:

- 2018, 2015, 2012, 2009 and 2006 International Building Code® (IBC)
- 2018, 2015, 2012, 2009 and 2006 International Residential Code® (IRC)
- 2016 and 2013 California Building Code (CBC) – See attached Supplement
- 2016 and 2013 California Residential Code (CRC) – See attached Supplement
- 2017 Florida Building Code, Building (FBC, Building) – See attached Supplement
- 2017 Florida Building Code, Residential (FBC, Residential) – See attached Supplement
- 2017 City of Los Angeles Building Code (LABC) – See attached Supplement
- 2017 City of Los Angeles Residential Code (LARC) – See attached Supplement

2.0 LIMITATIONS

Use of the SlackJack, HeavyJack and MiniJack Shrinkage Compensation Devices recognized in this report are subject to the following limitations:

2.1 The SlackJack, HeavyJack and MiniJack devices shall be limited to installations in dry, interior locations.

2.2 Use of the SlackJack, HeavyJack and MiniJack devices in direct contact with fire-retardant or preservative-treated wood is beyond the scope of recognition of this report.

2.3 Where required, designs using these products shall be submitted to the building code official for review.

2.4 No increase in the allowable capacities shown in Table 4 of this report shall be permitted.

2.5 The dead load is limited to the self-weight of the SlackJack, HeavyJack and MiniJack devices. Additional dead load on the devices is beyond the scope of this report.

2.6 The maximum offset tolerance shall be 1.33 degrees from vertical.

2.7 "When the devices are used in continuous rod systems that resist light-frame shear wall overturning forces, calculations shall be submitted to the code official confirming that the total vertical displacement, which would include steel rod elongation and the shrinkage compensating device deflection, is less than or equal to 0.20 inch (5 mm) for each story, or between restraints, whichever is more restrictive, using allowable stress design (ASD). Shear wall drift limit calculations shall consider the 0.20 inch (5 mm) vertical displacement limit. This 0.20-inch (5 mm) vertical displacement limit may be exceeded when it can be demonstrated that the shear wall story drift limit and the deformation compatibility requirements of IBC Section 1604.4 are met when considering all sources of vertical displacement." (AC316)

2.8 Buildings constructed to the IRC shall have engineered designs performed on the elements of construction using this device as required in Section R301.1.3.

2.9 The shrinkage compensation devices recognized in this report are produced by Earthbound Corporation in Monroe, Washington.

3.0 PRODUCT USE INSTRUCTIONS

3.1 The Earthbound installation instructions, this evaluation report, and the applicable provisions of the building code shall be followed when installing this product. Where conflicts occur between these documents, the more restrictive provisions shall govern. The published installation instructions shall be available at the jobsite during construction for use by installers and for quality assurance.

3.2 Where required by the code official or other authority having jurisdiction, calculations based on applied loads to the device shall be provided by a registered design professional to show the basis for its selection. The calculations shall show the projected shrinkage, deflection, and settlement the device will compensate for, and the method of transferring the loads through the supports. The appropriate SlackJack, HeavyJack and MiniJack device shall be chosen based on the model and series characteristics. The Rated Shrinkage Capacity, Allowable

Compression Load, Deflection at Allowable Load and Device Average Travel and Seating Increment, Δ_R, for each model are shown in Table 4 of this report.

3.3 The chosen SlackJack, HeavyJack or MiniJack device shall be slid over a threaded-rod or anchor bolt, over an approved bearing surface or plate. The appropriate color-coded swivel washer (listed in Table 4 of this report), shall be installed as required by the manufacturer's installation instructions with the flat side up. A hex nut shall be installed over the rod and hand-tightened.

To place the device into service, the pull clip shall be completely removed and placed on the device to show that the device has been activated.

Where necessary, the devices may be reset in the field. The manufacturer's installation instructions shall be referenced for details.

3.4 SlackJacks may be substituted and interchangeable with HeavyJack devices per Table 3 of this report.

4.0 PRODUCT DESCRIPTION

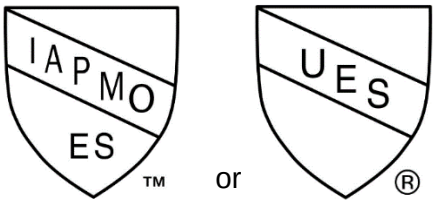
4.1 SlackJack, HeavyJack and MiniJack Shrinkage Compensation Devices are spring-loaded, compression-controlled shrinkage compensating devices that are designed to work with threaded-rod or anchor bolt hold-down systems in wood-frame construction. The devices are cylindrical, high-strength structural connectors that enable axial compression travel along a bolted or sliding connection but to withstand movement due to tensile loads.

4.2 The materials used for the inner and outer cylinders, locking rings, springs, pull-clips, capture-rings and swivel washers, for the SlackJack, HeavyJack and MiniJack models are shown in Table 1 of this report.

4.3 The model and series number describe the attributes of each shrinkage compensation device. The devices are color-coded to identify the specific model type, which varies based on strength and length of travel. The available travel lengths are: 1 inch, 1 ½ inches, 2 inches, and 3 inches (25.4 mm, 38.1 mm, 50.8 mm, and 76.2 mm). Table 2 of this report describes the model and series notations. Color coding is also used to identify the size of the swivel washer for the SlackJack devices as shown in Table 5 of this report.

5.0 IDENTIFICATION

A label shall be affixed on at least one of the following: product, packaging, installation instructions or descriptive literature. The label shall include the Earthbound name or trademark, the device model number, the IAPMO Uniform ES Mark of Conformity and the Evaluation Report Number (ER-429) to identify the products recognized in this report. A die-stamp label may be used as a substitute for the label. Either Mark of Conformity may be used as shown below:



IAPMO UES ER-429

6.0 SUBSTANTIATING DATA

Data in accordance with ICC-ES Acceptance Criteria for Shrinkage Compensating Devices (AC316), dated June 2013 (Editorially Revised November 2017).

7.0 STATEMENT OF RECOGNITION

This report describes the results of research carried out by the IAPMO Uniform Evaluation Service on Earthbound's SlackJack, HeavyJack and MiniJack Shrinkage Compensation Devices to assess their conformance to the codes and standards listed in Section 1.0 and serves as documentation of the product certification. Products are manufactured at the location noted in Section 2.9 of this report under a quality control program with periodic inspection under the supervision of IAPMO UES.

Brian Gerber, P.E., S.E.
Vice President, Technical Operations
Uniform Evaluation Service

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Vice President, Uniform Evaluation Service

GP Russ Chaney
CEO, The IAPMO Group

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org

TABLE 1 – Material Information for SlackJack, HeavyJack and MiniJack Devices

Component	Material
Internal and Outer Cylinders for HeavyJack Models HJS and HJX	ASTM A513/5 520 DOM Steel
Internal and Outer Cylinders for SlackJack Models SJT and SJA, HeavyJack Model HJA and MiniJack Model MJ	ASTM B221-08 6061-T6511 Aluminum
Locking Components for all Models	ASTM A313 Stainless Steel
Springs and Pull Clips for all Models	ASTM A764 Galvanized Hard Drawn Spring Wire
Capture Rings for all Models	Plastic Injection Molded
Swivel Washers	ASTM A108 12L14 Steel

TABLE 2 – Model and Series Notations

Notation	
Model Type	MJ = MiniJack, HJ = HeavyJack SJ = SlackJack
First Number (Series Type)	2= 2 Locking Rings 3= 3 Locking Rings 4= 4 Locking Rings 6= 6 Locking Rings 7=7 Locking Rings
Second Number (Rated Shrinkage Capacity)	1 = 1 inch 1-5 = 1.5 inches 2 = 2 inches 3 = 3 inches
Third Number (Swivel Washer Code/Color)	See Table 5

Example Nomenclature: SlackJack model with a series number A420, the letter "A" indicates the model number, with the first number "4" which has 4 locking rings. The second number indicates the rated compensation capacity, which in this case is 2 inches and finally, the third number indicates the diameter of the rod and color code for the swivel washer. For example, if the rod is ½ inch in diameter, the swivel washer color will be purple.

TABLE 3 – HeavyJack Device Substitution for SlackJack Devices

HJA, HJS, HJX Series HeavyJacks are interchangeable and maybe substituted where SJA, SJS, and SJX devices are specified under the following conditions:

SlackJack Devices	Allowed HeavyJack Substitution Devices	Conditions of Use
SJS-410	HJA-710	Loads up to 15,650 lbs
SJS-420	HJA-720	Loads up to 15,590 lbs
SJS-410	HJS-410	Any SJS-410 Load Conditions
SJS-420	HJS-420	Any SJS-420 Load Conditions
SJA-610	HJA-710	Loads up to 15,650 lbs
SJA-620	HJA-720	Loads up to 15,590 lbs
SJT-610	HJA-710	Loads up to 15,650 lbs
SJT-620	HJA-720	Loads up to 15,590 lbs
SJX-410	HJA-710	Loads up to 15,650 lbs
SJX-410	HJS-710	Any SJX-410 Load Conditions
SJX-410	HJX-410	Any SJX-410 Load Conditions

TABLE 4 - Attributes for the SlackJack, HeavyJack and MiniJack Shrinkage Compensating Devices

Model[3] & Series Number	Capture Ring Color Code	Additional Color Code	Nominal Dimensions (Inches) Figure 1 Shows Dimensions A, B And C			Rated Shrinkage Capacity (Inches)	Allowable Compression Load [1,2,] (Lbs)	Δ_A Deflection at Allowable Load (Inch)[5]	Δ_R[5] (Inch)
			Height Before Activation (A)	Outer Diameter of Body (B)	Inner Diameter of Body (C)				
MJ100[4]	Red	N/A	2.540	1.349	0.532	1.0	5,000	0.028	0.032
MJ150[4]	Green	N/A	3.040	1.349	0.532	1.5	5,000	0.030	0.032
MJ200[4]	Orange	N/A	3.540	1.349	0.532	2.0	4,900	0.033	0.031
SJA-210	Blue	N/A	3.330	2.365	1.420	1.0	7,360	0.013	0.045
SJA-21-50	White	N/A	3.830	2.365	1.420	1.5	8,000	0.018	0.047
SJA-220	Yellow	N/A	4.330	2.365	1.420	2.0	7,730	0.018	0.050
SJT-410	Orange	N/A	3.700	2.365	1.375	1.0	9,000	0.020	0.024
SJT-420	Black	N/A	4.700	2.365	1.375	2.0	9,000	0.018	0.028
SJA-410	Red	N/A	3.800	2.365	1.250	1.0	14,000	0.022	0.051
SJA-420	Green	N/A	4.800	2.365	1.250	2.0	14,000	0.030	0.047
SJA-430	Brown	N/A	5.800	2.365	1.250	3.0	14,750	0.033	0.046
SJA-610	Tan	N/A	4.800	2.365	1.250	1.0	20,340	0.028	0.045
SJA-620	White	Blue[6]	5.800	2.365	1.250	2.0	20,100	0.038	0.048
HJA-710	Purple	N/A	4.730	2.500	1.625	1.0	15,650	0.015	0.015
HJA-720	Gray	N/A	5.730	2.500	1.625	2.0	15,590	0.018	0.014
HJS-410[8]	Black	Blue[7]	3.270	2.500	1.625	1.0	22,000	0.020	0.028
HJS-420[8]	Black	Yellow[7]	4.270	2.500	1.625	2.0	22,000	0.026	0.028
HJS-710	Black	Green[7]	4.730	2.500	1.625	1.0	39,190	0.029	0.012
HJS-720	Black	Orange[7]	5.730	2.500	1.625	2.0	37,770	0.030	0.011
HJX-410[8]	Black	Gold[7]	3.700	2.500	1.625	1.0	34,220	0.035	0.047

(Information in Table 4 and Notes 1-4 are from Earthbound QC ("QC") Documentation and Test Data)

Notes to Table 4:

1. "Tabulated allowable loads are for the shrinkage compensating device only. The attached components (including anchors, tension rods, bearing plates, wood framing members, etc.) shall be designed to resist design loads in accordance with the applicable code." (QC)
2. "No further increases to the tabulated allowable loads are permitted." (QC)
3. "Model numbers beginning with an A or T are designed for use with W3 through W10 swivel washers capable of fitting over threaded rods or bolts having diameters ranging from 3/8 inch to 1¼ inches. Model numbers beginning with an S or X are designed for use with W10 or W12 swivel washers capable of fitting over threaded rods or bolts having diameters of 1 ¼ inches and 1 ½ inches respectively." (QC)
4. "MJ100, MJ150 and MJ200 Series are for either 3/8 -inch or 1/2 -inch rod diameter. Requires Heavy Hex nut when installing on 3/8-inch-diameter rod." (QC)
5. "The device Δ_R and Δ_A describe the total movement of the device at allowable load, Δ_T, and are additive. For design loads, P_D, less than the allowable load, P_A, the total movement of the device, Δ_T, is calculated as follows:

   $\Delta_{T=} \Delta_R+\Delta_A(P_D/P_A)$" (AC316)

6. Additional color code for this series is a painted compression spring.
7. Additional color code for this series is a painted outer cylinder.
8. Earlier series of SlackJacks SJS-4xx and SJX-41x are relabeled as HJS-4xx and HJX-41x HeavyJacks respectively in this report.

Table 5 – Swivel Washer Color Code

Number	Diameter of Rod	Color
	0=Base Model	
3	3/8"	Orange
4	1/2"	Purple
5	5/8"	Black
6	3/4	Gray
7	7/8"	Blue
8	1"	Yellow
9	1 1/8"	White
10	1 1/4"	Green
12	1 1/2"	Red

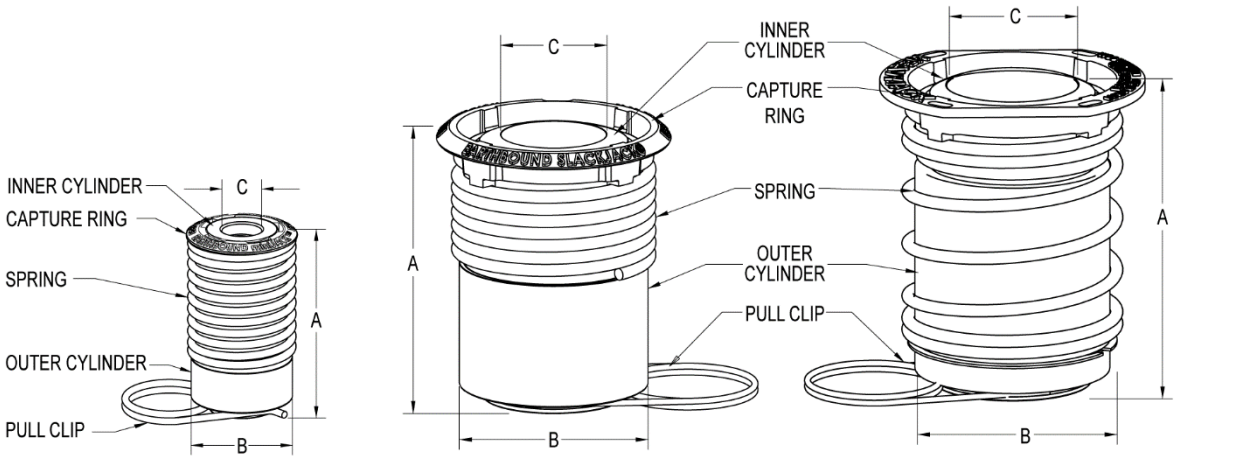

FIGURE 1 - SLACKJACK®, HEAVYJACK™ AND MINIJACK™ SHRINKAGE COMPENSATING DEVICES

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Project:	**Westman Mill**	***WOOD COMPRESSION CALCULATION BASED ON IBC 2015 (NDS 2015)***
Project #	**19028**	***BASED ON NO. 2 DOUG FIR STUDS/POSTS ON DOUG FIR PLATES***
Date:	**5/15/2019**	***SEE SPECIFIC MEMBER HEIGHTS***
Struct Plans Date:	**3/19/2019**	

POST COLUMN DESIGN STUD HEIGHT #1

DOUG-FIR POSTS ON DOUG FIR FLOOR PLATES

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
Size	Grade	Height h inch	PARALLEL F_{cII} psi	DURATION C_D	REPETITIVE C_r	SIZE FACT. C_F	M.O.E E ksi	PERPENDICULAR TO GRAIN F_{cp} psi	C_b	WIDTH b(d) inch	THICK t inch	E_{min} ksi	F_{c*} psi	l_e/d	F_{ce} = (0.822*Emin)/(le/d)^2	COLUMN FACTOR C_p	COL. STRESS F'_c psi	VERTICAL CAPACITY P_v lbs	BEARING CAPACITY P_b lbs	ALLOW. P_c lbs	Size
2 x 4	No. 2	107	1,350	1.60	1.00	1.15	1,600	625	1.00	3.50	1.50	584	2,484	30.70	509.68	0.196	486.03	2,552	3,281	**2,552**	**2 x 4**
3 x 4	No. 2	107	1,350	1.60	1.00	1.15	1,600	625	1.00	3.50	2.50	584	2,484	30.70	509.68	0.196	486.03	4,253	5,469	**4,253**	**3 x 4**
4 x 4	No. 1	107	1,500	1.60	1.00	1.15	1,700	625	1.00	3.50	3.50	621	2,760	30.70	541.53	0.188	517.63	6,341	7,656	**6,341**	**4 x 4**
4 x 6	No. 1	107	1,500	1.60	1.00	1.10	1,700	625	1.00	3.50	5.50	621	2,640	30.70	541.53	0.196	516.41	9,941	12,031	**9,941**	**4 x 6**
4 x 8	No. 1	107	1,500	1.60	1.00	1.05	1,700	625	1.00	3.50	7.25	621	2,520	30.70	541.53	0.204	515.07	13,070	15,859	**13,070**	**4 x 8**
4 x 10	No. 1	107	1,500	1.60	1.00	1.00	1,700	625	1.00	3.50	9.25	621	2,400	30.70	541.53	0.214	513.57	16,627	20,234	**16,627**	**4 x 10**
4 x 12	No. 1	107	1,500	1.60	1.00	1.00	1,700	625	1.00	3.50	11.25	621	2,400	30.70	541.53	0.214	513.57	20,222	24,609	**20,222**	**4 x 12**
2 x 6	No. 2	107	1,350	1.60	1.00	1.00	1,600	625	1.00	5.50	1.50	584	2,160	19.54	1258.59	0.489	1056.36	8,715	5,156	**5,156**	**2 x 6**
3 x 6	No. 2	107	1,350	1.60	1.00	1.05	1,600	625	1.00	5.50	2.50	584	2,268	19.54	1258.59	0.471	1068.32	14,689	8,594	**8,594**	**3 x 6**
6 x 4	No. 1	107	1,500	1.60	1.00	1.10	1,700	625	1.00	5.50	3.50	621	2,640	19.54	1337.25	0.438	1156.80	22,268	12,031	**12,031**	**6 x 4**
6 x 6	No. 1	107	1,000	1.60	1.00	1.10	1,600	625	1.00	5.50	5.50	584	1,760	19.54	1258.59	0.567	997.56	30,176	18,906	**18,906**	**6 x 6**
6 x 8	No. 1	107	1,000	1.60	1.00	1.10	1,600	625	1.00	5.50	7.25	584	1,760	19.54	1258.59	0.567	997.56	39,778	24,922	**24,922**	**6 x 8**
6 x 10	No. 1	107	1,000	1.60	1.00	1.10	1,600	625	1.00	5.50	9.25	584	1,760	19.54	1258.59	0.567	997.56	50,751	31,797	**31,797**	**6 x 10**
2 x 8	No. 2	107	1,350	1.60	1.00	1.15	1,600	625	1.00	7.25	1.50	584	2,484	14.82	2186.93	0.645	1603.25	17,435	6,797	**6,797**	**2 x 8**
2 x 4	No. 2	71	1,350	1.60	1.00	1.15	1,600	625	1.00	3.50	1.50	584	2,484	20.14	1184.16	0.417	1035.94	5,439	3,281	**3,281**	**2 x 4**
2 x 6	No. 2	71	1,350	1.60	1.00	1.15	1,600	625	1.00	5.50	1.50	584	2,484	12.82	2924.15	0.744	1848.57	15,251	5,156	**5,156**	**2 x 6**

COLUMN NOTES

A	Nominal Member Size
B	Lumber Grade
C	Nominal Post Height - 4.5 inches for double 2x top plate and single 2x bottom plate.
D - J	Coefficients and parameters per NDS 2015
K	Lumber depth (3.5" in 4" wall, 5.5" in 6" wall)
L	Lumber thickness parallel to wall direction
M	Emin' = (2.03)(E)(2-2.645(CoVE)))/2.66, CoVE = 0.25 for sawn lumber
N	$F^*_c = (F_{cII})(C_d)(C_r)(C_F)$ - (Columns D, E, F, G)
O	Slenderness Ratio: Effective Length / depth ratio: (Col. C / Col. K)
P	Emin' = Euler critical buckling stress for columns Fce = 08.22(Emin')/(le/d)2. Equation H-2 in NDS 2015.
Q	Column Stability Factor CP, Equation 3.7-2 in NDS 2015
R	Column Stress F'c = F*c x Cp (Col. N x Col. Q). Equation H-2 in NDS 2015
S	Final Buckling Capacity: Post Area x F'_c. (Col. K x Col. L x Col. R)
T	Maximum Bearing Capacity Perpendicular to Grain Code Limitation: (Col. I x Col. K x Col. L).
U	Final Post Capacity, minimum value of Col. S or Col. T.
V	Nominal Member Size (Same as Col. A)

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

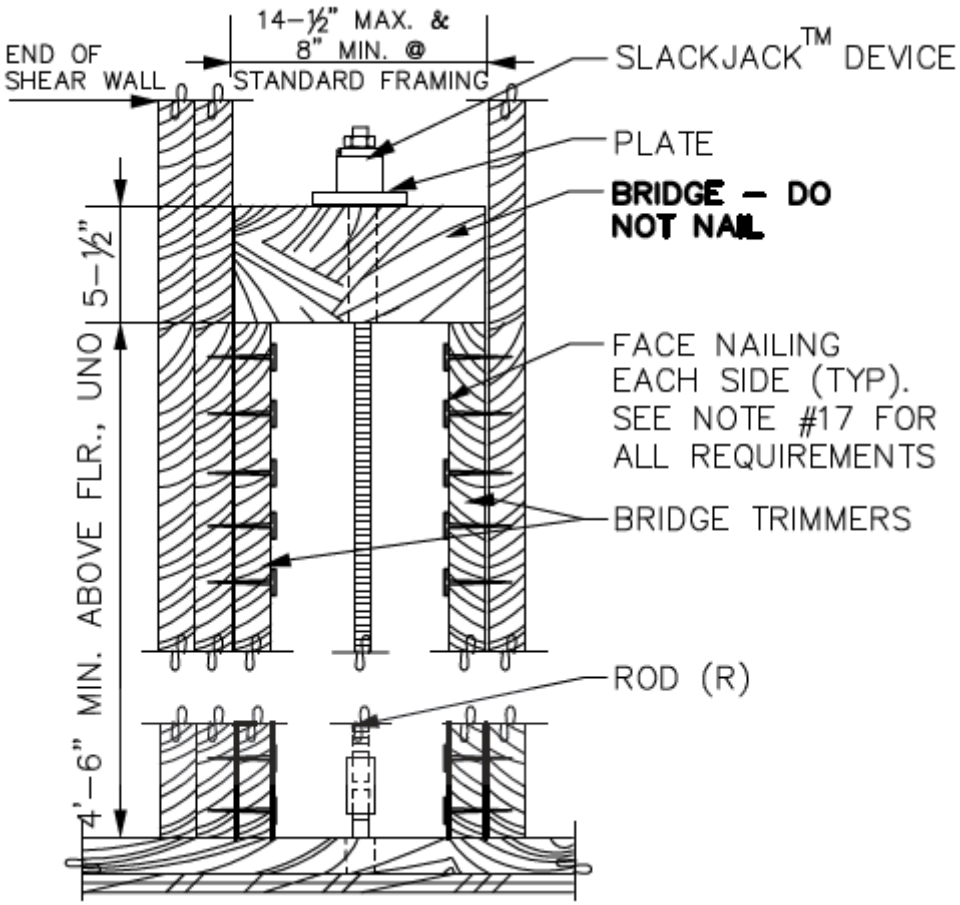
Earthbound System Compression Bridge and Support Trimmer Calculation

Summary of Compression Bridge Concept:

The "Compression Bridge" consists of 4x6 sawn lumber turned upright (or 6x6) and framed in the stud bay at each end of a shear wall. These bridges are utilized at the top floor of every holdown run in the Earthbound System. The 4x6 is framed in the wall similar to a header where it is supported by cripple studs. Depending on load, the minimum number of cripple studs is two, one at each end of the 4x6 bridge.

If the bearing load exceeds the maximum bearing pressure of the cripple studs peripendicular to grain of the floor plate, more studs can be added under the bridge. The outermost cripple studs are faced nailed two (2) nails on 4" o.c. to the adjacent full height stud members. The following example calculation will be based on **4'-6"** tall cripple studs in performing the face nail calculation. The Earthbound System also recommends these cripple studs receive nailing for redundancy from the sheathing side equivalent to required plywood edge nailing schedules for the shear wall. For this calculation, we will use 4" o.c. plywood edge nailing.

The Slackjack or MiniJack Device is mounted at the top of the bridge resting on the Earthbound System bearing plates. The holdown load path is intended to transfer down via the bearing plate through the 4x6 bridge to the cripple studs with load transferring from the face nails into the full length studs.



Objective: Calculate lumber and nailing capacities to support holdown load under the Shrinkage Device and bearing plate. We are using face nailing and diaphragm nailing to transfer holdown load back into wall:

Define Variables and Coefficients:

From Table 10.3.1 2015 NDS (attached at end of calculation), the following are Adjustments Factors for Corrections applicable in calculating nail and spike capacities (under Dowel-Type Fasteners)

$C_D := 1.33$;Load Duration Factor = 1.33 for seismic

$C_{D\_Nails} := 1.60$;Load Duration Factor = 1.6 for Nails in 2015 NDS.

$C_M := 1.0$;Wet Service Factor = 1.0 if dry conditions

$C_t := 1.0$;Temperature Factor = 1.0 if below 100 degrees

$C_\Delta := 1.0$;Geometry Factor = 1.0 unless you have a split ring or shear plate connection.

$C_{eg} := 1.0$;End Grain Factor = 1.0 if non end grain nailing application

$C_{di} := 1.0$;Diaphragm Factor = 1.0 if non diaphragm nailing application. 1.1 if diaphragm nailing

$C_{tn} := 1.0$;Toenail Factor = 1.0 if non toe nailing application

$Z := 93\,lbf$;Box Nail Shear Design values from supplemental calculation from WWPA Wood-To-Wood Single Shear Connections is at the end of this document. WWPA = 148 lbs / 1.6 (Cd) = 93 lbf

Calculate Shear Value of one FACE nail based on above adjustment factors:

$Z_{nail} := Z \cdot C_{D\_Nails} \cdot C_M \cdot C_t \cdot C_\Delta \cdot C_{eg} \cdot C_{di} \cdot C_{tn}$ $Z_{nail} = 148.8\,lbf$

Calculate Face Nailing Capacity based on two (2) nails on 4"o.c. rows and 4'-6" trimmer stud length:

$StudHeight := 4.5ft$;Typically Trimmer Stud Height is set at mid floor or 1/2 full length studs used for wall framing

$NailRowSeperationOC := 4.0in$

$NumberNailRows := \left(\frac{StudHeight \cdot 12\frac{in}{ft}}{NailRowSeperationOC}\right) - 1$;We subtract one row of nails for spacing and clearance to the bridge.

$NumberNailRows = 13$

$NumberNailsPerRow := 2$

$NumberofRowArrays := 2$

$TotalFaceNailCapacity := NumberNailRows \cdot NumberNailsPerRow \cdot NumberofRowArrays \cdot Z_{nail}$

$TotalFaceNailCapacity = 7440\,lbf$;This is (number of rows) x (2 nails per row) x (2 rows, one each side) x (nail capacity)

Nailing Capacity Summary: The above calculation is based on the cripple stud height used and the spacing between rows of nails. Note that the Earthbound System does recommend sheathing nailing to match plywood edge nailing schedules. The additional transfer from shear panel nails is calculated later in this document.

Calculate Cripple Stud Bearing Capacity: This is a calculation of the maximum capacity per stud bearing perpendicular to grain on the bottom plates:

$l_e := StudHeight \cdot \frac{12in}{1ft}$ $l_e = 54 \cdot in$;Stud Height in inches

$d := 3.5in$;Stud Depth

$t := 1.5in$;Stud Thickess

$A := t \cdot d$;Stud Bearing Area

$A = 5.25 \cdot in^2$;Note the effective stud bearing area for a 2x6 cripple stud will be based on a 2x4 (1.5 in x 3.5 in) because we specify a 4x6 bridge turned upwards, the effective stud bearing area will be the same for a 2x4 or 2x6.

$Fc_{perp} := 625psi$;From 2015 NDS Table 4A Douglas Fir Stud Grade = 625 psi

$StudBearingCapacity := A \cdot Fc_{perp}$

$StudBearingCapacity = 3281 \cdot lbf$;NDS does not allow for Load Duration Factor greater than 1.0 to be applied to loads perpendicular to grain.

Calculate Trimmer Stud Vertical (Column Buckling) Capacity: This is a calculation of the maximum buckling or column capacity per stud. Calculations are based from 2015 NDS:

$Fc_{para} := 850psi$;Fc (parallel): Douglas Fir (stud grade) = 850 psi

$C_D := 1.333$;Load Duration Factor = 1.33 for seismic

$C_r := 1.00$;Repetitive Member Factor = 1.00

$C_F := 1.05$;Size Factor = 1.05, From 2015 NDS Table 4A for 2,3,4 inch width Stud Grade

$C_M := 1.0$;Wet Service Factor = 1.0, From 2015 NDS Table 4A, assume lumber is below 19% moisture content

$E := 1400000psi$;Modulus of Elasticity of wood, From 2015 NDS Table 4A: Douglas Fir Stud. Grade = 1,400,000 psi

$c := 0.80$;c = 0.8 for sawn lumber

$Adjusted\_Fc_{para} := Fc_{para} \cdot C_D \cdot C_F \cdot C_M$;Adjusted_Fc(para) is also known as F*c from NDS 2015 reference. Mathcad cannot show the asterisk in "F*c".

$Adjusted\_Fc_{para} = 1189.7 \cdot psi$

$CoV_E := 0.25$;Coefficient of variation of E, CoV(E) = 0.25 for sawn lumber, 0.10 for glue lam lumber per NDS 2015 Appendix F.2.

$$E_{min} := 1.03 \times E \times \frac{\left(1 - 1.645 \times CoV_E\right)}{1.66}$$

$E_{min} = 511432.2 \times psi$

;Equation D-4 in NDS 2015. Determine reference modulus of elasticity where:
E = Modulus of Elasticity
1.03 = adjustment factor to convert E to pure bending basis.
Use 1.05 for structural glued laminated timber.
1.66 = factor of safety
CoV(E) = cofficient of varation in modulus of elasticity defined in NDS 2015 Appendix F.2.
Emin represents an approx 5% lower exclusion value on pure bending MOE, plus a factor of safety of 1.66.

$$F_{cE} := \frac{\left(0.822 \times E_{min}\right)}{\left(\frac{l_e}{d}\right)^2} \qquad F_{cE} = 1766 \times psi$$

;Equation H-2 in NDS 2015: The 0.822 factor in Equation H-2 represents the Euler buckling coefficient for rectangular columns calulated as $p^2/12$. MOE for beam and column stability Emin in H-2 represents an approximate 5% lower exclusion value on pure bending MOE, plus a 1.66 factor of safety (See NDS 2015 D.4.)

We effectively removed the 1.66 factor of safety from Equation H-2 by dividing Emin by 1.66 used in Equation D-4 above.

The maximum design value Fc in psi of cross-sectional area of individual members of columns shall be determined in accordance with the following formula. (Taken from 2015 NDS Equation 3.7-1).

$$F_c := Adjusted\_Fc_{para} \times \left[\frac{\left[1 + \left(\frac{F_{cE}}{Adjusted\_Fc_{para}}\right)\right]}{2 \times c} - \sqrt{\left[\frac{\left[1 + \left(\frac{F_{cE}}{Adjusted\_Fc_{para}}\right)\right]}{2 \times c}\right]^2 - \left(\frac{\frac{F_{cE}}{Adjusted\_Fc_{para}}}{c}\right)}\right]$$

$F_c = 960.6 \times psi$

The vertical capacity of this column if design value Fc multiplied by the bearing area of the stud, in this case a 2x4:

$d = 3.5 \times in \qquad t = 1.5 \times in$

$StudVerticalCapacity := d \times t \times F_c$

$StudVerticalCapacity = 5043 \times lbf$

$StudBearingCapacity = 3281 \times lbf$;From above bearing calculations, based on DF at Fc(perp)=625 psi.

The allowable stud capacity should be the <u>lower</u> value between Vertical Capacity and Bearing Capacity:

$$AllowStudCapacity := if(StudBearingCapacity > StudVerticalCapacity, StudVerticalCapacity, StudBearingCapacity)$$

;The above formula is a conditional statement inherent to Mathcad to use the lower capacity as the final value.

$AllowStudCapacity = 3281 \times lbf$

Calculate Shear Value of 10d nail assuming 1/2" Plywood:

$Z := 70lbf$;Box Nail Shear Design values from 2015 NDS Table 11Q (attached at end of calc) using 1/2" side member thickness 10d nails (x 3 inches nail length) and Douglas Fir Larch lumber.

$C_{di} := 1.1$;Cdi is 1.1 for diaphragm nailing.

$Z_{nail} := Z \cdot C_{D\_Nails} \cdot C_M \cdot C_t \cdot C_\Delta \cdot C_{eg} \cdot C_{di} \cdot C_{tn}$;Incorporate all adjustment factors including C(D_Nails) = 1.60

$Z_{nail} = 123.2 \cdot lbf$

Calculate Plywood Side Nailing Capacity based on 4"o.c. and 6'-0" trimmer stud length:

$StudHeight := 4.5ft$

$NailRowSeperationOC := 4.0in$

$$NumberNailsPerStud := \left(\frac{StudHeight \cdot 12\frac{in}{ft}}{NailRowSeperationOC}\right) - 1$$

$NumberNailsPerStud = 12.5$

$NumberStuds := 4$

$TotalPlywoodNailCapacity := NumberNailsPerStud \cdot NumberStuds \cdot Z_{nail}$

$TotalPlywoodNailCapacity = 6160 \cdot lbf$

$TotalNailCapacity := TotalPlywoodNailCapacity + TotalFaceNailCapacity$; See Page 2 for Face Nail Calc...

$TotalNailCapacity = 13600 \cdot lbf$

Nailing Capacity Summary: The above calculation is based on the trimmer stud height used and the spacing between rows of nails. Note that the Earthbound System does require 4" o.c. sheathing nailing on all trimmer members and 4" o.c. face nailing of the outermost trimmer to the full height stud members.

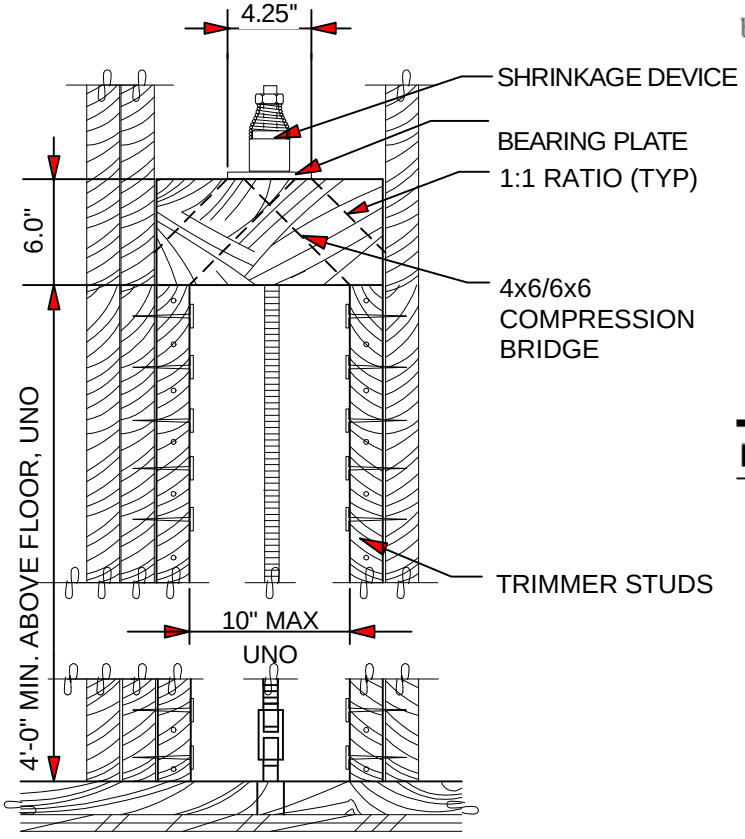
Calculation Summary:

For a given bearing load underneath the take up device, the required amount of cripple studs under the bridge is an even number of multiples of the above Allowable Stud Capacity. We use even numbers to balance the supporting under the 4x6 or 6x6 bridge.

This bearing load may be greater that the actual uplift load required for the top floor due to assignment of loads upward in the building using the threaded rod system. The face nailing portion of the cripple studs need to exist to transfer shear load that occurs above the bridge back underneath the bridge and into the threaded rod. The loads required for panel nailing calculations will be the uplift load for that floor only. The additional studs required are to take up the bearing loads from loads transferred from below.

Examine Shear at Bridge:

The figure at the left shows a worst case scenario of a bridge trimmer with our smallest plate (Part "P8" 3 1/4 x 4 1/4 x 3/8) and only two (2) trimmers total. By inspection we are within a 1:1 requirement per 2015 NDS 3.4.3 to ignore shear force. If the load under the shrinkage device exceeds 8,000 lbs, a larger bearing plate will used. Depending on the lumber species (Hem vs Doug Fir) of the trimmers and floor plates, we would also increase the number of trimmer members under the bridge.

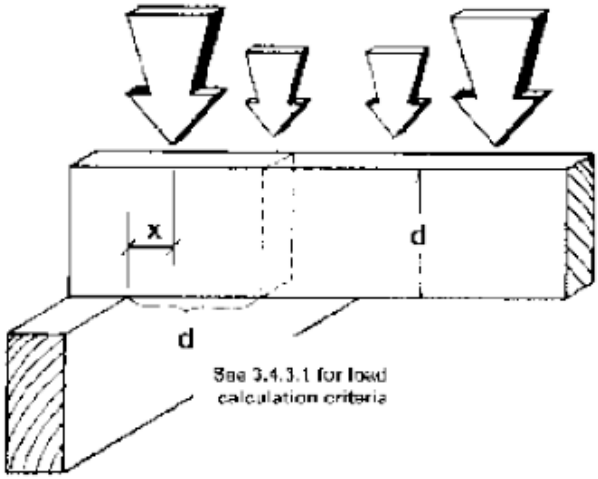


3.4.3 Shear Design

3.4.3.1 When calculating the shear force, V, in bending members:

(a) For beams supported by full bearing on one surface and loads applied to the opposite surface, uniformly distributed loads within a distance from supports equal to the depth of the bending member, d, shall be permitted to be ignored. For beams supported by full bearing on one surface and loads applied to the opposite surface, concentrated loads within a distance, d, from supports shall be permitted to be multiplied by x/d where x is the distance from the beam support face to the load (see Figure 3C).

Figure 3C Shear at Supports



Version: 2.0 Designed on: August 20, 2008

Wood-to-Wood Single Shear Connections

wwpa.org

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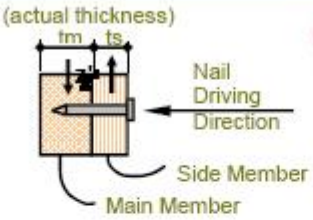
Developed by: Forum Engineers



Main Member Species	Douglas Fir-Larch
Main Member Thickness (tm ")	1 1/2
Side Member Species	Douglas Fir-Larch
Side Member Thickness (ts ")	1 1/2
Loading Type	Seismic Load
End Grain Condition?	No

Mode

Open Detailed Calculation Sheet

Type of Connector

- (•) Box Nail
- ( ) Common Wire Nail
- ( ) Sinker Nail
- ( ) Bolt
- ( ) Wood Screw
- ( ) Lag Screw

Connector Size		Length (in)		Shear Capacity		Controlling Mode
10d	x	3	=	148	lb each	MODE IV

Version: 2.0 Designed on: August 20, 2008

Wood-to-Wood Single Shear Connections

wwpa.org

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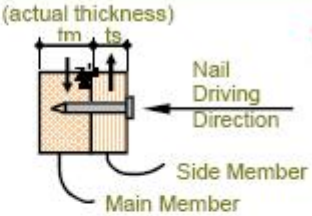
Developed by: Forum Engineers



Main Member Species	Douglas Fir-Larch
Main Member Thickness (tm ")	3 1/2
Side Member Species	Plywood (Str. 1 or Marine Gr.)
Side Member Thickness (ts ")	7/16
Loading Type	Seismic Load
End Grain Condition?	No

Mode

Open Detailed Calculation Sheet

Type of Connector

- (•) Box Nail
- ( ) Common Wire Nail
- ( ) Sinker Nail
- ( ) Bolt
- ( ) Wood Screw
- ( ) Lag Screw

Connector Size		Length (in)		Shear Capacity		Controlling Mode
10d	x	3	=	112	lb each	MODE IIIs

NOTE: THIS CALCULATION MUST INCLUDE CdI = 1.1 FOR DIAPHRAGM FACTOR. THEREFORE 112 LBS x 1.1 = 123 lbs PER SHEAR NAIL.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

- [ ] Conforms to Design Concept
- [x] Conforms to Design Concept as noted
- [ ] Does Not Conform - Revise & Resubmit

Checking is only for conformance with the design concept of the project. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for the coordination of the work of all trades.

By SJW Date 07/17/2019

PCS Structural Solutions
101 SW Main Street, Suite 280
Portland, OR 97204 503-232-3746

Reviewed for Code Compliance
Construction Permitting Only

Olympia
Building Plans Examiner
Community Planning & Development Department
601 4th Ave East
Olympia, WA 98501
(360) 753-8248
rbalders@ci.olympia.wa.us

SHOP DRAWING / SUBMITTAL REVIEW

- [ ] APPROVED
- [x] APPROVED WITH CHANGES NOTED
- [ ] REVISE AND RESUBMIT
- [ ] REJECTED: ______

SUBMITTAL WAS REVIEWED FOR DESIGN CONFORMITY AND GENERAL CONFORMANCE TO CONTRACT DOCUMENTS ONLY. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING DIMENSIONS AT JOB SITES FOR TOLERANCES, CLEARANCES, QUANTITIES, FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATION OF HIS WORK WITH OTHER TRADES AND FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS.

BY ______ DATE 07/26/19

THOMAS ARCHITECTURE STUDIO, INC.
109 Capitol Way N., Olympia, WA 98501

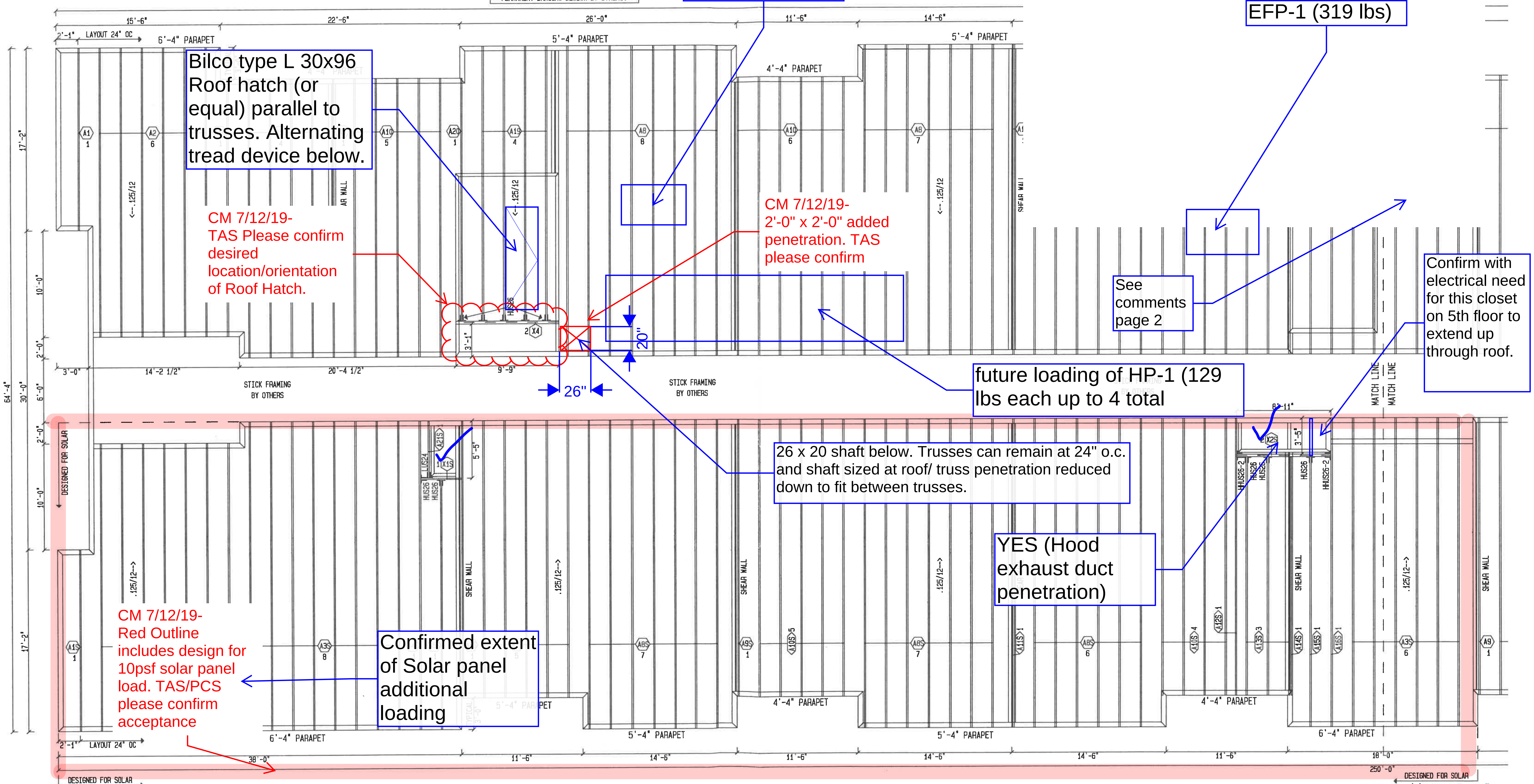
Refer to Mechanical M002 and M206 for rooftop equipment size and location

CM 7/12/19-
TAS/PCS advise if any additional structural provisions are required f
HVAC equipment at locations shown per A2.(

WESTMAN MILL
EAST BAY LOT A
ROOF TRUSS LAYOUT

ROOF TRUSS SUPPLY - (425) 481-0900
5910 - 234 ST. SE, WOODINVILLE, WA 98072
DESIGNER: DENNIS MOORE REVISED: 05/02/19
PATH: S:\DENNIS\LAY\W\WESTMAN\BLDG_1S

1) ALL TRUSSES TO BE SPACED 24" OC UNLESS NOTED OTHERWISE (U.N.O.)
2) PROVIDE FULL BEARING UNDER GIRDER TRUSSES.
3) BEARING BEAMS DESIGNED BY OTHERS.
4) 2X6 PARAPETS AS NOTED.
5) .125/12 (1/8") PITCH U.N.O..
6) CEILINGS FLAT U.N.O..
7) SEE ATTACHED FRAMING DETAILS FOR HIP, VALLEY, AND GABLE FRAMING.
8) SEE BCSI-B1 (ATTACHED) FOR HANDLING AND BRACING RECOMMENDATIONS. INDIVIDUAL TRUSSES MAY REQUIRE WEB BRACING. SEE TRUSS ENGINEERING SHEETS. PERMANENT BRACING DESIGN BY OTHERS.



PCS REVIEW

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

☐ Conforms to Design Concept
☒ Conforms to Design Concept as noted
☐ Does Not Conform - Revise & Resubmit

Checking is only for conformance with the design concept of the project. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for the coordination of the work of all trades.

By SJW Date 07/17/2019

PCS Structural Solutions
101 SW Main Street, Suite 280
Portland, OR 97204 503-232-3746

CONFIRMED - 2X8 FRAMING @ 24" O.C.
- ~~PROVIDE DOUBLE 2X8'S AROUND THE MECHANICAL UNIT~~

22"x30" mechanical exhaust duct between 2x8's

Mechanical unit not on 2x8 roof. See page 1 for EPF-1 comments

SFP-1 (267 lbs)

CM 7/12/19- TAS/PCS confirm intent for roofing system at Elevator Roof Per RFI 015. It has been suggest to change to a 2x8" perpendicular at 24" O.C.

future loading of HP-1 (129 lbs each up to 4 total

20"

26"

CM 7/12/19- 2'-0" x 2'-0" added penetration. TAS please confirm

2x8's at 24" o.c. over elevator

26 x 20 shaft below. Trusses can remain at 24" o.c. and shaft sized at roof/ truss penetration reduced down to fit between trusses.

MiTek Industries, Inc.

Note: T-Bracing / I-Bracing to be used when continuous lateral bracing is impractical. T-Brace / I-Brace must cover 90% of web length.

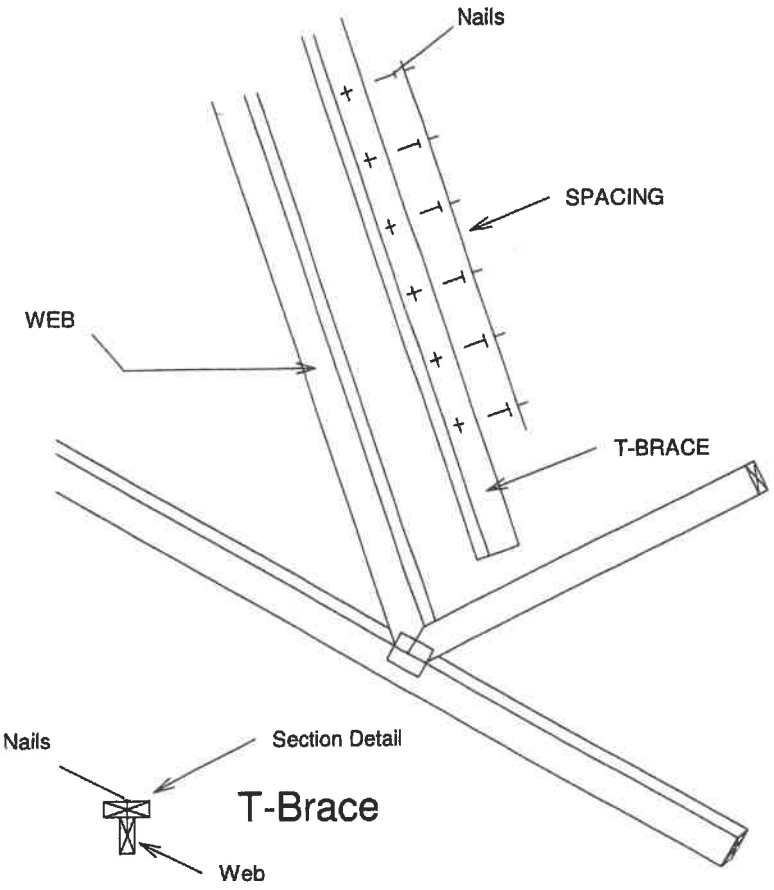
Note: This detail NOT to be used to convert T-Brace / I-Brace webs to continuous lateral braced webs.

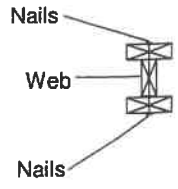
Nailing Pattern		
T-Brace size	Nail Size	Nail Spacing
2x4 or 2x6 or 2x8	10d	6" o.c.
Note: Nail along entire length of T-Brace / I-Brace (On Two-Ply's Nail to Both Plies)		

	Brace Size for One-Ply Truss	
	Specified Continuous Rows of Lateral Bracing	
Web Size	1	2
2x3 or 2x4	2x4 T-Brace	2x4 I-Brace
2x6	2x6 T-Brace	2x6 I-Brace
2x8	2x8 T-Brace	2x8 I-Brace

	Brace Size for Two-Ply Truss	
	Specified Continuous Rows of Lateral Bracing	
Web Size	1	2
2x3 or 2x4	2x4 T-Brace	2x4 I-Brace
2x6	2x6 T-Brace	2x6 I-Brace
2x8	2x8 T-Brace	2x8 I-Brace

T-Brace / I-Brace must be same species and grade (or better) as web member.





I-Brace

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x6 HF #2 A

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

Plateline to peak (L): 17-00-12
Plateline to peak (R): 3-05-15

TRUSS SPAN 17'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

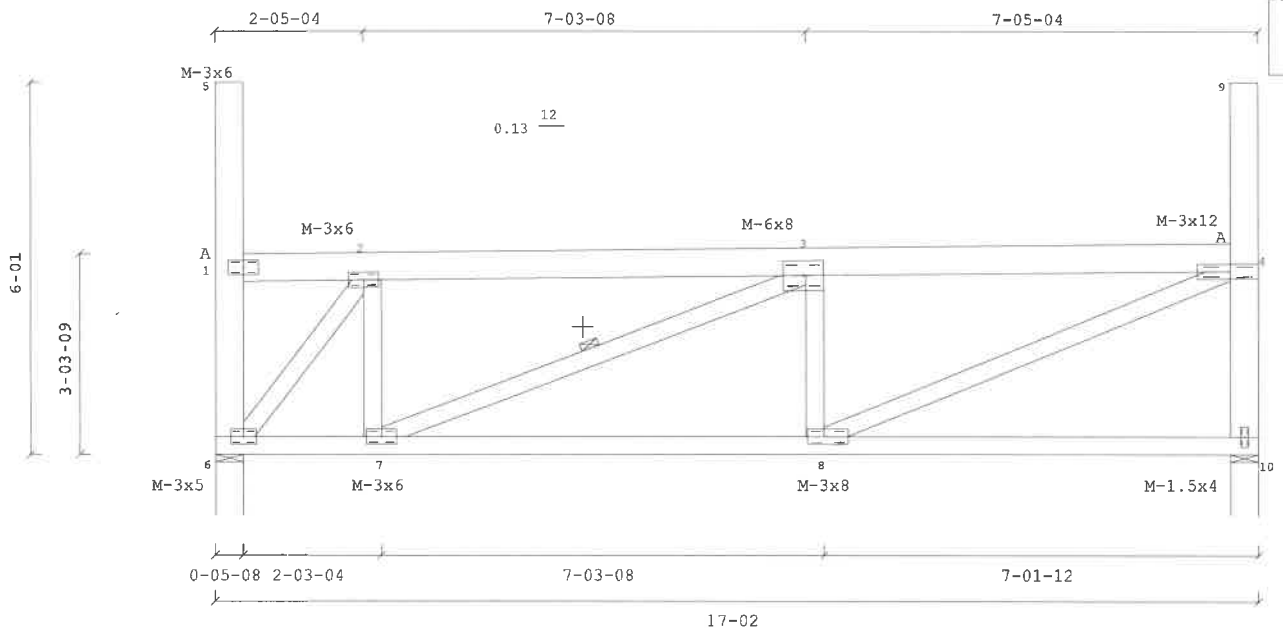
1- 2=(-41)	33	6- 7=(-36)	831	1- 5=(0)	0
2- 3=(-878)	23	7- 8=(0)	1682	1- 6=(0)	157
3- 4=(-1633)	17	8-10=(-24)	91	6- 2=(-1464)	0
				2- 7=(0)	519
				7- 3=(-1001)	0
				3- 8=(-529)	87
				8- 4=(0)	1684
				10- 4=(-950)	35
				4- 9=(0)	0

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN. (SPECIES)
0'- 0.0"	0/ 1130V	-88/ 93H	5.50"	2.79 HF (405)
17'- 2.0"	0/ 1011V	0/ 0H	5.50"	2.50 HF (405)

Weight: 102.29 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.069" @ 9'- 8.7" Allowed = 0.542"
MAX DL DEFL = -0.039" @ 9'- 8.7" Allowed = 0.812"
MAX TL DEFL = -0.108" @ 9'- 8.7" Allowed = 0.812"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.016" @ 16'- 11.3"
MAX HORIZ. TL DEFL = 0.026" @ 16'- 11.3"



COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
End vertical(s) are exposed to wind,
Truss designed for wind loads
in the plane of the truss only.

ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

January 25,2019

JOB NAME: WESTMAN MILL - A1

Scale: 0.3310

Truss: A1

DATE: 1/24/2019
SEQ.: K5650383
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x6 HF #2 A;
2x4 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

Plateline to peak (L): 17-00-12
Plateline to peak (R): 3-05-15

TRUSS SPAN 17'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

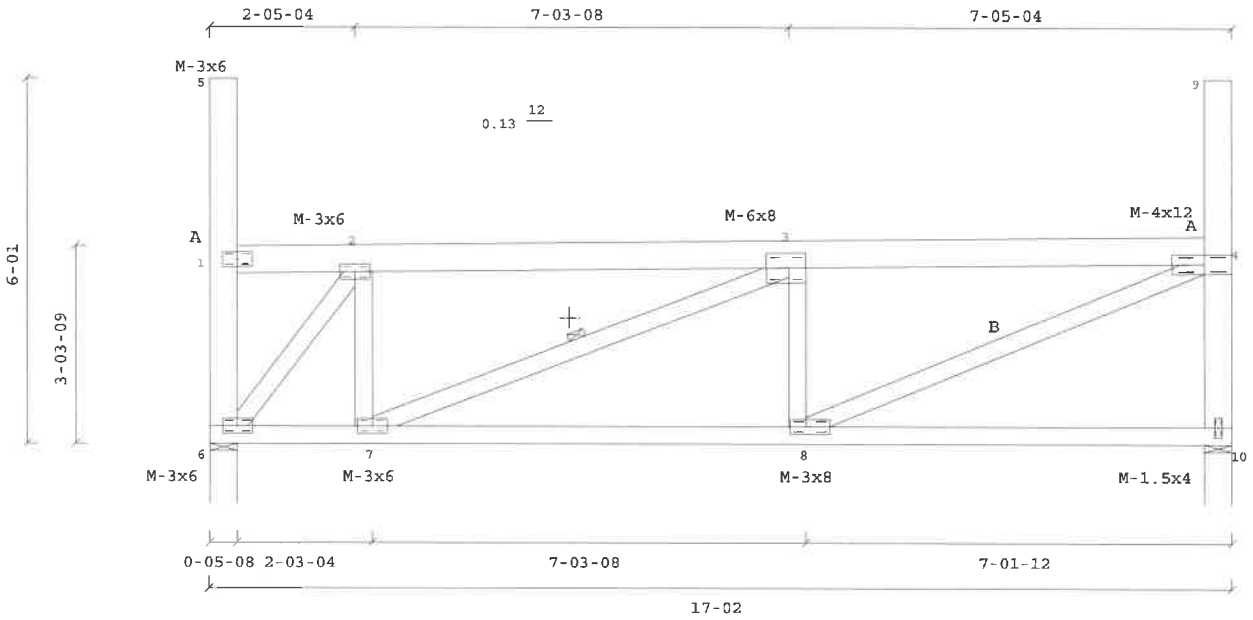
1- 2=(-43)	32	6- 7=(0)	950	1- 5=(0)	0
2- 3=(-1004)	0	7- 8=(0)	1932	1- 6=(0)	168
3- 4=(-1875)	0	8-10=(-14)	109	6- 2=(-1675)	0
				2- 7=(0)	574
				7- 3=(-1137)	0

3- 8=(-628)	27	10- 4=(-1110)	0	BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
8- 4=(0)	1928			0'- 0.0"	0/ 1295V	-88/ 93H	5.50"	3.20	HF (405)
				17'- 2.0"	0/ 1171V	0/ 0H	5.50"	2.89	HF (405)

Weight: 102.64 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.068" @ 9'- 8.7" Allowed = 0.542"
MAX DL DEFL = -0.054" @ 9'- 8.7" Allowed = 0.812"
MAX TL DEFL = -0.121" @ 9'- 8.7" Allowed = 0.812"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.016" @ 16'- 11.3"
MAX HORIZ. TL DEFL = 0.029" @ 16'- 11.3"



COND. 2: Design checked for 50LBS sprinkler load located at any point along top chord except end panels and overhangs. Additional 250LBS vertical load applied non-concurrently at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10, (All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir), load duration factor=1.6, End vertical(s) are exposed to wind, Truss designed for wind loads in the plane of the truss only.

ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

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XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

May 2,2019

JOB NAME: WESTMAN MILL - A1S

Scale: 0.3243

Truss: A1S

DATE: 5/1/2019
SEQ.: K6059035
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 27'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-2484) 0	6- 7=(-45) 85	6- 1=(-1610) 15	4- 9=(-1121) 77
2- 3=(-3950) 0	7- 8=(0) 2609	1- 7=(0) 2774	9- 5=(0) 3124
3- 4=(-3950) 0	8- 9=(0) 3067	7- 2=(-1262) 75	11- 5=(-1536) 28
4- 5=(-2962) 1	9-11=(-23) 105	2- 8=(0) 1589	5-10=(0) 0
		3- 8=(-893) 80	
		8- 4=(0) 1150	

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 1649V	-61/ 72H	5.50"	4.07	HF (405)
27'- 2.0"	0/ 1598V	0/ 0H	5.50"	3.95	HF (405)

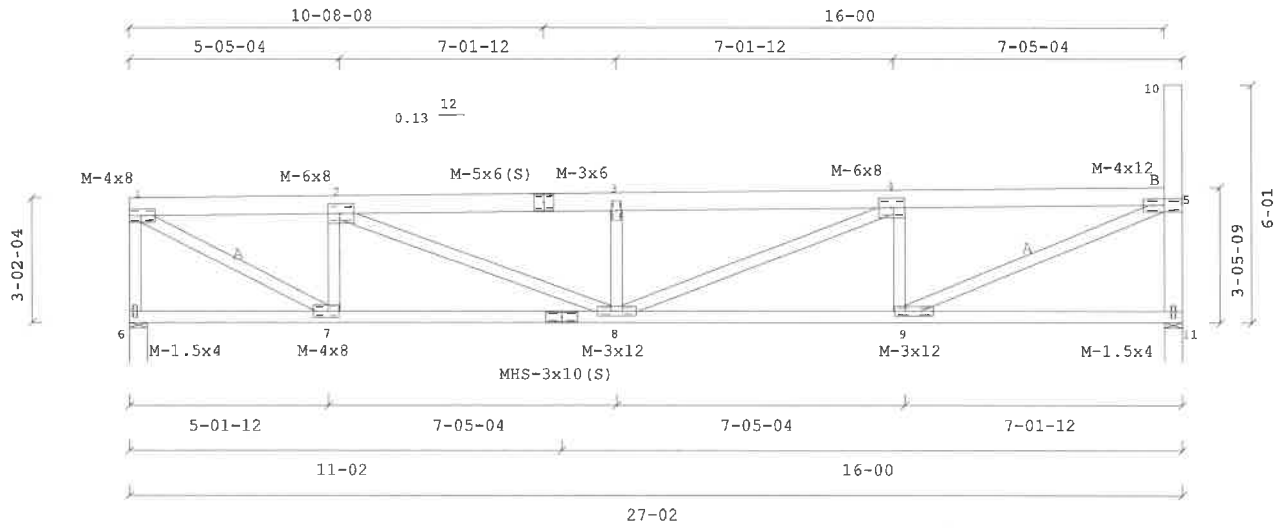
Weight: 143.80 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.246" @ 12'- 7.0" Allowed = 0.875"
MAX DL DEFL = -0.151" @ 12'- 7.0" Allowed = 1.312"
MAX TL DEFL = -0.398" @ 12'- 7.0" Allowed = 1.312"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.044" @ 26'- 11.3"
MAX HORIZ. TL DEFL = 0.073" @ 26'- 11.3"

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
{All Heights}, Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

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January 25,2019

JOB NAME: WESTMAN MILL - A2

Scale: 0.2113

Truss: A2

DATE: 1/24/2019
SEQ.: K5650384
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES. unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 27'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-2881)	0	6- 7=(-38) 99	6- 1=(-1881)	0	4- 9=(-1322) 0
2- 3=(-4581)	0	7- 8=(0) 3028	1- 7=(0) 3217		9- 5=(0) 3617
3- 4=(-4581)	0	8- 9=(0) 3559	7- 2=(-1486)	0	11- 5=(-1799) 0
4- 5=(-3435)	0	9-11=(-12) 127	2- 8=(0) 1816		5-10=(0) 0
			3- 8=(-1037)	0	
			8- 4=(0) 1300		

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 1920V	-61/ 72H	5.50"	4.74	HF (405)
27'- 2.0"	0/ 1861V	0/ 0H	5.50"	4.60	HF (405)

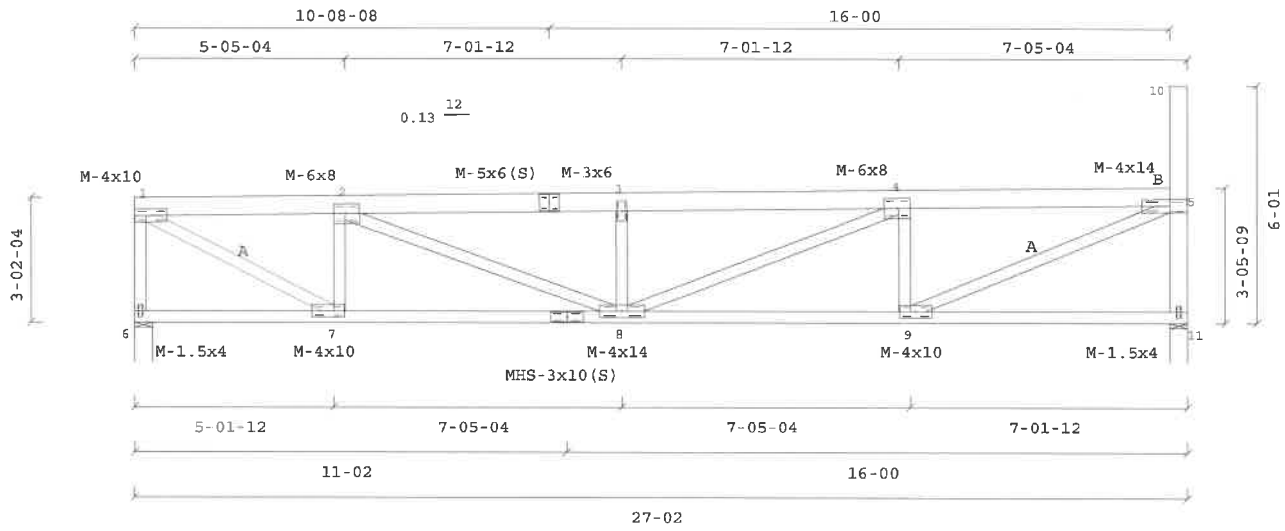
Weight: 144.90 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.246" @ 12'- 7.0" Allowed = 0.875"
MAX DL DEFL = -0.216" @ 12'- 7.0" Allowed = 1.312"
MAX TL DEFL = -0.462" @ 12'- 7.0" Allowed = 1.312"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.044" @ 26'- 11.3"
MAX HORIZ. TL DEFL = 0.085" @ 26'- 11.3"

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
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XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

May 2,2019

JOB NAME: WESTMAN MILL - A2S

Scale: 0.2112

Truss: A2S

DATE: 5/1/2019
SEQ.: K6059036
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 29'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-3429) 0	6- 7=(-46) 89	6- 1=(-1676) 26	4- 9=(-1232) 77
2- 3=(-4501) 0	7- 8=(0) 3548	1- 7=(0) 3607	9- 5=(0) 3397
3- 4=(-4500) 0	8- 9=(0) 3329	7- 2=(-1210) 89	11- 5=(-1645) 28
4- 5=(-3213) 0	9-11=(-23) 107	2- 8=(0) 1215	5-10=(0) 0
		3- 8=(-874) 76	
		8- 4=(0) 1449	

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN. (SPECIES)
0'- 0.0"	0/ 1736V	-61/ 72H	5.50"	4.29 HF (405)
29'- 2.0"	0/ 1708V	0/ 0H	5.50"	4.22 HF (405)

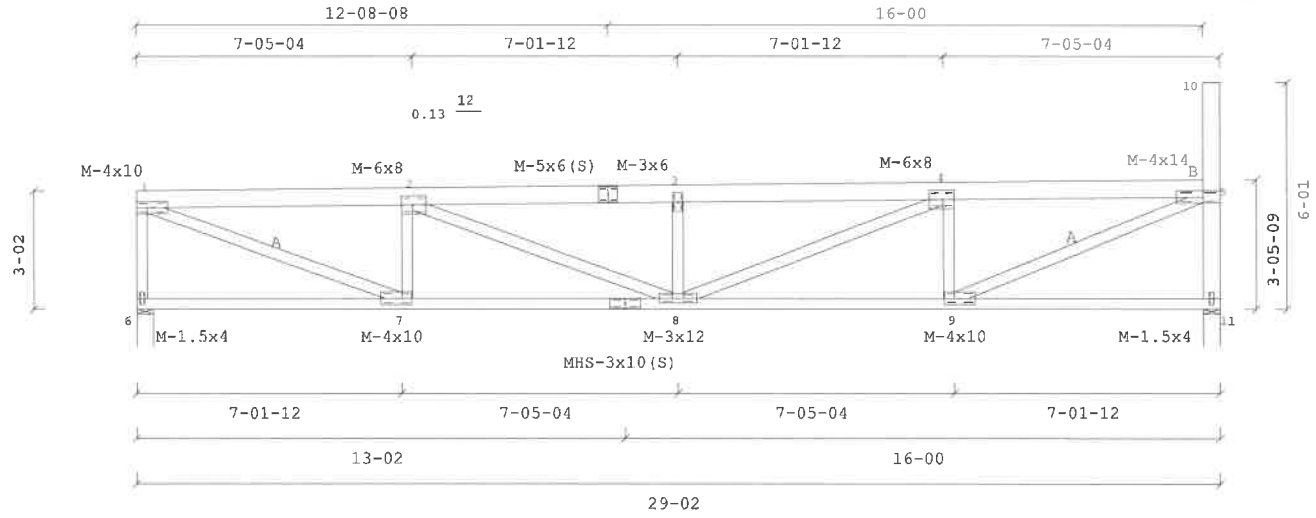
Weight: 152.56 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.322" @ 14'- 7.0" Allowed = 0.942"
MAX DL DEFL = -0.201" @ 14'- 7.0" Allowed = 1.413"
MAX TL DEFL = -0.523" @ 14'- 7.0" Allowed = 1.413"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.054" @ 28'- 11.3"
MAX HORIZ. TL DEFL = 0.088" @ 28'- 11.3"

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

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January 25,2019

JOB NAME: WESTMAN MILL - A3

Scale: 0.2025

Truss: A3

DATE: 1/24/2019
SEQ.: K5650385
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.5.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 29'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-3984)	0	6- 7=(-38) 104	6- 1=(-1967)	0	4- 9=(-1454) 0
2- 3=(-5227)	0	7- 8=(0) 4124	1- 7=(0)	4189	9- 5=(0) 3939
3- 4=(-5226)	0	8- 9=(0) 3869	7- 2=(-1432)	0	11- 5=(-1928) 0
4- 5=(-3732)	0	9-11=(-11) 129	2- 8=(0)	1376	5-10=(0) 0
			3- 8=(-1013)	0	
			8- 4=(0)	1650	

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN. (SPECIES)
0'- 0.0"	0/ 2027V	-61/ 72H	5.50"	5.00 HF (405)
29'- 2.0"	0/ 1991V	0/ 0H	5.50"	4.92 HF (405)

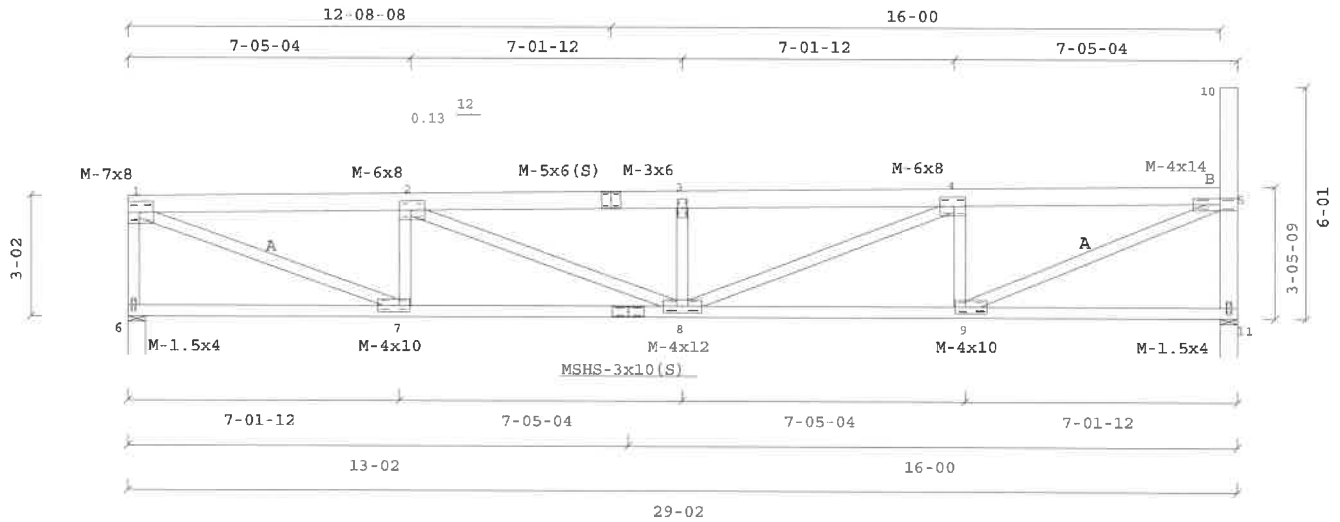
Weight: 153.41 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.322" @ 14'- 7.0" Allowed = 0.942"
MAX DL DEFL = -0.287" @ 14'- 7.0" Allowed = 1.413"
MAX TL DEFL = -0.608" @ 14'- 7.0" Allowed = 1.413"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.054" @ 28'- 11.3"
MAX HORIZ. TL DEFL = 0.103" @ 28'- 11.3"

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



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XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

May 2,2019

JOB NAME: WESTMAN MILL - A3S

Scale: 0.2074

Truss: A3S

DATE: 5/1/2019
SEQ.: K6059037
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF SS
BC: 2x4 DF #1&BTR;
2x6 DF 2400F B1
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 29'- 2.0"
LOAD DURATION INCREASE = 1.15 (Non-Rep)
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)
ADDL: BC CONC LL+DL= 1120.0 LBS @ 5'- 5.8"

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-3615) 0	7- 8=(-30) 157	7- 1=(-2978) 0	10- 5=(0) 2226
2- 3=(-3616) 0	8- 9=(0) 5697	1- 8=(0) 4407	5-11=(-1659) 0
3- 4=(-6246) 0	9-10=(0) 5658	2- 8=(-590) 0	11- 6=(0) 4446
4- 5=(-6245) 0	10-11=(0) 4357	8- 3=(-2746) 0	12- 6=(-2136) 0
5- 6=(-4200) 0	11-12=(-9) 135	9- 3=(0) 778	6-13=(0) 0
		3-10=(-67) 817	
		4-10=(-1063) 0	

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN. (SPECIES)
0'- 0.0"	0/ 2978V	-61/ 72H	5.50"	4.45 DF (670)
29'- 2.0"	0/ 2198V	0/ 0H	5.50"	3.52 DF (625)

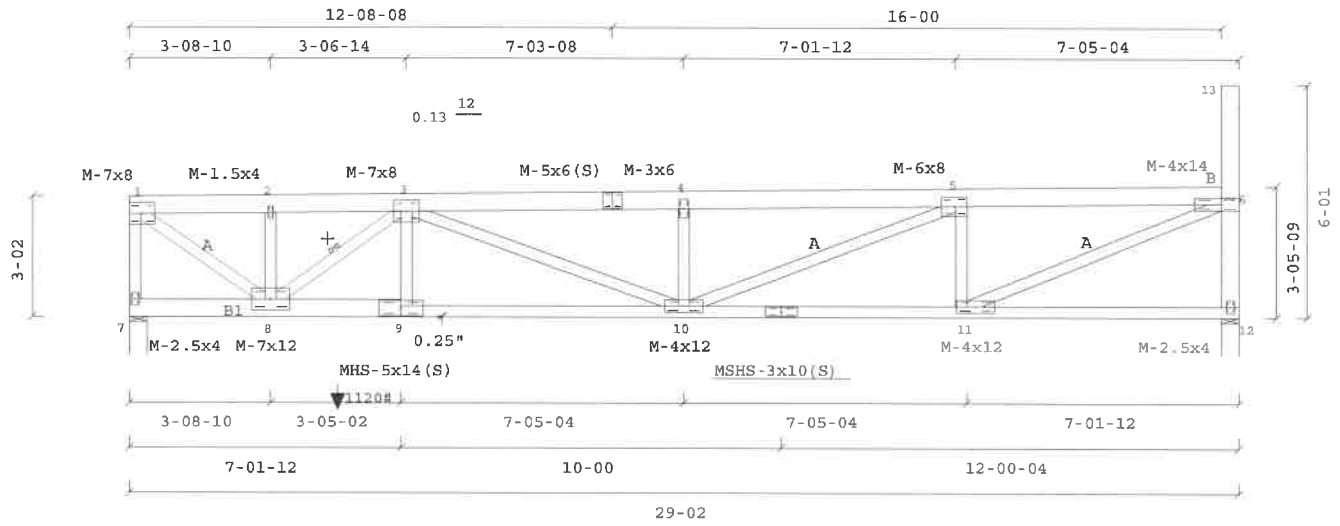
Weight: 164.82 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.256" @ 14'- 7.0" Allowed = 0.942"
MAX DL DEFL = -0.322" @ 14'- 7.0" Allowed = 1.413"
MAX TL DEFL = -0.578" @ 14'- 7.0" Allowed = 1.413"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.043" @ 28'- 11.3"
MAX HORIZ. TL DEFL = 0.105" @ 28'- 11.3"

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

May 2,2019

JOB NAME: WESTMAN MILL - A4S

Scale: 0.2074

Truss: A4S

DATE: 5/1/2019
SEQ.: K6059038
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2;
2x6 HF SS B1
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

(2) complete trusses required.
Attach 2 ply with 3"x.131 DIA GUN nails staggered:
9" oc in 2 row(s) throughout 2x6 top chords,
9" oc in 2 row(s) throughout 2x6 bottom chords,
9" oc in 1 row(s) throughout 2x4 bottom chords,
9" oc in 1 row(s) throughout 2x4 webs,
9" oc in 2 row(s) throughout 2x6 webs.

TRUSS SPAN 29'- 2.0"
LOAD DURATION INCREASE = 1.15 (Non-Rep)
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)
ADDL: BC CONC LL+DL= 1695.0 LBS @ 5'- 5.8"

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-3948)	0	7- 8=(-44)	168	7- 1=(-3204)	0
2- 3=(-3950)	0	8- 9=(0)	5958	1- 8=(0)	4818
3- 4=(-6038)	0	9-10=(0)	5902	2- 8=(-528)	32
4- 5=(-6038)	0	10-11=(0)	4070	8- 3=(-2656)	0
5- 6=(-3922)	0	11-12=(-22)	114	9- 3=(0)	1032
				3-10=(-554)	334
				4-10=(-924)	82
				10- 5=(0)	2314
				5-11=(-1544)	70
				11- 6=(0)	4166
				12- 6=(-1958)	22
				6-13=(0)	0

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 3156V	-61/ 72H	5.50"	7.79	HF (405)
29'- 2.0"	0/ 2022V	0/ 0H	5.50"	4.99	HF (405)

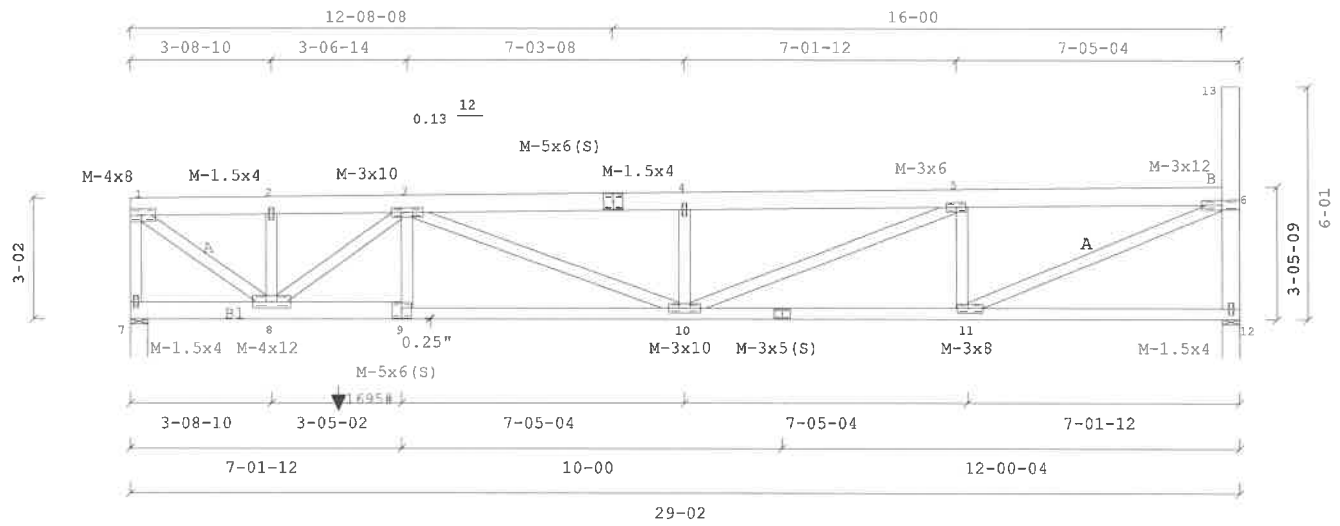
Weight: 317.59 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.149" @ 14'- 7.0" Allowed = 0.942"
MAX DL DEFL = -0.179" @ 14'- 7.0" Allowed = 1.413"
MAX TL DEFL = -0.328" @ 14'- 7.0" Allowed = 1.413"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.029" @ 28'- 11.3"
MAX HORIZ. TL DEFL = 0.072" @ 28'- 11.3"

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



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WOODINVILLE, WA 98072
(425) 481-0900

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XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

January 25,2019

JOB NAME: WESTMAN MILL - A4G

Scale: 0.2073

Truss: A4G

DATE: 1/24/2019
SEQ.: K5650387
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
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MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

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2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 23'- 7.5"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-10) 0	6- 7=(-11) 907	1- 6=(-14) 265	4- 9=(-913) 77
2- 3=(-2896) 0	7- 8=(-11) 907	6- 2=(-1974) 0	9- 5=(0) 2618
3- 4=(-2895) 0	8- 9=(0) 2581	2- 7=(0) 269	11- 5=(-1331) 29
4- 5=(-2496) 3	9-11=(-24) 100	2- 8=(0) 2243	5-10=(0) 0
		3- 8=(-898) 82	
		8- 4=(0) 566	

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN. (SPECIES)
0'- 0.0"	0/ 1513V	-62/ 72H	5.50"	3.74 HF (405)
23'- 7.5"	0/ 1393V	0/ 0H	5.50"	3.44 HF (405)

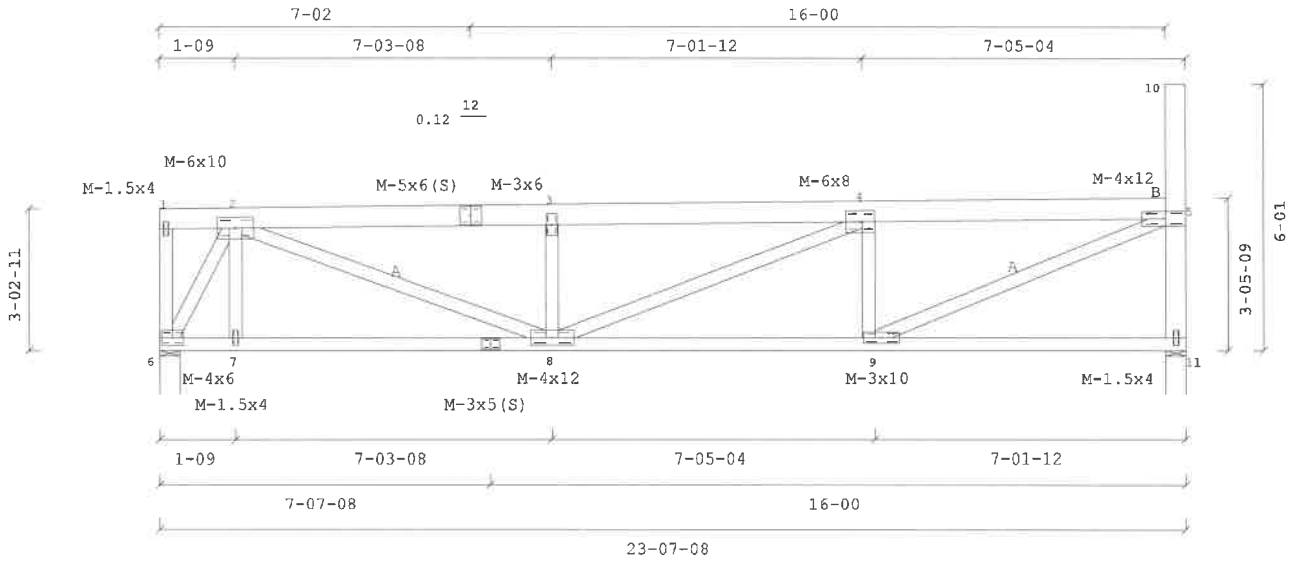
Weight: 129.45 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.150" @ 9'- 0.5" Allowed = 0.757"
MAX DL DEFL = -0.090" @ 9'- 0.5" Allowed = 1.135"
MAX TL DEFL = -0.240" @ 9'- 0.5" Allowed = 1.135"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.029" @ 23'- 4.8"
MAX HORIZ. TL DEFL = 0.047" @ 23'- 4.8"

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



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(425) 481-0900

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XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

January 25,2019

JOB NAME: WESTMAN MILL - A5

Scale: 0.2367

Truss: A5

DATE: 1/24/2019
SEQ.: K5650388
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.5.8(1L)-E

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2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 23'- 7.5"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHP/Cq=1.00

1- 2=(-11) 0	6- 7=(0) 1042	1- 6=(0) 291	4- 9=(-1077) 0		
2- 3=(-3348) 0	7- 8=(0) 1042	6- 2=(-2269) 0	9- 5=(0) 3020		
3- 4=(-3348) 0	8- 9=(0) 2985	2- 7=(0) 270	11- 5=(-1557) 0		
4- 5=(-2885) 0	9-11=(-12) 122	2- 8=(0) 2584	5-10=(0) 0		
		3- 8=(-1043) 0			
		8- 4=(0) 617			

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 1750V	-62/ 72H	5.50"	4.32	HF (405)
23'- 7.5"	0/ 1620V	0/ 0H	5.50"	4.00	HF (405)

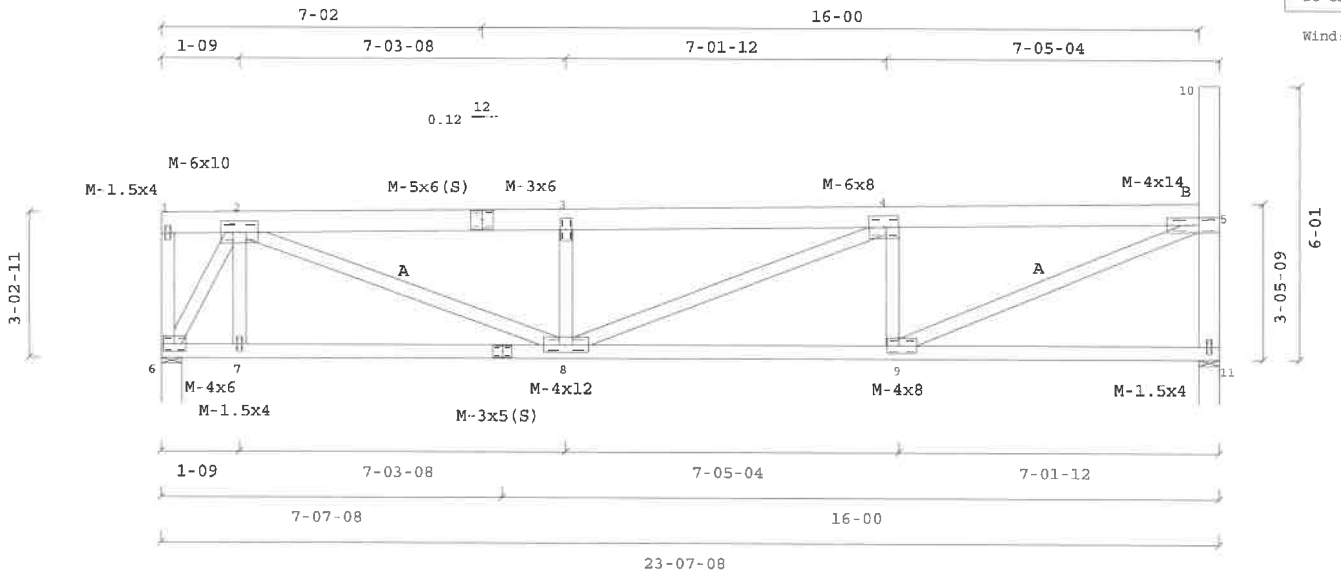
Weight: 129.68 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.150" @ 9'- 0.5" Allowed = 0.757"
MAX DL DEFL = -0.128" @ 9'- 0.5" Allowed = 1.135"
MAX TL DEFL = -0.278" @ 9'- 0.5" Allowed = 1.135"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.029" @ 23'- 4.8"
MAX HORIZ. TL DEFL = 0.054" @ 23'- 4.8"

COND. 2: Design checked for 50LBS sprinkler load located at any point along top chord except end panels and overhangs. Additional 250LBS vertical load applied non-concurrently at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10, (All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir), load duration factor=1.6, Only right end vertical is exposed to wind, Truss designed for wind loads in the plane of the truss only.



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WOODINVILLE, WA 98072
(425) 481-0900

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May 2,2019

JOB NAME: WESTMAN MILL - A5S

Scale: 0.2441

Truss: A5S

DATE: 5/1/2019
SEQ.: K6059039
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

Weight: 137.41 lb

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 44"OC. UON.

Unbalanced live loads have been considered for this design.

TRUSS SPAN 26'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

COND. 2: Design checked for 50LBS sprinkler load located at any point along top chord except end panels and overhangs. Additional 250LBS vertical load applied non-concurrently at each sprinkler location.
COND. 3: 370.00 PLF SEISMIC LOAD.
SHEARWALL 0.00 to 26.17

NOTE: TRUSS DESIGN ASSUMES UNIFORM SHEAR TRANSFER

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10, (All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir), load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads in the plane of the truss only.

Note:Truss design requires continuous bearing wall for entire span UON.

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WOODINVILLE, WA 98072
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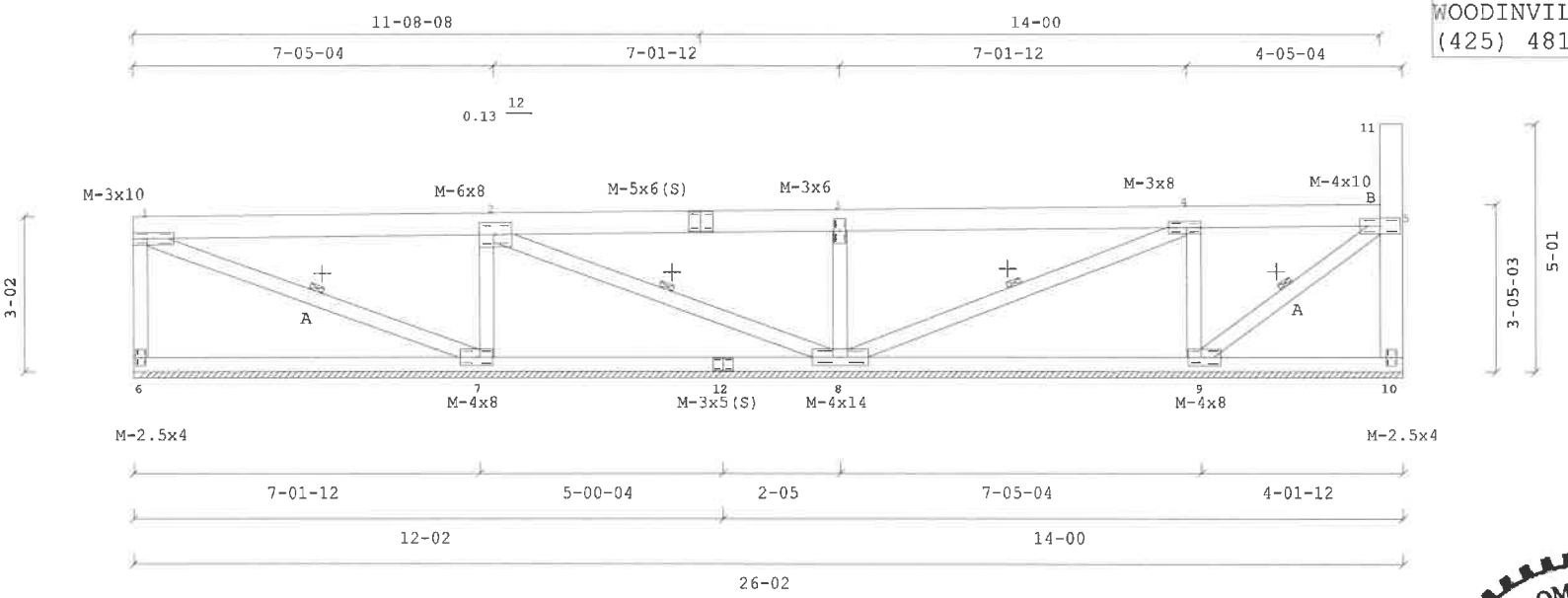


JOB NAME: WESTMAN MILL - A6

Scale: 0.2678

Truss: A6

DATE: 1/24/2019
SEQ.: K5650389
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

January 25,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 44"OC. UON.

Unbalanced live loads have been considered for this design.

TRUSS SPAN 26'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

Weight: 138.19 lb

COND. 2: Design checked for 50LBS sprinkler load located at any point along top chord except end panels and overhangs. Additional 250LBS vertical load applied non-concurrently at each sprinkler location.
COND. 3: 370.00 PLF SEISMIC LOAD. SHEARWALL 0.00 to 26.17

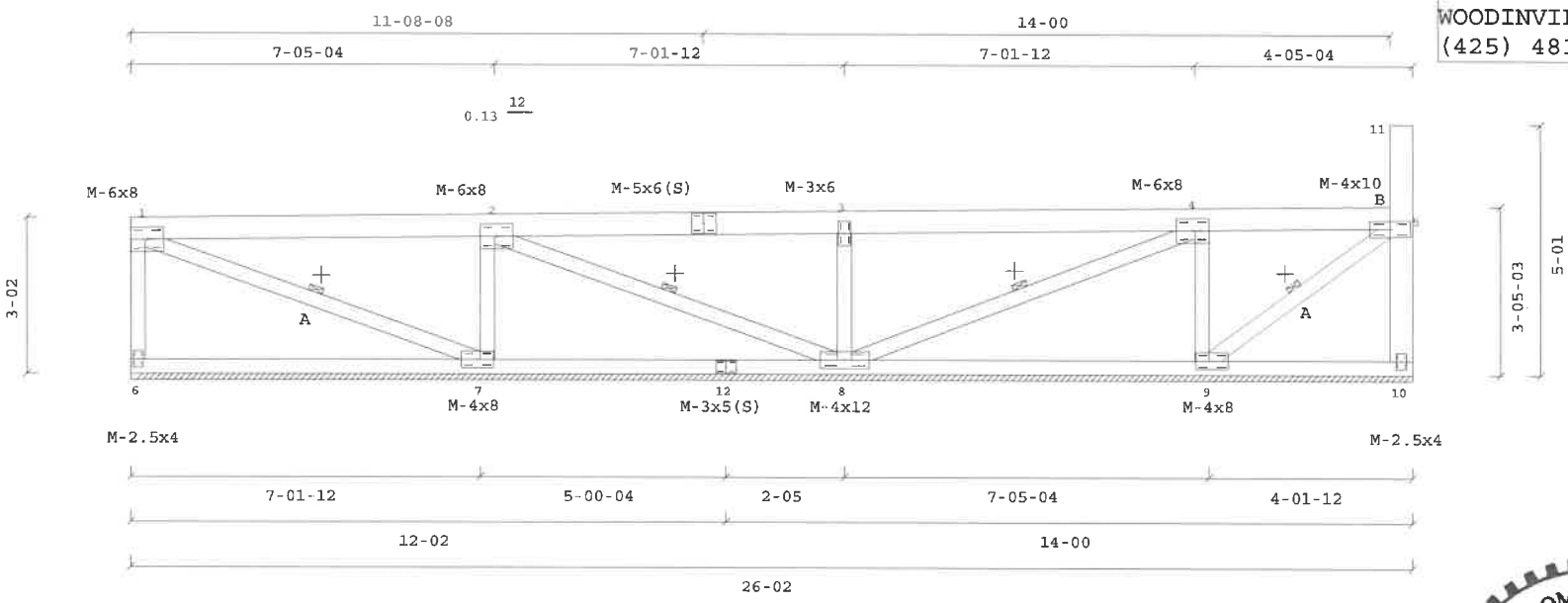
NOTE: TRUSS DESIGN ASSUMES UNIFORM SHEAR TRANSFER

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10, (All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir), load duration factor=1.6, Only right end vertical is exposed to wind, Truss designed for wind loads in the plane of the truss only.

Note:Truss design requires continuous bearing wall for entire span UON.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900



JOB NAME: WESTMAN MILL - A6S

Scale: 0.2699

Truss: A6S

DATE: 5/1/2019
SEQ.: K6059040
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2'o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

May 2,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 26'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-3028)	0	6- 7=(-45)	82	6- 1=(-1511)	28
2- 3=(-3660)	0	7- 8=(0)	3130	1- 7=(0)	3183
3- 4=(-3659)	0	8- 9=(0)	2023	7- 2=(-1050)	90
4- 5=(-1895)	13	9-10=(-21)	34	2- 8=(0)	782
				3- 8=(-885)	80
				8- 4=(0)	1902
4- 9=(-1343)	59				
9- 5=(0)	2381				
10- 5=(-1550)	9				
5-11=(0)	0				

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 1571V	-61/ 71H	5.50"	3.88	HF (405)
26'- 2.0"	0/ 1578V	0/ 0H	5.50"	3.90	HF (405)

Weight: 137.99 lb

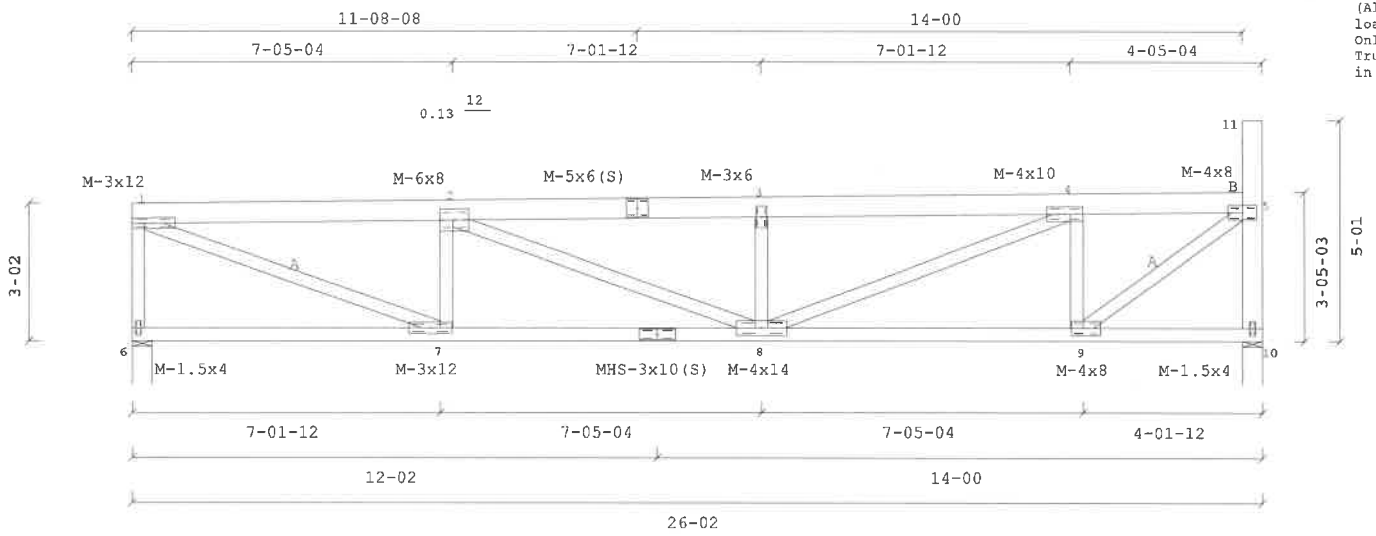
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.219" @ 14'- 7.0" Allowed = 0.842"
MAX DL DEFL = -0.134" @ 14'- 7.0" Allowed = 1.263"
MAX TL DEFL = -0.354" @ 14'- 7.0" Allowed = 1.263"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.040" @ 25'- 11.3"
MAX HORIZ. TL DEFL = 0.065" @ 25'- 11.3"

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

JOB NAME: WESTMAN MILL - A7

Scale: 0.2354

Truss: A7

DATE: 1/24/2019
SEQ.: K5650390
TRANS ID: LINK

WARNINGS:

1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:

1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

January 25,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 26'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-3509) 0	6- 7=(-37) 95	6- 1=(-1772) 0	4- 9=(-1572) 0
2- 3=(-4242) 0	7- 8=(0) 3630	1- 7=(0) 3688	9- 5=(0) 2751
3- 4=(-4242) 0	8- 9=(0) 2342	7- 2=(-1242) 0	10- 5=(-1803) 0
4- 5=(-2193) 0	9-10=(-15) 40	2- 8=(0) 871	5-11=(0) 0
		3- 8=(-1029) 0	
		8- 4=(0) 2187	

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 1832V	-61/ 71H	5.50"	4.52	HF (405)
26'- 2.0"	0/ 1831V	0/ 0H	5.50"	4.52	HF (405)

Weight: 138.9 lb

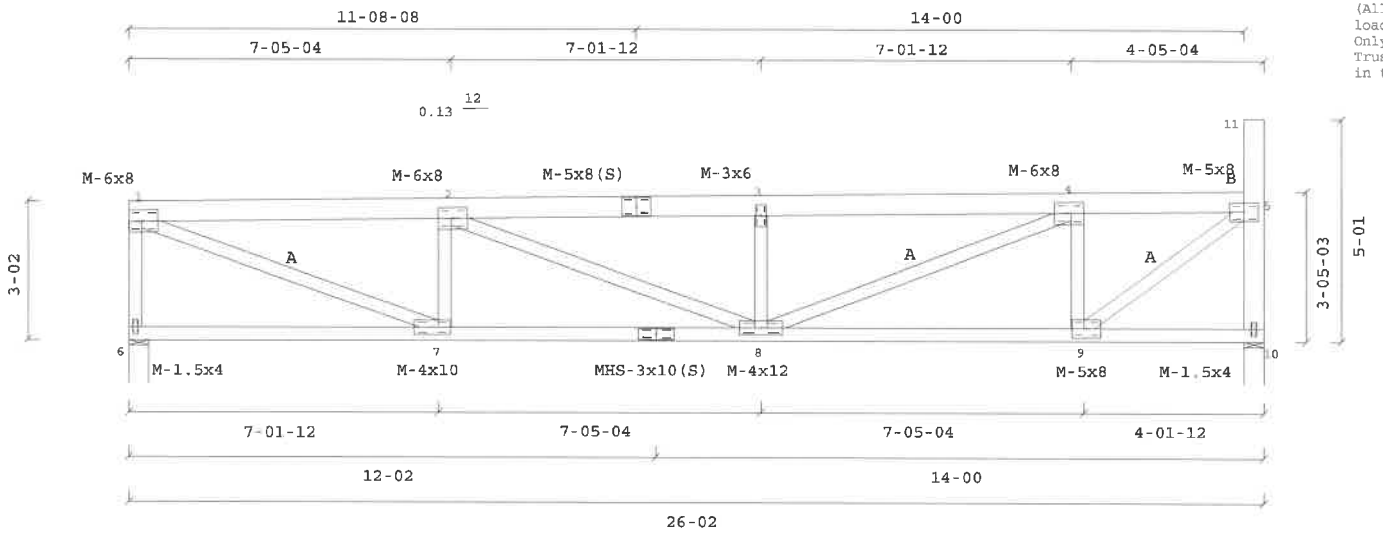
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.217" @ 14'- 7.0" Allowed = 0.842"
MAX DL DEFL = -0.189" @ 14'- 7.0" Allowed = 1.263"
MAX TL DEFL = -0.407" @ 14'- 7.0" Allowed = 1.263"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.040" @ 25'- 11.3"
MAX HORIZ. TL DEFL = 0.076" @ 25'- 11.3"

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

JOB NAME: WESTMAN MILL - A7S

Scale: 0.2363

Truss: A7S

DATE: 5/1/2019
SEQ.: K6059041
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
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MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

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2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

May 2,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 29'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-3429) 0	6- 7=(-46) 89	6- 1=(-1676) 26	4- 9=(-1232) 77
2- 3=(-4501) 0	7- 8=(0) 3548	1- 7=(0) 3607	9- 5=(0) 3397
3- 4=(-4500) 0	8- 9=(0) 3329	7- 2=(-1210) 89	11- 5=(-1645) 28
4- 5=(-3213) 0	9-11=(-23) 107	2- 8=(0) 1215	5-10=(0) 0
		3- 8=(-874) 76	
		8- 4=(0) 1449	

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN. (SPECIES)
0'- 0.0"	0/ 1736V	-61/ 72H	5.50"	4.29 HF (405)
29'- 2.0"	0/ 1708V	0/ 0H	5.50"	4.22 HF (405)

Weight: 150.73 lb

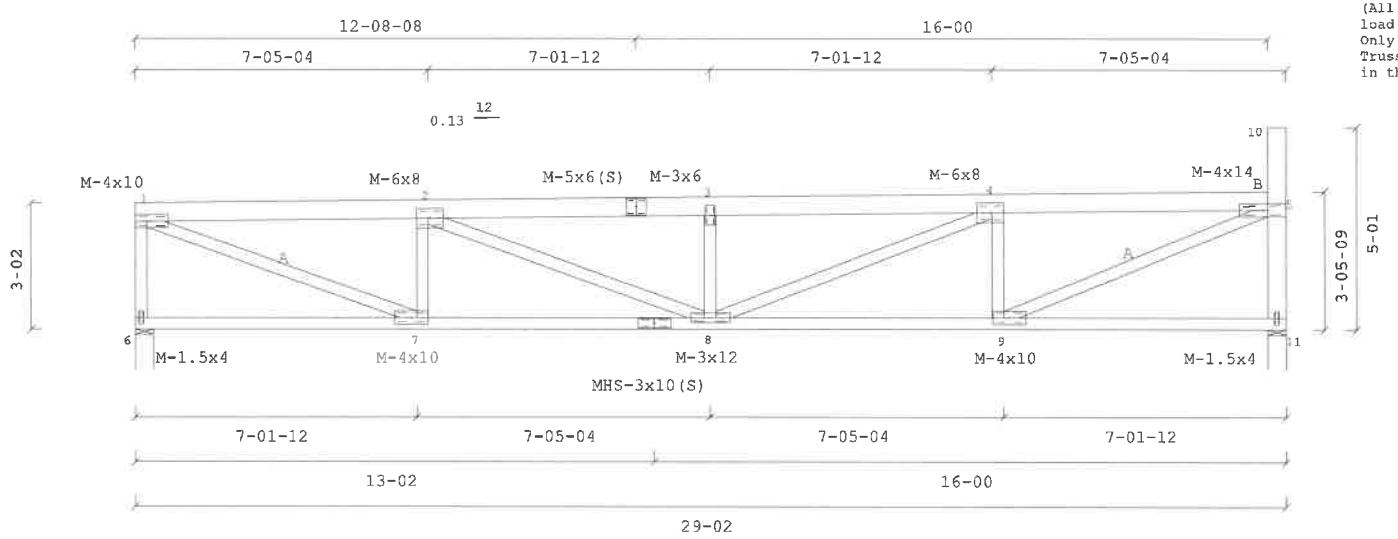
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.322" @ 14'- 7.0" Allowed = 0.942"
MAX DL DEFL = -0.201" @ 14'- 7.0" Allowed = 1.412"
MAX TL DEFL = -0.523" @ 14'- 7.0" Allowed = 1.412"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.054" @ 28'- 11.3"
MAX HORIZ. TL DEFL = 0.088" @ 28'- 11.3"

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

JOB NAME: WESTMAN MILL - A8

Scale: 0.2150

Truss: A8

DATE: 1/24/2019
SEQ.: K5650391
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

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2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

January 25,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 29'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-3984)	0	6- 7=(-37)	104	6- 1=(-1967)	0
2- 3=(-5227)	0	7- 8=(0)	4124	1- 7=(0)	4189
3- 4=(-5226)	0	8- 9=(0)	3869	7- 2=(-1432)	0
4- 5=(-3732)	0	9-11=(-10)	129	2- 8=(0)	1376
				3- 8=(-1013)	0
				8- 4=(0)	1650

4- 9=(-1454)	0						
9- 5=(0)	3939						
11- 5=(-1928)	0						
5-10=(0)	0						

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 2027V	-61/ 72H	5.50"	5.00	HF (405)
29'- 2.0"	0/ 1991V	0/ 0H	5.50"	4.92	HF (405)

Weight: 151.58 lb

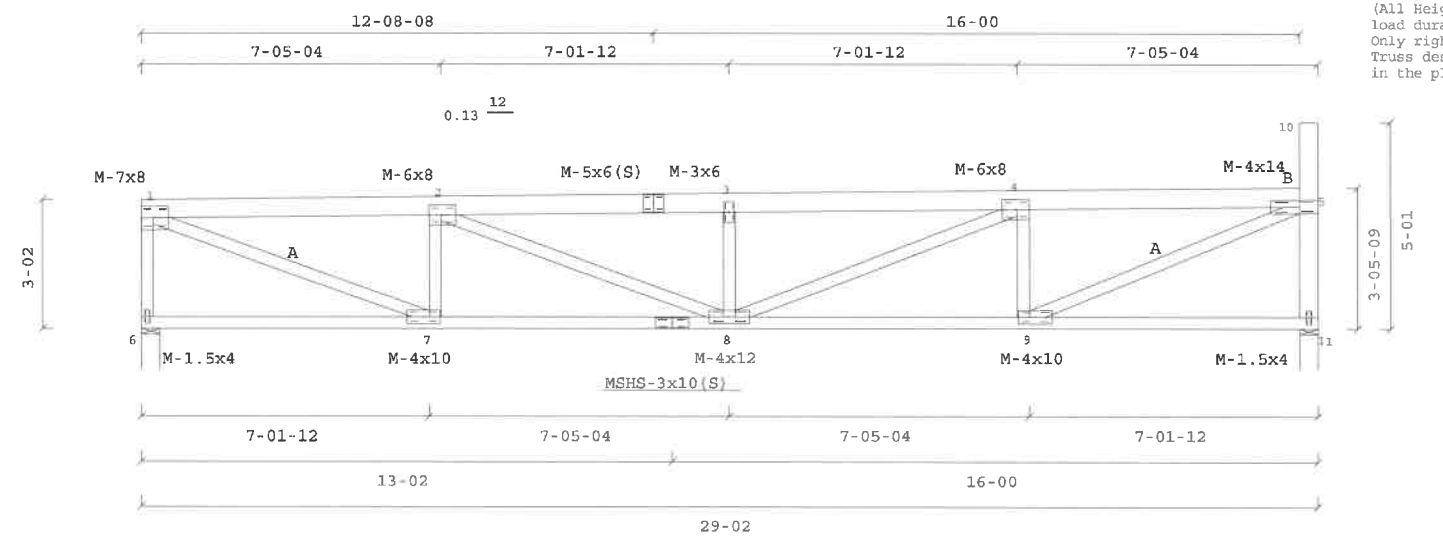
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.322" @ 14'- 7.0" Allowed = 0.942"
MAX DL DEFL = -0.287" @ 14'- 7.0" Allowed = 1.412"
MAX TL DEFL = -0.608" @ 14'- 7.0" Allowed = 1.412"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.054" @ 28'- 11.3"
MAX HORIZ. TL DEFL = 0.103" @ 28'- 11.3"

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

May 2,2019

JOB NAME: WESTMAN MILL - A8S

Scale: 0.2199

Truss: A8S

DATE: 5/1/2019
SEQ.: K6059042
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
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2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 44"OC. UON.

Unbalanced live loads have been considered for this design.

TRUSS SPAN 26'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

Weight: 135.58 lb

COND. 2: Design checked for 50LBS sprinkler load located at any point along top chord except end panels and overhangs. Additional 250LBS vertical load applied non-concurrently at each sprinkler location.
COND. 3: 370.00 PLF SEISMIC LOAD. SHEARWALL 0.00 to 26.17

NOTE: TRUSS DESIGN ASSUMES UNIFORM SHEAR TRANSFER

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10, (All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir), load duration factor=1.6, Only right end vertical is exposed to wind, Truss designed for wind loads in the plane of the truss only.

Note:Truss design requires continuous bearing wall for entire span UON.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

ROOF TRUSS SUPPLY, INC.
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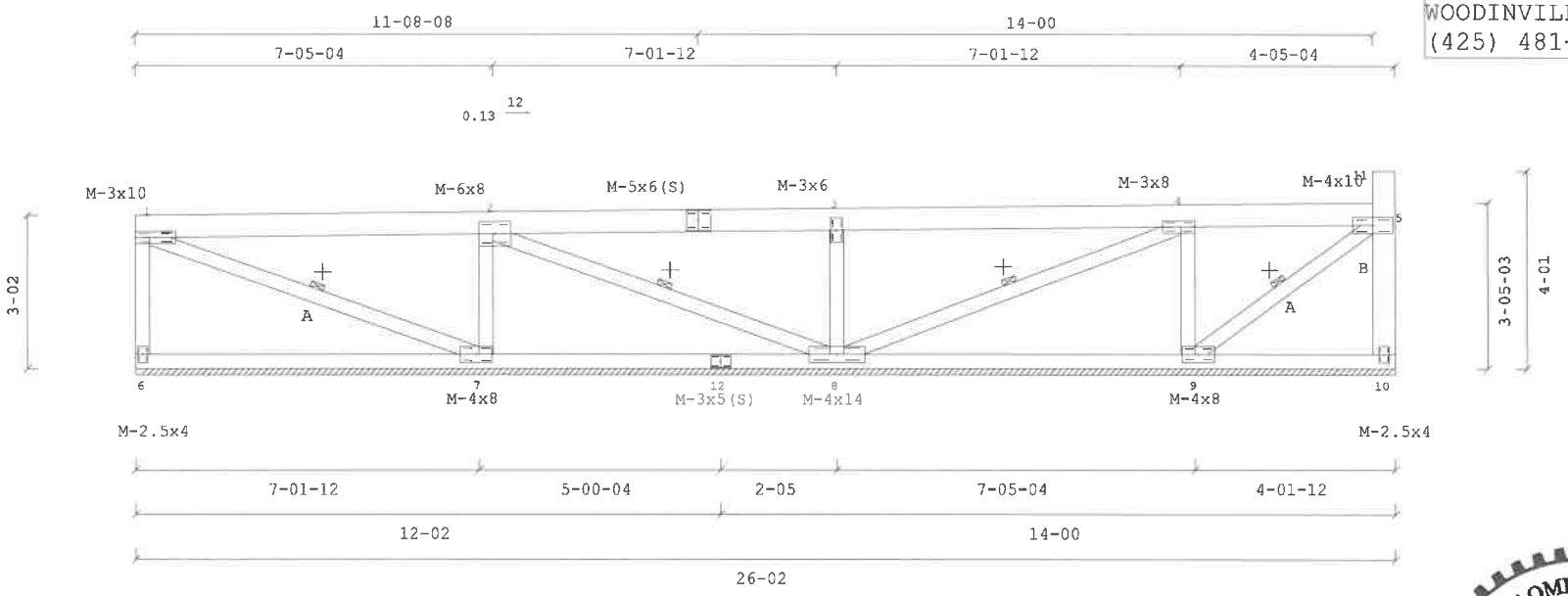
(425) 481-0900



JOB NAME: WESTMAN MILL - A9

Scale: 0.2678

Truss: A9

DATE: 1/24/2019
SEQ.: K5650392
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

January 25,2019

This design prepared from computer input by
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Weight: 136.36 lb

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 44"OC. UON.

Unbalanced live loads have been considered for this design.

TRUSS SPAN 26'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

COND. 2: Design checked for 50LBS sprinkler load located at any point along top chord except end panels and overhangs. Additional 250LBS vertical load applied non-concurrently at each sprinkler location.
COND. 3: 370.00 PLF SEISMIC LOAD. SHEARWALL 0.00 to 26.17

NOTE: TRUSS DESIGN ASSUMES UNIFORM SHEAR TRANSFER

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10, (All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir), load duration factor=1.6, Only right end vertical is exposed to wind, Truss designed for wind loads in the plane of the truss only.

Note:Truss design requires continuous bearing wall for entire span UON.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

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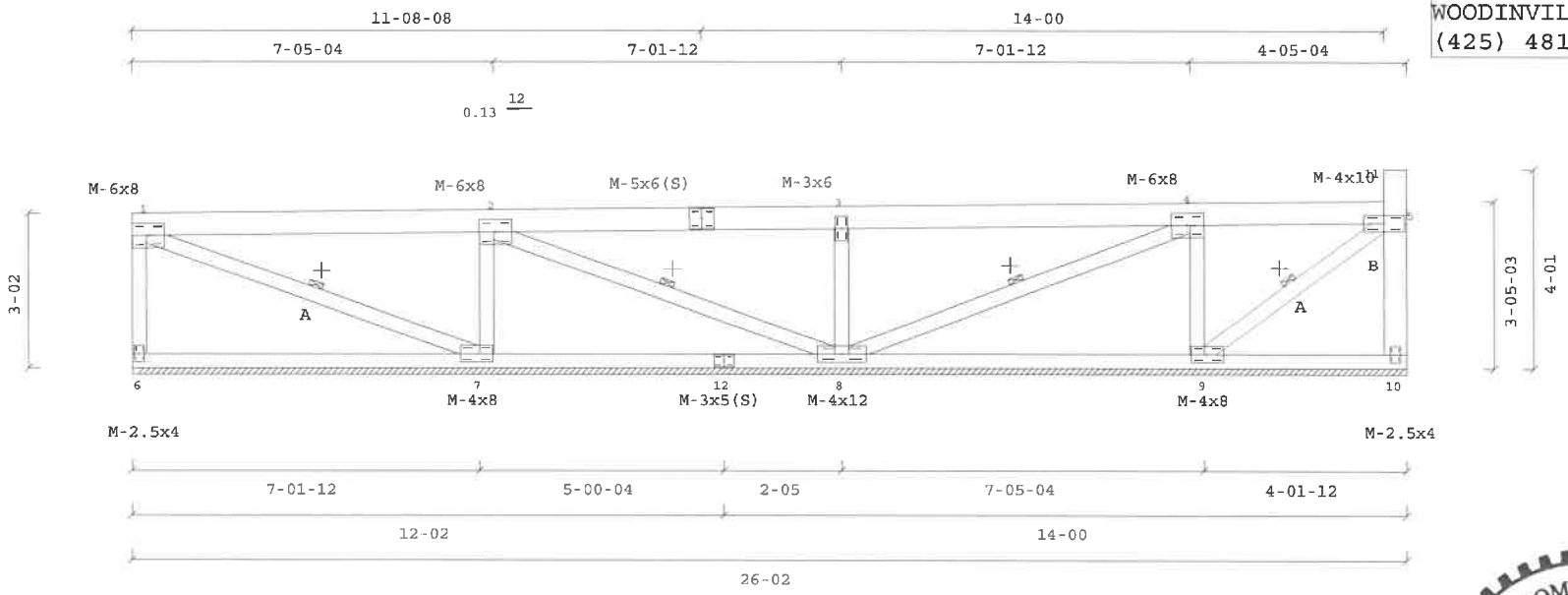

JOB NAME: WESTMAN MILL - A9S

Scale: 0.2699

Truss: A9S

DATE: 5/1/2019
SEQ.: K6059043
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
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2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

May 2,2019

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LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 26'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-3028)	0	6- 7=(-45)	82	6- 1=(-1511)	28
2- 3=(-3660)	0	7- 8=(0)	3130	1- 7=(0)	3183
3- 4=(-3659)	0	8- 9=(0)	2023	7- 2=(-1050)	90
4- 5=(-1895)	13	9-10=(-21)	34	2- 8=(0)	782
				3- 8=(-885)	80
				8- 4=(0)	1902
4- 9=(-1343)	59				
9- 5=(0)	2381				
10- 5=(-1550)	9				
5-11=(0)	0				

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 1571V	-61/ 71H	5.50"	3.88	HF (405)
26'- 2.0"	0/ 1578V	0/ 0H	5.50"	3.90	HF (405)

Weight: 136.15 lb

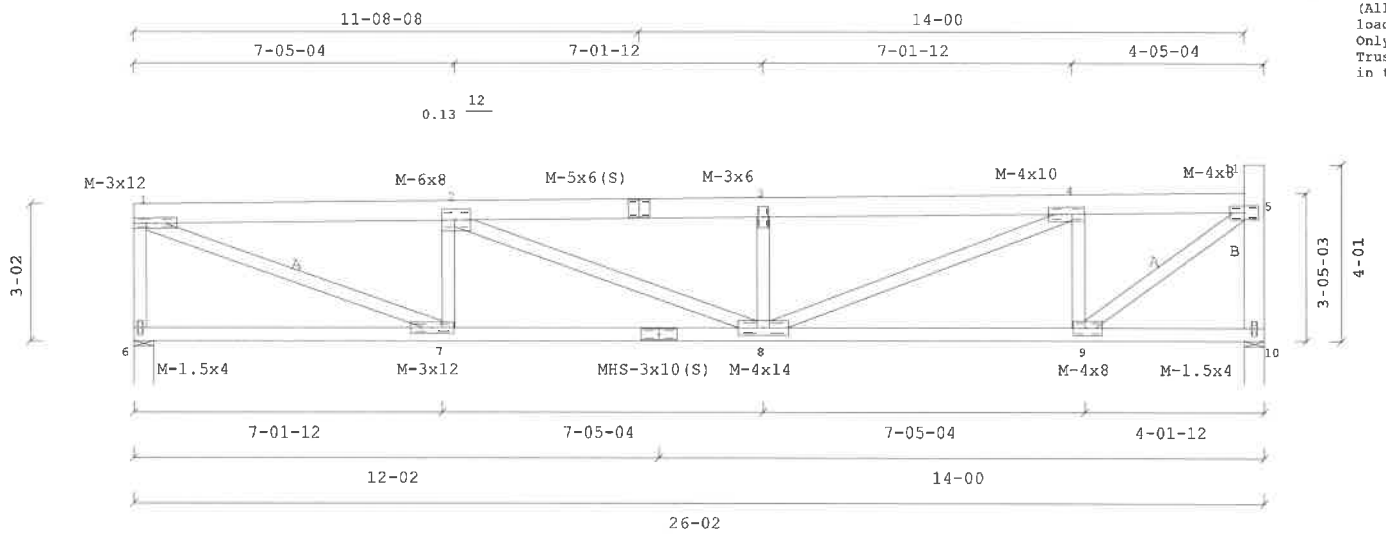
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.219" @ 14'- 7.0" Allowed = 0.842"
MAX DL DEFL = -0.134" @ 14'- 7.0" Allowed = 1.263"
MAX TL DEFL = -0.354" @ 14'- 7.0" Allowed = 1.263"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.040" @ 25'- 11.3"
MAX HORIZ. TL DEFL = 0.065" @ 25'- 11.3"

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

JOB NAME: WESTMAN MILL - A10

Scale: 0.2354

Truss: A10

DATE: 1/24/2019
SEQ.: K5650393
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
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2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

January 25,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 26'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-3509) 0	6- 7=(-37) 95	6- 1=(-1772) 0	4- 9=(-1572) 0
2- 3=(-4242) 0	7- 8=(0) 3630	1- 7=(0) 3688	9- 5=(0) 2751
3- 4=(-4242) 0	8- 9=(0) 2342	7- 2=(-1242) 0	10- 5=(-1803) 0
4- 5=(-2193) 0	9-10=(-15) 40	2- 8=(0) 871	5-11=(0) 0
		3- 8=(-1029) 0	
		8- 4=(0) 2187	

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 1832V	-61/ 71H	5.50"	4.52	HF (405)
26'- 2.0"	0/ 1831V	0/ 0H	5.50"	4.52	HF (405)

Weight: 137.12 lb

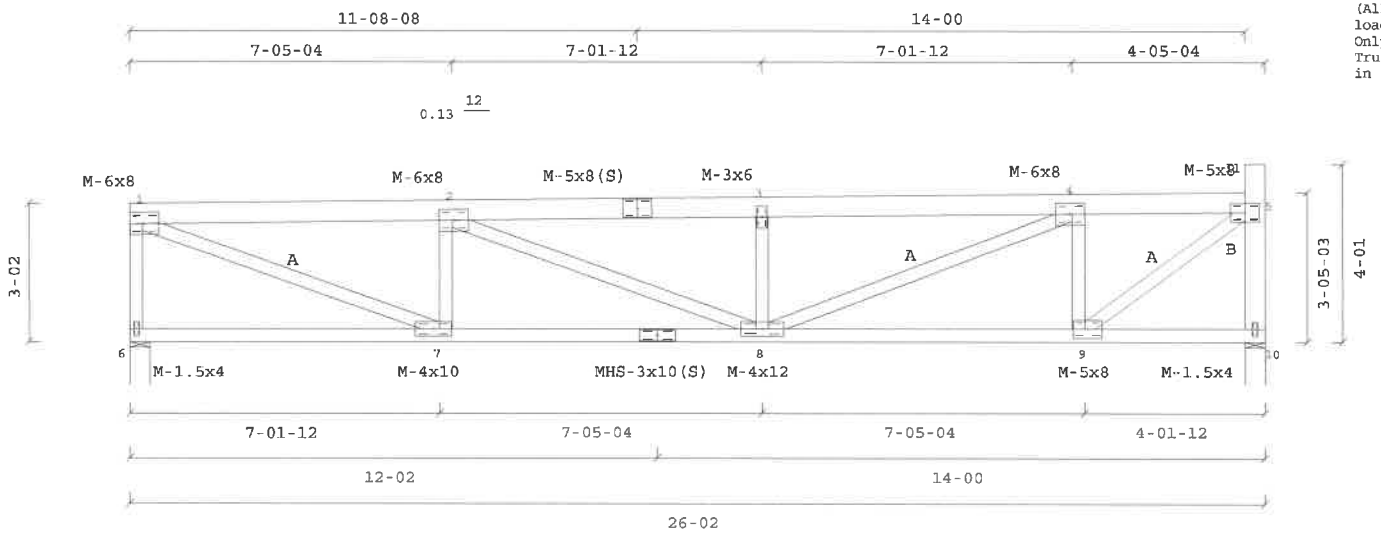
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.217" @ 14'- 7.0" Allowed = 0.842"
MAX DL DEFL = -0.189" @ 14'- 7.0" Allowed = 1.263"
MAX TL DEFL = -0.407" @ 14'- 7.0" Allowed = 1.263"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.040" @ 25'- 11.3"
MAX HORIZ. TL DEFL = 0.076" @ 25'- 11.3"

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

JOB NAME: WESTMAN MILL - A10S

Scale: 0.2363

Truss: A10S

DATE: 5/1/2019
SEQ.: K6059044
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

May 2,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 56"OC. UON.

TRUSS SPAN 29'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

Weight: 150.43 lb

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.
COND. 3: 370.00 PLF SEISMIC LOAD.
SHEARWALL 0.00 to 29.17

NOTE: TRUSS DESIGN ASSUMES UNIFORM
SHEAR TRANSFER

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.

Note:Truss design requires continuous
bearing wall for entire span UON.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

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P.O. BOX 532
WOODINVILLE, WA 98072
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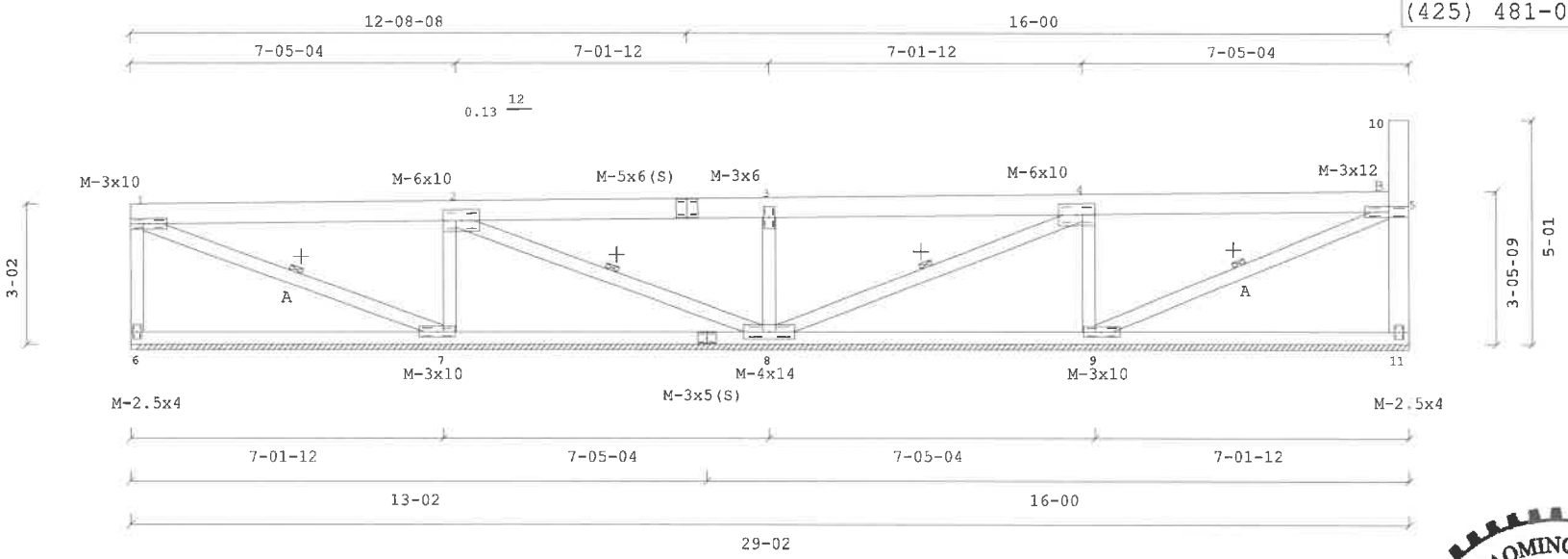

JOB NAME: WESTMAN MILL - A11

Scale: 0.2484

Truss: A11

DATE: 1/24/2019
SEQ.: K5650394
TRANS ID: LINK

WARNINGS:

1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
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MiTek USA, Inc./CompuTrus Software 7.5.8(1L)-E

GENERAL NOTES, unless otherwise noted:

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2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

January 25,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 56"OC. UON.

TRUSS SPAN 29'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

Weight: 150.84 lb

COND. 2: Design checked for 50LBS sprinkler load located at any point along top chord except end panels and overhangs. Additional 250LBS vertical load applied non-concurrently at each sprinkler location.
COND. 3: 370.00 PLF SEISMIC LOAD. SHEARWALL 0.00 to 29.17

NOTE: TRUSS DESIGN ASSUMES UNIFORM SHEAR TRANSFER

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10, (All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir), load duration factor=1.6, Only right end vertical is exposed to wind, Truss designed for wind loads in the plane of the truss only.

Note:Truss design requires continuous bearing wall for entire span UON.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

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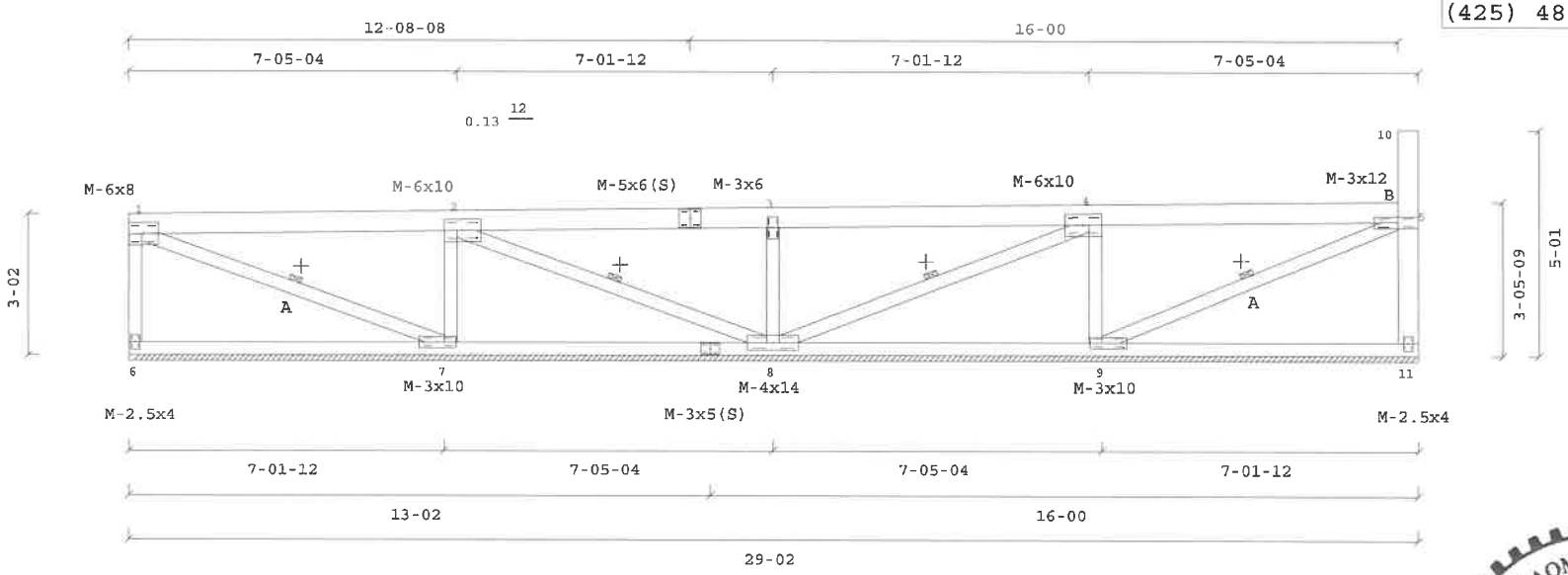
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900



JOB NAME: WESTMAN MILL - A11S

Scale: 0.2440

Truss: A11S

DATE: 5/1/2019
SEQ.: K6059045
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
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MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

May 2,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2;
2x6 HF SS T1
BC: 2x4 DF #1&BTR;
2x4 HF #2 B3;
2x6 HF #2 B1
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 26'- 2.0"
LOAD DURATION INCREASE = 1.15 (Non-Rep)
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)
ADDL: BC CONC LL+DL= 1520.0 LBS @ 3'- 6.5"

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-3735) 0	7- 8=(-29) 162	7- 1=(-3082) 0	10- 5=(0)	2744
2- 3=(-3735) 0	8- 9=(0) 4882	1- 8=(0) 4552	5-11=(-1768)	0
3- 4=(-5029) 0	9-10=(0) 4877	2- 8=(-566) 1	11- 6=(0)	3067
4- 5=(-5029) 0	10-11=(0) 2615	8- 3=(-1569) 0	12- 6=(-2003)	0
5- 6=(-2447) 0	11-12=(-14) 42	9- 3=(0) 212	6-13=(0)	0
		3-10=(-251) 373		
		4-10=(-1078) 0		

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 3195V	-61/ 71H	5.50"	7.89	HF (405)
26'- 2.0"	0/ 2031V	0/ 0H	5.50"	5.02	HF (405)

Weight: 148.53 lb

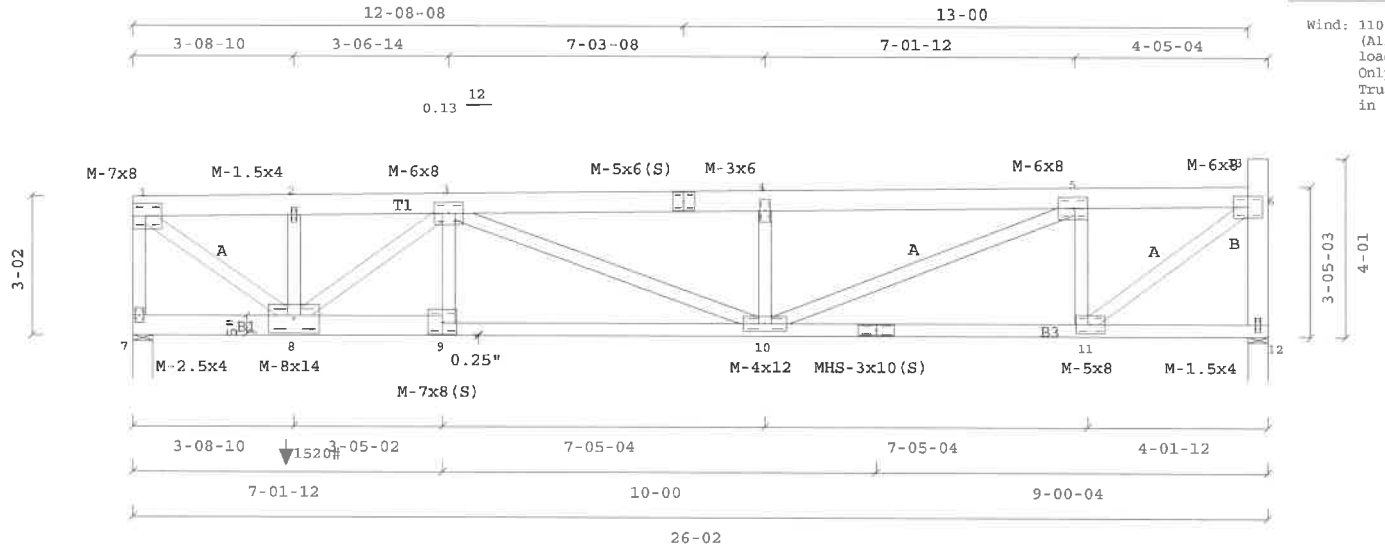
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.186" @ 14'- 7.0" Allowed = 0.842"
MAX DL DEFL = -0.231" @ 14'- 7.0" Allowed = 1.263"
MAX TL DEFL = -0.417" @ 14'- 7.0" Allowed = 1.263"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.039" @ 25'- 11.3"
MAX HORIZ. TL DEFL = 0.095" @ 25'- 11.3"

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

COND. 2: Design checked for 50LBS sprinkler load located at any point along top chord except end panels and overhangs. Additional 250LBS vertical load applied non-concurrently at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10, (All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir), load duration factor=1.6, Only right end vertical is exposed to wind, Truss designed for wind loads in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
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(425) 481-0900

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

May 2,2019

JOB NAME: WESTMAN MILL - A12S

Scale: 0.2364

Truss: A12S

DATE: 5/1/2019
SEQ.: K6059046
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 22'- 6.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(0) 8	6- 7=(0) 1788	1- 6=(-112) 0	4- 9=(-1315) 0		
2- 3=(-3261) 0	7- 8=(0) 1788	6- 2=(-2362) 0	9- 5=(0) 2334		
3- 4=(-3261) 0	8- 9=(0) 1987	2- 7=(0) 241	10- 5=(-1557) 0		
4- 5=(-1862) 0	9-10=(-17) 37	2- 8=(0) 1713	5-11=(0) 0		
		3- 8=(-1068) 0			
		8- 4=(0) 1519			

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 1653V	-61/ 71H	5.50"	4.08	HF (405)
22'- 6.0"	0/ 1586V	0/ 0H	5.50"	3.92	HF (405)

Weight: 121.04 lb

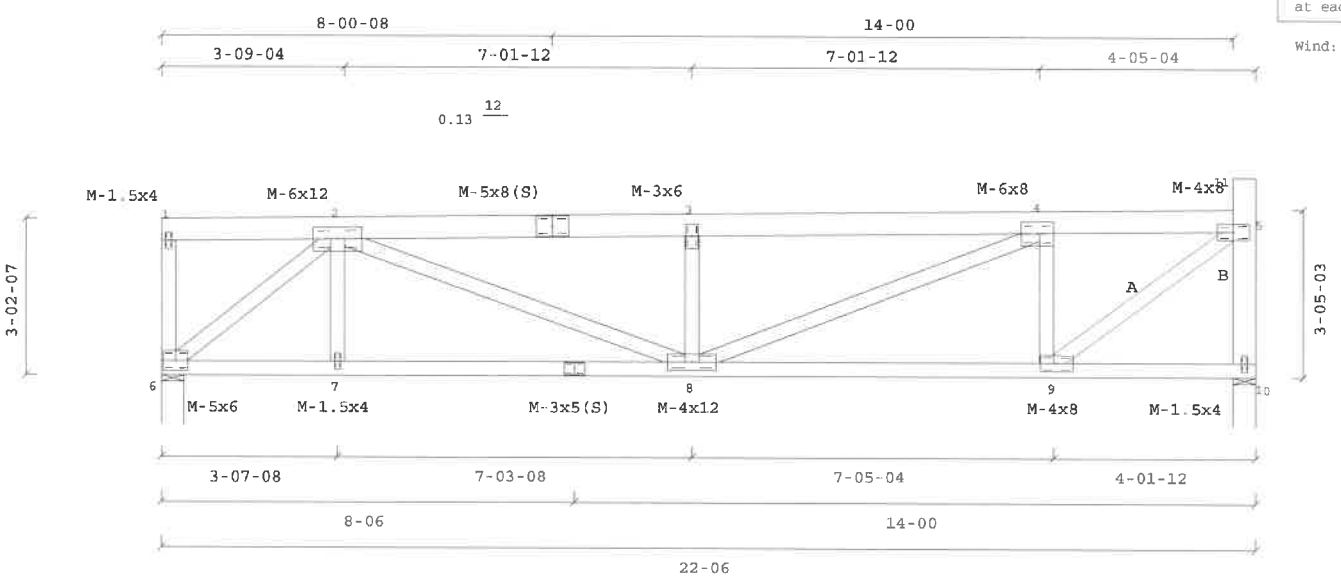
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.133" @ 10'- 11.0" Allowed = 0.719"
MAX DL DEFL = -0.111" @ 10'- 11.0" Allowed = 1.079"
MAX TL DEFL = -0.244" @ 10'- 11.0" Allowed = 1.079"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.030" @ 22'- 3.3"
MAX HORIZ. TL DEFL = 0.057" @ 22'- 3.3"

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

JOB NAME: WESTMAN MILL - A13S

Scale: 0.2650

Truss: A13S

DATE: 5/1/2019
SEQ.: K6059047
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

May 2,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 56"OC. UON.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

TRUSS SPAN 22'- 6.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

Weight: 120.75 lb

COND. 2: Design checked for 50LBS sprinkler load located at any point along top chord except end panels and overhangs. Additional 250LBS vertical load applied non-concurrently at each sprinkler location.
COND. 3: 370.00 PLF SEISMIC LOAD. SHEARWALL 0.00 to 22.50

NOTE: TRUSS DESIGN ASSUMES UNIFORM SHEAR TRANSFER

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10, (All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir), load duration factor=1.6, Only right end vertical is exposed to wind, Truss designed for wind loads in the plane of the truss only.

Note:Truss design requires continuous bearing wall for entire span UON.

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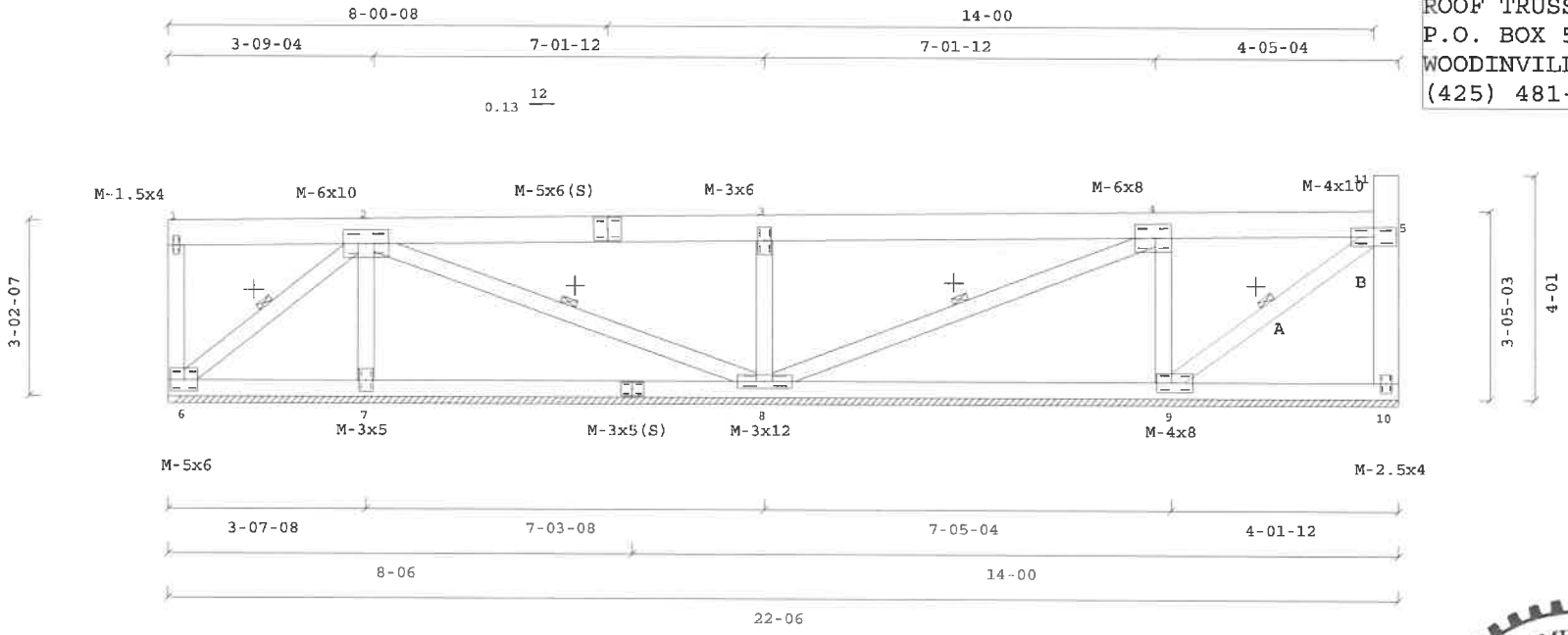

JOB NAME: WESTMAN MILL - A14S

Scale: 0.3038

Truss: A14S

DATE: 5/1/2019
SEQ.: K6059048
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
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MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

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3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

May 2,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x5 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 25'- 6.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-1994)	0	6- 7=(-36)	95	6- 1=(-1817)	0
2- 3=(-4032)	0	7- 8=(0)	2151	1- 7=(0)	2546
3- 4=(-4031)	0	8- 9=(0)	3300	7- 2=(-1572)	0
4- 5=(-3187)	0	9-11=(-10)	125	2- 8=(0)	2152
				3- 8=(-1044)	0
				8- 4=(0)	998

BEARING LOCATIONS		MAX VERT REACTIONS		MAX HORZ REACTIONS		BRG SIZE	REQUIRED BRG AREA SQ.IN. (SPECIES)
0'- 0.0"		0/ 1832V		-62/ 72H		5.50"	4.52 HF (405)
25'- 6.0"		0/ 1753V		0/ 0H		5.50"	4.33 HF (405)

Weight: 137.75 lb

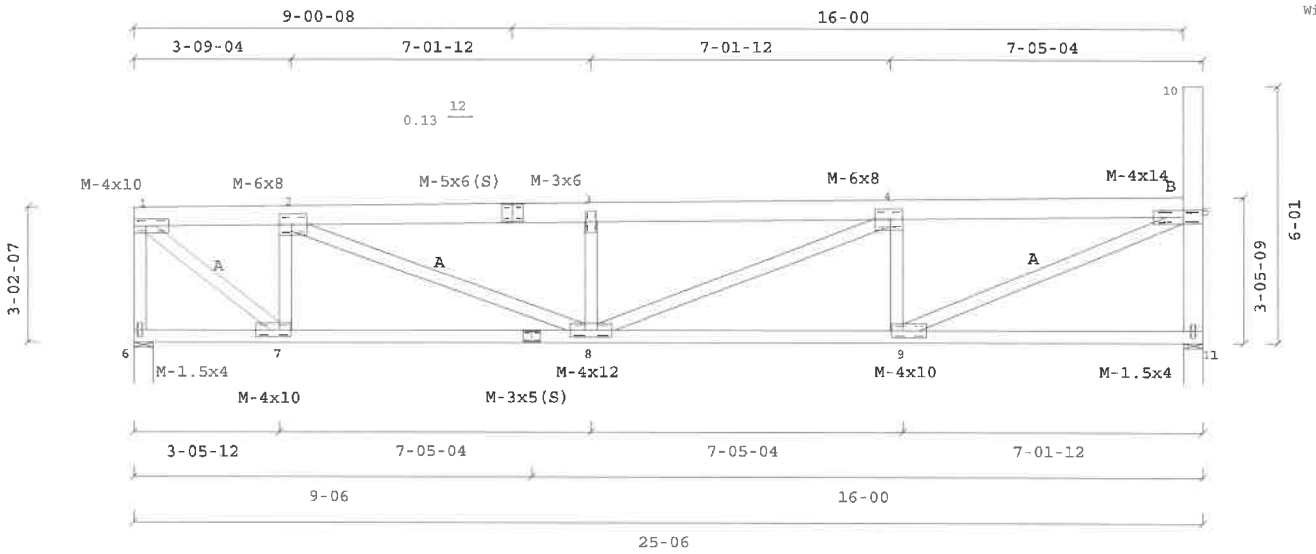
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.196" @ 10'- 11.0" Allowed = 0.819"
MAX DL DEFL = -0.170" @ 10'- 11.0" Allowed = 1.229"
MAX TL DEFL = -0.366" @ 10'- 11.0" Allowed = 1.229"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.037" @ 25'- 3.3"
MAX HORIZ. TL DEFL = 0.070" @ 25'- 3.3"

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

JOB NAME: WESTMAN MILL - A15S

Scale: 0.2284

Truss: A15S

DATE: 5/1/2019
SEQ.: K6059049
TRANS ID: LINK

WARNINGS:

1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:

1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

May 2,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF SS
BC: 2x4 DF #1&BTR;
2x6 HF #2 B1
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x4 DF #1&BTR B;
2x6 HF #2 C

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 29'- 2.0"
LOAD DURATION INCREASE = 1.15 (Non-Rep)
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)
ADDL: BC CONC LL+DL= 1520.0 LBS @ 3'- 6.5"

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-4029) 0	7- 8=(-28) 174	7- 1=(-3300) 0	10- 5=(0) 2155
2- 3=(-4029) 0	8- 9=(0) 5428	1- 8=(0) 4912	5-11=(-1634) 0
3- 4=(-6113) 0	9-10=(0) 5424	2- 8=(-579) 0	11- 6=(0) 4376
4- 5=(-6112) 0	10-11=(0) 4290	8- 3=(-1891) 0	12- 6=(-2107) 0
5- 6=(-4135) 0	11-12=(-9) 134	9- 3=(0) 210	6-13=(0) 0
		3-10=(0) 926	
		4-10=(-1060) 0	

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 3406V	-61/ 72H	5.50"	8.41	HF (405)
29'- 2.0"	0/ 2170V	0/ 0H	5.50"	3.47	DF (625)

Weight: 165.28 lb

Caution: Note bearing area requirements.

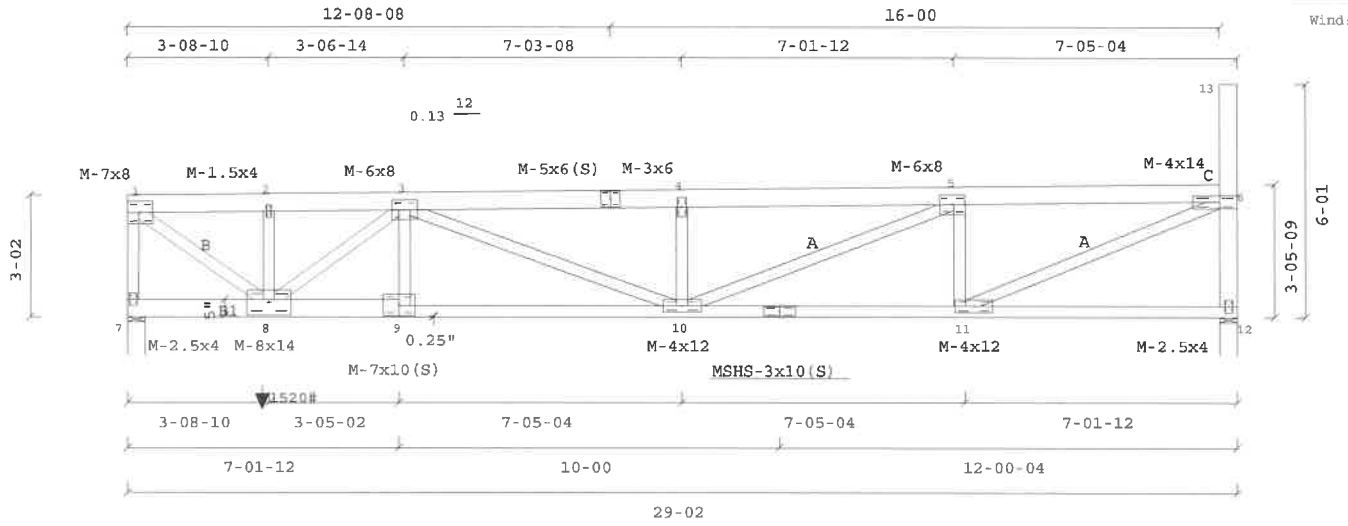
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.257" @ 14'- 7.0" Allowed = 0.942"
MAX DL DEFL = -0.313" @ 14'- 7.0" Allowed = 1.413"
MAX TL DEFL = -0.570" @ 14'- 7.0" Allowed = 1.413"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.046" @ 28'- 11.3"
MAX HORIZ. TL DEFL = 0.109" @ 28'- 11.3"

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=13.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir).
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

JOB NAME: WESTMAN MILL - A16S

Scale: 0.2074

Truss: A16S

DATE: 5/1/2019
SEQ.: K6059050
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

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2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. end at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

May 2,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2;
2x6 HF SS B1
WEBS: 2x4 HF STD/STUD;
2x6 HF #2 A

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

(2) complete trusses required.
Attach 2 ply with 3"x.131 DIA GUN nails staggered:
9" oc in 2 row(s) throughout 2x6 top chords,
9" oc in 2 row(s) throughout 2x6 bottom chords,
9" oc in 1 row(s) throughout 2x4 bottom chords,
9" oc in 1 row(s) throughout 2x4 webs,
9" oc in 2 row(s) throughout 2x6 webs.

TRUSS SPAN 27'- 2.0"
LOAD DURATION INCREASE = 1.15 (Non-Rep)
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)
ADDL: BC CONC LL+DL= 1695.0 LBS @ 3'- 5.7"

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-1916) 0	7- 8=(-42) 178	7- 1=(-3412) 0	10- 5=(0) 1726
2- 3=(-1918) 0	8- 9=(0) 4272	1- 8=(0) 3750	5-11=(-1328) 72
3- 4=(-4976) 0	9-10=(0) 4216	2- 8=(-394) 16	11- 6=(0) 3636
4- 5=(-4976) 0	10-11=(0) 3564	8- 3=(-3070) 0	12- 6=(-1746) 24
5- 6=(-3438) 0	11-12=(-22) 112	9- 3=(0) 1018	6-13=(0) 0
		3-10=(-126) 968	
		4-10=(-918) 82	

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 3175V	-61/ 72H	5.50"	7.84	HF (405)
27'- 2.0"	0/ 1809V	0/ 0H	5.50"	4.47	HF (405)

Weight: 302.6 lb

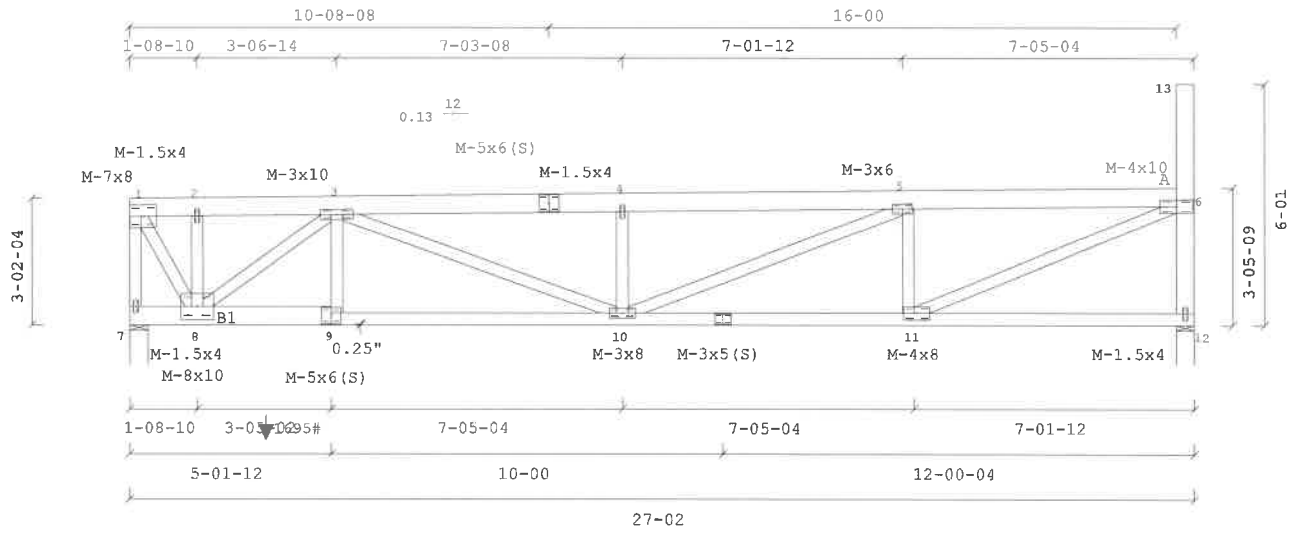
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.121" @ 12'- 7.0" Allowed = 0.875"
MAX DL DEFL = -0.125" @ 12'- 7.0" Allowed = 1.312"
MAX TL DEFL = -0.245" @ 12'- 7.0" Allowed = 1.312"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.024" @ 26'- 11.3"
MAX HORIZ. TL DEFL = 0.055" @ 26'- 11.3"

COND. 2: Design checked for 50LBS sprinkler load located at any point along top chord except end panels and overhangs. Additional 250LBS vertical load applied non-concurrently at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10, (All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir), load duration factor=1.6, Only right end vertical is exposed to wind, Truss designed for wind loads in the plane of the truss only.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.



JOB NAME: WESTMAN MILL - A17

Scale: 0.2136

Truss: A17

DATE: 1/24/2019
SEQ.: K5650400
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

January 25,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 24'- 2.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-2197)	0	6- 7=(-45)	78	6- 1=(-1446)	17
2- 3=(-3228)	0	7- 8=(0)	2306	1- 7=(0)	2453
3- 4=(-3227)	0	8- 9=(0)	1864	7- 2=(-1102)	75
4- 5=(-1748)	13	9-10=(-21)	33	2- 8=(0)	1156
				3- 8=(-906)	84
				8- 4=(0)	1611
4- 9=(-1229)	58				
9- 5=(0)	2195				
10- 5=(-1441)	9				
5-11=(0)	0				

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 1485V	-61/ 71H	5.50"	3.67	HF (405)
24'- 2.0"	0/ 1470V	0/ 0H	5.50"	3.63	HF (405)

Weight: 126.84 lb

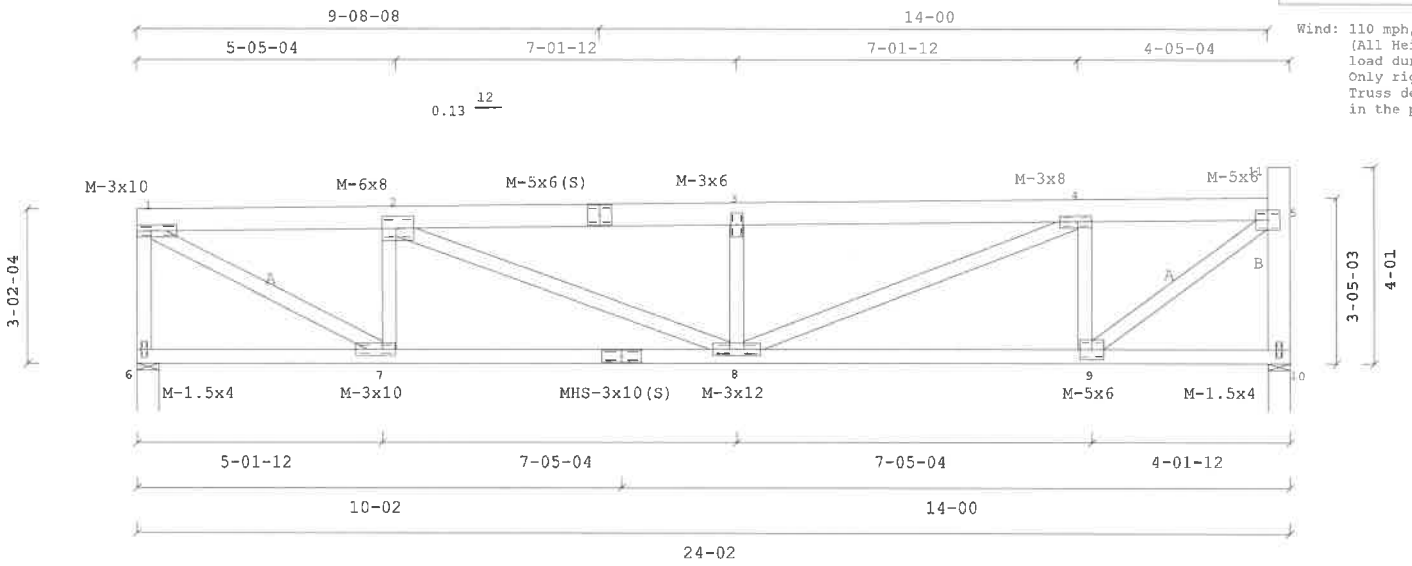
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.168" @ 12'- 7.0" Allowed = 0.775"
MAX DL DEFL = -0.100" @ 12'- 7.0" Allowed = 1.163"
MAX TL DEFL = -0.268" @ 12'- 7.0" Allowed = 1.163"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.032" @ 23'- 11.3"
MAX HORIZ. TL DEFL = 0.053" @ 23'- 11.3"

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

JOB NAME: WESTMAN MILL - A18

Scale: 0.2599

Truss: A18

DATE: 1/25/2019
SEQ.: K5650401
TRANS ID: LINK

WARNINGS:

1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:

1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

January 25,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 25'- 10.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-1875)	0	6- 7=(-44)	83	6- 1=(-1571)	5	4- 9=(-1046)	77
2- 3=(-3575)	0	7- 8=(0)	2008	1- 7=(0)	2305	9- 5=(0)	2942
3- 4=(-3574)	0	8- 9=(0)	2892	7- 2=(-1322)	67	11- 5=(-1462)	29
4- 5=(-2794)	2	9-11=(-23)	103	2- 8=(0)	1817	5-10=(0)	0
				3- 8=(-897)	81		
				8- 4=(0)	943		

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 1592V	-62/ 72H	5.50"	3.93	HF (405)
25'- 10.0"	0/ 1524V	0/ 0H	5.50"	3.76	HF (405)

Weight: 136.17 lb

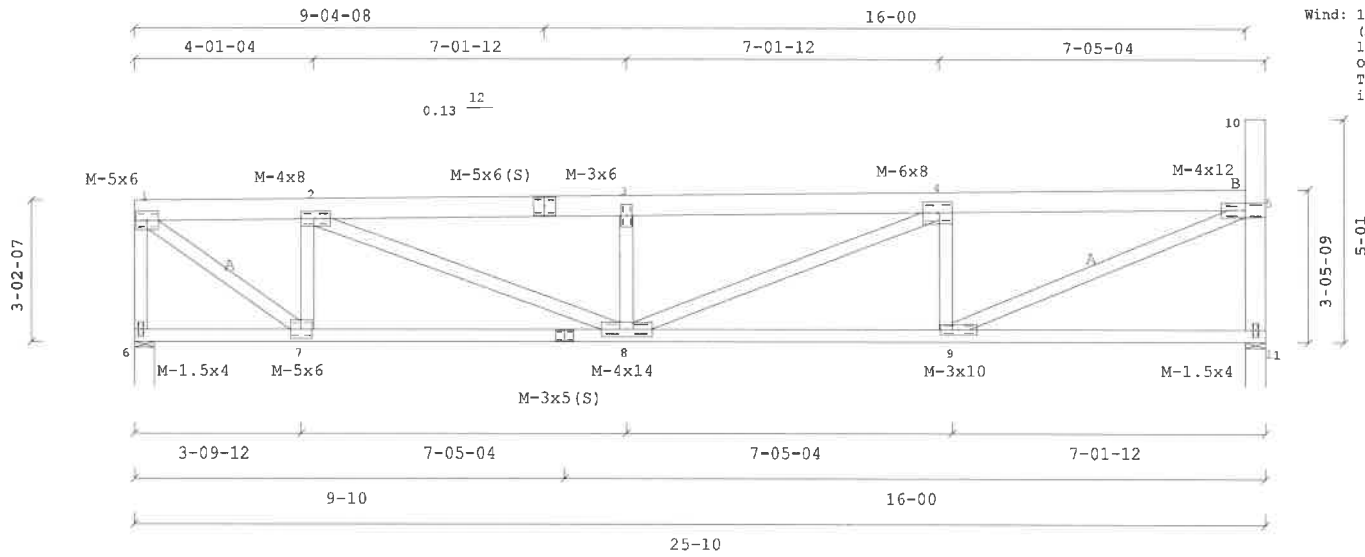
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.207" @ 11'- 3.0" Allowed = 0.831"
MAX DL DEFL = -0.126" @ 11'- 3.0" Allowed = 1.246"
MAX TL DEFL = -0.332" @ 11'- 3.0" Allowed = 1.246"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.038" @ 25'- 7.3"
MAX HORIZ. TL DEFL = 0.063" @ 25'- 7.3"

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

JOB NAME: WESTMAN MILL - A19

Scale: 0.2386

Truss: A19

DATE: 1/24/2019
SEQ.: K5650402
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

January 25,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD;
2x4 HF #2 A;
2x6 HF #2 B

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

TRUSS SPAN 22'- 10.0"
LOAD DURATION INCREASE = 1.15
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1- 2=(-1658)	0	6- 7=(-45)	76	6- 1=(-1408)	7
2- 3=(-2931)	0	7- 8=(0)	1773	1- 7=(0)	2037
3- 4=(-2930)	0	8- 9=(0)	1758	7- 2=(-1155)	68
4- 5=(-1649)	14	9-10=(-22)	32	2- 8=(0)	1384
				3- 8=(-911)	85
				8- 4=(0)	1407

4- 9=(-1153)	58	5- 3=(-1369)	10	10- 5=(-1369)	10
9- 5=(0)	2071	10- 5=(-1369)	10		
5-11=(0)	0				

BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 1430V	-61/ 71H	5.50"	3.53	HF (405)
22'- 10.0"	0/ 1397V	0/ 0H	5.50"	3.45	HF (405)

Weight: 120.49 lb

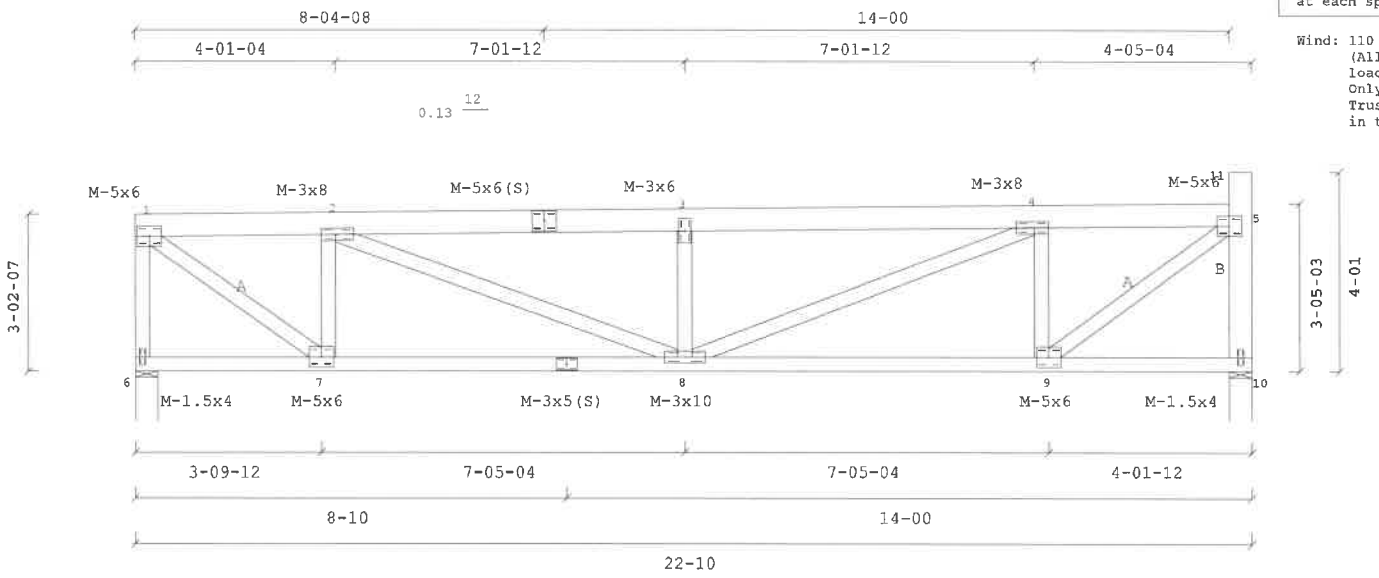
VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.141" @ 11'- 3.0" Allowed = 0.731"
MAX DL DEFL = -0.083" @ 11'- 3.0" Allowed = 1.096"
MAX TL DEFL = -0.224" @ 11'- 3.0" Allowed = 1.096"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.027" @ 22'- 7.3"
MAX HORIZ. TL DEFL = 0.044" @ 22'- 7.3"

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

COND. 2: Design checked for 50LBS sprinkler load
located at any point along top chord
except end panels and overhangs.
Additional 250LBS vertical load applied non-concurrently
at each sprinkler location.

Wind: 110 mph, h=61.7ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
Only right end vertical is exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

JOB NAME: WESTMAN MILL - A20

Scale: 0.2665

Truss: A20

DATE: 1/24/2019
SEQ.: K5650403
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
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2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

January 25,2019

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

Plateline to peak (L): 6-03-10
Plateline to peak (R): 3-02-11

TRUSS SPAN 5'- 5.0"
LOAD DURATION INCREASE = 1.15 (Non-Rep)
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(22.0) ON TOP CHORD = 52.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 62.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00
1-2=(0) 17 3-4=(0) 14 1-3=(-274) 0 2-4=(-273) 0
3-2=(-33) 0

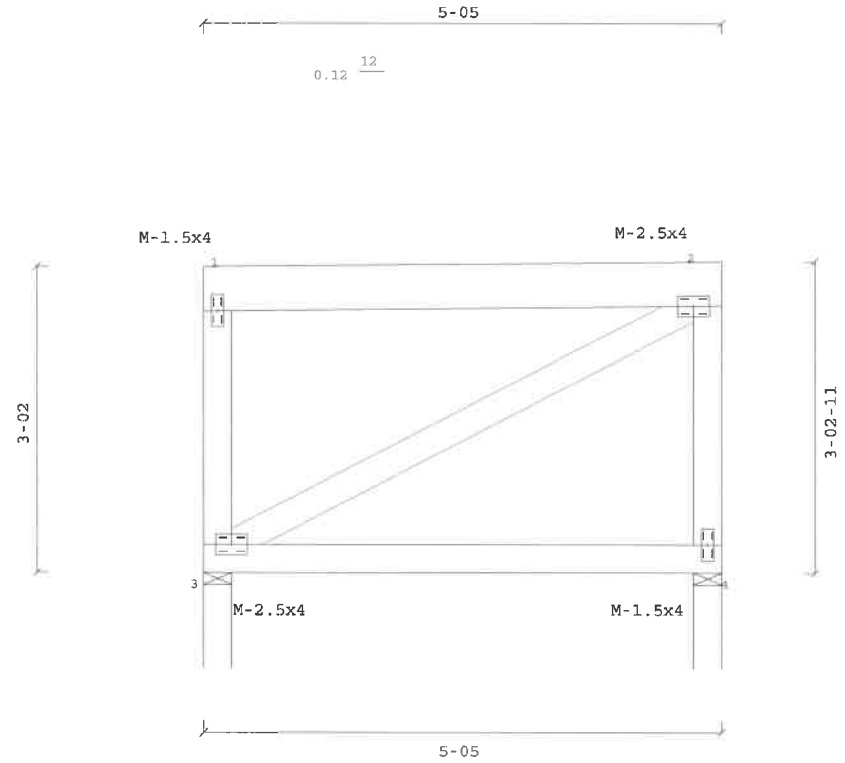
BEARING LOCATIONS	MAX VERT REACTIONS	MAX HORZ REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 346V	0/ 1H	3.50"	0.85	HF (405)
5'- 5.0"	0/ 325V	0/ 0H	3.50"	0.80	HF (405)

Weight: 29.04 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX TL DEFL = -0.001" @ 5'- 1.5" Allowed = 0.242"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.000" @ 5'- 3.2"
MAX HORIZ. TL DEFL = 0.000" @ 5'- 3.2"

Wind: 110 mph, h=61.6ft, TCDL=13.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir).
load duration factor=1.6,
End vertical(s) not exposed to wind,
Truss designed for wind loads
in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

May 2,2019

JOB NAME: WESTMAN MILL - A21S

Scale: 0.5215

Truss: A21S

DATE: 5/1/2019
SEQ.: K6059051
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x6 HF #2
BC: 2x4 HF #2
WEBS: 2x4 HF STD/STUD

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

Plateline to peak (L): 4-08-06
Plateline to peak (R): 3-02-11

TRUSS SPAN 3'- 5.0"
LOAD DURATION INCREASE = 1.15 (Non-Rep)
SPACED 24.0" O.C.

LOADING
LL(30.0)+DL(12.0) ON TOP CHORD = 42.0 PSF
DL ON BOTTOM CHORD = 10.0 PSF
TOTAL LOAD = 52.0 PSF

LL = 30 PSF Ground Snow (Pg)

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00
1-2=(0) 8 3-4=(0) 7 1-3=(-137) 18 2-4=(-135) 18
3-2=(-20) 1

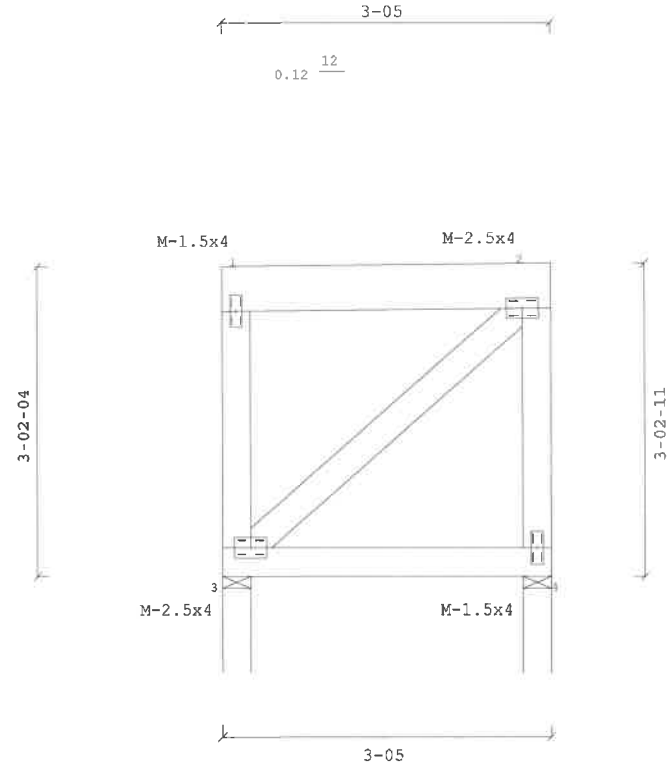
BEARING LOCATIONS	MAX VERT REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 187V	3.50"	0.46	HF (405)
3'- 5.0"	0/ 168V	3.50"	0.42	HF (405)

Weight: 21.11 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX TC PANEL LL DEFL = -0.006" @ 1'- 7.6" Allowed = 0.174"
MAX BC PANEL TL DEFL = -0.012" @ 1'- 9.4" Allowed = 0.174"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.000" @ 3'- 3.2"
MAX HORIZ. TL DEFL = 0.000" @ 3'- 3.2"

Wind: 110 mph, h=61.6ft, TCDL=7.2,BCDL=6.0, ASCE 7-10, (All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir), load duration factor=1.6, End vertical(s) not exposed to wind, Truss designed for wind loads in the plane of the truss only.



ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

Checking by PCS is only for conformance of design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

January 25,2019

JOB NAME: WESTMAN MILL - A22

Scale: 0.5243

Truss: A22

DATE: 1/24/2019
SEQ.: K5650405
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
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2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

LUMBER SPECIFICATIONS
TC: 2x4 HF #2
BC: 2x6 HF #2
WEBS: 2x4 HF STD/STUD

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

Plateline to peak: 3-02-10

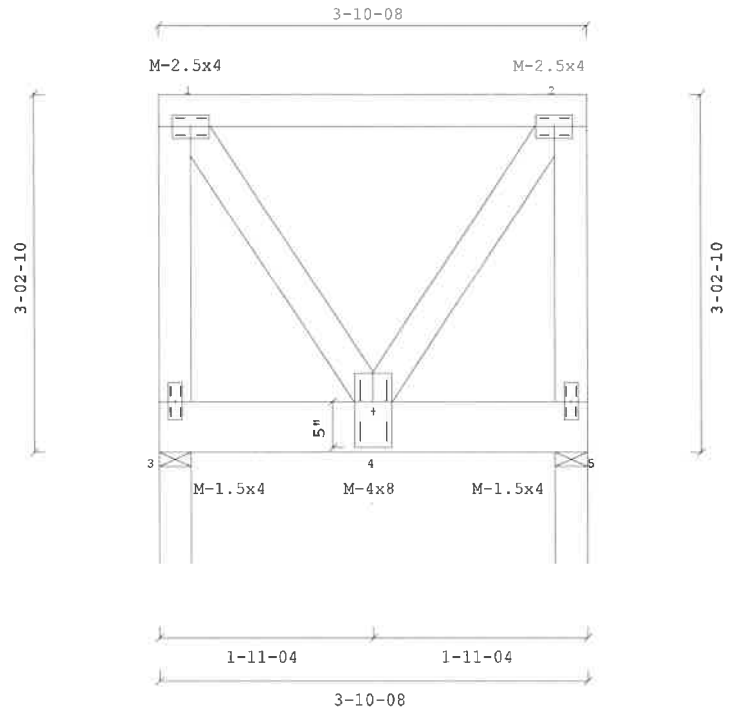
Single member as shown.
Hangers attached to the bottom chord
will have 1.5" max. nail penetration.

3-10-08 GIRDER SUPPORTING 23-07-08 FROM 0-11-04 TO 2-11-04
3-10-08 GIRDER SUPPORTING 5-05-00
LOAD DURATION INCREASE = 1.15 (Non-Rep)

LOADING
LL = 30 PSF Ground Snow (Pg)

TC UNIF LL(	60.0)+DL(	24.0)=	84.0 PLF	0'- 0.0" TO	3'- 10.5" V
BC UNIF LL(	0.0)+DL(	20.0)=	20.0 PLF	0'- 0.0" TO	0'- 11.2" V
BC UNIF LL(	324.4)+DL(	257.9)=	582.2 PLF	0'- 11.2" TO	2'- 11.2" V
BC UNIF LL(	0.0)+DL(	20.0)=	20.0 PLF	2'- 11.2" TO	3'- 10.5" V
BC UNIF LL(	51.3)+DL(	37.6)=	88.8 PLF	0'- 0.0" TO	3'- 10.5" V

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.



This design prepared from computer input by
RTS - DENNIS

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00
1-2=(-341) 0 3-4=(0) 35 3-1=(-692) 0 2-5=(-692) 0
4-5=(0) 35 1-4=(0) 611
4-2=(0) 611

BEARING LOCATIONS	MAX VERT REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 936V	3.50"	2.31	HF (405)
3'- 10.5"	0/ 936V	3.50"	2.31	HF (405)

Weight: 25.78 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.005" @ 1'- 11.2" Allowed = 0.110"
MAX DL DEFL = -0.004" @ 1'- 11.2" Allowed = 0.165"
MAX TL DEFL = -0.009" @ 1'- 11.2" Allowed = 0.165"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.000" @ 3'- 8.8"
MAX HORIZ. TL DEFL = 0.000" @ 3'- 8.8"

Wind: 110 mph, h=21.6ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
End vertical(s) not exposed to wind,
Truss designed for wind loads
in the plane of the truss only.

ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

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XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

January 25,2019

JOB NAME: WESTMAN MILL - X1

Scale: 0.6026

Truss: X1

DATE: 1/24/2019
SEQ.: K5650420
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
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2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x4 HF #2
BC: 2x6 HF #2
WEBS: 2x4 HF STD/STUD;
2x8 HF #2 A

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

Plateline to peak: 3-02-06

(2) complete trusses required.
Attach 2 ply with 3"x.131 DIA GUN nails staggered:
9" oc in 1 row(s) throughout 2x4 top chords,
5" oc in 2 row(s) throughout 2x6 bottom chords,
9" oc in 1 row(s) throughout 2x4 webs,
9" oc in 2 row(s) throughout 2x8 webs.

8-11-00 GIRDER SUPPORTING 22-07-08 FROM 0-00-00 TO 4-00-00
8-11-00 GIRDER SUPPORTING 25-07-08 FROM 6-00-00 TO 8-11-00
LOAD DURATION INCREASE = 1.15 (Non-Rep)

LOADING
LL = 30 PSF Ground Snow (Pg)

TC UNIF LL(	60.0)+DL(	44.0)=	104.0 PLF	0'- 0.0" TO	8'- 11.0"	V
BC UNIF LL(	309.4)+DL(	350.0)=	659.4 PLF	0'- 0.0" TO	4'- 0.0"	V
BC UNIF LL(	0.0)+DL(	20.0)=	20.0 PLF	4'- 0.0" TO	8'- 11.0"	V
BC UNIF LL(	354.4)+DL(	378.0)=	732.4 PLF	6'- 0.0" TO	8'- 11.0"	V

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00
1-2=(0) 8 4-5=(0) 36 1-4=(-184) 0 2-6=(-54) 0
2-3=(0) 8 5-6=(0) 36 4-2=(-54) 0 6-3=(-184) 0
5-2=(-496) 0

BEARING LOCATIONS	MAX VERT REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 1490V	3.50"	3.68	HF (405)
4'- 5.5"	0/ 2791V	7.00"	6.89	HF (405)
8'- 11.0"	0/ 1518V	3.50"	3.75	HF (405)

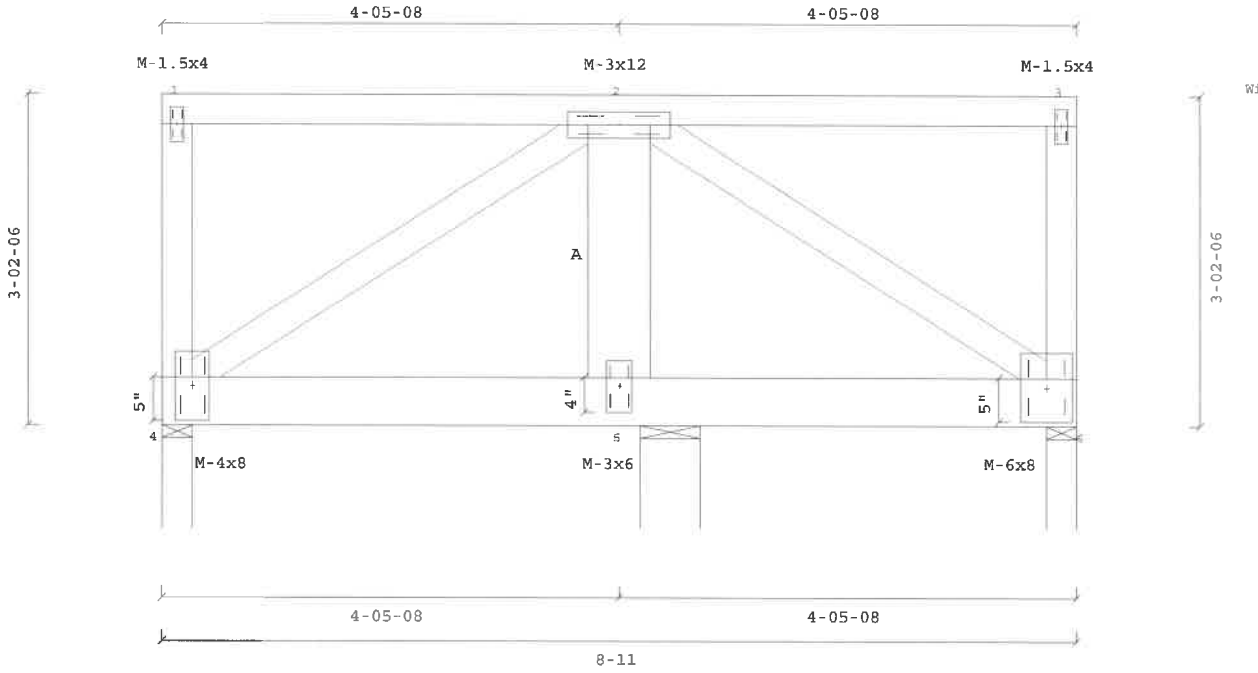
PROVIDE FULL BEARING:Jts:4,5,6

Weight: 104.82 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX BC PANEL LL DEFL = -0.015" @ 2'- 2.7" Allowed = 0.180"
MAX BC PANEL TL DEFL = -0.031" @ 2'- 2.7" Allowed = 0.239"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.000" @ 8'- 7.5"
MAX HORIZ. TL DEFL = 0.000" @ 8'- 7.5"

Wind: 110 mph, h=61.6ft, TCDL=13.2,BCDL=6.0, ASCE 7-10, (All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir), load duration factor=1.6,
End vertical(s) not exposed to wind,
Truss designed for wind loads in the plane of the truss only.



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XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

May 2,2019

JOB NAME: WESTMAN MILL - X2S

Scale: 0.5587

Truss: X2S

DATE: 5/1/2019
SEQ.: K6059052
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
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MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

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3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS ~ DENNIS

LUMBER SPECIFICATIONS
TC: 2x4 HF #2
BC: 2x6 HF #2
WEBS: 2x4 HF STD/STUD

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

Plateline to peak: 3-02-10

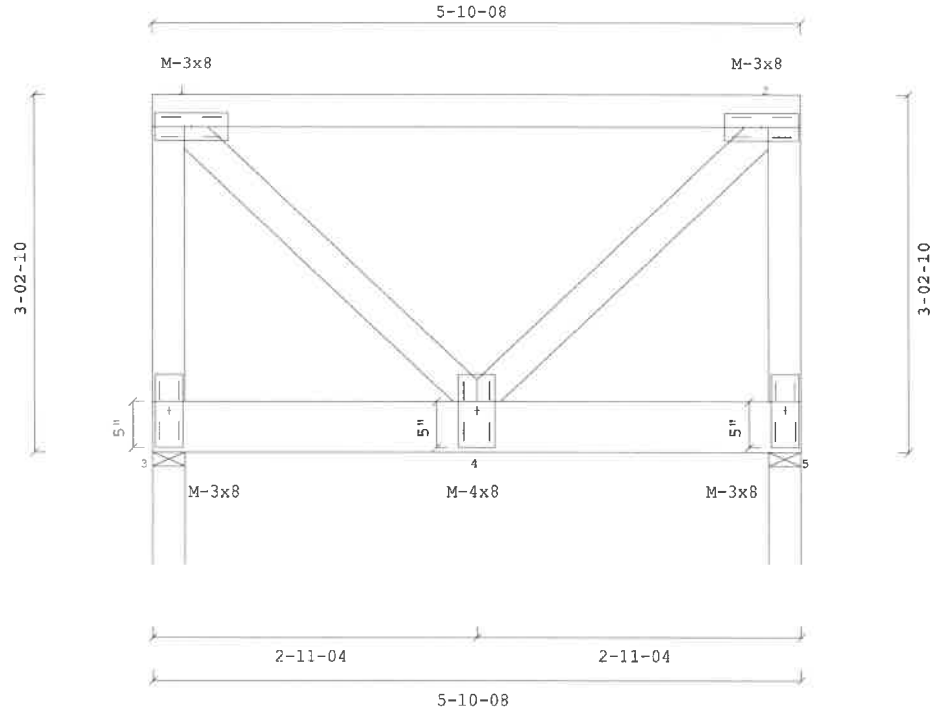
Single member as shown.
Hangers attached to the bottom chord
will have 1.5" max. nail penetration.

5-10-08 GIRDER SUPPORTING 23-07-08 FROM 0-11-04 TO 4-11-04
5-10-08 GIRDER SUPPORTING 5-05-00
LOAD DURATION INCREASE = 1.15 (Non-Rep)

LOADING
LL = 30 PSF Ground Snow (Pg)

TC UNIF LL{	60.0)+DL{	24.0)=	84.0 PLF	0'- 0.0" TO	5'- 10.5" V
BC UNIF LL{	0.0)+DL{	20.0)=	20.0 PLF	0'- 0.0" TO	0'- 11.2" V
BC UNIF LL{	324.4)+DL{	257.9)=	582.2 PLF	0'- 11.2" TO	4'- 11.2" V
BC UNIF LL{	0.0)+DL{	20.0)=	20.0 PLF	4'- 11.2" TO	5'- 10.5" V
BC UNIF LL{	51.3)+DL{	37.6)=	88.8 PLF	0'- 0.0" TO	5'- 10.5" V

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP
AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.



IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00
1-2=(-1000) 0 3-4={0) 64 3-1=(-1254) 0 2-5=(-1254) 0
4-5={0) 64 1-4=(0) 1374
4-2=(0) 1374

BEARING LOCATIONS	MAX VERT REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 1691V	3.50"	4.18	HF (405)
5'- 10.5"	0/ 1691V	3.50"	4.18	HF (405)

Weight: 34.77 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.014" @ 2'- 11.2" Allowed = 0.176"
MAX DL DEFL = -0.011" @ 2'- 11.2" Allowed = 0.265"
MAX TL DEFL = -0.025" @ 2'- 11.2" Allowed = 0.265"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.000" @ 5'- 8.8"
MAX HORIZ. TL DEFL = 0.000" @ 5'- 8.8"

Wind: 110 mph, h=21.6ft, TCDL=7.2,BCDL=6.0, ASCE 7-10,
(All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir),
load duration factor=1.6,
End vertical(s) not exposed to wind,
Truss designed for wind loads
in the plane of the truss only.

ROOF TRUSS SUPPLY, INC.
P.O. BOX 532
WOODINVILLE, WA 98072
(425) 481-0900

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XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

January 25,2019

JOB NAME: WESTMAN MILL - X3

Scale: 0.6016

Truss: X3

DATE: 1/24/2019
SEQ.: K5650422
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
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MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

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2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

This design prepared from computer input by
RTS - DENNIS

LUMBER SPECIFICATIONS
TC: 2x4 HF #2
BC: 2x6 HF #2
WEBS: 2x4 HF STD/STUD

TC LATERAL SUPPORT <= 12"OC. UON.
BC LATERAL SUPPORT 120"OC. UON.

Plateline to peak: 3-02-04

(2) complete trusses required.
Attach 2 ply with 3"x.131 DIA GUN nails staggered:
9" oc in 1 row(s) throughout 2x4 top chords,
6" oc in 2 row(s) throughout 2x6 bottom chords,
9" oc in 1 row(s) throughout 2x4 webs.

9-09-00 GIRDER SUPPORTING 25-10-00
LOAD DURATION INCREASE = 1.15 (Non-Rep)

LOADING
LL = 30 PSF Ground Snow (Pg)
TC UNIF LL(60.0)+DL(24.0)= 84.0 PLF 0'- 0.0" TO 9'- 9.0" V
BC UNIF LL(357.5)+DL(282.2)= 639.7 PLF 0'- 0.0" TO 9'- 9.0" V

BOTTOM CHORD CHECKED FOR 10PSF LIVE LOAD. TOP AND BOTTOM CHORD LIVE LOADS ACT NON-CONCURRENTLY.

IBC 2015 MAX MEMBER FORCES 4WR/DHF/Cq=1.00

1-2=(	0)	6	5-6=(0)	2418	1-5=(	-122)	6	7-3=(	0)	1996
2-3=(-2632)	0		6-7=(0)	2552	5-2=(-3372)		0	3-8=(-3478)		0
3-4=(	0)	6	7-8=(0)	2552	2-6=(	0)	2072	8-4=(-130)		6
					6-3=(	0)	112			

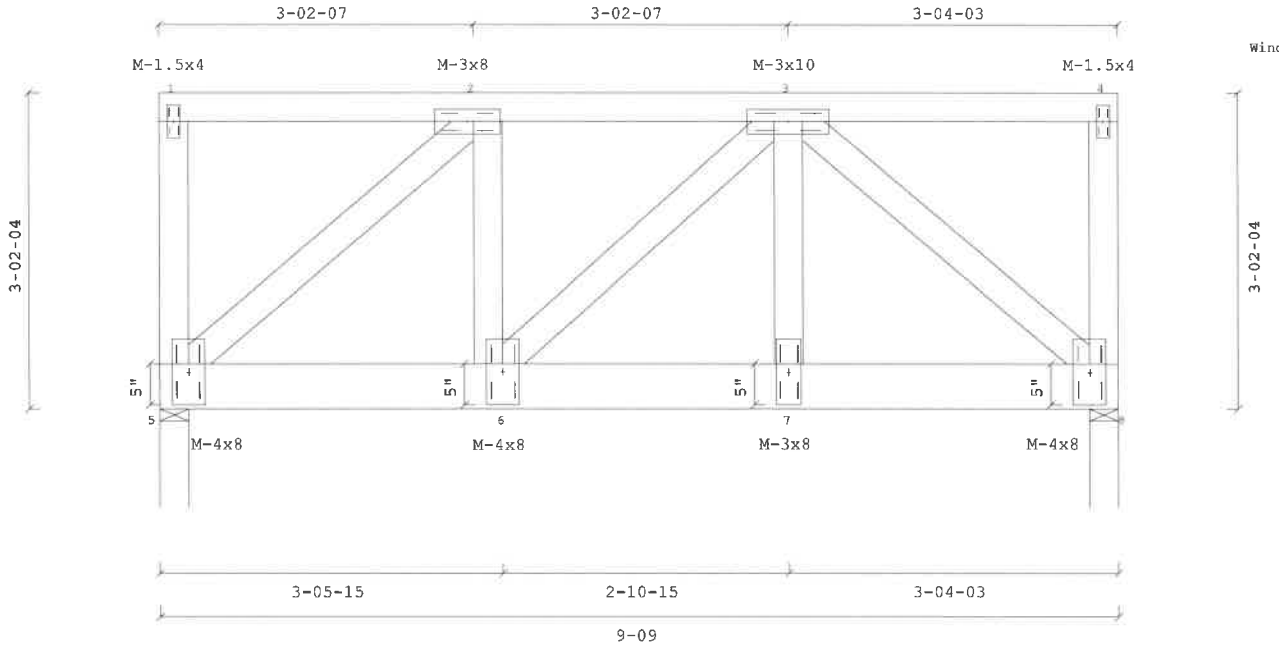
BEARING LOCATIONS	MAX VERT REACTIONS	BRG SIZE	REQUIRED BRG AREA SQ.IN.	(SPECIES)
0'- 0.0"	0/ 3528V	3.50"	8.71	HF (405)
9'- 9.0"	0/ 3528V	3.50"	8.71	HF (405)

Weight: 116.12 lb

VERTICAL DEFLECTION LIMITS: LL=L/360, TL=L/240
MAX LL DEFL = -0.021" @ 6'- 4.8" Allowed = 0.306"
MAX DL DEFL = -0.016" @ 6'- 4.8" Allowed = 0.458"
MAX TL DEFL = -0.037" @ 6'- 4.8" Allowed = 0.458"
SEASONED LUMBER IN DRY SERVICE CONDITIONS

MAX HORIZ. LL DEFL = 0.007" @ 9'- 5.5"
MAX HORIZ. TL DEFL = 0.013" @ 9'- 5.5"

Wind: 110 mph, h=21.6ft, TCDL=7.2,BCDL=6.0, ASCE 7-10, (All Heights), Enclosed, Cat.2, Exp.B, MWFRS(Dir), load duration factor=1.6,
End vertical(s) not exposed to wind,
Truss designed for wind loads in the plane of the truss only.



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XIAOMING ZHAO
STATE OF WASHINGTON
54074
REGISTERED
PROFESSIONAL ENGINEER

January 25,2019

JOB NAME: WESTMAN MILL - X4

Scale: 0.5358

Truss: X4

DATE: 1/24/2019
SEQ.: K5650423
TRANS ID: LINK

WARNINGS:
1. Builder and erection contractor should be advised of all General Notes and Warnings before construction commences.
2. 2x4 compression web bracing must be installed where shown +.
3. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer.
4. No load should be applied to any component until after all bracing and fasteners are complete and at no time should any loads greater than design loads be applied to any component.
5. CompuTrus has no control over and assumes no responsibility for the fabrication, handling, shipment and installation of components.
6. This design is furnished subject to the limitations set forth by TPI/WTCA in BCSI, copies of which will be furnished upon request.

MiTek USA, Inc./CompuTrus Software 7.6.8(1L)-E

GENERAL NOTES, unless otherwise noted:
1. This design is based only upon the parameters shown and is for an individual building component. Applicability of design parameters and proper incorporation of component is the responsibility of the building designer.
2. Design assumes the top and bottom chords to be laterally braced at 2' o.c. and at 10' o.c. respectively unless braced throughout their length by continuous sheathing such as plywood sheathing(TC) and/or drywall(BC).
3. 2x Impact bridging or lateral bracing required where shown + +
4. Installation of truss is the responsibility of the respective contractor.
5. Design assumes trusses are to be used in a non-corrosive environment, and are for "dry condition" of use.
6. Design assumes full bearing at all supports shown. Shim or wedge if necessary.
7. Design assumes adequate drainage is provided.
8. Plates shall be located on both faces of truss, and placed so their center lines coincide with joint center lines.
9. Digits indicate size of plate in inches.
10. For basic connector plate design values see ESR-1311, ESR-1988 (MiTek)

TABLES

WMC 2015 TABLE 507.1.2 TYPE OF HOOD REQUIRED FOR DOMESTIC COOKING APPLIANCES IN THE FOLLOWING SPACES		
TYPE OF SPACE	TYPE OF COOKING	TYPE OF HOOD
CHURCH	1. BOILING, STEAMING AND WARMING PRECOOKED FOOD	TYPE II HOOD
	2. ROASTING, PAN FRYING AND DEEP FRYING	TYPE I HOOD
COMMUNITY OR PARTY ROOM IN APARTMENT AND CONDOMINIUM	1. BOILING, STEAMING AND WARMING PRECOOKED FOOD	RESIDENTIAL HOOD OR TYPE II HOOD
	2. ROASTING, PAN FRYING AND DEEP FRYING	TYPE I HOOD
DAYCARE	1. BOILING, STEAMING AND WARMING PRECOOKED FOOD	RESIDENTIAL HOOD OR TYPE II HOOD
	2. ROASTING, PAN FRYING AND DEEP FRYING	TYPE I HOOD
DORMITORY,BOARDING HOME, NURSING HOME	1. BOILING, STEAMING AND WARMING PRECOOKED FOOD	TYPE II HOOD
	2. ROASTING, PAN FRYING AND DEEP FRYING	TYPE I HOOD
OFFICE LUNCH ROOM	1. BOILING, STEAMING AND WARMING PRECOOKED FOOD	RESIDENTIAL HOOD OR TYPE II HOOD
	2. ROASTING, PAN FRYING AND DEEP FRYING	TYPE I HOOD

PER WSMC 2015, TABLE 507.1.2 THE RANGE HOOD IN BUILDING A WILL BE A RESIDENTIAL HOOD THAT IS VENTED TO THE OUTSIDE. TYPE OF COOKING INCLUDES BOILING, STEAMING, AND WARMING PRECOOKED FOODS.

NOTE:
. COMMERCIAL COOKING APPLIANCES SHALL COMPLY WITH SECTION 507.2

. REQUIREMENT IN THE TABLE APPLY TO ELECTRIC OR GAS FUEL APPLIANCES ONLY. SOLID FUEL APPLIANCES OR CHARBOILERS REQUIRE TYPE 1 HOODS.

. RESIDENTIAL HOOD SHALL VENTILATE TO THE OUTSIDE.

. TYPE II HOOD REQUIRES WHEN MORE THAN ONE APPLIANCE IS USED

DRYER EXHAUST LENGTH (1)(2)(3)		
BASIC OF DESIGN MODEL #	WED75HEDW	WET4027EW
# OF 90° ELBOWS	MAXIMUM DUCT LENGTH (FT) WITHOUT BOOSTER FAN	
0	64	64
1	54	54
2	44	44
3	35	35
4	27	27

NOTE:
(1) LENGTHS GIVEN FOR RECOMMENDED 4"Ø VENT WITH 4" WALL CAP. FOR EXTRA 90° ELBOW, REDUCE THE ALLOWABLE VENT SYSTEM LENGTH BY 10 FT.
(2) PER WA MECHANICAL AMENDMENTS 504.4, DRYER EXHAUST SHALL HAVE BACKDRAFT DAMPER, NO SCREENS, NO SCREWS OR OTHER FASTENER THAT WILL OBSTRUCT FLOW, CANNON CONNECTED TO VENT CONNECTOR, VENT OR CHIMNEY, AND SHALL NOT EXTEND INTO OR THROUGH DUCT OR PLENUMS.
(3) PER IMC 504.8.6, CAPPED FUTURE DRYER EXHAUST IF THE DRYER IS NOT INSTALLED AT THE TIME OF OCCUPANCY.

WHOLE HOUSE VENTILATION CRITERIA				
UNIT	2015 WMC CRITERIA (1)			OUTDOOR AIR INLET REQUIREMENT (3)
	FLOOR AREA (SQFT)	NUMBER OF BEDROOMS	REQUIRED CFM (2)	REQUIRED TRICKLE VENT AREA (SQIN)
STUDIO	0–500	0	30	12
1 BEDROOM	500–1000	1	45	20
2 BEDROOM	1000–1500	2	70	28
TOWNHOUSE	1000–1500	3	70	28

NOTED:
(1) VENTILATION CRITERIA BASED ON THE WMC TABLE 403.8.1
(2) MIN. OSA FOR OPERATING CONTINUOUSLY
(3) OUTDOOR AIR INLET REQUIREMENT BASE ON THE WMC 403.8.6.1

CALCULATIONS

VENTILATION CALCULATIONS									
ROOM	EQUIPMENT	AREA, SF	OCCUPANTS, PEOPLE	CFM/ SQ FT	CFM/ PEOPLE	CFM (AREA)	CFM (OCC)	CFM REQUIRED	CFM PROVIDED
~~GAMEROOM~~	~~FCU-2-1~~	~~900~~	~~27~~	~~0.06~~	~~7.5~~	~~54~~	~~203~~	~~256~~	~~265~~
LOUNGE	FCU-1	705	21	0.06	7.5	42	159	201	225

PROJECT NOTES

WA STATE ENERGY CODE

1. HVAC THERMOSTATS SHALL BE SET TO MAINTAIN A MINIMUM DEADBAND OF 5°F IN AREAS SERVED AS REQUIRED PER WSEC C403.2.4.2.

2. PER WSEC 403.2.7, ALL DUCTS SHALL BE INSULATED AS FOLLOWS:

DUCT INSULATION SCHEDULE			
WSEC	SUPPLY & RETURN AIR DUCTS IN UNCONDITIONED SPACE	MINERAL–WOOL BLANKET	6.0
	SUPPLY & RETURN AIR DUCTS LOCATED OUTSIDE THE BUILDING	MINERAL–WOOL BLANKET	8.0
	SUPPLY WITH SA TEMP <55°F OR >105°F WITHIN CONDITIONED SPACE	MINERAL–WOOL BLANKET	3.3
	SUPPLY DUCTS EXPOSED WITHIN CONDITIONED SPACE	MINERAL–WOOL BLANKET	0.0
	OUTSIDE AIR FROM EXTERIOR OF BUILDING TO AUTOMATIC SHUT–OFF DAMPER OR HEATING OR COOLING EQUIPMENT AND GREATER THAN 2,800 CFM	MINERAL–WOOL BLANKET	NOTE 2
	OUTSIDE AIR FROM EXTERIOR OF BUILDING TO AUTOMATIC SHUT–OFF DAMPER OR HEATING OR COOLING EQUIPMENT AND LESS THAN 2,800 CFM	MINERAL–WOOL BLANKET	7.0
	OUTSIDE AIR DUCT IN UNHEATED EQUIPMENT ROOMS WITH COMBUSTION AIR LOUVERS, ISOLATED FROM CONDITIONED SPACE AT SIDES, TOP AND BOTTOM WITH R–11 INSULATION	MINERAL–WOOL BLANKET	0.0
IMC W/ WASHINGTON STATE AMENDMENT	OUTSIDE AIR DUCT IN CONDITION SPACE	MINERAL–WOOL BLANKET	4.0
	FOR HEAT OR ENERGY RECOVERY VENTILATION SYSTEM, DUCT UPSTREAM OF HEAT EXCHANGER	MINERAL–WOOL BLANKET	4.0
	EXHAUST DUCTS IN UNCONDITIONED SPACE	MINERAL–WOOL BLANKET	4.0
	ROUND & RECTANGULAR EXHAUST AIR DUCTS IN UNCONDITIONED SPACE	MINERAL–WOOL BLANKET	N/A
	ROUND & RECTANGULAR SUPPLY AIR DUCTS, EXPOSED WITHIN CONDITIONED SPACE	MINERAL–WOOL BLANKET	N/A
	ROUND & RECTANGULAR RETURN AIR DUCTS, EXPOSED WITHIN CONDITIONED SPACE	MINERAL–WOOL BLANKET	N/A

NOTES
(1) DUCT INSULATION SHALL COMPLY WITH IMC AND WSEC
(2) DUCT SHALL MEET THE REQUIREMENTS OF METAL FRAMED WALLS PER WSEC TABLE C402.1.2
(3) VAPOR RETARDER IS INSTALLED ON SUPPLY AND OUTSIDE AIR DUCT PER IMC 604.11
(4) EXTERNAL DUCT INSULATION IS IDENTIFIABLE PER IMC 604.7
(5) ALL DUCTWORK IS CONSTRUCTED AND SEALED PER IMC
(6) INSULATION SHALL HAVE A MAXIMUM FLAME SPREAD INDEX OF 25 AND MAXIMUM SMOKE DEVELOPED INDEX OF 50 PER IMC 604.3

3. MOTORIZED DAMPERS: PER WSEC C402.4.5.2 PROVIDE MOTORIZED DAMPERS ON ALL OUTSIDE AIR INTAKES, EXHAUST OUTLETS AND RELIEF OUTLETS SERVING CONDITIONED SPACES WHICH CLOSE AUTOMATICALLY WHEN THE SYSTEM IS OFF. RETURN AIR DAMPERS SHALL BE EQUIPPED WITH MOTORIZED DAMPERS. SEE WSEC C402.4.5.2 FOR EXCEPTIONS AND ADDITIONAL REQUIREMENTS.

COMMISSIONING REQUIREMENTS

BUILDING MECHANICAL SYSTEMS SHALL BE COMMISSIONED UNDER WSEC 2015 – SECTION C408

OUTSIDE AIR

OUTSIDE AIR: OUTSIDE AIR TO EACH RESIDENTIAL UNIT IS PROVIDED BY THE WHOLE HOUSE VENTILATION FAN. RATES WERE OBTAINED FROM TABLE 403.8.6. AIR PROVIDED THROUGH OPERABLE OPENINGS INSTALLED WITHIN THE WINDOW SYSTEM (TRICKLE VENTS). THE QUANTITY OF 4 SQUARE INCH TRICKLE VENTS ARE IDENTIFIED IN THE WHOLE HOUSE VENTILATION CRITERIA SCHEDULE. TRICKLE VENTS MAY BE COMBINED INTO LARGER VENT OF EQUIVALENT AREA. EACH EXTERIOR OCCUPIABLE LIVING SPACE SHALL BE PROVIDED WITH WITH AT LEAST ONE TRICKLE VENT.

THE BATHROOM EXHAUST FAN SHALL BE USED AS THE WHOLE HOUSE EXHAUST FAN. WHOLE HOUSE FAN TO BE EQUIPPED WITH AN ECM MOTOR AND 2–SPEED MOTOR. FAN TO RUN CONTINUOUSLY ON LOW SPEED AND HIGH SPEED SHALL BE ACTIVATED BY A FACTORY MOUNTED MOTION SENSOR. WHOLE HOUSE VENTILATION FANS SHALL OPERATE CONTINUOUSLY.

EXHAUST FAN ONLY VENTILATION SYSTEMS SHALL BE PROVIDED WITH OUTDOOR AIR TO EACH OCCUPIED SPACE, AND OR ANY SPACE THAT CAN BE OCCUPIED THROUGH ONE OF THE FOLLOWING METHODS:

OUTDOOR AIR MAY BE DRAWN THROUGH AIR INLETS INSTALLED IN EXTERIOR WALLS OR WINDOWS. THE AIR INLETS SHALL COMPLY WITH ALL OF THE FOLLOWING:

1. INLETS SHALL HAVE CONTROLLABLE, SECURE OPENINGS AND SHALL BE DESIGNED TO NOT COMPROMISE THE THERMAL PROPERTIES OF THE BUILDING ENVELOPES.
2. INLETS SHALL BE ACCESSIBLE TO OCCUPANTS INCLUDING COMPLIANCE WITH THE BARRIER FREE CODE.
3. INLETS SHALL BE SCREENED OR OTHERWISE PROTECTED FROM ENTRY BY INSECTS, LEAVES OR OTHER MATERIAL.
4. INLETS SHALL PROVIDE NOT LESS THAN 4 SQUARE INCHES OF NET FREE AREA FOR EACH 10 CFM OF OUTDOOR AIR REQUIRED.
5. INTERNATIONAL MECHANICAL CODE, SECTION 401.2, ITEM #1, AS AMENDED BY THE STATE OF WASHINGTON.

APPLICABLE CODES

2015 INTERNATIONAL BUILDING CODE (IBC)
2015 INTERNATIONAL MECHANICAL CODE (IMC)
2015 UNIFORM PLUMBING CODE (UPC)
2017 NATIONAL ELECTRIC CODE (NEC)
2015 WASHINGTON STATE ENERGY CODE (WSEC)

WHOLE HOUSE VENTILATION

1. EACH DWELLING UNIT SHALL BE EQUIPPED WITH A WHOLE HOUSE VENTILATION SYSTEM AND SHALL COMPLY WITH SECTIONS 403.8.1 THROUGH 403.8.11 OF THE 2015 IMC WITH WASHINGTON STATE AMENDMENTS.

2. LOCATION OF CONTROLS. CONTROLS FOR ALL VENTILATION SYSTEMS SHALL BE READILY ACCESSIBLE BY THE OCCUPANT.

3. INSTRUCTIONS. OPERATING INSTRUCTIONS FOR WHOLE HOUSE VENTILATION SYSTEMS SHALL BE PROVIDED TO THE OCCUPANT BY THE INSTALLER OF THE SYSTEM.

4. LOCAL VENTILATION SYSTEMS. LOCAL VENTILATION SYSTEMS SHALL BE CONTROLLED BY MANUAL SWITCHES, DEHUMIDISTATS, TIMERS, OR OTHER APPROVED MEANS.

5. CONTINUOUS WHOLE HOUSE VENTILATION SYSTEMS. CONTINUOUS WHOLE HOUSE VENTILATION SYSTEMS SHALL OPERATE CONTINUOUSLY. EXHAUST FANS, FORCED–AIR SYSTEM FANS, OR SUPPLY FANS SHALL BE EQUIPPED WITH "FAN ON" AS OVERRIDE CONTROLS. CONTROLS SHALL BE CAPABLE OF OPERATING THE VENTILATION SYSTEM WITHOUT ENERGIZING OTHER ENERGY–CONSUMING APPLIANCES. A LABEL SHALL BE AFFIXED TO THE CONTROLS THAT READS "WHOLE HOUSE VENTILATION (SEE OPERATING INSTRUCTIONS)."

6. WHOLE HOUSE FANS SHALL HAVE A SONE RATING OF 1.0 OR LESS MEASURED AT 0.1" WATER GAUGE.

7. CONFIRM WITH WINDOW SUPPLIER THAT THE WINDOWS WILL BE EQUIPPED WITH OUTDOOR AIR INLETS. IF THEY DO NOT, PROVIDE OUTDOOR AIR INLETS COMPLYING WITH SECTION 403.8.6.1 OF THE 2015 IMC WITH WASHINGTON STATE AMENDMENTS.

SMOKE CONTROL NOTES

1. SMOKE CONTROL SYSTEM SHALL BE INSPECTED BY A THIRD PARTY AGENCY. PROVIDE THIRD PARTY REPORT PRIOR TO ROUGH INSPECTION.

2. CONTRACTOR IS TO SUPPORT ALL TESTING AND INSPECTIONS WORK AS REQUIRED.

3. PER WSBC 1010.1.3, THE FIRE DOOR LATCH SHALL RELEASE WHEN SUBJECTED TO 15–LBS FORCE. THE FIRE DOOR SHALL BE SET IN MOTION WHEN SUBJECTED TO A 30–LBS FORCE. THE DOOR SHALL SWING TO A FULL–OPEN POSITION WHEN SUBJECTED TO A 15–LBS FORCE.

4. SMOKE DETECTION SYSTEM CONTROL SHALL COMPLY WITH SMC 606
4.1. PER WSMC 606.1, DUCT SMOKE DETECTOR SHALL COMPLY WITH UL 268A.
4.2. PER WSMC 606.1, OTHER SMOKE DETECTOR SHALL COMPLY WITH UL 268.
4.3. PER WSMC 606.2.1, SMOKE DETECTOR SHALL BE INSTALLED IN RETURN AIR SYSTEM WITH DESIGN CAPACITY GREATER THAN 2,000 CFM.
4.4. PER WSMC 606.2.2, WHERE MULTIPLE AIR–HANDLER SYSTEM SHARE COMMON DUCT OR PLENUM WITH COMBINED DESIGN CAPACITY GREATER THAN 2,000 CFM SHALL BE INSTALLED SMOKE DETECTOR IN RETURN AIR SYSTEM.

5. PRESSURIZATION SYSTEM SHALL COMPLY WITH WSBC 909.

6. PER WSBC 909.4.6, SMOKE CONTROL SYSTEM SHALL BE CAPABLE OF CONTINUED OPERATION AFTER DETECTION OF THE FIRE EVENT FOR PERIOD OF NOT LESS THAN EITHER 20 MINUTES OR 1.5 TIMES THE CALCULATED EGRESS TIME, WHICHEVER IS GREATER.

7. PER WSBC 909.10.2, DUCTS SHALL BE LEAK TESTED TO 1.5 TIMES THE MAXIMUM DESIGN PRESSURE IN ACCORDANCE TO INDUSTRY STANDARD. MEASURED LEAKAGE SHALL NOT EXCEED 5% OF DESIGN FLOW

8. PER WSBC 909.10.5, BELT–DRIVEN FANS SHALL HAVE 1.5 TIMES THE NUMBER OF BELTS REQUIRED FOR THE DESIGN DUTY, WITH THE MINIMUM NUMBER OF BELTS BEING TWO.

9. PER WSBC 909.10.5, MOTORS DRIVING FANS SHALL NOT BE OPERATED BEYOND THEIR NAMEPLATE HP AND SHALL HAVE A MINIMUM SERVICE FACTOR OF 1.15.

10. PER WSBC 909.11, SMOKE CONTROL SYSTEM SHALL BE PROVIDED STANDBY POWER PER SBC 2702.

11. PER WSBC 909.11.1, STANDBY POWER SOURCE AND TRANSFER SWITCH ROOM SHALL BE VENTILATED DIRECTLY TO AND FROM THE EXTERIOR.

12. PER WSBC 909.12, FIRE DETECTION AND SMOKE CONTROL SYSTEM SHALL COMPLY WITH UL 864 AND LISTED AS SMOKE CONTROL EQUIPMENT.

13. PER WSBC 909.16, THE FIREFIGHTER'S SMOKE CONTROL PANEL SHALL BE PROVIDED ADJACENT TO THE FIRE ALARM ANNUNCIATION AND CONTROL PANEL FOR MANUAL CONTROL OR OVERRIDE OF AUTOMATIC CONTROL FOR THE SMOKE CONTROL SYSTEM.

14. ACCEPTANCE TESTING PER WSBC 909.18.

15. STAIRWAY AND RAMP PRESSURIZATION ALTERNATIVE
15.2. PER WSBC 909.20.5, BUILDING EQUIPPED WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, VESTIBULE IS NOT REQUIRED, MAINTAIN MINIMUM POSITIVE PRESSURE OF 0.10 INCH OF WATER AND NOT MORE THAN 0.35 INCHES OF WATER. FAN SYSTEM SHALL BE EQUIPPED WITH VFD TO BALANCE OR MODULATE THE AIRFLOW
15.3. PER WSBC 909.20.6.2, PRESSURIZATION SYSTEM SHALL BE PROVIDED WITH STANDBY POWER IN ACCORDANCE WITH SECTION 2702.
15.4. PER 909.20.6.3, BEFORE MECHANICAL EQUIPMENT IN APPROVED, THE SYSTEM SHALL BE TESTED IN THE PRESENCE OF THE BUILDING OFFICIAL TO CONFIRM THAT THE SYSTEM IS OPERATING IN COMPLIANCE.

16. ELEVATOR HOISTWAY SHAFT
16.1. PER WSBC 909.21, ELEVATOR HOISTWAY SHAFT PRESSURIZATION IS PROVIDED IN LIEU OF ENCLOSED ELEVATOR LOBBIES.
16.2. PER WSBC 909.21.1, FAN SYSTEM SHALL BE EQUIPPED WITH VFD TO BALANCE OR MODULATE THE AIRFLOW TO MEET ELEVATOR HOISTWAY PRESSURE OF NOT LESS THAN 0.10 INCH OF WATER AND NOT MORE THAN 0.25 INCHES OF WATER AT THE MIDPOINT OF EACH HOISTWAY DOOR.
16.3. PER WSBC 909.21.1.1, SUPPLY AIR SHALL BE TAKEN DIRECTLY FORM AN OUTSIDE, UNCONTAMINATED SOURCE AT LEAST 20 FT FROM ANY OUTLET
16.4. PER WSEC 909.21.5, PRESSURIZATION SYSTEM SHALL BE PROVIDED WITH STANDBY POWER IN ACCORDANCE WITH SECTION 2702.

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TOWNZEN & ASSOCIATES PLAN APPROVAL
The plans submitted for review are approved in accordance with local state applicable standards. This approval does not relieve the applicant of the responsibility of compliance with the applicable codes.
4 Approved as submitted. 09/25/2019

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EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
4	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE
3	09/03/19	ASI-3

PROJECT NOTES, TABLES & CALCULATIONS

M001

MECHANICAL SCHEDULES

FAN SCHEDULE

EQUIP NO.	SERVICE	MOUNTING/ DISCHARGE	AIRFLOW, CFM	ESP. IN WG	ELECTRICAL VOLTAGE	ELECTRICAL HP	OPERATION	WEIGHT, LBS	BASIS OF DESIGN (1)(3)
BEF-1	UNIT BATHROOM	CEILING MOUNTED	45/80	0.25	120V/1P	FHP	(4)	12	PANASONIC FV-08VKM3 (2)
LEF-1	LAUNDRY ROOM	CEILING MOUNTED	60	0.25	120V/1P	FHP	(5)	12	PANASONIC FV-08VQC5
EF-1	ELECTRICAL ROOM	INLINE	75	0.5	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A200
EF-2	L1 WEST BIKE	INLINE	125	0.5	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A200
EF-3	L1 EAST BIKE	INLINE	125	0.5	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A200
EF-4	L2 RESTROOM	CEILING MOUNTED	80	0.25	120V/1P	FHP	(13)	12	PANASONIC FV-08VK3
EF-5	TRANSFER SWITCH	CEILING MOUNTED	110	0.25	120V/1P	FHP	(11)	12	PANASONIC FV-11VK3 (10)
EF-2A	L2 W CORRIDOR EXHAUST	INLINE	150	0.25	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A200
EF-2B	L2 E CORRIDOR EXHAUST	INLINE	150	0.25	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A200
EF-3A	L3 W CORRIDOR EXHAUST	INLINE	150	0.25	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A200
EF-3B	L3 E CORRIDOR EXHAUST	INLINE	150	0.25	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A200
EF-4A	L4 W CORRIDOR EXHAUST	INLINE	150	0.25	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A200
EF-4B	L4 E CORRIDOR EXHAUST	INLINE	150	0.25	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A200
EF-5A	L5 W CORRIDOR EXHAUST	INLINE	150	0.25	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A200
EF-5B	L5 E CORRIDOR EXHAUST	INLINE	150	0.25	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A200
SF-1	LEASE OFFICE	INLINE	200	0.25	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A200
SF-2	L2 CORRIDOR OSA	INLINE	300	0.25	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A390
SF-3	L3 CORRIDOR OSA	INLINE	300	0.25	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A390
SF-4	L4 CORRIDOR OSA	INLINE	300	0.25	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A390
SF-5	L5 CORRIDOR OSA	INLINE	300	0.25	120V/1P	FHP	CONTINUOUS	23	GREENHECK CSP-A390
TF-1	UNIT PER DRAWINGS	WALL MOUNTED	300	0.1	120V/1P	4/25	(12)	19	GREENHECK CBF-205-QD
EPF-1	ELEVATOR PRESSURIZATION	ROOF MOUNTED	5,750	1.0	208V/3P	2	(11)	319	GREENHECK TBI-FS-5L24-20 (6)(7)(8)(9)(10)
SPF-1	EAST STAIR PRESSURIZATION	ROOF MOUNTED	2,200	1.0	208V/3P	1.5	(11)	267	GREENHECK TBI-FS-4H24-15 (6)(7)(8)(9)(10)
SPF-2	WEST STAIR PRESSURIZATION	ROOF MOUNTED	2,200	1.0	208V/3P	1.5	(11)	267	GREENHECK TBI-FS-4H24-15 (6)(7)(8)(9)(10)

NOTES:
(1) PROVIDE BACKDRAFT DAMPERS ON EXHAUST FANS.
(2) PROVIDE SPEED CONTROLLER.
(3) VIBRATION ISOLATION: FANS < 125 LBS RUBBER ISOLATORS, FANS > 125 LBS SPRING ISOLATORS
(4) FAN SHALL BE 2-SPEED: 45 CFM CONTINUOUS LOW SETTING AND 80 CFM HIGH SPEED ACTIVATED BY INTEGRAL OCCUPANCY SENSOR ON FAN GRILLE.
(5) INTERLOCK WITH INTEGRAL HUMIDITY CONTROL
(6) EQUIPMENT TO BE TESTED IN PRESENCE OF BUILDING OFFICIAL PRIOR TO FINAL APPROVAL.
(7) PROVIDE VFD
(8) BELT-DRIVEN FANS SHALL HAVE 1.5 TIMES THE NUMBER OF BELTS REQUIRED FOR THE DESIGN DUTY, WITH THE MINIMUM NUMBER OF BELTS BEING TWO.
(9) MOTORS DRIVING FANS SHALL NOT BE OPERATED BEYOND THEIR NAMEPLATE HP AND SHALL HAVE A MINIMUM SERVICE FACTOR OF 1.15
(10) STANDBY POWER IN ACCORDANCE WITH IBC 2702
(11) INTERLOCK WITH SMOKE CONTROL SYSTEM
(12) INTERLOCK WITH WALL SWITCH
(13) INTERLOCK WITH LIGHT SWITCH

ELECTRIC WALL HEATERS

EQUIP NO.	SERVICE	MOUNTING/ DISCHARGE	BTU/HR	ELECTRICAL VOLTAGE	ELECTRICAL AMPS	ELECTRICAL INPUT KW	WEIGHT, LBS	BASIS OF DESIGN (1)
EWH-A	UNIT 101	WALL MOUNTED	2560	208V/1P	3.61	0.75	7.5	BROAN 170
EWH-B		WALL MOUNTED	2560	208V/1P	3.61	0.75	7.5	BROAN 170
EWH-C		WALL MOUNTED	2560	208V/1P	3.61	0.75	7.5	BROAN 170
EWH-D	UNIT 102	WALL MOUNTED	2560	208V/1P	3.61	0.75	7.5	BROAN 170
EWH-E		WALL MOUNTED	2560	208V/1P	3.61	0.75	7.5	BROAN 170
EWH-F		WALL MOUNTED	2560	208V/1P	3.61	0.75	7.5	BROAN 170
EWH-1	WEST STAIR	WALL MOUNTED	2560	208V/1P	3.61	0.75	7.5	BROAN 170
EWH-2	EAST STAIR	WALL MOUNTED	2560	208V/1P	3.61	0.75	7.5	BROAN 170
EWH-3	LEASE OFFICE	WALL MOUNTED	2560	208V/1P	3.61	0.75	7.5	BROAN 170
EWH-4	L2 CORRIDOR	WALL MOUNTED	2560	208V/1P	3.61	0.75	7.5	BROAN 170
EWH-5	L3 CORRIDOR	WALL MOUNTED	2560	208V/1P	3.61	0.75	7.5	BROAN 170
EWH-6	L4 CORRIDOR	WALL MOUNTED	2560	208V/1P	3.61	0.75	7.5	BROAN 170
EWH-7	L5 CORRIDOR	WALL MOUNTED	2560	208V/1P	3.61	0.75	7.5	BROAN 170

NOTES: (1) INSTALL UNITS AS SHOWN AND AS RECOMMENDED BY THE MANUFACTURER IN COMPLIANCE WITH LOCAL CODES. PROVIDE INTEGRAL THERMOSTAT.

SPLIT AIR CONDITIONER SCHEDULE – OUTDOOR UNIT

EQUIP NO.	SERVICE	NOMINCAL CAPACITY, TONS	TOTAL COOLING CAPACITY, BTUH	SEER (EER)	ELECTRICAL VOLTAGE	ELECTRICAL MCA	ELECTRICAL MOCP	BASIS OF DESIGN (1)(2)(3)(4)	CONNECTED INDOOR UNIT
OAC-1	ELEVATOR MACHINE ROOM	1.5	18,200	20.5	208V/1P	19	25	LG LSU180HSV4	IAC-1

NOTES:
(1) ARI LISTED WITH ALL STANDARD FEATURES, INSTALLATION ACCESSORIES AND COMPRESSOR SHORT CYCLING PROTECTION. FILTER DRIER, REFRIGERANT LINE FILTER, LIQUID SOLENOID VALVE, AND SAFETY PRESSURE SWITCHES. INSTALL REFRIGERANT TUBING IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
(2) WITH FACTORY OPTION ELECTRICAL DISCONNECT.
(3) ROUTING OF REFRIGERANT LINES FROM INDOOR TO OUTDOOR UNITS NOT SHOWN ON PLANS. CONTRACTOR TO FIELD COORDINATE ROUTING.
(4) PRIOR TO ORDERING, CONTRACTOR TO COORDINATE WITH ELEVATOR MFR TO ENSURE UNIT CAN ADEQUATELY COOL THE ROOM.

SPLIT AIR CONDITIONER SCHEDULE – INDOOR UNIT

EQUIP NO.	SERVICE	MOUNTING/ DISCHARGE	FAN AIRFLOW, CFM	FAN MOTOR DRIVE	ELECTRICAL VOLTAGE	BASIS OF DESIGN (1)(2)(3)	CONNECTED OUTDOOR UNIT
IAC-1	ELEVATOR MACHINE ROOM	HIGH WALL	620	FHP	208V/1P	LG LA180HSV4	OAC-1

NOTES:
(1) PROVIDE ELECTRICAL DISCONNECT SWITCH AND INDIVIDUAL THERMOSTAT FOR EACH UNIT.
(2) PRIOR TO ORDERING, CONTRACTOR TO COORDINATE WITH ELEVATOR MFR TO ENSURE UNIT CAN ADEQUATELY COOL THE ROOM.
(3) PROVIDE CONDENSATE PUMP KIT.

THROUGH-WALL HEAT PUMP SCHEDULE

EQUIP NO.	SERVICE	SUPPLY FAN AIRFLOW, CFM	SUPPLY FAN MOTOR HP	VENT MIN. OSA, CFM	COOLING BTUH	COOLING EER	HEATING BTUH	HEATING COP	AUX. HEAT, KW (208V)	ELECTRICAL VOLTAGE	ELECTRICAL MCA	ELECTRICAL MOP	BASIS OF DESIGN
TWHP-1	APARTMENT UNITS	370	1/8	45	12,000	10.7	11,300	3.2	2.5	208V/1P	14.1	15	AMANA PTH123G25 (1)(2)(3)

NOTES:
(1) EXTERIOR GRILLE SHALL BE THE ARCHITECTURAL GRILLE. COORDINATE STYLE AND COLOR WITH ARCHITECT. SIZE OF LOUVER SHALL BE COORDINATED WITH WINDOW MANUFACTURER.
(2) PROVIDE UNIT SUPPORT SUB-BASE RECEPTACLE ACCESSORY KIT WITH ATTACHMENT CORD.
~~(3) REFRIGERANT SHALL BE R-410A.~~
(4) PROVIDED 5-2 PROGRAMMABLE THERMOSTAT. THERMOSTAT SHALL BE CAPABLE OF BEING SET PER WSEC C403.2.4.10.

HEAT PUMP SCHEDULE – OUTDOOR UNIT

EQUIP NO.	SERVICE	CAPACITY, TONS	TOTAL COOLING CAPACITY, BTUH	SEER	TOTAL HEATING CAPACITY, BTUH	HSPF	ELECTRICAL VOLTAGE	ELECTRICAL MCA	ELECTRICAL MOCP	DIMENSIONS, INCHES L	DIMENSIONS, INCHES W	DIMENSIONS, INCHES H	WEIGHT, LBS	BASIS OF DESIGN (1)(2)(3)(4)	CONNECTED FAN COIL UNIT
HP-1	L2 LOUNGE	2.0	24,000	18.0	27,000	10	208V/1PH	20	30	16	38	33	129	LG LUU248HV	FCU-1

NOTES:
(1) ARI LISTED WITH ALL STANDARD FEATURES, INSTALLATION ACCESSORIES AND COMPRESSOR SHORT CYCLING PROTECTION. FILTER DRIVER, REFRIGERANT LINE FILTER, LIQUID SOLENOID VALVE, AND SAFETY PRESSURE SWITCHES. INSTALL REFRIGERANT TUBING AND LENGTH IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION.
(2) PROVIDE ALL REQUIRED ACCESSORIES FOR LOW-AMBIENT AND LONG-LINE APPLICATIONS.
(3) ROUTING OF REFRIGERANT LINES FROM INDOOR TO OUTDOOR UNITS NOT SHOWN ON PLANS. CONTRACTOR TO FIELD COORDINATE ROUTING.
(4) REFRIGERANT SHALL BE R-410A.

FAN COIL UNIT SCHEDULE – INDOOR UNIT

EQUIP NO.	SERVICE	MOUNTING/ DISCHARGE	FAN AIRFLOW, CFM	FAN ESP. IN WG	FAN MOTOR HP	FAN OSA MIN, CFM	ELECTRICAL VOLTAGE	DIMENSIONS, INCHES L	DIMENSIONS, INCHES W	DIMENSIONS, INCHES H	WEIGHT, LBS	BASIS OF DESIGN (1)	CONNECTED OUTDOOR UNIT
FCU-1	L2 LOUNGE	HORIZONTAL	700	0.5	FHP	(4)	(3)	21	49	18	129	LG LVN240HV4 (2)	HP-1

NOTES:
(1) REFRIGERANT SHALL BE R-410A.
(2) PROVIDE MIXING BOX AND ASSOCIATE CONTROLS FOR ECONOMIZER OPERATION
(3) POWERED BY OUTDOOR UNIT
(4) SEE VENTILATION CALCULATIONS ON SHEET M001 FOR OUTSIDE AIR REQUIREMENTS.

PLAN CHECK REVIEW NOTE:

ELEVATOR TESTING SHALL BE PERFORMED IN PRESENCE OF BUILDING OFFICIAL.

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TOWNZEN & ASSOCIATES PLAN APPROVAL
The plans submitted for review are approved in accordance with local state applicable standards. This approval does not relieve the applicant of the responsibility of compliance with the applicable codes.
4 Approved as submitted.
09/25/2019

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Reviewed for Code Compliance
Construction Permitting Only

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EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
1R	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE
3	09/03/19	ASI-3

MECHANICAL SCHEDULES

M002

GENERAL NOTES

GENERAL NOTES – MECHANICAL

1. REFERENCE TO RELATED WORK: "REF" INDICATIONS DENOTE WORK COVERED ELSEWHERE (ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL, LANDSCAPE, OR KITCHEN), OR ITEM BASED ON A SPECIFIC MANUFACTURER'S DIMENSIONS (VERIFY).

2. ELECTRICAL CHARACTERISTICS: REFER TO ELECTRICAL DRAWINGS FOR ELECTRICAL CHARACTERISTICS (VOLTAGES, ETC. OF MECHANICAL EQUIPMENT, UNLESS OTHERWISE INDICATED.

3. CODES: COMPLETE INSTALLATION OF THE MECHANICAL SYSTEM SHALL BE PER THE APPLICABLE BUILDING, MECHANICAL, ENERGY, PLUMBING, FIRE, AND HEALTH CODES AND REGULATIONS AS ADOPTED BY THE LOCAL AHJ.

4. PREPARE AND SUBMIT FOR REVIEW A SHOP DRAWING BASED ON FINAL STRUCTURAL SHOP DRAWINGS FOR LOCATING AND ROUTING ALL DUCTWORK, DAMPERS, EQUIPMENT, PIPING, ETC.
   A. COORDINATE FLOOR AND BEAM PENETRATIONS WITH STRUCTURAL.
   B. COORDINATE FINAL LOCATION AND ROUTING WITH CEILING, LIGHTS, WALLS, FIRE SPRINKLER PIPING, AND OTHER TRADES WORK.
   C. INCLUDE ADDITIONAL OFFSETS, ELBOWS, ROUTING, EQUIVALENT DUCT SIZING EXCHANGE, RELOCATING, ETC. AS REQUIRED FOR A COMPLETE OPERATING MECHANICAL SYSTEM.
   D. PROVIDE SHOP DRAWINGS AT NO ADDITIONAL COST TO THE OWNER.

5. MECHANICAL CONTRACTOR SHALL LOCATE AND COORDINATE EXACT LOCATION OF ALL MECHANICAL EQUIPMENT WITHIN THE STRUCTURE.

6. ACCESS DOORS: COORDINATE WITH ARCHITECT AND LOCATE ALL ACCESS DOORS ON SHOP DRAWINGS PRIOR TO BEGINNING OF CONSTRUCTION. ACCESS DOORS IN FIRE RATED STRUCTURE SHALL BE FIRE RATED. VERIFY ACCESS DOOR LOCATIONS WITH GENERAL CONTRACTOR PRIOR TO BIDDING.

7. RATED PENETRATION: DUCT PENETRATIONS THROUGH RATED ENCLOSURES SHALL BE FIRE/SMOKE DAMPERED PER THE LATEST EDITION OF THE UNDERWRITERS LABORATORIES(UL) FIRE RESISTANCE WITH HOURLY RATINGS FOR THROUGH-PENETRATION FIRE STOPS SYSTEM VOLUME #2, OR SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S UL LISTINGS (3M OR EQUIVALENT). DETERMINE REQUIREMENTS WITH GENERAL CONTRACTOR PRIOR TO BID.

8. EXHAUST OUTLETS: SOURCE-SPECIFIC FANS SHALL BE VENTED TO OUTDOORS WITH A MINIMUM 3' CLEARANCE BETWEEN VENT OUTLETS AND BUILDING OPENINGS, AND 10' MINIMUM BETWEEN VENT OUTLETS AND MECHANICAL AIR INTAKES.

9. ROOF PENETRATIONS: SEE ARCHITECTURAL DRAWINGS FOR ROOF CAP, ROOF CURB, ROOF DRAIN, AND VTR DETAILS.

10. EXPOSED PIPING: PROVIDE CHROME PLATING FOR EXPOSED PIPING IN FINISHED ROOMS.

11. PENETRATIONS: PROVIDE ESCUTCHEON PLATES FOR EXPOSED PIPING PENETRATIONS AND SHEET METAL FLASHING FOR EXPOSED DUCTWORK PENETRATIONS.

12. SHAFT AND PLENUM CONNECTIONS: SEAL CONNECTIONS TO AIR SHAFTS AIRTIGHT. PROVIDE AIRTIGHT SEAL AROUND PENETRATIONS IN AIR PLENUMS.

13. LIGHT FIXTURE CLEARANCE: COORDINATE LOCATIONS OF MECHANICAL WORK TO PROVIDE CLEARANCES OVER LIGHTING FIXTURES FOR REMOVAL AND REPLACEMENT.

14. MOTORS: COMPLY WITH ENERGY CODE ENFORCED BY AHJ FOR MINIMUM EFFICIENCIES UNDER FULL LOAD.

15. ACCESS CLEARANCES FOR MAINTENANCE AND REPLACEMENT: VERIFY PHYSICAL DIMENSIONS OF EQUIPMENT TO ENSURE THAT ACCESS CLEARANCES CAN BE MET. COORDINATE LOCATIONS OF MECHANICAL WORK AND WORK OF OTHER TRADES TO PROVIDE ACCESS CLEARANCES FOR SERVICE AND MAINTENANCE.

COORDINATION REQUIREMENTS

1. PIPING: COORDINATE WITH STRUCTURAL FOR EXACT LOCATION OF ALL STRUCTURAL FRAMING AND FOOTINGS AND FINALIZE THE EXACT ROUTING OF ALL PIPES WITH STRUCTURAL AND AT THE SITE PRIOR AND DURING THE CONSTRUCTION.

2. DUCTWORK: LOCATE AND COORDINATE THE EXACT LOCATION OF DUCTWORK WITH STRUCTURAL PLANS AND WITH THE GENERAL CONTRACTOR PRIOR TO INSTALLATION OF ANY STRUCTURE OR EQUIPMENT. COORDINATE WITH FRAMING CONTRACTOR TO ASSURE JOIST SPACES LINE UP WHEN DUCTWORK MUST PASS THROUGH DIFFERENT JOIST SPACES.

3. ADJUSTMENTS: ALL EQUIPMENT, MOTORS, FANS GAS BURNERS, IGNITION DEVICES, DRIVES, ETC. SHALL BE ADJUSTED AND BALANCED TO OPERATE AT SPECIFIED RATINGS AS REQUIRED FOR THIS PROJECT SITE AND ACCOUNTING FOR ELEVATION ABOVE SEA LEVEL.

4. APPROVALS: MECHANICAL AND PLUMBING EQUIPMENT SHALL BE APPROVED FOR INSTALLATION IN THE PROJECT LOCATION AND SHALL HAVE ALL CERTIFICATIONS AND RATINGS TO MEET ALL ENERGY, POLLUTION, ENVIRONMENTAL, SEISMIC, ETC. CODES AND REGULATIONS. THE CONTRACTOR SHALL COORDINATE WITH HIS MANUFACTURE SUPPLIERS AND SHALL INCLUDE ALL COSTS REQUIRED TO MEET THESE REQUIREMENTS IN HIS BID.

5. FIRE PROTECTION: CONTRACTOR SHALL PROVIDE A FULLY DESIGNED FIRE PROTECTION SPRINKLER SYSTEM IN COMPLIANCE WITH NFPA AND LOCAL CODES. PROVIDE DESIGN, PERMITS, MATERIALS, INSTALLATION, TESTING AND ALL OTHER FOR A FULLY OPERATIONAL SYSTEM. LOCATION OF ALL PIPING TO BE COORDINATED WITH OTHER TRADES.

6. FIREPLACES: COORDINATE WITH THE GENERAL CONTRACTOR TO DETERMINE GAS FIREPLACE FLUE AND COMBUSTION AIR DUCTWORK REQUIREMENTS PRIOR TO BIDDING.

PIPING NOTES

1. DISASSEMBLY PROVISIONS: PROVIDE UNIONS OR FLANGES AT PIPING CONNECTIONS TO EQUIPMENT, COILS, TRAPS, CONTROL VALVES, AND OTHER COMPONENTS TO ALLOW DISASSEMBLY FOR MAINTENANCE.

2. REDUCERS: PROVIDE AS REQUIRED FROM LINE PIPE SIZE TO EQUIPMENT, TRAP, COIL, AND CONTROL VALVE CONNECTION SIZES.

3. OFFSETS: PROVIDE FOR BRANCH LINES TO EQUIPMENT.

4. DIELECTRIC UNIONS: PROVIDE AT CONNECTIONS OF DISSIMILAR PIPE.

5. REFRIGERANT PIPING: PROVIDE SIZING & INSTALLATION IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

6. CONDENSATE DRAIN: PROVIDE A P-TRAP FOR EACH HVAC UNIT CONDENSATE PAN WITH PLUG TEES FOR CLEANING. CONDENSATE DRAINS SHALL BE DISCHARGED TO AN INDIRECT WASTE OR OUTSIDE.

INSULATION/LINING NOTES

1. ENERGY CODE: AS A MINIMUM, COMPLY WITH THICKNESSES AND TYPES LISTED IN ENERGY CODE ENFORCED BY AHJ.

2. EXTENT OF INTERNAL DUCT LINING:
   A. GRILLE AND DIFFUSER BOXES AND BOOTS.
   B. TRANSFER DUCTS.
   C. THE FIRST 10 FEET OF SUPPLY AND RETURN DUCTWORK FROM THE AIR HANDLER.

3. EXTENT OF EXTERNAL DUCT INSULATION:
   A. SUPPLY AND RETURN AIR IN UNCONDITIONED SPACES, MECHANICAL ROOMS, ELECTRICAL ROOMS, AND EQUIPMENT ROOMS NOT SPECIFIED TO BE INTERNALLY LINED.
   B. SUPPLY AIR ABOVE CEILINGS OR EXPOSED NOT SPECIFIED TO BE INTERNALLY LINED.
   C. OUTDOOR AIR INTAKE.

4. MISCELLANEOUS DUCT FITTINGS (CONICAL TAKEOFFS, ETC.): WRAP WITH INSULATION FOR CONDENSATION CONTROL.

PLAN NOTES

1. DUCTWORK SHALL BE METALLIC DUCTWORK

2. TEST AND BALANCE WORK SHALL BE PERFORMED BY AN INDEPENDENT TEST AND BALANCE AGENCY. PROVIDE (3) COPIES OF TEST AND BALANCE REPORT TO OWNER.

3. COORDINATE DUCTWORK WITH MISCELLANEOUS OBSTRUCTIONS IN CEILING SPACE.

4. RESTROOM EXHAUST SHALL BE A MINIMUM OF 10' FROM ANY MECHANICAL OUTSIDE AIR INTAKES.

5. ROUTE DUCTWORK UNDERNEATH JOISTS UON.

6. TRANSITION DUCT UNDER BEAMS AND DUCTS. FIELD VERIFY AVAILABLE CEILING CAVITY DIMENSIONS.

7. COORDINATE MOUNTING HEIGHT OF DIFFUSERS WITH ARCHITECTURAL PLANS.

SHEET METAL NOTES

1. REFERENCE: SMACNA HVAC DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE, CURRENT EDITION.

2. CLEARANCE: COORDINATE DUCTWORK WITH MISCELLANEOUS OBSTRUCTIONS IN CEILING SPACE.

3. ROUND ELBOWS AND OFFSETS: FULL RADIUS (R/D = 1.5), 5-PIECE SEGMENTED OR STAMPED. REFER TO SMACNA HVAC FIG 2-7, 3-3. DO NOT USE ANGLED OFFSET (TYPE 1). MITERED OFFSET (TYPE 2) MAY BE USED UP TO 30 DEGREE OFFSET ANGLE.

4. ROUND TEES AND LATERALS: CONICAL TEE PER SMACNA HVAC FIG 3-5; DO NOT USE STRAIGHT TEE; DO NOT USE CONICAL SADDLE TAP FOR EXPOSED DUCTWORK IN FINISHED SPACES. 90-DEGREE TEE WITH OVAL TO ROUND TAP, LATERAL, AND 45-DEGREE RECTANGULAR LEAD-IN PER SMACNA HVAC FIG 3-4.

5. RECTANGULAR ELBOWS AND OFFSETS: FULL RADIUS WHERE SPACE PERMITS, R/W = 1.5; OTHERWISE USE SQUARE CORNER ELBOW WITH TURNING VANES.

6. RECTANGULAR DIVIDED FLOW FITTINGS: USE GENERALLY, EXCEPT BRANCHES TO TERMINALS; SMACNA HVAC FIG 2-5, TYPES 1, 2, 4A, AND 4B. DO NOT USE TYPE 3.

7. TURNING VANES: H.E.P. MANUFACTURER OR APPROVED HIGH EFFICIENCY PROFILE AIRFOIL TYPE FOR RECTANGULAR SQUARE THROAT ELBOWS. ACOUSTICAL TYPE FOR RETURN AIR MITERED ELBOWS.

8. TAKEOFFS TO OPENINGS: CONICAL TYPE WITH VOLUME DAMPER FOR ROUND DUCT BRANCHES PER SMACNA HVAC FIG 2-6, MINIMUM INLET DIAMETER 2 INCHES LARGER THAN DUCT SIZE. 45 DEGREE ENTRY FITTING FOR RECTANGULAR DUCT BRANCHES PER SMACNA HVAC FIG 2-6.

9. FLEXIBLE CONNECTIONS: PROVIDE AT EACH DUCT CONNECTION TO FANS, PACKAGED HVAC EQUIPMENT, EXTERNALLY ISOLATED AIR HANDLING UNITS, FAN COIL UNITS, AND SIMILAR EQUIPMENT. EXCEPTION: EQUIPMENT IN CORRIDOR CEILING SPACES WHERE FIRE RATING IS REQUIRED.

HVAC NOTES

1. ATTACHMENTS: AIR DISTRIBUTION OUTLETS AND LOUVERS SHALL HAVE ALL REQUIRED ACCESSORIES AND ATTACHMENTS FOR A COMPLETE CONNECTION TO THE SPECIFIC TYPE OF STRUCTURE THAT THEY ARE BEING ATTACHED TO. THIS INCLUDES, BUT IS NOT LIMITED TO, EXTERIOR BRICKS, GWB WALLS, GWB CEILING, ETC.

2. DUCTWORK: DUCTWORK SHALL BE SMOOTH SHEET METAL (CLASS-1). DUCTWORK THROUGH FIRE RATED STRUCTURE AND FLOOR SHALL BE MIN. 26 GA. STEEL. MAXIMUM LENGTH OF FLEXIBLE DUCTS SHALL BE 5'-0", UNLESS OTHERWISE NOTED ON DRAWINGS. DUCTWORK SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS.

3. VOLUME DAMPERS: PROVIDE AN ACCESSIBLE MANUAL VOLUME DAMPER FOR EACH SUPPLY, RETURN, OSA, AND EXHAUST OPENING, LOCATED AS FAR UPSTREAM AS POSSIBLE FROM THE OPENING. PROVIDE A MANUAL VOLUME DAMPER FOR BRANCH MAINS SERVING MORE THAN ONE OPENING. VOLUME DAMPERS IN NON-ACCESSIBLE CEILINGS SHALL HAVE A CONTROL ARM EXTENDED TO AN ACCESSIBLE LOCATION.

4. SEISMIC: PROVIDE SEISMIC RESTRAINTS FOR MECHANICAL EQUIPMENT, PIPING, AND DUCTWORK PER SMACNA AND LOCAL REGULATIONS.

5. FILTER CLEARANCE: PROVIDE ADEQUATE CLEARANCE FOR CHANGING AIR FILTERS.

6. DUCTWORK AND PIPING OUTSIDE OF MECHANICAL ROOMS SHALL BE CONCEALED, COORDINATE WITH THE GENERAL CONTRACTOR TO FUR-OUT AS REQUIRED.

7. FIRE RATINGS: RATED FLOOR/CEILING JOINT SPACES HAVING DUCTWORK INSIDE THEM SHALL BE FIRE/SMOKE PROTECTED TO MAINTAIN THE 1-HOUR FLOOR/CEILING RATING PER LOCAL JURISDICTIONS. EXHAUST DUCTWORK PENETRATING THE 1-HOUR ROOF/CEILING OR FLOOR/CEILING ASSEMBLY SHALL HAVE ACCESSIBLE CEILING FIRE DAMPERS. ALTERNATIVELY, THE EXHAUST DUCTWORK SHALL BE ROUTED INSIDE A RATED SHAFT TO PROTECT THE CEILING/ROOF RATING PER THE LOCAL JURISDICTIONS.

8. FIRESTOP: PIPE, DUCT AND CONDUIT PENETRATIONS THROUGH RATED ASSEMBLIES SHALL BE FIRE AND SMOKE STOPPED PER CODE.

9. DUCTWORK: DUCTWORK SHALL BE SMOOTH SHEET METAL (CLASS-1). DUCTWORK THROUGH FIRE RATED STRUCTURE AND FLOOR SHALL BE MIN. 26 GA. STEEL. MAXIMUM LENGTH OF FLEXIBLE DUCTS SHALL BE 5'-0" UNLESS OTHERWISE NOTED ON DRAWINGS. DUCTWORK SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS.

10. VOLUME DAMPERS: PROVIDE AN ACCESSIBLE MANUAL VOLUME DAMPER FOR EACH SUPPLY, RETURN, OSA AND EXHAUST OPENING, LOCATED AS FAR UPSTREAM AS POSSIBLE FROM THE OPENING. PROVIDE A MANUAL VOLUME DAMPER FOR BRANCH MAINS SERVING MORE THAN ONE OPENING. VOLUME DAMPERS IN NON-ACCESSIBLE CEILING SHALL HAVE A CONTROL ARM EXTENDED TO AN ACCESSIBLE LOCATION. PROVIDE "YOUNG" REGULATOR OR EQUAL. EXACT LOCATION OF CONTROL DEVICES VISIBLE IN FINISHED SPACES SHALL BE COORDINATED WITH THE ARCHITECT.

11. CORRIDOR THERMOSTAT: PROVIDE TAMPERPROOF THERMOSTATS IN CORRIDORS. DO NOT PROVIDE PLASTIC GUARDS TO MAKE THE THERMOSTATS TAMPERPROOF. PROVIDE BLANK SECURABLE THERMOSTAT COVERS.

PRE-CON MEETING NOTES

CONTRACTORS SHALL ATTEND A PRE-CONSTRUCTION MEETING WITH THE ENGINEER FOR THE PURPOSE OF REVIEWING THE WORK PRIOR TO ORDERING ANY EQUIPMENT OR PERFORMING ANY WORK. THE MEETING SHALL BE LOCATED AT THE PROJECT SITE ON A DATE AND TIME TO BE MUTUALLY AGREED. THE MEETING WILL BE A WORKING SESSION. THE MEETING WILL BE FACILITATED BY THE ENGINEER AND THE AGENDA WILL INCLUDE A DETAILED REVIEW OF THE PLANS AND SPECIFICATIONS, CROSS CHECK WITH OTHER TRADES FOR COORDINATION ISSUES, REVIEW OF PROPOSED PRODUCTS, REVIEW OF PLANNED MEANS AND METHODS,AND ON-SITE INVESTIGATION OF FIELD CONDITIONS RELATIVE TO EXISTING CONDITIONS THAT COULD AFFECT THE WORK. PERSONS ATTENDING THE MEETING SHALL BE KNOWLEDGEABLE OF THE PROJECT AND SHALL BE THE SPECIFIC PERSONS INTENDED TO CONTINUE WITH THE PROJECT THROUGH TO COMPLETION. IF REQUIRED, REVISED PLANS WILL BE ISSUED THROUGH OFFICIAL CHANNELS. CHANGES IN THE BID PRICE WILL BE DISCUSSED, BUT NO CHANGE ORDERS WILL BE ISSUED UNLESS PROCESSED THOUGH OFFICIAL CHANNELS. IT SHALL BE UNDERSTOOD THAT THE ENGINEER HAS NO AUTHORITY TO ISSUE CHANGE ORDERS.

THE FOLLOWING TRADES SHALL BE REPRESENTED FOR THE MINIMUM TIME INDICATED:

MECHANICAL SHEET METAL	4 HOURS
PLUMBING/PIPING	4 HOURS
ELECTRICAL	4 HOURS
SPRINKLER	2 HOURS
GENERAL CONTRACTOR	ALL SESSIONS

ABBREVIATIONS

ACU	AIR CONDITIONING UNIT
AFF	ABOVE FINISHED FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
BDD	BACKDRAFT DAMPER
BHP	BRAKE HORSEPOWER
BTUH	BRITISH THERMAL UNIT PER HOUR
C	COMMON
CAP	CAPACITY
CC	COOLING COIL
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CLG	CEILING, COOLING
CO	CLEANOUT
COMB	COMBUSTION
CONT	CONTINUE, CONTROL
COP	COEFFICIENT OF PERFORMANCE
CWS	CHILLED/CONDENSER WATER SUPPLY
CWR	CHILLED/CONDENSER WATER RETURN
D	DIAMETER
DB	DRY BULB, DECIBEL
DIM	DIMENSION
DISCH	DISCHARGE
DN	DOWN
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EFF	EFFICIENCY
EG	EXHAUST GRILLE
ELEC	ELECTRIC
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
EXT	EXTERIOR, EXTERNAL
F	FAHRENHEIT
FCU	FAN COIL UNIT
FLR	FLOOR
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FSD	FIRE/SMOKE DAMPER
G	GAS
GAL	GALLONS
GPM	GALLONS PER MINUTE
GRD	GRILLES, REGISTERS, DIFFUSERS
GWB	GYPSUM WALLBOARD
HD	HEAD
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPU	HEAT PUMP UNIT
HRU	HEAT RECOVERY UNIT
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HVU	HEATING & VENTILATION UNIT
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX	HEAT EXCHANGER
ID	INDIRECT DRAIN, INSIDE DIAMETER
IN	INCH
KW	KILOWATT
L	LONG, LENGTH
LB	POUND
MBH	THOUSAND BTU PER HOUR
MECH	MECHANICAL
MCA	MIN. CIRCUIT AMPACITY
MOCP	MAX. OVER CURRENT PROTECTION
MTD	MOUNTED
OSA	OUTDOOR AIR
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIMENSION OR DIAMETER
OPNG	OPENING
P	PUMP
PD	PRESSURE DROP, PUMPED DRAIN
POC	POINT OF CONNECTION
PRV	PRESSURE REDUCING VALVE
PSIG	POUNDS PER SQUARE IN GAUGE
RA	RETURN AIR
RD	ROOF DRAIN
REF	REFERENCE
RF	RELIEF FAN
RG	RETURN GRILLE
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SCH	SCHEDULE
SF	SUPPLY FAN, SQUARE FOOT
SENS	SENSIBLE
SG	SUPPLY GRILLE
SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
SO	SCREENED OPENING
SP	STATIC PRESSURE
SS	STAINLESS STEEL, SANITARY SEWER
SQ	SQUARE
TG	TRANSFER GRILLE
TYP	TYPICAL
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
V	VENT
VENT	VENTILATION, VENTILATOR
VTR	VENT THRU ROOF
W	WASTE, WATT, WIDE
WB	WET BULB (TEMPERATURE)

SYMBOLS

EQUIPMENT

- EF-1 — TYPICAL EQUIPMENT DESIGNATION (EXHAUST FAN SHOWN)
- DSD — DUCT SMOKE DETECTOR
- T — ROOM THERMOSTAT OR TEMPERATURE TRANSMITTER
- H — ROOM HUMIDISTAT OR HUMIDITY TRANSMITTER
- CO — CARBON MONOXIDE SENSOR
- SD — SMOKE DETECTOR

TERMINALS

- CD-12x12 OR 400 / CD-1 400 — DIFFUSER/GRILLE TYPE, AND NUMBER OR SIZE; DESIGN CFM (WHERE APPLICABLE)
- CEILING DIFFUSER (FLOW ARROWS SHOWN FOR NON SYMMETRICAL AIRFLOW)
- CEILING RETURN/EXHAUST GRILLE
- LINEAR DIFFUSER, CEILING OR WALL MOUNTED (FLOW ARROWS SHOWN FOR NON SYMMETRICAL AIRFLOW)
- WALL SUPPLY GRILLE (SG)
- WALL RETURN/EXHAUST GRILLE (RG, EG)
- 50 — TRANSFER GRILLE (TG), DUCT CONNECTED, WALL MOUNTED W/ OPTIONAL CFM SHOWN
- TRANSFER GRILLE, CEILING MOUNTED WITH FULL-SIZED LINED DUCT CONNECTION

PIPING

- CD — CONDENSATE DRAINAGE
- G — NATURAL GAS – STD. PRESSURE
- MPG — NATURAL GAS – MEDIUM PRESSURE
- PIPE CAP
- PIPE PLUG
- UNION
- FLANGE
- GATE VALVE OR BALL VALVE
- BALL VALVE
- PRESSURE REDUCING VALVE (PRV)
- BREAK IN PIPING OR DUCTWORK
- RL — RAIN LEADER (RL)
- OL — OVERFLOW RAIN LEADER (OL)
- CHECK VALVE

DUCTWORK

- 18x12 — DUCT (1ST FIGURE = SIDE SHOWN, 2ND FIGURE = SIDE NOT SHOWN)
- UP / DOWN — DUCT SECTION, POSITIVE PRESSURE
- UP / DOWN — DUCT SECTION, NEGATIVE PRESSURE
- UP / DOWN — ROUND DUCT SECTION
- UP UP UP — DUCT PENETRATION THRU FLOOR OR ROOF
- VOLUME DAMPER
- FSD / FSD — FIRE/SMOKE DAMPER (--◀ = HORIZ DUCT, --◆ = VERT DUCT), 2-HR RATED, UON
- FD / FD — FIRE DAMPER (--◀ = HORIZ DUCT, --◆ = VERT DUCT), 2-HR RATED, UON
- 90° ELBOW, R/D OR R/W=1.5
- SQUARE CORNER ELBOW WITH TURNING VANES
- 90° TAKE-OFF OR TEE
- 90° CONICAL TAKE-OFF
- 45° LATERAL TAKE-OFF
- TRANSITION OR REDUCER (FOT = FLAT ON TOP, FOB = FLAT ON BOTTOM)
- WYE FITTING
- 90° RECTANGULAR TAKE-OFF WITH 45° TAPER
- 90° DIVERGING RECTANGULAR TEE, EITHER RADIUS OR TURNING VANES
- PARALLEL FLOW BRANCH CONNECTION, EITHER RADIUS OR TURNING VANES
- FLEXIBLE DUCT
- Ø — ROUND DUCT INDICATOR

CONTRACTOR SUBSTITUTIONS & REVISIONS

CONTRACTOR SUBSTITUTIONS & REVISIONS: PLEASE SUBMIT PROPOSALS FOR SUBSTITUTIONS OR REVISIONS FOR REVIEW AND APPROVAL PRIOR TO ORDERING MATERIAL OR DOING WORK. FOR EQUIPMENT THAT IS SCHEDULED BY MANUFACTURER'S NAME AND CATALOG DESIGNATIONS, THE MANUFACTURER'S PUBLISHED DATA AND/OR SPECIFICATION FOR THAT ITEM ARE CONSIDERED PART OF SPECIFICATION. ENGINEERING COSTS FOR REVISING MEP PLANS SHALL BE ADDRESSED IN THE COST ANALYSIS OF THE SUBSTITUTION PROPOSAL. CONTRACTOR TO COORDINATE WITH ENGINEER AND DETERMINE ASSOCIATED DESIGN AND PERMITTING COSTS. CONTRACTOR SHALL BE RESPONSIBLE FOR OTHER COSTS ASSOCIATED WITH UNFORESEEN ISSUES RESULTING FROM SUBSTITUTIONS OR REVISIONS.

DRAWINGS ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, LAYOUT, AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENT. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS. REFER TO MANUFACTURER'S STANDARD INSTALLATION DRAWINGS FOR EQUIPMENT CONNECTIONS AND INSTALLATION REQUIREMENTS. PROVIDE DUCTWORK, CONNECTIONS, ACCESSORIES, OFFSETS, AND MATERIALS NECESSARY FOR A COMPLETE SYSTEM.

DRAWING INDEX

DWG	DESCRIPTION	INCLUDED IN SET: FOUNDATION SET 6/05/18	RESUBMITTAL SET 1/31/19	ASI-3 SET 09/03/19		
M000	LEGEND, GENERAL NOTES & DRAWING INDEX	X	X	X		
M001	PROJECT NOTES, TABLES & CALCULATIONS	X	X	X		
M002	MECHANICAL SCHEDULES	X	X	X		
M201	MIXED USE PLANS – LEVEL 1	X	X	X		
M202	MIXED USE PLANS – LEVEL 2	X	X	X		
M203	MIXED USE PLANS – LEVEL 3	X	X	X		
M204	MIXED USE PLANS – LEVEL 4	X	X	X		
M205	MIXED USE PLANS – LEVEL 5	X	X	X		
M206	MIXED USE PLANS – ROOF	X	X	X		
M300	MIXED USE PLANS – ENLARGED	X	X	X		
M301	MIXED USE PLANS – ENLARGED	X	X	X		
M400	MECHANICAL DETAILS & DIAGRAMS	X	X	X		
M401	MECHANICAL DETAILS & DIAGRAMS	X	X	X		
M600	ENERGY COMPLIANCE FORMS	X	X	X		
M601	ENERGY COMPLIANCE FORMS	X	X	X		
M610	LOAD CALCULATIONS	X	X	X		
M611	LOAD CALCULATIONS	X	X	X		

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09/25/2019

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06/05/18

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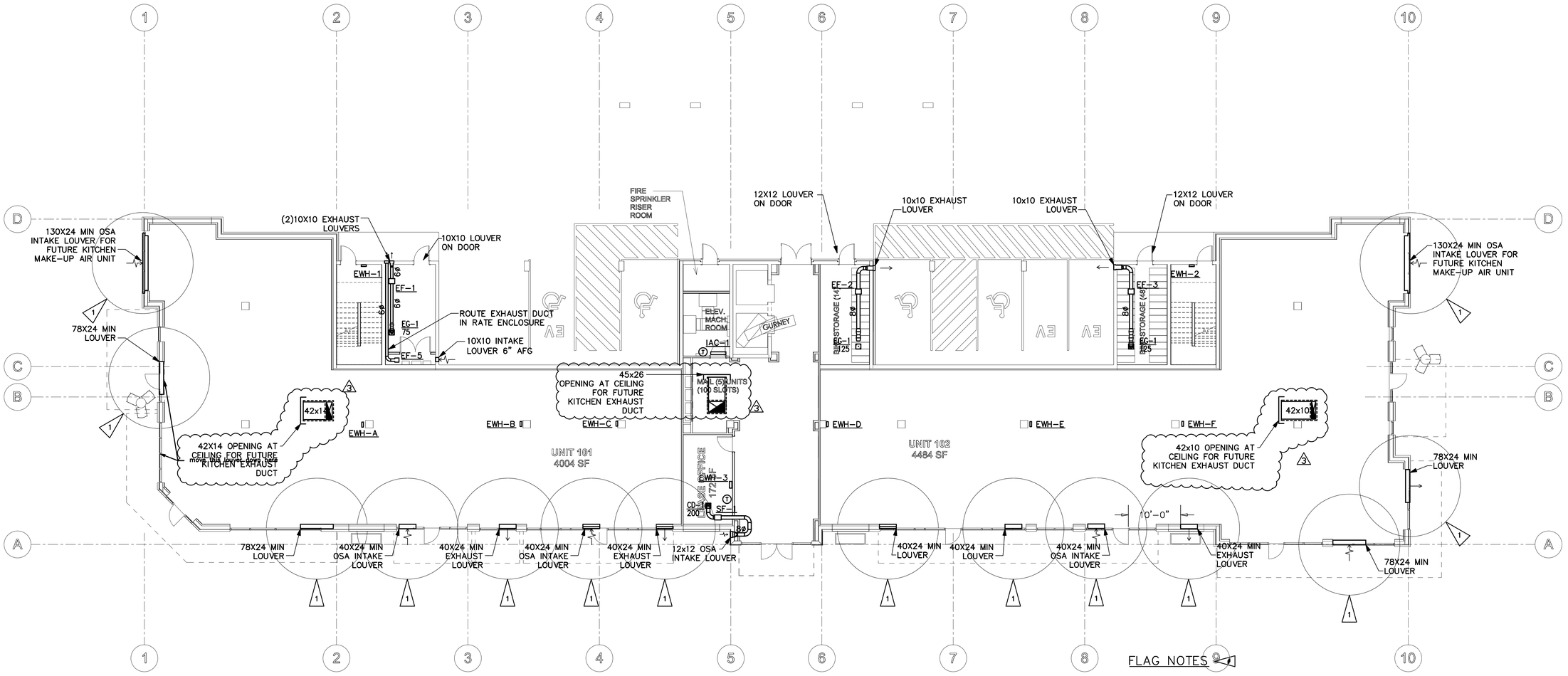
EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
1	01/30/19	PERMIT COMMENT
2	01/30/19	OTHER CHANGES
3	06/12/19	GREASE WASTE
4	09/03/19	ASI-3

LEGEND, GENERAL NOTES & DRAWING INDEX

M000



FLAG NOTES

1. 10' CLEARANCE BETWEEN LOUVERS

FIRST FLOOR PLAN

SCALE: 3/32" = 1'-0"

0' 4' 8' 16' N

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PERMIT SET
5/16/18

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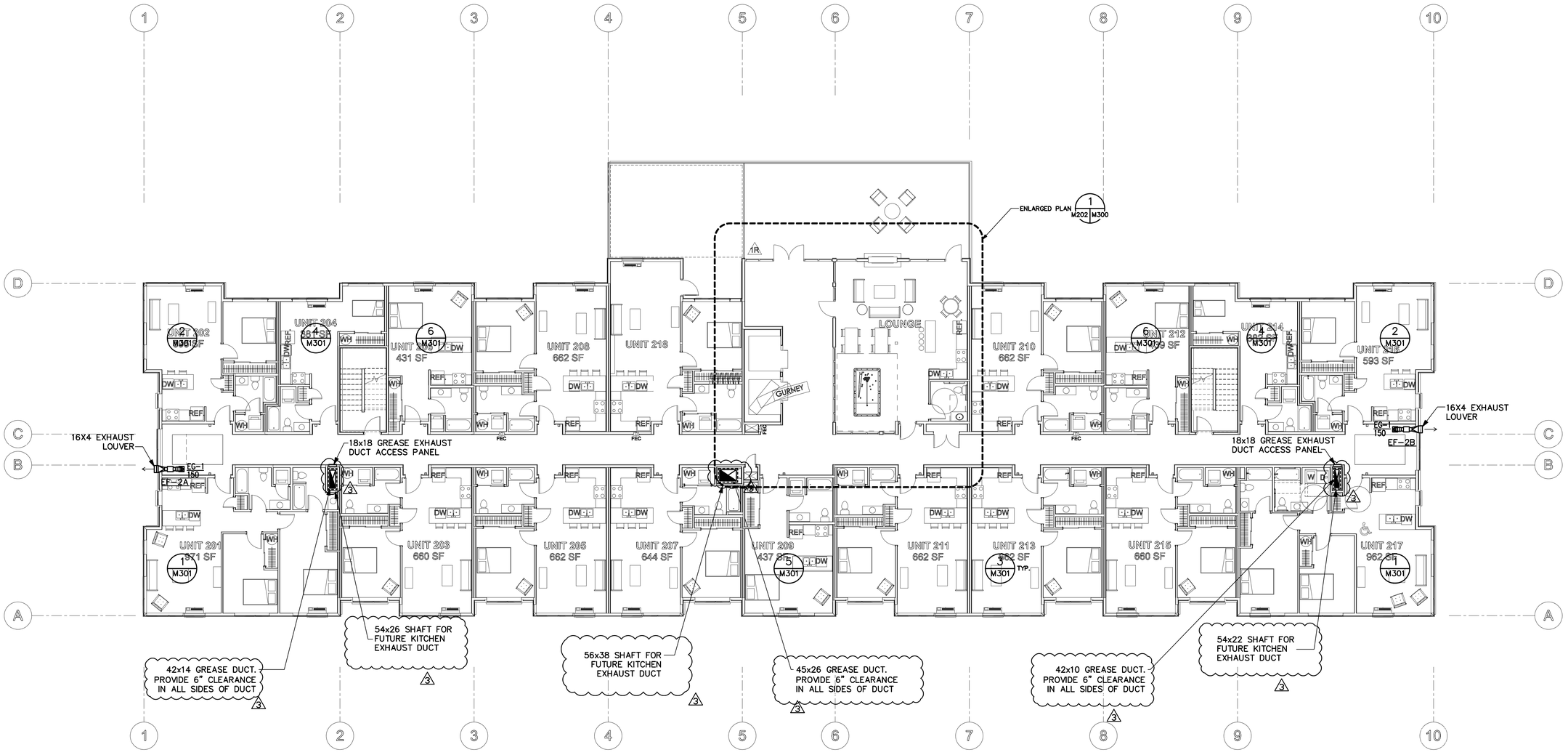
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE
3	09/03/19	ASI-3

MIXED USED
PLANS - LEVEL 1

M201



SECOND FLOOR PLAN

SCALE: 3/32" = 1'-0"

0' 4' 8' 16' N

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5/16/18

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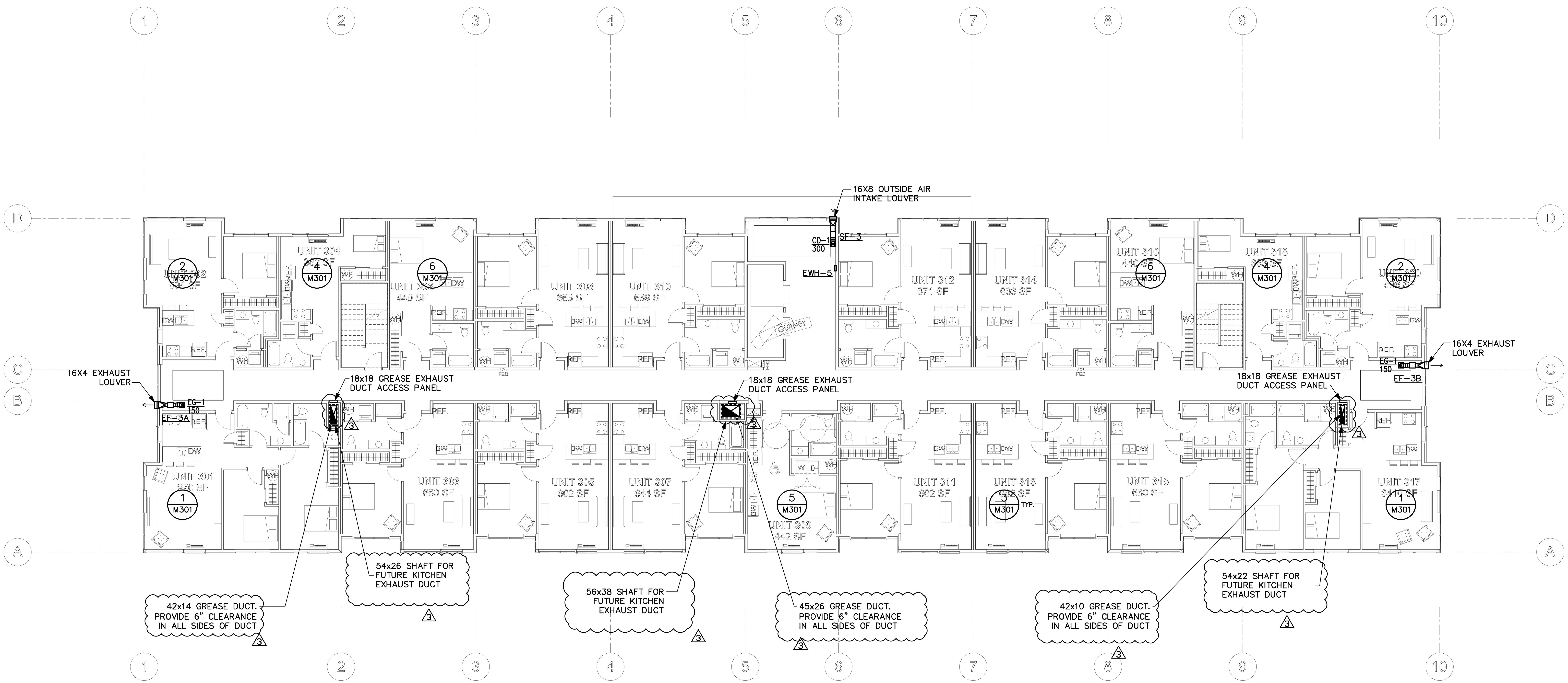
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE
3	09/03/19	ASI-3

MIXED USED
PLANS - LEVEL 2

M202



THIRD FLOOR PLAN

SCALE: 3/32" = 1'-0"

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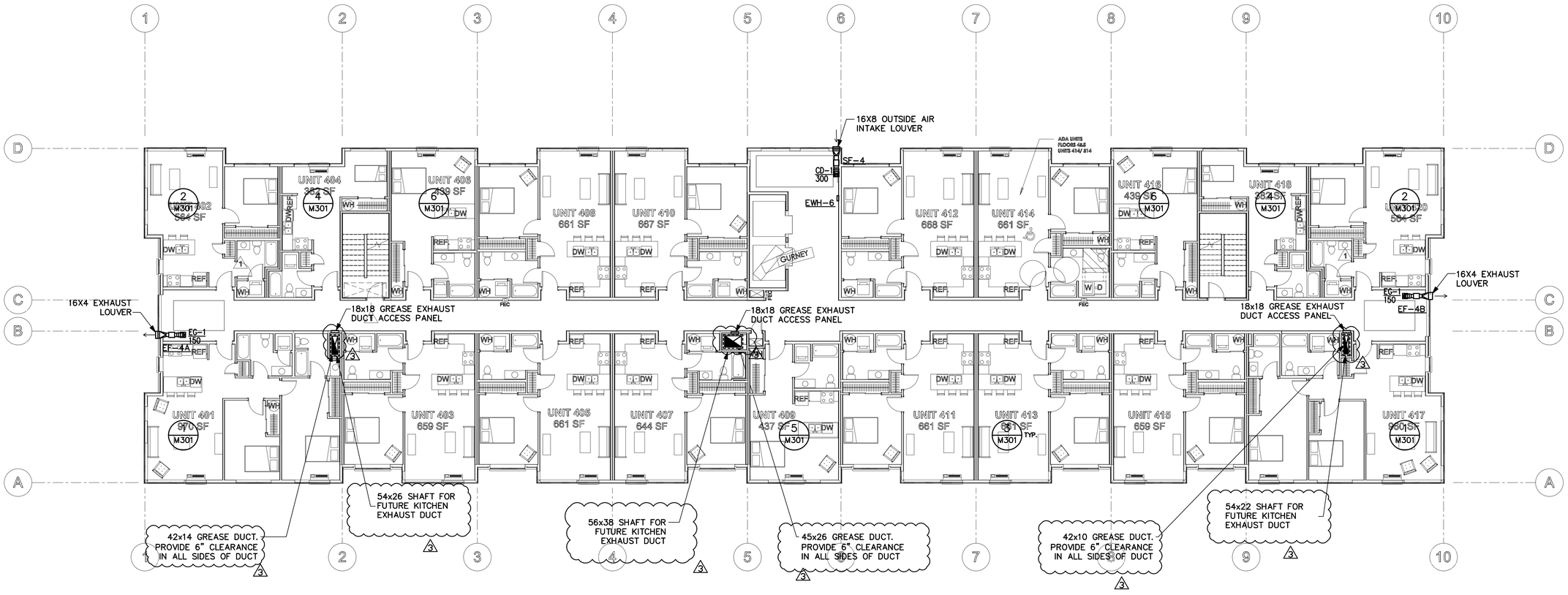
MIXED USED PLANS - LEVEL 3

M203



FOURTH FLOOR PLAN

SCALE: 3/32" = 1'-0"

0' 4' 8' 16' N

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EAST BAY LOT A WESTMAN MILL

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PERMIT SET
5/16/18

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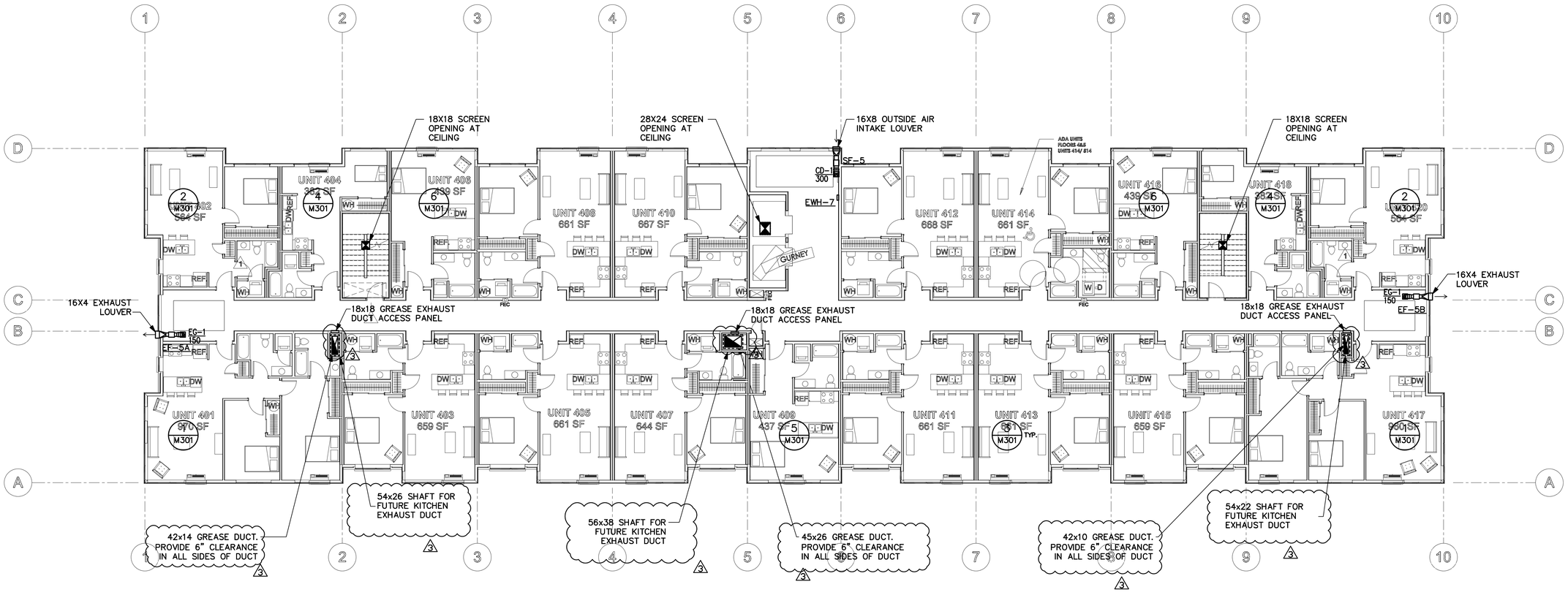
4 B	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE
3	09/03/19	ASI-3

MIXED USED
PLANS - LEVEL 4

M204



FIFTH FLOOR PLAN

SCALE: 3/32" = 1'-0"

0' 4' 8' 16' N

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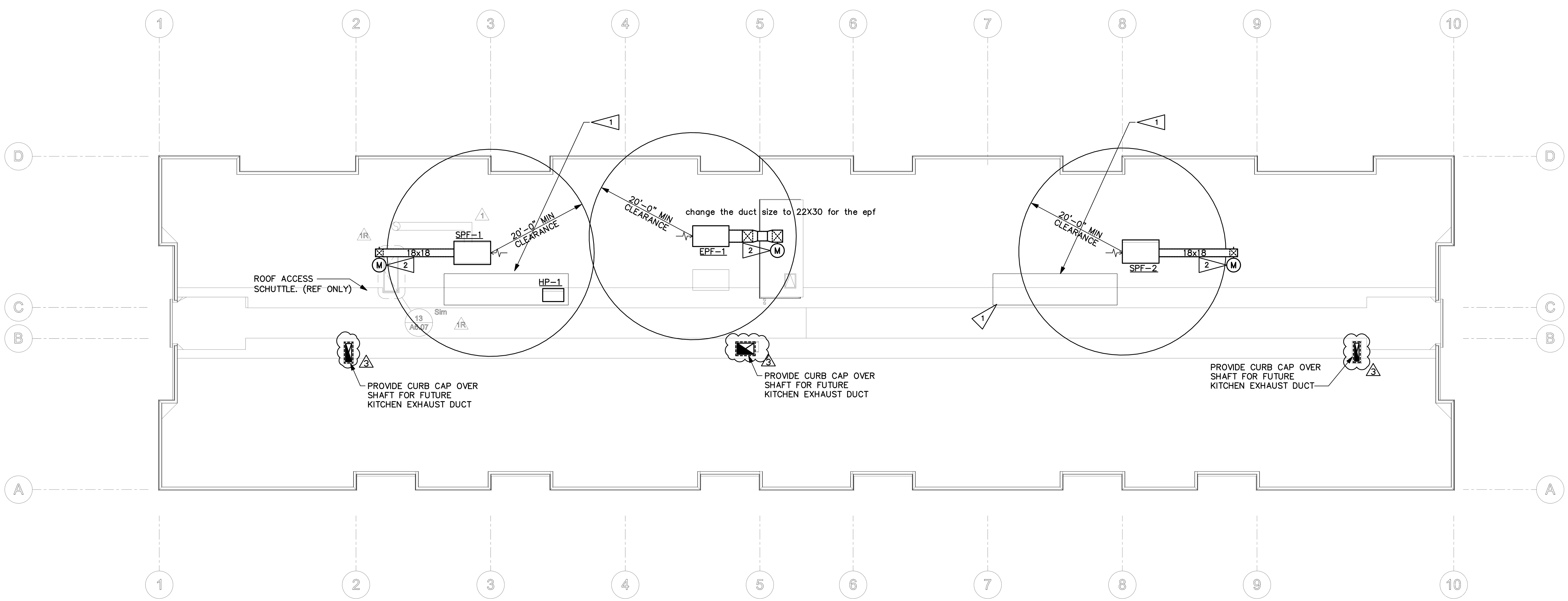
3	09/03/19	ASI-3

MIXED USED
PLANS - LEVEL 5

M205



GENERAL NOTES

1. CONDENSATE DRAIN TO TERMINATE AT APPROVED RECEPTOR WITH INDIRECT CONNECTION.

FLAG NOTES

1. ROOF PAD FOR FUTURE OUTDOOR HEAT PUMP
2. MOTORIZED DAMPER INTERLOCK WITH SMOKE CONTROL SYSTEM.

ROOF PLAN

SCALE: 3/32" = 1'-0"

0' 4' 8' 16'

N

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EAST BAY LOT A
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PERMIT SET
5/16/18

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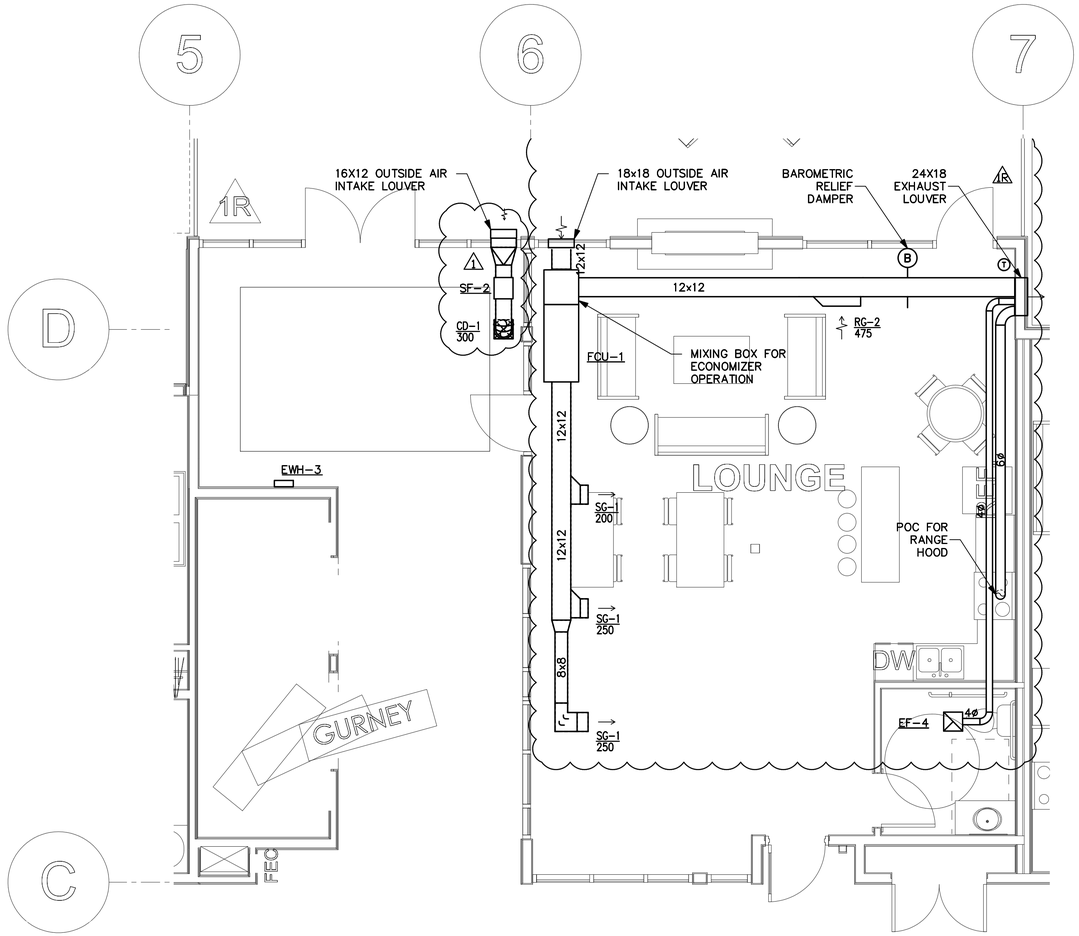
MIXED USED
PLANS - ROOF

M206



L2 LOUNGE

ENLARGED PLAN

SCALE: 1/4" = 1'

1 / M300

GENERAL NOTES

1. MOUNT REMOTE THERMOSTAT AT 48" AFF.
2. PROVIDE ACCESS PANELS FOR ALL ENERGY RECOVERY VENTILATOR, FAN COIL UNITS, HEAT RECOVERY UNITS, AND FIRE SMOKE DAMPERS.
3. CONDENSATE DRAIN TO TERMINATE AT APPROVED RECEPTOR WITH INDIRECT CONNECTION. REFER TO PLUMBING PLANS FOR CONDENSATE PIPE ROUTING AND ADDITIONAL INFORMATION.

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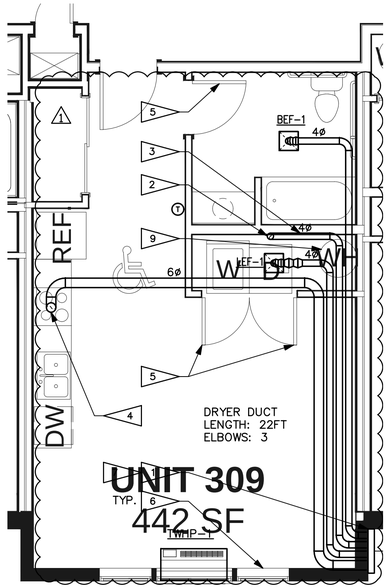
3	09/03/19	ASI-3

MIXED USED PLANS - ENLARGED

M300

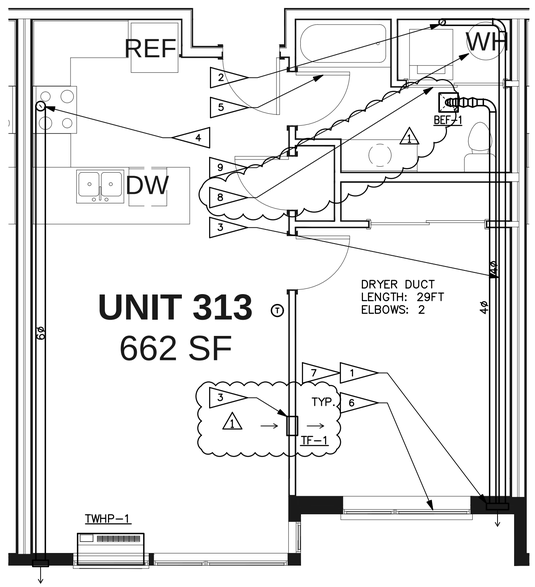


0–BD/1–BA

ENLARGED PLAN

SCALE: 1/4" = 1'

5 M301

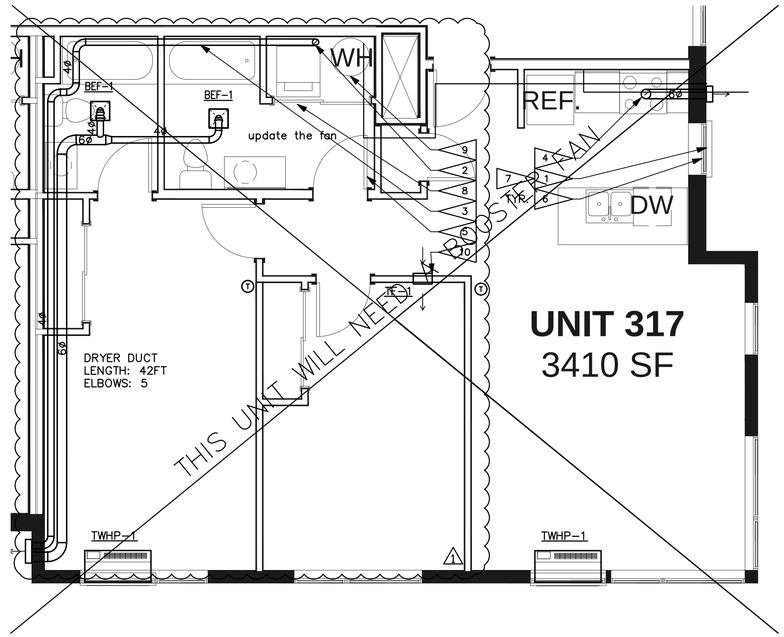


1–BD/1–BA

ENLARGED PLAN

SCALE: 1/4" = 1'

3 M301

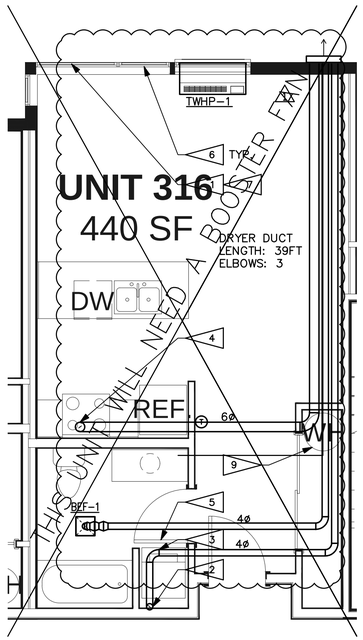


2–BD/2–BA

ENLARGED PLAN

SCALE: 1/4" = 1'

1 M301

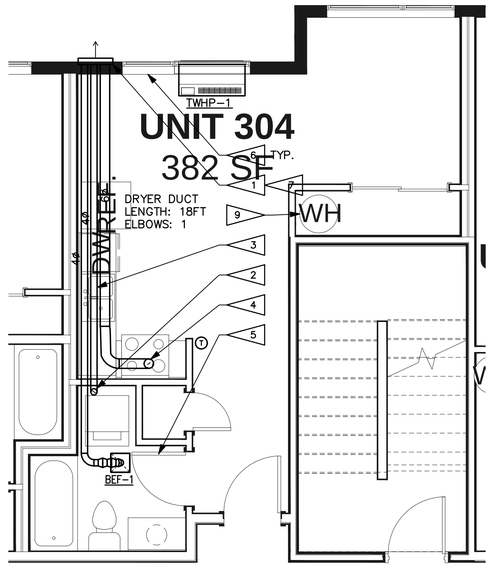


0–BD/1–BA

ENLARGED PLAN

SCALE: 1/4" = 1'

6 M301



0–BD/1–BA

ENLARGED PLAN

SCALE: 1/4" = 1'

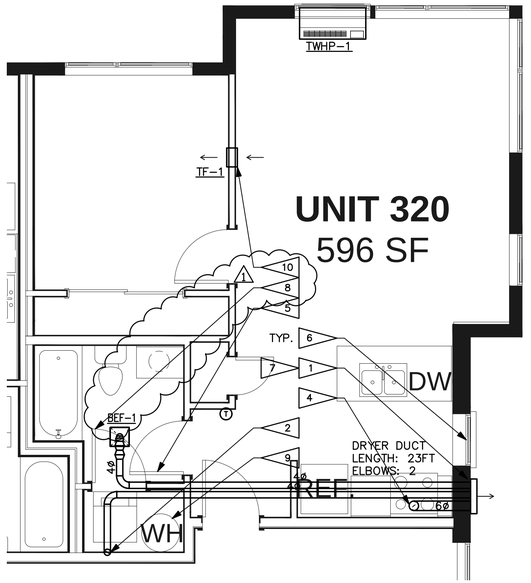
4 M301

GENERAL NOTES

1. MOUNT REMOTE THERMOSTAT AT 48" AFF.
2. OUTDOOR AIR INLET COMPLY WITH SECTION 403.8.6.1 AND LOCATED COMPLYING WITH SECTION 403.8.3 OF 2015 IMC WITH WASHINGTON STATE AMENDMENTS. VERIFY THAT THE UNIT OUTSIDE AREA INTAKE WILL MEET WHOLE HOUSE VENTILATION REQUIREMENT ON SHEET M001.
3. CONDENSATE DRAIN TO TERMINATE AT APPROVED RECEPTOR WITH INDIRECT CONNECTION. REFER TO PLUMBING PLANS FOR CONDENSATE PIPE ROUTING AND ADDITIONAL INFORMATION..

FLAG NOTES

1. LOCATE EXHAUST OUTLETS MINIMUM 3–FEET FROM OPERABLE WINDOWS AND DOORS.
2. POC TO DRYER.
3. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR THE MAXIMUM LENGTH OF THE DRYER VENT. PROVIDE DRYER BOOSTER FAN IF NECESSARY. PROVIDE DRYER BOX
4. POC RANGE HOOD
5. UNDERCUT ALL BATHROOM AND LAUNDRY DOORS BY ½" FOR TRANSFER OF MAKE–UP AIR FOR THE EXHAUST SYSTEM.
6. WINDOWS WILL BE EQUIPPED WITH OUTDOOR AIR INLETS.
7. WALL CAP WITH SCREENED OPENING.
8. 10X10 LOUVER AT LOWER DOOR FOR DRYER MAKEUP AIR.
9. ELECTRIC WATER HEATER. VENTING NOT REQUIRED.
10. TRANSFER FAN: COORDINATE WITH ELECTRICIAN TO PROVIDE SWITCH IN BEDROOM WITH CIRCUIT TO FAN.



1–BD/1–BA

ENLARGED PLAN

SCALE: 1/4" = 1'

2 M301

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5/16/18

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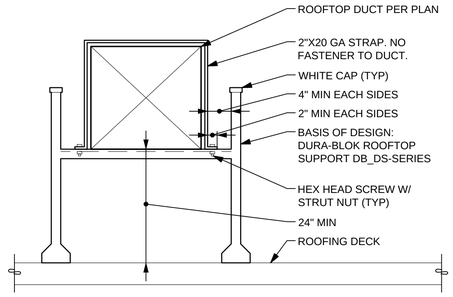
3	09/03/19	ASI-3

MIXED USED
PLANS -
ENLARGED

M301

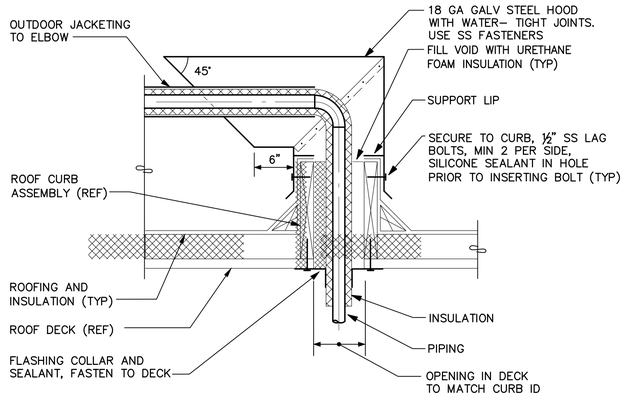


ROOFTOP DUCT SUPPORT

DETAIL

SCALE: NONE

6 M400

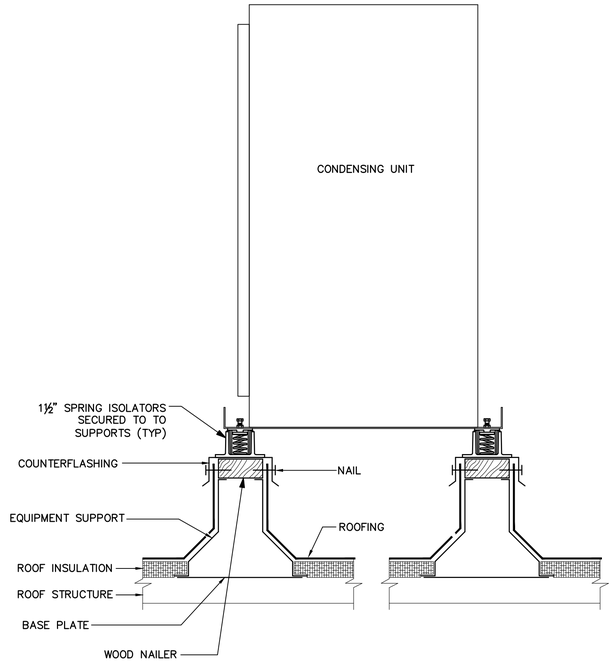


REFRIGERANT PIPE PENETRATION THRU ROOF

DETAIL

SCALE: NONE

3 M400

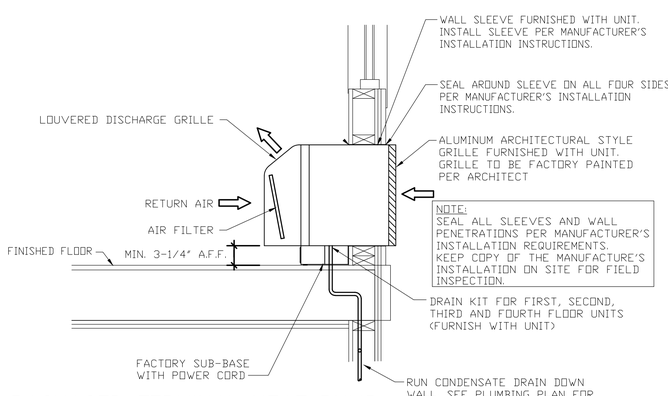


ROOFTOP CONDENSING UNIT MOUNTING DETAIL

DETAIL

SCALE: NONE

1 M400

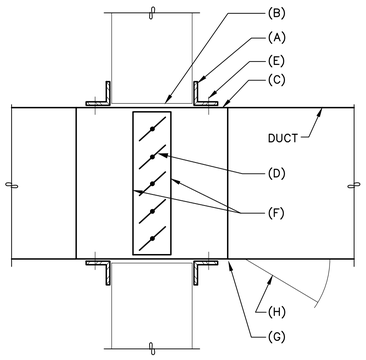


PACKAGED TERMINAL HEAT PUMP

DETAIL

SCALE: NONE

7 M400



NOTES:

(A) RETAINING ANGLES, LAP OPENING 1" MINIMUM AND COVER CORNERS OF OPENING.
(B) CLEARANCE BETWEEN WALL AND SLEEVE BOTH DIMENSIONS.
(C) STEEL SLEEVE.
(D) APPROVED COMBINATION FIRE/SMOKE DAMPER.
(E) SECURE RETAINING ANGLES TO SLEEVE ONLY.
(F) SECURE DAMPER TO SLEEVE.
(G) CONNECT DUCT TO SLEEVE WITH BREAK-AWAY CONNECTION (TYP).
(H) ACCESS DOOR, SIZE TO MEET AHJ REQUIREMENTS (6x6 MINIMUM, ACCESS DOOR SHALL BE PERMANENTLY IDENTIFIED ON THE EXTERIOR BY A LABEL WITH LETTERS NOT LESS THAN 1/2" IN HEIGHT READING: SMOKE/FIRE DAMPER).

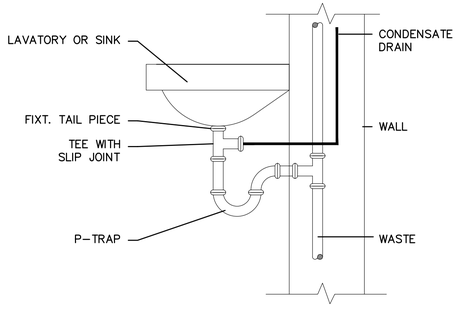
1. COMPLY WITH SMACNA FSRDIG AND MANUFACTURER'S INSTRUCTIONS.
2. DAMPER FREE AREA SHALL BE MINIMUM 90% OF AREA OF CONNECTING DUCT. INCREASE DAMPER SIZE AND PROVIDE TRANSITIONS TO CONNECTING DUCTS AS NECESSARY TO MEET THIS REQUIREMENT.
3. PER 2006 IBC, SECTION 716.3.2.1, COMBINATION FIRE/SMOKE DAMPER SHALL CLOSE UPON ACTIVATION OF THE TOTAL-COVERAGE SMOKE DECTOR SYSTEM.

COMBINATION FIRE/SMOKE DAMPER INSTALLATION

DETAIL

SCALE: NONE

4 M400

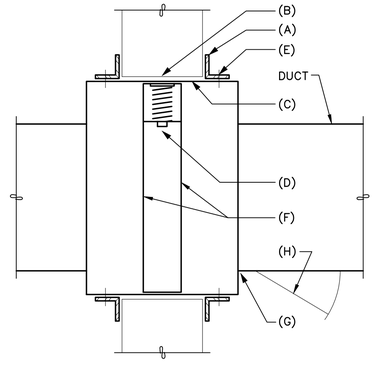


CONDENSATE TERMINATION

DETAIL

SCALE: NONE

8 M400



NOTES:

(A) RETAINING ANGLES, LAP OPENING 1" MINIMUM AND COVER CORNERS OF OPENING.
(B) CLEARANCE BETWEEN WALL AND SLEEVE.
(C) STEEL SLEEVE.
(D) APPROVED FIRE DAMPER (CURTAIN OR BLADE TYPE).
(E) SECURE RETAINING ANGLES TO SLEEVE ONLY.
(F) SECURE DAMPER TO SLEEVE.
(G) CONNECT DUCT TO SLEEVE WITH BREAK-AWAY CONNECTION (TYP).
(H) ACCESS DOOR, SIZE TO MEET AHJ REQUIREMENTS (6x6 MINIMUM, ACCESS DOOR SHALL BE PERMANENTLY IDENTIFIED ON THE EXTERIOR BY A LABEL WITH LETTERS NOT LESS THAN 1/2" IN HEIGHT READING: FIRE DAMPER).

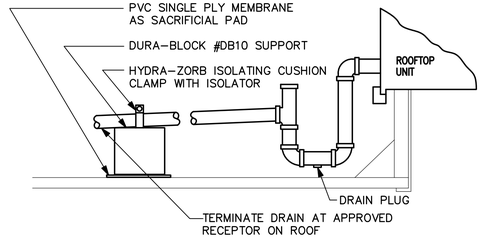
1. COMPLY WITH SMACNA FSRDIG AND MANUFACTURER'S INSTRUCTIONS.
2. DAMPER FREE AREA SHALL BE MINIMUM 90% OF AREA OF CONNECTING DUCT. INCREASE DAMPER SIZE AND PROVIDE TRANSITIONS TO CONNECTING DUCTS AS NECESSARY TO MEET THIS REQUIREMENT.

FIRE DAMPER INSTALLATION

DETAIL

SCALE: NONE

5 M400



RTU CONDENSATE DRAIN

DETAIL

SCALE: NONE

2 M400

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TOWNZEN & ASSOCIATES PLAN APPROVAL

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4 Approved as submitted. 09/25/2019

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06/05/18

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EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
1R	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE
3	09/03/19	ASI-3

MECHANICAL DETAILS & DIAGRAMS

M400

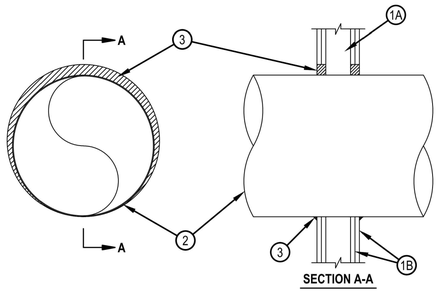
WL 7214

System No. W-L-7214

CLASSIFIED c UL us

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings — 1 and 2 Hr (See Items 1 and 3)	F Ratings — 1 and 2 Hr (See Items 1 and 3)
T Rating — 0 Hr	FT Rating — 0 Hr
	FH Ratings — 1 and 2 Hr (See Items 1 and 3)
	FTH Rating — 0 Hr



SECTION A-A

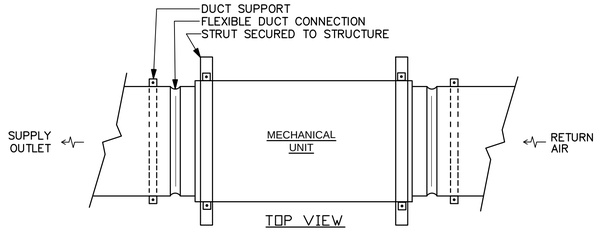
1. Wall Assembly — The 1 or 2 hr fire rated wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features.
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced 24 in. (610 mm) OC.
   B. Gypsum Board* — For 1 hr assembly, one layer of min 5/8 in. (16 mm) thick wallboard as required in the individual Wall and Partition Design. For 2 hr assembly, two layers of min 5/8 in. (16 mm) thick wallboard as required in the individual Wall and Partition Design. Max diam of opening is 14-1/2 in. (368 mm) for wood stud walls and 21-3/4 in. (552 mm) for steel stud walls.
   The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. Through Penetrant — Galv steel duct to be installed concentrically or eccentrically within the firestop system. The annular space between the duct and periphery of opening shall be 0 in. (point contact) and max 1-1/2 in. (38 mm). Duct to be rigidly supported on both sides of wall assembly.
   A. Spiral Wound HVAC Duct — Nom 20 in. (508 mm) diam (or smaller) No. 24 MSG (or heavier) galv steel spiral wound duct.
   B. Sheet Metal Duct — Nom 12 in. (305 mm) diam (or smaller) No. 28 MSG (or heavier) galv sheet steel duct.
3. Fill, Void or Cavity Material* — Sealant — Min 5/8 in. and 1-1/4 in. (16 and 32 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly for 1 or 2 hr rated walls, respectively. At the point contact location between duct and wallboard, a min 1/2 in. (13 mm) diam bead of sealant shall be applied at the wallboard/duct interface on both surfaces of wall assembly.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-S SIL GG Sealant

*Bearing the UL Classification Mark

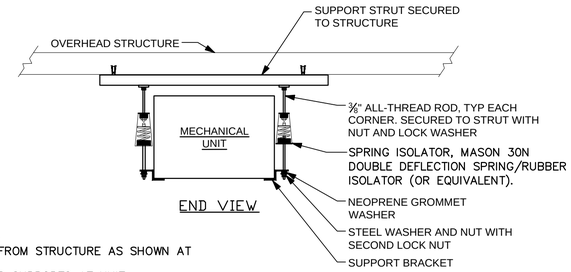
HILTI Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 14, 2014

FIRESTOP SYSTEM
DETAIL
SCALE: NONE
5 M401



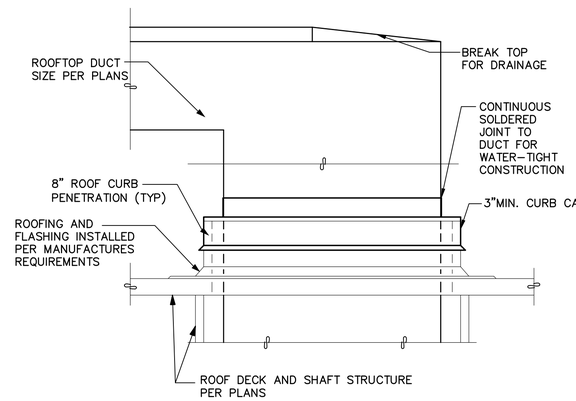
TOP VIEW



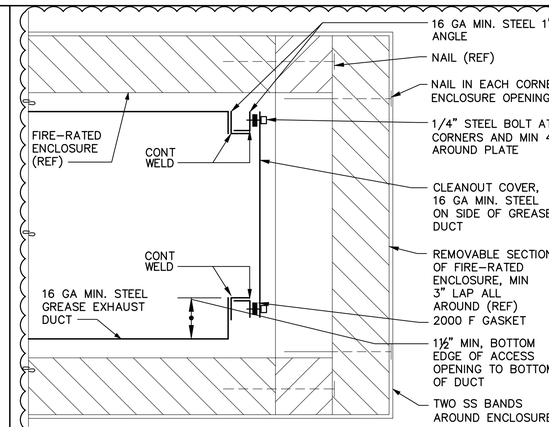
END VIEW

MECHANICAL UNIT SUPPORT REQUIREMENTS:
1. MECHANICAL UNITS TO BE SUPPORTED FROM STRUCTURE AS SHOWN AT ALL FOUR CORNERS.
2. PROVIDE RUBBER GROMMETS AT CORNER SUPPORTS AT UNIT.
3. PROVIDE MASON #30N COMBINATION DOUBLE DEFLECTION AND SPRING ISOLATORS SECURED TO STRUT SECTIONS. SUSPEND THREADED ROD FROM ISOLATOR.
4. PROVIDE FLEX CONNECTION BETWEEN UNIT AND DUCTWORK.
5. SUPPORT RODS AND ANCHORS TO BE PLACED SUCH THAT THE SUPPORTS TO NOT CONTACT THE MECHANICAL UNIT.
6. PROVIDE SECTION OF RUBBER HOSE TO ISOLATE THE COPPER CONDENSATE DRAIN. SECURE THE HOSE TO PIPE WITH HOSE CLAMPS.
7. PROVIDE FLEXIBLE HOSES FOR CONDENSER WATER CONNECTIONS (WHERE APPLICABLE).

HORIZONTAL EQUIPMENT MOUNTING
DETAIL
SCALE: NONE
1 M401

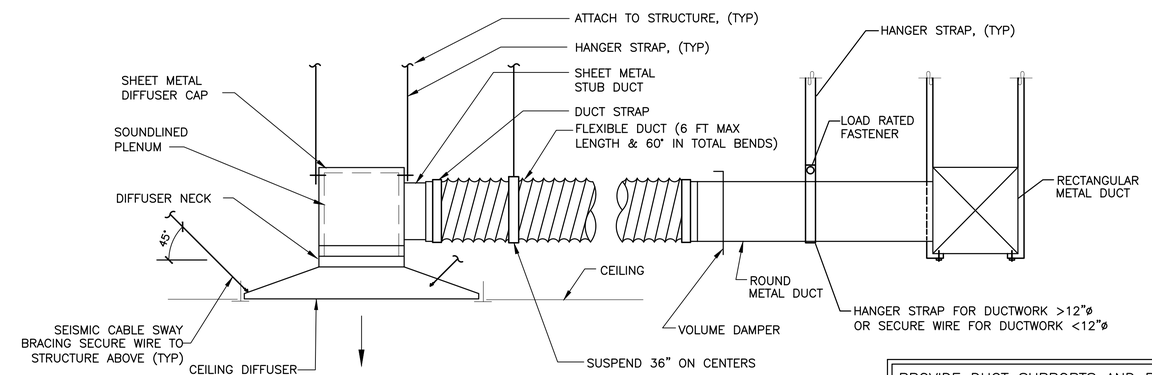


DUCT PENETRATION THROUGH ROOF
DETAIL
SCALE: NONE
3 M401



NOTE:
1. PROVIDE ACCESS DOORS AT CHANGES IN DIRECTION OF DUCTWORK FOR INSPECTION AND CLEANING
2. IN LIEU OPF THE CLEANOUT DETAIL, A PRE-MANUFACTURED, UL LISTED CLEANOUT ACCESS DOOR MAY BE USED.

CLEANOUT IN GREASE EXHAUST DUCT
DETAIL
SCALE: NONE
2 M401



PROVIDE DUCT SUPPORTS AND RESTRAINTS IN ACCORDANCE WITH IMC 603.10

DIFFUSER CONNECTION & DUCT SUPPORT
DETAIL
SCALE: NONE
4 M401

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06/05/18

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Community Planning & Development Department
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EAST BAY LOT A WESTMAN MILL
510 STATE AVE OLYMPIA, WA. 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
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MECHANICAL DETAILS & DIAGRAMS

M401

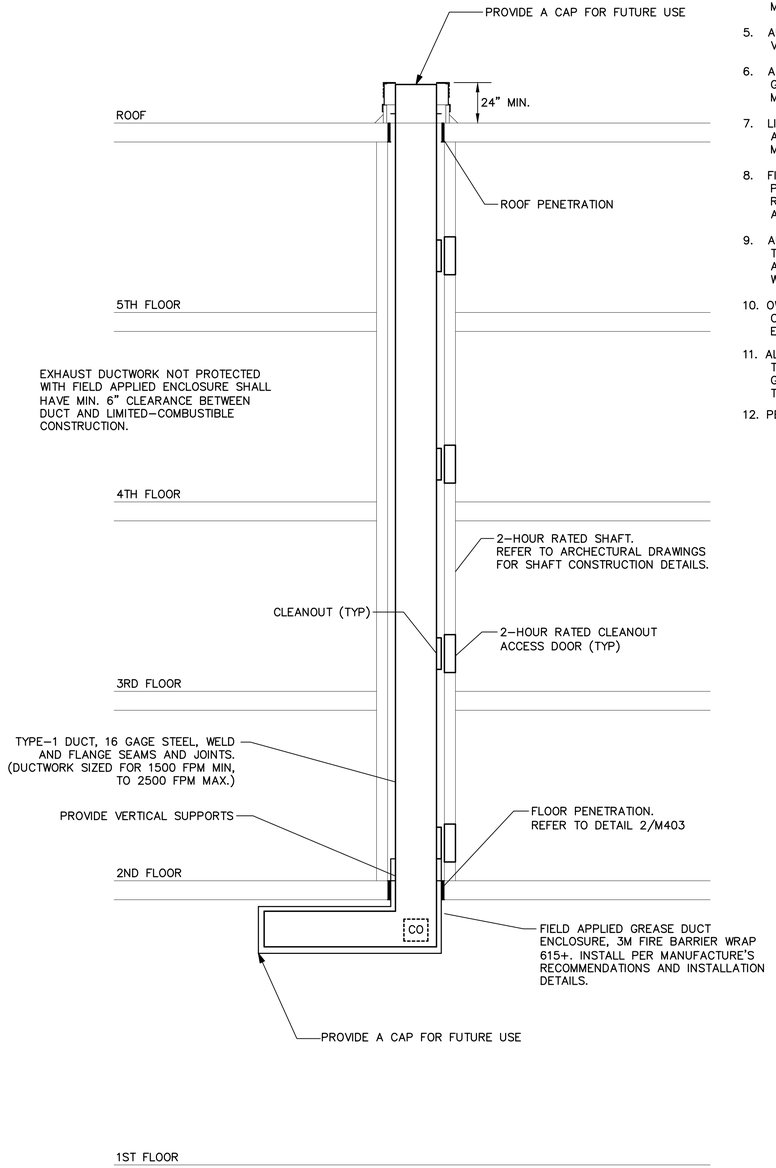

DIAGRAM – TYPE I EXHAUST DUCT SYSTEM △3

SCALE: NONE

NOTES:

1. EXPOSED DUCTWORK SHALL BE 18 GAGE STAINLESS STEEL.
2. CLEANOUTS SHALL BE INSTALLED AT CHANGES IN DIRECTION, AT 12' INTERVALS OF HORIZONTAL DUCTWORK, AT THE BASE OF VERTICAL DUCTS, AND AT EVERY FLOOR OF VERTICAL RISERS.
3. FIELD APPLIED OR FACTORY BUILT GREASE DUCT ENCLOSURE SHALL BE INSTALLED PER THE LATEST MANUFACTURER'S INSTALLATION INSTRUCTIONS AND IN COMPLIANCE WITH TERMS OF ITS LISTING.
4. ALL END CUTS OR CUTS IN THE FOIL JACKET OF FIELD APPLIED GREASE DUCT ENCLOSURE SHALL BE SEALED PER THE MANUFACTURER'S RECOMMENDATIONS.
5. ALL INSTALLATIONS SHALL BE COMPLETELY ACCESSIBLE FOR VISUAL INSPECTION.
6. AT TIME OF INSPECTION, THE FIELD APPLIED OR FACTORY BUILT GREASE DUCT ENCLOSURE INSTALLATION INSTRUCTIONS SHALL BE MADE AVAILABLE AT THE JOB SITE.
7. LISTED GREASE HOOD ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE TERMS OF THEIR LISTING AND THE MANUFACTURER?S INSTALLATION INSTRUCTIONS.
8. FIRE DEPARTMENT APPROVAL SHALL BE REQUIRED ON FIRE PROTECTION SYSTEM FOR GREASE HOODS AND DUCTS AS REQUIRED BY SECTION 513 OF THE MECHANICAL CODE AND AS REQUIRED BY THE FIRE CODE.
9. ALL FIRE-EXTINGUISHING SYSTEMS SHALL BE INTERCONNECTED TO THE FUEL OR CURRENT SUPPLY SO THAT THE FUEL IS AUTOMATICALLY SHUT OFF TO ALL EQUIPMENT UNDER THE HOOD WHEN THE SYSTEM IS ACTIVATED.
10. OWNER OF ESTABLISHMENT SHALL BE RESPONSIBLE FOR CLEANLINESS, MAINTENANCE, AND INSPECTION OF KITCHEN EXHAUST SYSTEM, FIRE PROTECTION, AND COOKING EQUIPMENT.
11. ALL SEAMS, JOINTS, AND PENETRATIONS OF THE HOOD ENCLOSURE THAT DIRECT AND CAPTURE GREASE-LADEN VAPORS AND EXHAUST GASES SHALL HAVE A LIQUID TIGHT CONTINUOUS EXTERNAL WELD TO THE LOWER OUTERMOST PERIMETER OF THE HOOD.
12. PERFORM LIGHT BULB TEST PER MECH CODE AND SEAL DUCT.

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DETAILS

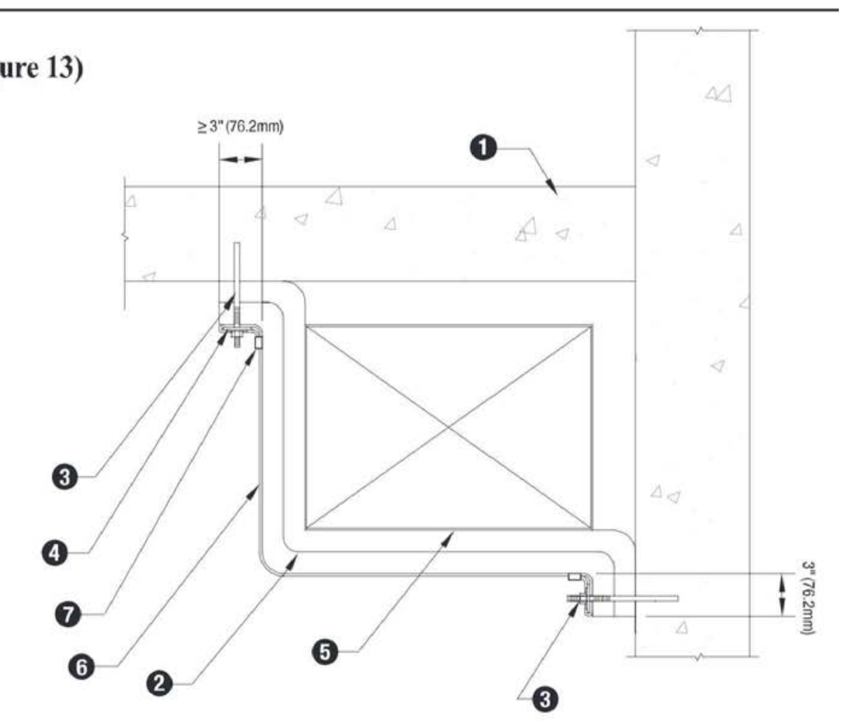
M402

10. Grease Duct & Ventilation Air Duct Installation Techniques cont.

3M™ Fire Barrier Duct Wrap 615+
Suggested Two-Sided Wrap Installation (Figure 13)

1. Concrete slab
2. 1 or 2 layers of 3M™ Fire Barrier Duct Wrap 615+ (application dependent)
3. Concrete fasteners – min. 1/4" (6.35mm) dia. steel concrete anchors
4. 1/8" (3.18mm) thick x 2" to 3" (50.8mm to 76.2mm) wide bar stock perforated 12" (30.5cm) O.C.
5. Duct
6. Steel banding 1/2" (12.7mm) wide min. typical for permanent fastening
7. Banding clips

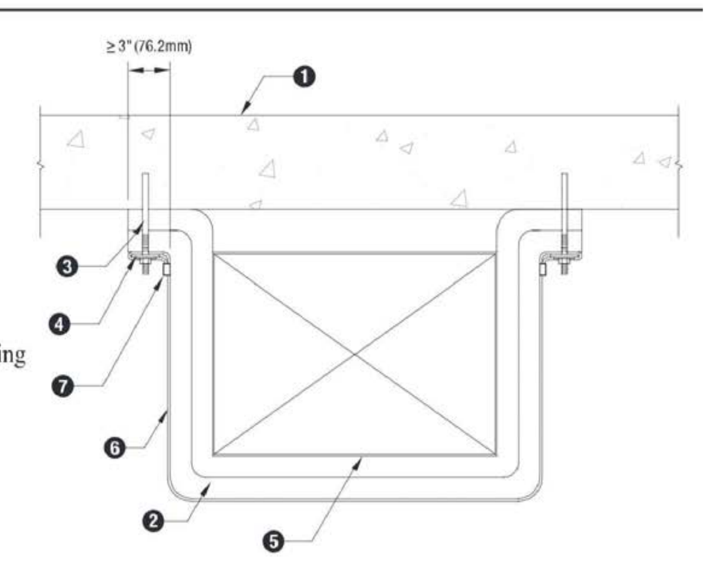
Note: System integrity is limited by quality of installation. Consult current independent testing laboratories (e.g. Intertek, UL) for Design or System Details.



3M™ Fire Barrier Duct Wrap 615+
Suggested Three-Sided Wrap Installation (Figure 14)

1. Concrete slab assembly
2. 1 or 2 layers of 3M™ Fire Barrier Duct Wrap 615+ (application dependent)
3. Concrete fasteners – min. 1/4" (6.35mm) dia. steel concrete anchors
4. 1/8" (3.18mm) thick x 2" to 3" (50.8mm to 76.2mm) wide bar stock perforated 12" (30.5cm) O.C.
5. Duct
6. Steel banding 1/2" (12.7mm) wide min. typical for permanent fastening
7. Banding clips

Note: System integrity is limited by quality of installation. Consult current independent testing laboratories (e.g. Intertek, UL) for Design or System Details.



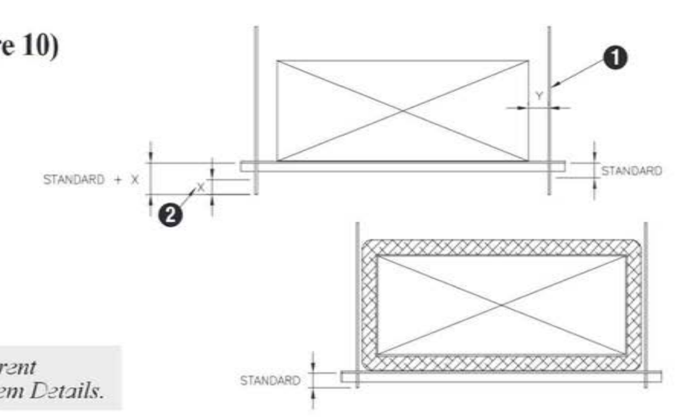
10. Grease Duct & Ventilation Air Duct Installation Techniques cont.

3M™ Fire Barrier Duct Wrap 615+
Hanging Support Details for Fire-Rated Ductwork (Figure 10)

Note: To facilitate the application of 3M Fire Barrier Duct Wrap 615+ so that the rods & trapeze hangers are outside the wrap envelope, the following dimensions are recommended:

	1-layer	2-layer
1. Rod-to-bare duct clearance (Y)	4" (102mm)	6" (152mm)
2. Added rod length (X)	2" (51mm)	4" (102mm)

Note: System integrity is limited by quality of installation. Consult current independent testing laboratories (e.g. Intertek, UL) for Design or System Details.

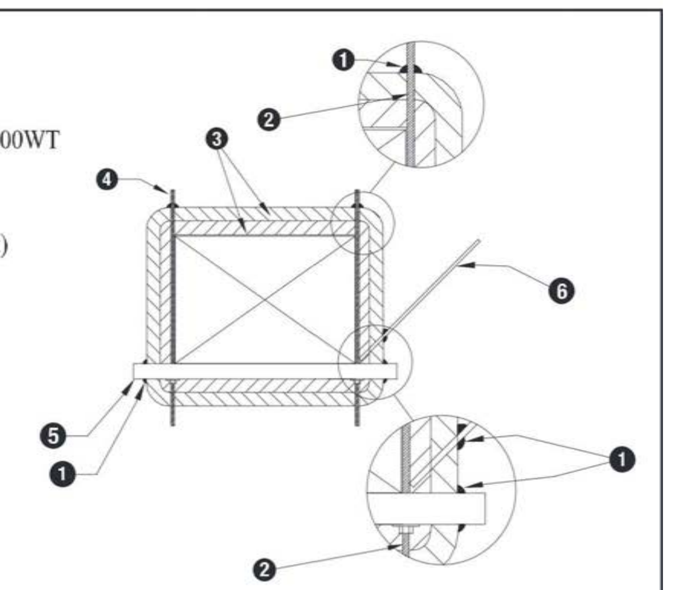


3M™ Fire Barrier Duct Wrap 615+
Hanger Penetrations of Wrap Envelope for Grease or Ventilation Duct Systems (Figure 11)

1. Min. 1/2" (12.7mm) crown of 3M™ Fire Barrier Sealant CP 25WB+ or 3000WT
2. Tape seams – min. 3" (76.2mm) wide aluminum tape, 3M™ FSK Facing Tape 3320 (or equivalent)
3. 1 or 2 layers of 3M™ Fire Barrier Duct Wrap 615+ (application dependent)
4. All Threaded Rod
5. C-channel or angle iron trapeze support
6. Seismic bracing wire

Note: The inclusion of metallic items penetrating out of the wrap envelope may diminish the T-Rating of the enclosure.

Note: System integrity is limited by quality of installation. Consult current independent testing laboratories (e.g. Intertek, UL) for Design or System Details.



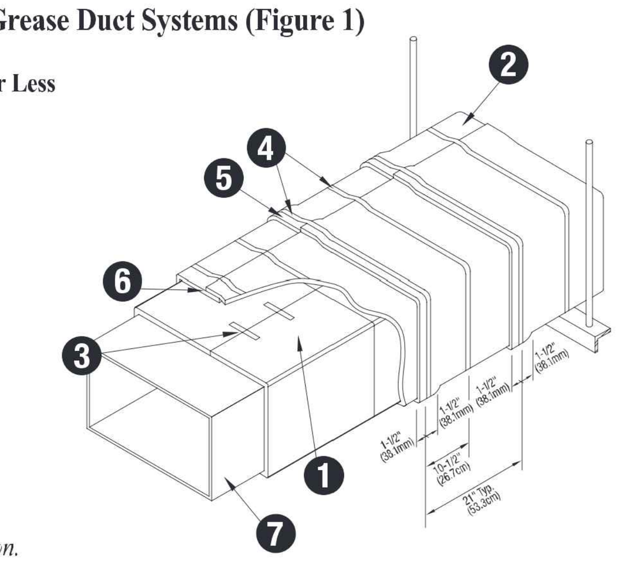
GREASE DUCT HANGING SUPPORT (3)
INSTALLATION DETAIL
SCALE: NONE
4 / M403

3M™ Fire Barrier Duct Wrap 615+ Commercial Kitchen Grease Duct Systems (Figure 1)
1- or 2-Hour Shaft Alternative Zero Clearance to Combustibles
Telescoping Wrap Technique With Banding For Ducts 24" (60.9cm) or Less

1. First layer 3M™ Fire Barrier Duct Wrap 615+
2. Second layer 3M™ Fire Barrier Duct Wrap 615+
3. 3/4" (19mm) wide filament tape
4. Steel banding 1/2" (12.7mm) wide min. typical for permanent fastening
5. Longitudinal joint butt or min. 3" (76.2mm) overlap on inner layer, min. 3" (76.2mm) overlap on outer layer
6. Perimeter (lateral) joint butt or min. 3" overlap (76.2mm) on inner layer, min. 3" (76.2mm) overlap on outer layer
7. Metallic commercial cooking exhaust duct

Note: System integrity is limited by quality of installation. Ducts ≥ 24" (60.9cm) wide require pinning on the bottom side of horizontal ducts and on a minimum of one of the wider sides of a vertical duct. Vertical ducts require pinning on all sides > 48" (121.8cm).

Consult current independent testing laboratories (e.g. Intertek, UL) for design or system details. See Detail 9 for additional pinning information.



GREASE DUCT FIRE WRAP WITH BANDS (3)
INSTALLATION DETAIL
SCALE: NONE
2 / M403

3M™ Fire Barrier Duct Wrap 615+
Elbow and Banding Installations (Figure 15)
Suggested Elbow Pattern Installation (A)

1. Perimeter
2. 3" (76.2mm) min. overlap
3. Hole cut (off-center)

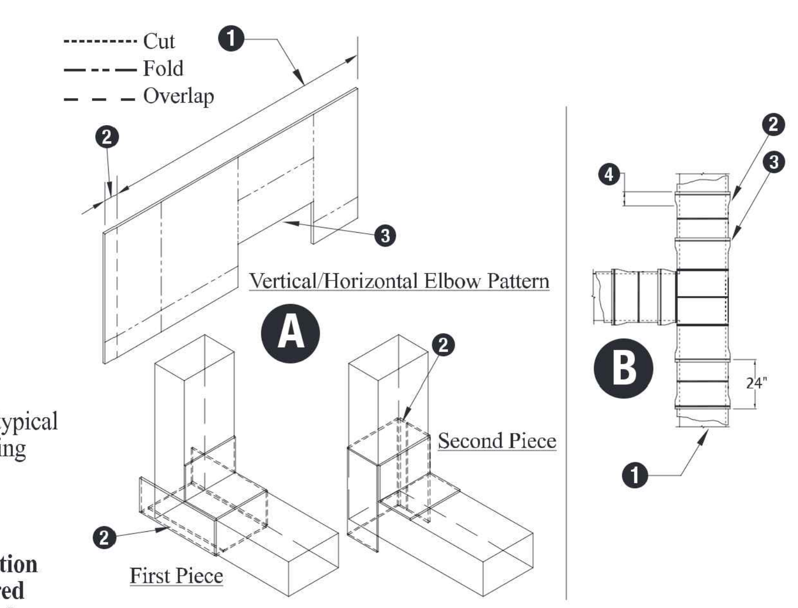
Note: Place overlap on opposite side of horizontal pattern.

Suggested Banding Pattern Installation (B)

1. Grease of ventilation duct
2. 1 or 2 layers of 3M™ Fire Barrier Duct Wrap 615+ (application dependent)
3. Steel or stainless steel banding 1/2" (12.7mm) wide min. typical for permanent fastening with max. 10-1/2" (26.7cm) spacing
4. 3" (76.2mm) overlay (typical throughout application)
5. Min. 3" (76.2mm) perimeter overlap (not shown)

Note: 1-layer application depicted. When 2-layer application is required, replicate these steps with outer joints staggered a min. 3" (76.2mm) from inner joints. Banding is required on outermost layer only.

Note: System integrity is limited by quality of installation. Consult current independent testing laboratories (e.g. Intertek, UL) for Design or System Details.

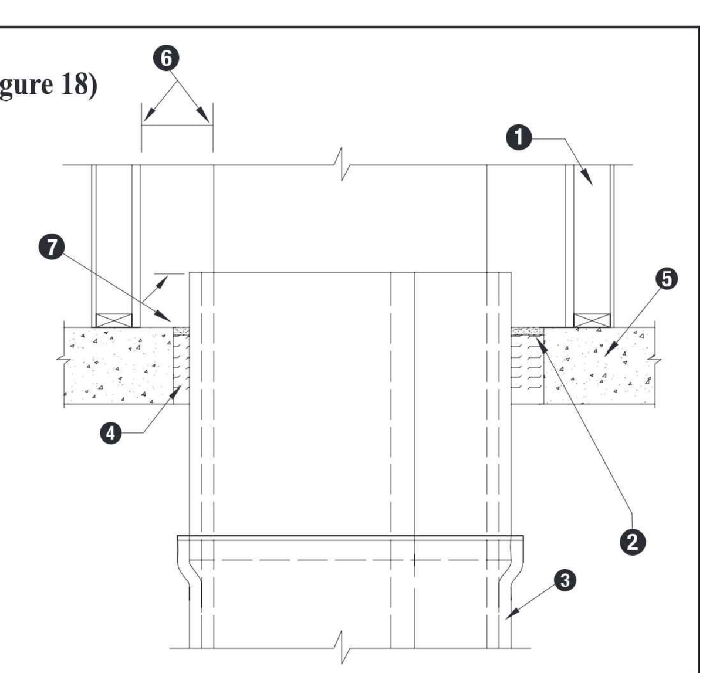


ELBOWS, BANDING, TURNS & BRANCHING (3)
INSTALLATION DETAIL
SCALE: NONE
3 / M403

3M™ Fire Barrier Duct Wrap 615+
Suggested Duct Wrap / Shaft Transition Installations (Figure 18)

1. Fire barrier gypsum shaft assembly
2. 5/8" (15.88mm) depth of 3M™ Fire Barrier Sealant 1000NS, 1003SL or 2000+
3. 1 or 2 layers of 3M™ Fire Barrier Duct Wrap 615+ (application dependent)
4. 3M™ Fire Barrier Duct Wrap 615+ (use small scrap piece)
5. Fire barrier concrete floor assembly
6. Air gap as required by local mechanical code (grease ducts)
7. Extend duct wrap into shaft a min. distance that meets local code requirements for clearance to combustibles

Note: System integrity is limited by quality of installation. Consult current independent testing laboratories (e.g. Intertek, UL) for Design or System Details.



THROUGH WALL & FLOOR (3)
INSTALLATION DETAIL
SCALE: NONE
6 / M403

3M™ Fire Barrier Duct Wrap 615+
Product Data Sheet and Installation Guide

1. Product Description

3M™ Fire Barrier Duct Wrap 615+ is a flexible fire-resistant wrap consisting of an inorganic fiber blanket encapsulated with a scrim-reinforced foil. The product is 1-1/2" thick, 6 pcf density.[1] It is used to fire rate commercial kitchen grease ducts as well as ventilation ducts. 3M™ Fire Barrier Duct Wrap 615+ is a proven alternative to 1- or 2-hour fire-resistant rated shaft enclosures for grease ducts (ICC-ES ESR-1255). With its excellent insulating capabilities, low weight and thin profile, it is an ideal choice for a duct enclosure system. This non-asbestos[2] wrap installs easily due to its high flexibility and strength.

[1] In accordance with the tolerances in ASTM C 892 Standard Specification for High-Temperature Fiber Blanket Thermal Insulation.
[2] These fibers are not biopersistent and are therefore non-carcinogenic per Note Q of EU Directive 67/548/EEC (guideline 97/69/EG).

Flexible and lightweight with a thin profile for easier application and reduced space requirements

Product Features

- Two-layer wrap for grease ducts rated as a shaft alternative per ASTM E 2336
- Zero clearance to combustible throughout the entire enclosure system
- Butted inner layer in 2-layer grease duct applications
- One-layer wrap for fire-resistive ventilation ducts per ISO 6944
- High flexibility for installation ease
- Foil encapsulated for blanket protection, less dust, and high wrap strength
- Wide range of penetration seal systems
- Available in: 24" x 25 ft. (609.6mm x 7.62m) and 48" x 25 ft. (1219.2mm x 7.62m) rolls
- Blanket adhered to foil scrim helps prevent wrap from slumping

FIRE BARRIER 2 HOUR · FLEXIBLE WRAP GREASE & AIR DUCT
ICC-ES ESR-1255 · NFPA 96
Intertek FIRE RESISTANT DUCT SEE INTERTEK DIRECTORY · Intertek FIRE RESISTANT DUCT SEE INTERTEK DIRECTORY
CLASSIFIED UL BATTS AND BLANKETS FOR USE IN FIRE RESISTIVE DUCT ASSEMBLIES SEE UL FIRE RESISTANCE DIRECTORY 90G9
CSFM LISTING No. 2440-0941:112

2. Applications

3M™ Fire Barrier Duct Wrap 615+ is an ideal fire resistive enclosure for commercial kitchen grease ducts and ventilation air ducts. It is a proven alternative to a 1- or 2-hour fire-resistant rated shaft enclosures for grease ducts and provides zero clearance to combustible construction throughout the entire enclosure system (per ICC-ES ESR-1255). 3M™ Fire Barrier Water Tight Sealant 1000 NS, 3M™ Fire Barrier Water Tight Sealant 1003 SL or 3M™ Fire Barrier Silicone Sealant 2000+ is used in combination with 3M™ Fire Barrier Duct Wrap 615+ to firestop the duct when the duct penetrates fire-rated floor or wall assemblies. 3M™ Fire Barrier Duct Wrap 615+ also provides a firestop solution where a T-rating is required for penetrations located outside wall cavities or outside fire-resistance rated shaft enclosures.

Two-layer grease duct applications: 3M™ Fire Barrier Duct Wrap 615+ meets the criteria of ASTM E 2336 Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems.

Single-layer ventilation duct applications: 3M™ Fire Barrier Duct Wrap 615+ has passed ISO 6944-1985 Fire Resistance Tests – Ventilation Ducts.

T-rating for metallic through-penetrating items: 3M™ Fire Barrier Duct Wrap 615+ is used in conjunction with 3M Fire Barrier sealants to achieve up to 2-hour equal F & T-ratings in ASTM E 814 (UL 1479) tested through-penetrations.

3. Specifications

Installation shall be in strict accordance with manufacture's written instructions, as shown on the approved shop drawings. 3M™ Fire Barrier Duct Wrap 615+ shall be a high-temperature fibrous thermal insulation blanket encapsulated in a fiberglass-reinforced aluminized polyester foil. Duct Wrap density shall be nominal 6 pcf (96 kg/m³) and have a nominal 1-1/2" (38.1mm) thickness. The fiber blanket shall have a continuous use limit of 1000°C (1832°F). The blanket thermal resistance (R-value) at ambient temperature shall be minimum $6.3 \frac{°F \cdot ft^2 \cdot hr}{Btu}$.

Smoke Developed Index and Flame Spread Index of the bare blanket, and of the foil encapsulated blanket shall be 0/0. The foil encapsulation shall be bonded to the core blanket material.

Typically Specified Division or Section
Division 7 – Thermal and Moisture Protection
Section 23 07 13 – Duct Insulation

Related Sections
Section 07 21 00 – Thermal Protection
Section 07 21 16 – Blanket Insulation
Section 07 84 00 – Firestopping
Section 23 00 00 – Heating, Ventilation and Air-Conditioning (HVAC)
Section 23 31 13 – Metal Ducts

For technical support relating to 3M™ Fire Protection Products and Systems, call: 1-800-328-1687
For more information on 3M™ Fire Protection Products, visit: www.3M.com/firestop
2

4. Performance & Typical Physical Properties

Scrim Color:	Aluminum with Black Text
Blanket Color:	White
Blanket Weight:	0.9 lbs/ft.² (4.38 kg/m²)
Surface Burning:	Foil Encapsulated Blanket (ASTM E 84) Flame Spread 0, Smoke Development 0

Single layer R-Value of 3M™ Fire Barrier Duct Wrap 615+ at 77°F (25°C): $6.38 \frac{°F \cdot ft^2 \cdot hr}{Btu}$

Single layer R (SI) Value of 3M™ Fire Barrier Duct Wrap 615+ at 77°F (25°C): $0.89 \frac{m^2 \cdot K}{W}$

Thermal Conductivity:

Temp.	$\frac{Btu - in.}{hr - ft^2 - °F}$	$\frac{W}{m^2 - K}$
500°F (260°C)	0.60	0.09
1000°F (537°C)	1.15	0.17
1500°F (815°C)	1.93	0.28
1800°F (982°C)	2.51	0.36
2000°F (1093°C)	2.94	0.43

Linear Shrinkage (24 hrs at 2012°F (1000°C)): 1.2%
Noise Reduction Coefficient (ASTM C 423): 0.80

5. Design Listings

Grease Duct Listings – ASTM E 2336 / ICC-ES AC101

Fire Resistive Rating	Enclosure System	Third-Party Testing Services Design Listing	Description
1- and 2-hour	2 layers of 3M™ Fire Barrier Duct Wrap 615+	ICC-ES ESR-1255 Intertek 3MU/FRD 120-18 Intertek 3MU/FRD 120-19	Rectangular Rectangular Round

Ventilation Duct Listings – ISO 6944-85

Fire Resistive Rating	Enclosure System	Third-Party Testing Services Design Listing	Description
1- and 2-hour	1 layer of 3M™ Fire Barrier Duct Wrap 615+	Intertek 3MU/DI 60-01 Intertek 3MU/DI 120-01 Underwriters Laboratories HNLJ.V-27 Underwriters Laboratories HNLJ.V-31	Rectangular/Round (1 hour) Rectangular/Round (2 hour) Rectangular (2 hour) 2- & 3-sided Rectangular (2 hour)

This document only contains a partial list of Design Listings. For the latest information go to www.3M.com/firestop or speak to your authorized 3M distributor or sales representative at (800) 328-1687.

6. Codes & Test Standards

3M™ Fire Barrier Duct Wrap 615+ has been tested in accordance with the following:

ASTM E 2336	Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems
ICC-ES AC101	Acceptance Criteria for Grease Duct Enclosure Assemblies
ASTM E 119	Standard Test Methods for Fire Tests of Building Construction
ASTM E 814	Standard Test Method for Fire Tests of Penetration Firestop Systems
ASTM E 136	Standard Test Method for Behavior of Material in a Vertical Tube Furnace at 750°C (1382°F)
ASTM C 518	Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
ASTM E 84	Standard Test Method for Surface Burning Characteristics of Building Materials
ISO 6944-85	Fire Resistance Tests – Ventilation Ducts

3M™ Fire Barrier Duct Wrap 615+, when installed per ASTM E 2336 tested Grease Duct Design Listings, addresses the following code requirements:

New York City OTCR	Buildings Bulletin 2010-021
NFPA 96	2008/2011
International Mechanical Code®	2003/2006/2009/2012
Uniform Mechanical Code	2003/2006/2009/2012

3M™ Fire Barrier Duct Wrap 615+, when installed per ISO 6944 tested Ventilation Duct Design Listings, can help to satisfy the following code requirements:

New York City OTCR	Buildings Bulletin 2012-011
NFPA 92A	Standard for Smoke-Control System Utilizing Barriers and Pressure Differences, 2009 Edition – Section 6.6.2
NFPA 92B	Standard for Smoke Management Systems in Malls, Atria, and Large Spaces, 2009 Edition – Section 7.5.2
International Mechanical Code®	2006/2009/2012 – Section 513.10.2
International Building Code®	2006/2009/2012 – Section 909.10.2

7. Packaging, Storage, Shelf Life

3M™ Fire Barrier Duct Wrap 615+ rolls are packaged in corrugated cardboard boxes. Product is stable under normal storage conditions. Normal stock and stock rotation practices are recommended. 3M™ Fire Barrier Duct Wrap 615+ shelf life is indefinite when stored in original unopened packaging in a dry warehouse environment. Pallets should not be stacked. 3M™ Fire Barrier Water Tight Sealant 1000 NS or 1003 SL or 3M™ Fire Barrier Silicone Sealant 2000+ must be also stored in a dry warehouse environment.

FIELD INSTALLED GREASE DUCT (3)
LIST OF STANDARDS
SCALE: NONE
1 / M403

TAS
THOMAS architecture studios
525 COLUMBIA ST. | OLYMPIA, WA 98501
360.915.8775 | tasolympia.com

TOWNZEN & ASSOCIATES
PLAN APPROVAL
The plans submitted for review are approved in accordance with local state applicable standards. This approval does not relieve the applicant of the responsibility of compliance with the applicable codes.
4 Approved as submitted.
09/25/2019

ROBISON ENGINEERING, INC
19401 40TH AVE W., SUITE 302
LYNNWOOD, WA 98036
206-364-3343 TEL
CONTACT: JON ROBISON

MARK D. ROBISON · STATE OF WASHINGTON · REGISTERED PROFESSIONAL ENGINEER
06/05/18

Olympia
Building Plans Examiner
Community Planning & Development Department
601 4th Ave East
Olympia, WA 98501

EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
A	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE
3	09/03/19	ASI-3

FIRE WRAP

M403

2015 Washington State Energy Code Compliance Forms for Commercial, R2 and R3 over 3 stories and all R1 - Page 7 of 18

Mechanical Permit Plans Checklist — MECH-CHK

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 — Revised January 2017

Project Title: East Bay Lot A Westman Mill — Date 5/11/2018

The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - *Must be in permit documents*	Location in Documents	Building Department Notes
NA	C403.5.3	Energy recovery - cooler / freezer condensers	For buildings with food service, meat or deli departments that have ≥ 500,000 Btu/h of remote refrigeration capacity for coolers / freezers, indicate condenser ER and use of captured energy (service water heating, space heating, or dehumidification reheating)		
			For buildings with ≥ 40,000 sf conditioned floor area and with ≥ 1,000,000 Btu/h of remote refrigeration capacity for coolers / freezers, indicate condenser ER and use of captured energy for service water heating and also for space heating, or dehumidification reheating		
NA	C403.5.4	Energy recovery - condenser systems	For buildings with 24-hour operation and with > 1,500,000 Btu/h of heat rejection capacity and design service hot water load > 250,000 Btu/h, indicate condenser ER to pre-heat service water; or exception taken. Provide calculations showing the amount of recovered heat that is utilized (60% of peak heat rejection load or pre-heat service water to 85°F).		
Hydronic System Controls					
NA	C403.2.13 C403.4.2.7	Variable flow control - hydronic system pumps	For hydronic system pump motors ≥ 7.5 hp, indicate method of variable flow control (VSD or equivalent method that requires ≥ 30% design wattage at 50% design fluid flow); note exception taken		
			Identify whether hydronic coils have DDC controls and associated manner of pump speed control (differential pressure, zone hydronic demand, etc)		
NA	C403.2.5 C403.4.2.4	Hydronic system setback and part load controls	For boilers that provide building heating, indicate controls that provide heating water temperature setback based on outdoor temperature		
			For heating and chilled water systems ≥ 300,000 Btu/h, indicate systems are configured to automatically reset supply water temperature based upon demand; or exception taken. If system pump motor hp ≥ 3 hp, also indicate controls automatically reduce flow by ≥ 50%.		
			For chilled water systems (≥ 300,000 Btu/h, pump motor hp ≥ 3 hp) that serve water-cooled unitary air conditioners, indicate VSD or staged pumps in chilled water system and heat rejection loop that reduce pump flow so that one control valve is nearly wide open, or to maintain a minimum differential pressure; or exception taken		
NA	C403.4.2	Boiler sequencing	Indicate automatic controls that sequence operation of multiple boilers		
NA	C403.4.6	Hot gas bypass limitation	For cooling equipment with hot gas bypass, provide either multiple step unloading or continuous capacity modulation; indicate bypass capacity per Table C403.4.6		
NA	C403.4.2.2	Two-pipe changeover systems	Indicate changeover deadband (min 15°F), heating / cooling mode scheduling and changeover temperature range (limit 30°F)		
NA	C403.4.2.6	Chiller / boiler plant pump isolation	Indicate controls are configured to automatically reduce overall plant flow and shut-off flow through individual chillers and boilers when not in use		
NA	C403.2.13.1.1 C403.4.3.1.1 C403.4.3.1.2	Heat rejection equipment - variable flow control	For cooling towers with fan motors ≥ 7.5 hp, indicate VSD and method to adjust fan speed (adjusted based on leaving fluid temperature or condenser temperature / pressure of heat rejection device)		
			For multiple-cell heat rejection equipment with VSD, indicate controls that ramp all fans in unison		
NA	C403.4.3.3	Heat rejection equipment - cooling tower flow turndown	Indicate open-circuit cooling towers with multiple pumps or VSD control are designed so all cells can be run in parallel		
NA	C403.4.2.3.1	Water loop heat pump - deadband	Indicate capability of central equipment to provide minimum 20°F water supply temperature deadband between heat rejection and heat addition modes; or exception taken		
NA	C403.4.2.3.2.1	Water loop heat pump - heat rejection equipment, Zone 4	Indicate type of cooling tower (open- or closed-circuit) in equipment schedule; indicate method used to limit system heat loss when heat rejection is not needed		
NA	C403.4.2.3.2.2	Water loop heat pump - heat rejection equipment, Zone 5	For open- or closed-circuit cooling towers, provide a heat exchanger that separates the cooling tower and heat pump loop		
NA	C403.4.2.3.3	Water loop heat pump - isolation valves	For hydronic heat pump systems with total system power > 10 hp, indicate 2-way isolation valves on each heat pump and variable flow system control		
Dedicated Outdoor Air Systems (DOAS) - Optional through 6/30/16, Prescriptive 7/1/2016					
NA	C403.6 C403.6.3	Dedicated outdoor air systems	For buildings with office, retail, education, library and fire station spaces, identify these spaces on plans; indicate that ventilation air in each occupied space is provided via a DOAS system; or document compliance with C403.6.3 Impracticality; or exception taken (buildings complying with C402.4.1.4 or C406.6 may not utilize exceptions)		
NA	C403.6.1	Energy recovery ventilation with DOAS	For all DOAS systems, indicate exhaust air ER method; or exception taken with supporting calculations. Indicate ER rated effectiveness that increases OSA enthalpy by ≥ 50% based on delta between OSA and return air enthalpies at design conditions.		
NA	C403.6.2	Heating / cooling system controls with DOAS	Indicate equipment associated with the delivery of zone level heating and cooling (fans, hydronic pumps, primary air dampers, etc) are configured to shut off, and central equipment is configured to turn down, when there is no call for heating or cooling in the zone they serve		
			If applying Exception to heating / cooling fans used for air mixing in the space during deadband periods, include fan watts per cfm in equipment schedule		

2015 Washington State Energy Code Compliance Forms for Commercial, R2 and R3 over 3 stories and all R1 - Page 5 of 18

Mechanical Permit Plans Checklist — MECH-CHK

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 — Revised January 2017

Project Title: East Bay Lot A Westman Mill — Date 5/11/2018

The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - *Must be in permit documents*	Location in Documents	Building Department Notes
Yes	C403.2.4.10 C403.2.4.11	Group R2 / R3 dwelling units, Group R2 sleeping units	For primary space conditioning system, indicate 5-2 programmable thermostats capable of two setback periods per day; for all thermostats indicate purpose (heating only, cooling only, or both), required temperature range and at minimum a 10°F deadband; or exception taken	M001	
Yes	C403.2.6 C403.2.11.4	Ventilation	Indicate method of ventilation air delivery (natural or mechanical) for each zone	M2XX	
			If mechanically delivered, indicate that systems are configured to provide not more than 150% of, but at least the minimum required volume of outdoor air to each zone per IMC, ASHRAE 62.1 or other applicable code (WAC, OSHA, etc); or exception taken	M001	
			If delivered via natural ventilation, identify required elements per IMC including minimum openable area to the outdoors or qualifying adjoining spaces		
NA	C403.2.6.2	Demand controlled ventilation	Identify spaces > 500 sf with occupant load > 25 people/1,000 sf per IMC; for each space indicate whether it is served by an HVAC system with total design OSA > 3,000 cfm, and / or the system has airside economizer or automatic modulating OSA damper; indicate OSA controls are configured to provide demand controlled ventilation or provide supporting documentation for applied exception		
NA	C403.2.6.3	Occupancy sensors	For gyms, classrooms, auditoriums and conference rooms > 500 sf, indicate occupancy-based OSA control when space is unoccupied and method (closes OSA damper or shuts-off equipment); or alternate means provided to automatically reduce OSA when space is partially occupied		
NA	C403.2.6.4 C403.2.6.4.1	Enclosed loading dock ventilation	For enclosed loading docks, indicate ventilation / exhaust system method of activation (gas detection system for CO and NO2, or occupancy sensors), and control method (staged or modulating)		
NA	C403.2.6.4 C403.2.6.4.2	Enclosed parking garage ventilation	For enclosed parking garages, indicate ventilation / exhaust system activated by gas detection system for CO and NO2, and control method (staged or modulating); or exception taken		
NA	C403.2.7.1	Kitchen exhaust hoods	Provide calculations that show a balanced accounting of total kitchen exhaust (include all hoods) with % of: supply air, transfer air from adjacent spaces, and make-up air; if applicable, indicate that direct make-up air to each hood does not exceed 10% of hood exhaust		
			For kitchens with total hood exhaust exceeding 2,000 cfm, indicate exhaust air rate per Table C403.2.7.1 and compliance method (DCV, energy recovery, or transfer air that would otherwise be exhausted)		
NA	C403.2.7.2	Laboratory exhaust systems	Refer to Systems Requiring Energy Recovery for requirements		
NA	C403.2.13	Variable flow capacity - HVAC system fans	For HVAC fan motors ≥ 7.5 hp, indicate method of variable flow control (VSD, or equivalent control method that reduces design air volume by 50% at 1/3 static design pressure); note exception taken		
NA	C403.3.1	DX air handler variable cooling control (Under Integrated Economizer)	For DX air handlers with economizer and cooling capacity ≥ 65,000 Btu/h, indicate number of cooling stages provided and method (multiple compressors and / or variable speed compressors); indicate minimum displacement (capacity reduction) as % of full load		
			Indicate control method (cooling capacity controlled in response to space temperature, space temperature controlled by modulating supply airflow, or both)		
NA	C403.2.11.5	Fan airflow control	For DX air handling units with cooling capacity ≥ 65,000 Btu/h and evaporative and chilled water air handling units with fan ≥ 0.25 hp, indicate whether system is single zone or multiple zone and related control method (cooling capacity controlled in response to space temperature, space temperature is controlled by modulating supply airflow, or both)		
			For mechanical cooling systems (includes DX and chilled water coils) that control cooling capacity in response to space temperature - Provide a minimum of two stages of fan control; indicate minimum fan speed is ≤ 66% of full speed drawing ≤ 40% of full speed fan power during periods of low cooling or ventilation only		
			For other mechanical cooling systems (includes DX and chilled water coils) that control space temperature by modulating airflow (in lieu of, or in addition to, controlling capacity in response to space temperature) - Provide fan controls for modulating supply airflow; indicate minimum fan speed is ≤ 50% of full speed drawing ≤ 30% of full speed fan power during periods of low cooling or ventilation only; or exception taken		
NA	C403.2.4.12	DDC system capabilities	Provide central and zone level DDC controls as required based on system application, capacity or size thresholds and other qualification per Table C403.2.4.12.1		
			Identify all DDC system input / output control points; indicate capability for trending and graphical display		
Ducting Systems					
Yes	C403.2.8.1 C403.2.8.3	Duct construction	Indicate on plans that all ductwork is constructed and sealed per IMC	M001	
			For OSA ductwork, also indicate on plans that ductwork meets air leakage requirements per C402.5 and vapor retarder requirements per the IBC	M001	
NA	C403.2.8.3	Duct pressure classifications	Identify location of low, medium and high pressure ductwork on plans		
NA	C403.2.8.3.3	High pressure duct leakage test	Indicate high pressure duct leakage testing requirements on plans; provide test results to jurisdiction when completed		

2015 Washington State Energy Code Compliance Forms for Commercial, R2 and R3 over 3 stories and all R1 - Page 3 of 18

Mechanical Permit Plans Checklist — MECH-CHK

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 — Revised January 2017

Project Title: East Bay Lot A Westman Mill — Date 5/11/2018

The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - *Must be in permit documents*	Location in Documents	Building Department Notes
Equipment - Sizing, Performance and Type					
NA	C403.1	Exempt process equipment	Identify equipment to be used in manufacturing, industrial or commercial processes that do not provide space conditioning; identify provisions applicable to this equipment per C403.1 exception		
Yes	C403.2.1	Load calculations	Provide load calculations performed per ASHRAE Std 183 or equivalent, using design parameters per C302 and Appendix C; include load adjustments to account for energy recovery	M61X	
Yes	C403.2.2	Equipment and system sizing	Indicate that output capacities of heating and cooling equipment and systems are no greater than the smallest available equipment size that exceeds the calculated loads; note exceptions taken	M002	
Yes	C403.2.3 C403.2.3.2 C403.2.13.1	HVAC equipment performance requirements (efficiency)	Provide equipment schedules on plans or complete MECH-EQ forms indicating type, capacity, rated and WSEC minimum efficiencies for all heating and cooling equipment; include supply and OSA cfms and operating hours for all air systems; identify heating and cooling equipment that does not have a corresponding WSEC minimum efficiency (manufacturer rated)	M002	
Yes	C405.8 C403.2.14	Electric motor efficiency	List all motors ≥ 1/12 hp (that are not integral to a rated piece of equipment) in the mechanical or electrical equipment schedules on plans; indicate hp, rpm, number of poles and rated efficiency, or exception applied		
			For fractional hp motors (1/12 - 1 hp), indicate whether they are an electronically commutated motor, have rated efficiency of at least 70%, or exception taken	M002	
Yes	C403.2.11.1	Fan power limitation	For all HVAC fan systems that provide heating and / or cooling, provide system total nameplate hp in MECH-FANSYS-SUM form	M002	
			For all applicable HVAC systems with total fan motor hp > 5hp, verify fan system motor hp or bhp complies with fan power limits per equations in Table C403.2.11.1(1), provide MECH-FANSYS form for each system		
NA	C403.2.11.2	Motor nameplate hp	For all applicable HVAC systems with total fan motor hp > 5hp, indicate fan motors specified are the smallest available motor hp size greater than fan bhp, note exceptions taken		
NA	C403.2.11.3	Fan efficiency	For all applicable HVAC systems with total fan motor hp > 5hp, identify in equipment schedule all fans required to comply with fan efficiency grade and indicate rated FEG is ≥ 67, or exception taken; indicate these fans are sized so total efficiency is within 15% of the fan maximum total efficiency		
Yes	C403.2.11.4	Group R occupancy exhaust fan efficacy	For all exhaust fans < 400 cfm in Group R occupancies, indicate in equipment schedule the fan flow rate and efficacy (cfm/watt), or exception taken; refer to Table C403.2.11.4 (CE-57)	M002	
NA	C403.2.13	Variable flow capacity - fans	For fan motors ≥ 7.5 hp, indicate method of variable flow control (VSD or equivalent method) in equipment schedule, or exception taken; for equivalent method for an HVAC system refer to HVAC System Controls for additional requirements		
NA	C403.2.3	Maximum air cooled chiller capacity	For chilled water plants and buildings with > 500 tons of cooling capacity, indicate air-cooled chiller capacity is ≤ 100 tons, or exception taken		
NA	C403.4	Large capacity cooling systems	For buildings with ≥ 300 tons of cooling capacity, indicate method of multi-stage or variable capacity control (VSD, multiple staged compressors, or max capacity of any single unit < 66% of the total)		
NA	C403.2.3.1	Non-standard water-cooled centrifugal chillers	For water-cooled centrifugal chillers not designed for operation at standard conditions, provide calculations documenting maximum full load and part load rated equipment performance requirements		
NA	C403.2.13.1 C403.4.3.2	Centrifugal fan open-circuit cooling towers	For open-circuit centrifugal fan cooling towers with ≥ 1,100 gpm capacity, indicate cooling towers comply with efficiency requirements for axial fan open circuit cooling towers		
NA	C403.4.2 C403.4.2.5	Large capacity boiler systems	For single boilers with > 500,000 Btu/h capacity, indicate multi-stage or modulating burner		
			For boiler system (single or multiple) with > 1,000,000 Btu/h capacity, indicate turndown ratio per Table C403.4.2.5 and method (multiple single input boilers, modulating boilers, or combination)		
NA	C403.2.13	Variable flow capacity - pumps	For pump motors ≥ 7.5 hp, indicate method of variable flow control (VSD or equivalent method) in equipment schedule, or exception taken; for equivalent method for a hydronic system refer to Hydronic System Controls for additional requirements		
NA	C403.2.3	Gas and oil-fired forced air furnace and unit heaters	For forced air furnaces with capacity ≥ 225,000 Btu/h and all unit heaters, indicate in equipment schedule intermittent ignition or IID, flue or draft damper, and rated jacket loss		
NA	C403.2.4.8	Combustion heating equipment	For combustion heating equipment with output capacity > 225,000 Btu/h, indicate modulating or staged combustion control		
Yes	C403.2.3.3	Packaged electric heating / cooling equipment	Verify all packaged electric equipment with > 6,000 Btu/h cooling capacity and any amount of heating is a heat pump; include in equipment schedules	M002	
NA	C403.2.12	Heating outside a building	Indicate systems providing heating in non-enclosed outdoor occupied spaces are radiant systems; refer to HVAC System Controls for additional requirements		
NA	C403.2.7.1	Kitchen exhaust hoods	Indicate on plans the type, duty and exhaust air rate of each kitchen hood, refer to HVAC System Controls for additional requirements		
Yes	C403.2.4.3	Outdoor supply air, exhaust and relief dampers	Indicate locations of OSA intake, and exhaust and relief outlet dampers on plans; indicate whether dampers are Class 1 motorized, or gravity and exception taken (include leakage rating, cfm/sf); refer to HVAC System Controls for additional requirements for OSA dampers	M001	
NA	C403.2.4.3	Return air dampers	Indicate locations of return air dampers that are integral to economizer operation; verify dampers are motorized; indicate whether dampers are Class 1, or within packaged equipment eligible for leakage rating exception (include leakage rating, cfm/sf)		

2015 Washington State Energy Code Compliance Forms for Commercial, R2 and R3 over 3 stories and all R1

Mechanical Summary — MECH-SUM

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 — Revised January 2017

Project Information

Project Title: East Bay Lot A Westman Mill
Date 5/11/2018
For Building Dept. Use

Applicant Information. Provide contact information for individual who can respond to inquiries about compliance form information provided.

Company Name: Robison Engineering
Company Address: 19401 40th Avenue W, Suite 302
Applicant Name: Ly Ho
Applicant Phone: 206-364-3343

Project Description

Briefly describe mechanical systems in the text box provided

☐ Total Bldg Performance (TBP)

This path includes all mandatory provisions per C401.2 Option 2. MECH-SUM, MECH-CHK, and C407 Energy Analysis forms required.

☑ New Building ☐ Building Addition ☐ Tenant Improvement ☐ System Retrofit ☐ No System Changes

Design Load Calculations

☑ Load calculation summary ☐ MECH-LOAD-CALC Form

Provide design load calculations for all mechanical systems and equipment serving the building heating, cooling or ventilating needs. If a load calculation summary is provided with the permit documents that includes all applicable compliance information then the MECH-LOAD-CALC form is not required.

Mechanical Schedules

☑ Mechanical Plans ☐ MECH-EQ Forms (TBD)

Indicate location of equipment compliance information. If provided on plans then MECH-EQ forms are not required, however, include on plans all applicable compliance information listed in MECH-EQ tables.

Dedicated Outdoor Air System Requirements and High Efficiency VAV Alternate

☐ DOAS is required per C403.6 effective July 1, 2017 (office, retail, education, library and fire station occupancies)

All occupied, conditioned areas shall be served by a DOAS that delivers required ventilation air in a manner that does not require space conditioning fan operation. Space conditioning fans cycled off when no heating or cooling is required.

- ☐ Ventilation provided via natural ventilation per 2015 IMC in lieu of DOAS (C403.6, Exception 1)
- ☐ Ventilation and space conditioning provided by a HEVAV system per C403.7 in lieu of DOAS (C403.6, Exception 2)

☐ DOAS included in project, although not required (occupancy not office, retail, education, library or fire station)

☐ DOAS related allowances included in project:

- ☐ Prescriptive vertical fenestration maximum area allowance increased to 40% per C402.4.1.4 with 100% of conditioned floor area in building served by DOAS.
- ☐ Exception to air economizer per C403.3 Exception 1, include MECH-ECONO form.

Fan Power

☑ Project includes HVAC air distribution systems that provide heating and/or cooling
If yes, provide a MECH-FANSYS -SUM form.

☐ For one or more systems, the total fan motor nameplate hp of all fans in HVAC system exceeds 5hp.
If yes, provide a seperate MECH-FANSYS form for each HVAC system exceeding the 5 horsepower threshold. Refer to Section C403.2.11 and MECH-FANSYS-DOC for requirements and exceptions.

HVAC Hydronic Systems

☐ Hydronic chilled water ☐ Water-loop heat pump ☑ No hydronic systems
☐ Hydronic heating water ☐ Geothermal

C406 Additional Efficiency Options - Mechanical

☐ C406.2 More efficient HVAC equipment and fan systems
Requires 90% of heating and cooling capacity to be equipment listed in tables C403.2.3(1)-(9) or air-to-water heat pumps and heat recovery chillers. All equipment listed in tables C403.2.3(1)-(7) must be 15% more efficient than minimum requirements. All stand alone supply, return, and exhaust fans over 1hp must have FEQ ≥ 71 and must be selected within 10% of maximum total or static pressure.

☐ C406.6 Dedicated outdoor air system (DOAS)
Requires 90% of conditioned floor area to be served by a DOAS per C403.6 that delivers required ventilation air in a manner that does not require space conditioning fan operation.

☐ C406.7 Reduced energy in service water heating
Requires 90% of floor area be in occupancy types listed in C406.7.1 and that 60% of annual hot water energy use be provided by heat pump, waste heat recovery or solar water-heating systems.

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Mechanical Permit Plans Checklist — MECH-CHK

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 — Revised January 2017

Project Title: East Bay Lot A Westman Mill — Date 5/11/2018

The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - *Must be in permit documents*	Location in Documents	Building Department Notes
NA	C402.4.1.4 C403.6	Increased prescriptive maximum vertical fenestration area with DOAS	Indicate that all occupied, conditioned spaces are served by a DOAS per C403.6		
Additional Efficiency Package Option, Dedicated Outside Air Systems (DOAS)					
NA	C406.6	Building provided with DOAS	To comply with additional efficiency package option, indicate that 90% or more of all occupied, conditioned spaces are served by a DOAS per C403.6		
Multiple Zone Air Systems					
NA	C403.4.4	Air systems serving multiple zones	Identify supply air systems serving multiple zones and the zones they serve on plans; indicate whether system is VAV and method of primary air control; or provide supporting documentation for applied exception to VAV		
NA	C403.4.4	VAV systems serving multiple zones	Provide equipment schedules on plans or MECH-EQ form that list all VAV air terminals and types		
			For each air terminal include: maximum airflow rates for primary supply air during zone peak heating and zone peak cooling; maximum airflow during reheating, recooling or mixing; minimum airflow rate to maintain required ventilation, and the basis for these values; if IMC or ASHRAE 62.1 multiple zone equation is basis for minimum flow rates, provide calculation on plans		
NA	C403.4.4.1	Single duct VAV terminal units	Indicate single duct terminal units are configured to reduce primary supply air before reheating or recooling		
NA	C403.4.4.2	Dual duct systems - terminal units	For systems with separate warm air and cool air ducts, indicate terminal units are configured to reduce the flow from one duct to minimum before mixing with air from the other duct		
NA	C403.4.1.1 C403.4.1.2	VAV system static pressure sensors - sensors and DDC set points	Indicate locations of duct static pressure sensors on plans; include at least one sensor per major duct branch; verify controller setpoint pressure at each sensor is ≤ 1.2 inch w.g.		
			For systems with zone level DDC, indicate controls are configured to monitor zone damper positions and reset static pressure setpoint based on the zone requiring most pressure; include control logic that automatically detects and generates an alarm if any zone excessively drives reset logic, and allows building operators to exclude zones from reset logic		
NA	C403.4.4.3	Multiple-zone VAV system ventilation optimization controls	For systems with zone level DDC controls, indicate controls are configured to automatically reduce outdoor airflow in response to changes in system ventilation efficiency; or exception taken		
NA	C403.4.4.4	VAV system supply air reset	Indicate controls automatically reset supply air temperature in response to building loads or outdoor air temperature; or exception taken		
Multiple Zone HVAC Systems, High Efficiency VAV - Required for systems utilizing C403.6 DOAS Exception 2, must comply with all 16 provisions					
NA	C403.7, Item 1	Air economizer	Indicate system is configured for 100% air economizer operation and complies with all related economizer requirements per C403.3 (without economizer exceptions)		
NA	C403.7, Item 2	Direct digital controls (DDC)	Provide DDC controls for all components of system; identify all DDC system input / output control points; indicate capability for trending and graphical display		
NA	C403.7, Item 3	Outdoor airflow measurement and reduction	For systems with minimum OSA > 2,500 cfm, indicate outdoor airflow monitoring station that measures OSA intake under all load conditions; indicate control sequence that increases or reduces system OSA cfm based on VAV terminal feedback of ventilation efficiency (per C403.4.4.3 without exceptions) or DCV (per C403.2.6.2)		
NA	C403.7, Item 4	Supply airflow measurement	For systems with minimum OSA > 2,500 cfm, indicate supply airflow monitoring station capable of measuring supply air delivered to VAV terminals under all load conditions		
NA	C403.7, Item 5	Zone isolation and maximum area served	Verify maximum area served by a single HEVAV system is ≤ 50,000 sf, or one entire floor, whichever is greater; in addition if a system serves > 25,000 sf, that includes areas that are expected to be occupied non-simultaneously, indicate zone isolation controls per C403.2.4.4		
NA	C403.7, Item 6	Interior / exterior zone design supply air temperature	Verify that VAV terminals serving interior cooling driven loads are sized per design supply air temperature that is 5°F higher than VAV terminals serving exterior zones		
NA	C403.7, Item 7	Maximum air terminal inlet velocity	Identify air terminals with minimum primary airflow setpoints > 50% of maximum setpoint in equipment schedule or MECH-EQ form; indicate air terminal inlet velocity does not exceed 900 fpm		
NA	C403.7, Item 8	Sequence of operation	Indicate DDC system sequences of operation are designed and configured per ASHRAE GPC 36		
NA	C403.7, Item 9	Maximum allowable system brake horsepower	Verify fan system bhp is ≤ 90% of the bhp limit per Option 2 equation in Table C403.2.11.1(1), provide MECH-FANSYS form for each system		
NA	C403.7, Item 10	Fan-powered terminal unit motor and control	Indicate all series and parallel terminal fans have electronically commutated motors; indicate DDC control system is configured to vary air terminal fan speed as a function of the load; indicate fan speed during periods of low heating, low cooling, or ventilation only is ≤ 66% of peak design air flow or provide supporting documentation for applied exception		

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Mechanical Permit Plans Checklist — MECH-CHK

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 — Revised January 2017

Project Title: East Bay Lot A Westman Mill — Date 5/11/2018

The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - *Must be in permit documents*	Location in Documents	Building Department Notes
Yes	C403.2.8.1 C403.2.8.2	Duct insulation	For supply and return ductwork located in unconditioned space or outdoors, indicate R-value of insulation on ductwork on plans; identify climate zone; note exceptions taken	M001	
			For supply ductwork located in conditioned space, identify if design supply temperature is < 55°F or > 105°F and indicate R-value of insulation on this ductwork on plans; note exception taken	M001	
			For OSA ductwork, shafts and plenums, indicate R-value of insulation on these elements on plans per Table C402.1.3 for steel-framed walls; note exception taken	M001	
Piping Systems					
NA	C403.2.9	Piping insulation	Indicate design temperature range of fluid conveyed in piping and thickness of insulation (in inches) on hydronic piping plans; or exception taken		
NA	C403.2.9.1	Piping insulation exposed to weather	Indicate method of protection of pipe insulation from damage / degradation on hydronic piping plans		
Economizers					
NA	C403.3	Air economizer required	Identify in equipment schedules on plans or in MECH-EQ forms all cooling systems requiring air economizer controls		
			Provide MECH-ECONO form indicating systems utilizing air economizer exceptions, including those with water-side economizer in lieu of air economizer; indicate on plans eligible exception(s) taken and measures to comply with exception(s)		
NA	C403.3.1	Integrated economizer operation - air and water	Indicate air and water-side economizers are configured for partial cooling operation even where additional mechanical cooling is required to meet the load		
NA	C403.3.2	Economizer heating system impact - air and water	Verify control method of HVAC systems with economizers does not increase building heating energy usage during normal operation		
NA	C403.3.3.1	Air economizer capacity	Indicate modulating OSA and return air dampers are configured to provide up to 100% OSA for cooling		
NA	C403.3.1 C403.3.3.2	Integrated air economizer	Verify mechanical cooling controls are interlocked with air economizer controls so the outside air damper remains in 100% open position when mechanical cooling is also required to meet the cooling load, until the leaving air temperature is < 45°F		
			For systems with cooling capacity ≥ 65,000 Btu/h, verify that control of economizer dampers is not based only on mixed air temperature; or exception taken		
NA	C403.3.3.3	Air economizer high limit controls	Indicate high limit shut-off control method and required high limit per Table C403.3.3.3		
NA	C403.3.4.1	Water economizer capacity	For eligible systems where water-side economizer may be provided in lieu of air economizer, indicate system is capable of 100% design cooling capacity at 50°F db / 45°F wb OSA temperatures		
NA	C403.3.4.2	Water economizer maximum pressure drop	Indicate pressure drop across precooling coils and heat exchangers in water economizer system do not exceed pressure drop limit		
NA	C403.3.1	DX air handling equipment control	For DX air handlers with economizer and cooling capacity ≥ 65,000 Btu/h, refer to HVAC System Controls for requirements		
NA	C403.2.4.7	DX equipment economizer fault detection and diagnostics	For DX air handlers with economizer and cooling capacity ≥ 54,000 Btu/h, provide a fault detection and diagnostics (FDD) system to monitor economizer system operation and report faults		
Systems Requiring Energy Recovery					
Yes	C403.5.1	Energy recovery (ER) - ventilation / exhaust systems	For systems with design OSA > 5,000 cfm, or design supply air cfm and % OSA exceeding the values in Tables C403.5.1(1) or (2), indicate exhaust air ER method; or exception taken with supporting calculations		
			For rooms served by multiple systems with aggregate design OSA > 5,000 cfm, or aggregate design supply air cfm and % OSA exceeding the values in Tables C403.5.1(1) or (2), indicate exhaust air ER method; or exception taken with supporting calculations		
			Indicate ER rated effectiveness that increases OSA enthalpy by ≥ 50% based on delta between OSA and return air enthalpies at design conditions	M002	
NA	C403.2.7.2	Laboratory exhaust systems (energy recovery)	For buildings with total lab exhaust > 5,000 cfm, indicate method of energy recovery used to pre-condition laboratory make-up air; ER effectiveness (min 25°F); or alternative method per exception (VAV exhaust, semi-conditioned makeup, or CERM calculation)		
NA	C404.10.4 (under C404.11)	Pools and permanent spas exhaust systems (energy recovery)	For buildings with pools or spas with water surface area > 200 sf, indicate exhaust air ER method and use of waste heat (preheat ventilation air, pool water or service hot water); or exception taken		
			Indicate ER system has the rated effectiveness and is configured to decrease the exhaust air temperature at design conditions by ≥ 36°F		
NA	C403.5.2	Energy recovery - steam condensate systems	For buildings with on-site steam heating systems, indicate condensate water ER		
			For buildings that use off-site generated steam where condensate is not returned to the source, indicate on-site condensate water ER		

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Mechanical Permit Plans Checklist — MECH-CHK

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 — Revised January 2017

Project Title: East Bay Lot A Westman Mill — Date 5/11/2018

The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - *Must be in permit documents*	Location in Documents	Building Department Notes
NA	C403.2.4.3	Stairway and shaft vent dampers	Indicate location of stairway and shaft vent dampers on plans; verify dampers are Class 1 motorized; refer to HVAC System Controls for additional requirements		
NA	C403.2.4.4	Zone isolation dampers	For systems serving areas > 25,000 sf or spanning more than one floor, that include areas that are expected to be occupied non-simultaneously; identify isolation zone areas on plans and locations of associated isolation dampers in HVAC distribution system; refer to HVAC System Controls for additional requirements		
NA	C403.2.3.4	Humidification	For cooling systems with humidification equipment that are also required to have air economizer, indicate humidifier is adiabatic (direct evaporative or fog atomization), or exception taken		
Additional Efficiency Package Option, More Efficient HVAC Equipment & Fan Performance - Must comply with all 3 provisions to be eligible					
NA	C406.2.1 C403.2.3	HVAC system selection	To comply with additional efficiency package option, calculate the percentage of heating and cooling equipment in the project (based on output capacity) that do not have a corresponding WSEC listed efficiency; shall be less than 10% to comply		
NA	C406.2.2 C403.2.3	Minimum equipment efficiency	To comply with additional efficiency package option, indicate that all listed heating and cooling equipment have a rated efficiency that exceeds WSEC listed efficiency by at least 15%		
NA	C406.2.3 C403.2.11.3	Minimum fan efficiency	To comply with additional efficiency package option, indicate rated FEG of stand alone fans is ≥ 71; indicate these fans are sized so the fan efficiency at design conditions is within 10% of the maximum total or static efficiency		
HVAC System Controls					
Yes	C403.2.4.1	Thermostatic controls (thermostats and humidistats)	Indicate locations of thermostatic and humidity control devices and the zones they serve on plans, including perimeter system zones	M2XX	
			Where adjacent (neighboring) zones are controlled by separate thermostats (including perimeter systems used to offset heat gain or loss), and are connected by permanent openings > 10% of either zone sf area, indicate controls configured to prevent adjacent zones from operating in conflicting modes (one in heat, other in cool); applies to adjacent perimeter zones, adjacent nonperimeter zones, and adjacent perimeter and nonperimeter zones		
			If applying Exception 2 to nonperimeter zones adjacent to perimeter zones, indicate that setpoints and deadband settings in these zones are coordinated so cooling in a nonperimeter zone does not occur until the temperature in that zone is 5°F higher than the adjacent perimeter zone temperature in heating		
NA	C403.2.4.1.1	Heat pump supplementary heat	Indicate staged heating operation with compression as the first stage of heating and supplemental heating controlled with outdoor lock-out temperature set to 40°F or less		
Yes	C403.2.4.1.2	Deadband	Indicate zone thermostatic controls configured with 5°F minimum deadband for systems that control both heating and cooling	M001	
NA	C403.2.4.1.3	Setpoint overlap restriction (thermostats)	If separate heating and cooling systems with separate thermostatic control devices are used to serve a zone, indicate locations of both thermostatic control devices and the zone they serve on plans		
			Indicate a limit switch, mechanical stop or DDC control with programming to prevent simultaneous heating and cooling		
NA	C403.2.4.2 C403.2.4.2.1 C403.2.4.2.2	Automatic setback and shutdown	Indicate zone thermostatic controls configured with required automatic setback and manual override functions, setback temperatures, and control method (automatic time clock or programmable controls); note exceptions taken		
Yes	C403.2.4.2.3	Automatic (optimum) start	Indicate system controls that adjust equipment start time required to bring each area served up to design temperature just prior to scheduled occupancy		
NA	C403.2.4.3	Outdoor supply air dampers	Indicate automatic controls configured to close OSA damper during unoccupied equipment operation; not including economizer cooling, night flush or IMC required OSA / exhaust		
NA	C403.2.4.3	Stairway and shaft vent dampers	Indicate method of activation of stairway and shaft vent dampers (fire alarm or interruption of power)		
NA	C403.2.4.4	Zone isolation controls	For systems serving areas > 25,000 sf or spanning more than one floor, that include areas that are expected to be occupied non-simultaneously; indicate controls that allow for independent space conditioning of isolation zones; or exception taken		
NA	C403.2.12	Heating outside a building	Indicate occupancy sensing or timer switch controls configured to automatically shut off heating system when area served is unoccupied		
NA	C403.2.4.5	Snow melt systems	Indicate automatic controls configured to shut off system when pavement temperature exceeds 50°F and no precipitation is falling, and when outdoor air temperature exceeds 40°F		
NA	C403.2.4.6	Freeze protection system controls	Indicate automatic controls to shut off system when outdoor temperature exceeds 40°F, or conditions protect fluid from freezing		
NA	C403.2.4.9	Group R1 hotel / motel guest rooms	For hotels and motels with over 50 guest rooms, indicate automatic controls serving guest rooms that are capable of setback (heating) and set-up (cooling) of temperature setpoint by at least 5°F; indicate control method - activated by room entry or occupancy sensor		

2015 Washington State Energy Code Compliance Forms for Commercial, R2 and R3 over 3 stories and all R1

Mechanical Summary, pg. 2 — MECH-SUM

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 — Revised January 2017

Service Water Heating Systems

Equipment Type (s)

☐ Hot water heating tank(s) ☐ Instantaneous ☐ No service water systems
☐ Dedicated boiler ☐ Heat exchange from space heat boiler or central hot water/steam

Distribution Type (s)

☐ Circulation System ☐ On-demand

Commissioning

Commissioning is required for:

☑ Mechanical systems per C408.2 ☐ Service water heating systems per C408.4

If required, commissioning shall be performed for all applicable systems regardless of individual equipment capacity.

Exceptions to commissioning requirements:

☐ Total output capacity of all mechanical space conditioning systems in the building do not exceed 240,000 Btu/h cooling or 300,000 Btu/h heating. Mechanical systems commissioning not required.

☐ Capacity of largest service water heating system in building does not exceed 200,000 Btu/h. Service water heating systems commissioning not required.

Low Energy and Semi-Heated Spaces

(Note 6 and 7)

Space Type	Location in Plan(s)	Space(s) Served	Area Served, square feet	Heating Capacity, Btu/h (Note 4)	Cooling Capacity, Btu/h (Note 5)	Peak Space Conditioning Capacity, Btu/h-sf	Compliance Check	Notes

Note 4 - Provide total installed heating output capacity of systems serving Low Energy or Semi-Heated space(s) in btuh.
Note 5 - Provide total installed cooling capacity of system serving Low Energy space(s) in Btu/h. Not allowed for semi-heated spaces. Enter 0 if no cooling.
*Note 6 - Refer to Section C402.1.1 Low Energy Building. Intalled peak space conditioning capacity, heating or cooling, may not exceed 3.4 Btu/h*sf.*
*Note 7 - Refer to Section C402.1.1.1 and Semi-Heated Space definition in Chapter 2. Total heating output capacity may not exceed 8 Btu/h*sf. Only systems without electric resistance heating and no cooling are eligible for the wall insulation exception under semi-heated.*

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TOWNZEN & ASSOCIATES
PLAN APPROVAL
The plans submitted for review are approved in accordance with local state applicable standards. This approval does not relieve the applicant of the responsibility of compliance with the applicable codes.
4 Approved as submitted.
09/25/2019
Lee Townzen

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EAST BAY LOT A
WESTMAN MILL

510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
1R	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE
3	09/03/19	ASI-3

ENERGY
COMPLIANCE
FORMS

M600

2015 Washington State Energy Code Compliance Forms for Commercial, R2 and R3 over 3 stories and all R1

Economizer Exceptions, cont. — MECH-ECONO

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 — Revised January 2017

Project Title: | Date 5/11/2018

Economizer Exception Summary

Refer to Section C403.3 for descriptions of economizer provisions and exceptions. For alterations refer to Section C503.4 and Table C503.4.

ECONOMIZER EXCEPTIONS - NEW CONSTRUCTION AND ADDITIONS, CONTINUED

Exp 10 *Cooling equipment for dedicated server, electronic equipment or telecom switch rooms.* Per building limit for this exception is 240,000 Btu/h cooling capacity or 10% of required building air economizer capacity, whichever is greater. Part load control required over 85,000 Btu/h. Additional requirements apply.

Option a - Cooling equipment efficiency shall be 15% better than the WSEC required minimum efficiency..
Option b - Waterside economizer required. Cooling equipment efficiency shall be 5% better than the WSEC required minimum efficiency.
Option c - Waterside economizer required. All cooling equipment is subject to ASHARE Standard 127.

System ID	Compliance Option	Cooling Capacity (Btu/h)

Total Claimed Exempt Capacity:
Total building air economizer capacity (if claimed > 240 kBtu/h):
Alternate Exp 10 Capacity Limit:

ECONOMIZER EXCEPTIONS - MECHANICAL SYSTEM ALTERATIONS OR REPLACEMENT

C503.4 Exp 1 *Pre-approved design alternative to full compliance with air economizer requirement.* An alternative for mechanical system alterations where existing building constraints make full compliance with air economizer requirement impractical. Provide calculations to the code official that demonstrate the proposed alternate design strategy provides similar energy savings to the annual energy that would be saved by the cooling system with air economizer per C403.3.

System ID	Alt. Strategy

ECONOMIZER EXCEPTIONS - SIMPLE SYSTEMS

C503.4 Exp 2 *Qualifying small equipment.* Per unit limit less than 33,000 Btu/h. Per building limit for this exception is 72,000 Btu/h cooling capacity or 5% of required building air economizer capacity, whichever is greater. Cooling equipment efficiency shall be 15% better than WSEC required minimum efficiency. Not eligible: non-unitary equipment, unitary equipment installed outdoors or in mech room adjacent to outdoors, equipment installed during new construction, shell-and-core construction, or initial tenant improvement.

System ID	Cooling Capacity (Btu/h)

Total Claimed Exempt Capacity:
Total building air economizer capacity (if claimed > 72,000 Btu/h):
Alternate C503.4 Exp 2 Capacity Limit:

C503.4 Exp 3 *Equipment that provides hydronic chilled water for chilled water terminal units.* Equipment part load cooling efficiency (IPLV) shall be better than WSEC required minimum efficiency by at least 25%. Per building limit for this exception is 480,000 Btu/h cooling capacity or 20% of required building air economizer capacity, whichever is greater. Chilled water terminal units serving Group R occupancies are not included in the building capacity total.

System ID	Cooling Capacity (Btu/h)

Total Claimed Exempt Capacity:
Total building air economizer capacity (if claimed > 480,000 Btu/h):
Alternate C503.4 Exp 3 Capacity Limit:

Table C503.4 *Compliance Options for alteration or replacement of existing mechanical cooling equipment per Table C503.4.* Refer to table and all applicable table footnotes for full requirements. Applies to the following retrofit conditions:

Option a - Any new or replacement equipment
Option b - Replacement equipment of same type with same or smaller cooling output capacity.
Option c - Replacement equipment of same type with large cooling output capacity.
Option d - New equipment added to existing system or replacement equipment that is different than existing being replaced.

System ID	Equipment Type	Compliance Path

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Mechanical Permit Plans Checklist — MECH-CHK

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Project Title: East Bay Lot A Westman Mill | Date 5/11/2018

The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - *Must be in permit documents*	Location in Documents	Building Department Notes
NA	C403.7, Item 11	Application of single duct and fan-powered terminal units	Indicate VAV terminal types on plans; verify fan-powered terminal units only serve perimeter zones with envelope loads; verify all other zones are served by single duct terminal units		
NA	C403.7, Item 12	Fan-powered terminal unit primary air reset	Indicate DDC controls are configured to automatically reset the primary supply air cfm setpoint of all fan-powered terminal units to the minimum required to maintain ventilation during occupied heating or deadband, based upon the VAV air handling unit OSA ventilation fraction		
NA	C403.7, Item 13	High occupancy space controls	For spaces > 150 sf with occupant density ≥ 25 people / 1000 sf, indicate space is served by a dedicated terminal unit with DCV control that resets terminal unit ventilation setpoint; also indicate occupancy sensor control that automatically reduces minimum ventilation to zero and sets back room heating and cooling setpoints by ≥ 5°F		
NA	C403.7, Item 14	Dedicated HVAC systems	For server, electronic equipment, telecom or similar spaces with cooling loads > 5 W/sf, indicate spaces are served by independent HVAC systems that are separate from HPVAV systems serving rest of building; indicate dedicated HVAC systems have air economizer controls or energy recovery per C403.3 Exception 9		
NA	C403.7, Item 15	Central plant efficiency	Indicate whether systems are served by a high efficiency heating water plant, or a high efficiency chilled water plant		
			If complying via high efficiency heating water plant: Indicate all VAV terminals have hydronic heating coils served by heating water system with either gas-fired boiler(s) with thermal efficiency ≥ 90%, air-to-water heat pumps, or heat recovery chillers		
			If complying via high efficiency chilled water plant: Indicate all VAV air handlers have cooling coils served by chillers with rated IPLV efficiency that exceeds WSEC listed IPLV by at least 25% per Table C403.2.3(7) (note water-cooled IPLV is max, all others are min); indicate smallest chiller or compressor in plant is ≤ 20% of total plant capacity, or provide thermal storage sized for ≤ 20% of total plant capacity		
NA	C403.7, Item 16	Fault detection and diagnostics	Indicate DDC system includes a fault detection and diagnostics (FDD) system configured to monitor operation and provide fault reporting of required parameters for all VAV air handlers and VAV air terminal units in the HPVAV system		
HVAC Equipment Energy Use Metering					
NA	C409.3.1	HVAC equipment energy use metering	For new buildings > 50,000 sf and building additions > 25,000 sf, verify energy use metering of all equipment used to provide space heating and cooling, dehumidification and ventilation will be provided per C409; indicate equipment eligible for exception		
Documentation and System Specific Requirement To Support Commissioning					
Yes	C408.2	Scope of mechanical systems commissioning	Indicate that all mechanical systems, equipment, and controls for which the WSEC requires control functions and / or configuration to perform specific functions are required to be commissioned;	M001	
			For buildings with ≥ 240,000 Btu/h total output cooling capacity or ≥ 300,000 Btu/h total output heating capacity, indicate that all mechanical systems regardless of individual capacity are required to be commissioned; or provide building heating / cooling capacity calculation demonstrating eligibility for exception	M001	
Yes	C403.2.10 C408.1.1 C408.1.2 C408.1.4.2 C103.6	Commissioning requirements in construction documents	Indicate in plans and specifications that Cx per C408 is required for all applicable mechanical systems;		
			Include general summary with at a minimum of Items 1 thru 4 of the Cx plan per C408.1.2 including: narrative description of activities, responsibilities of the Cx team, schedule of activities including verification of project close out documentation per C103.6, and conflict of interest plan (if required);		
			Include in general summary that a Cx project report or Compliance Checklist (Figure C408.1.4.2) shall be completed by the Certified Cx Professional and provided to the owner prior to the final mechanical inspection.		
Yes	C408.2.2	Air system and hydronic system balancing	Indicate in plans that air and fluid flow rates shall be tested and balanced within the tolerances defined in the specifications; indicate systems shall be balanced in a manner to first minimize throttling losses, then adjusted to meet design flow conditions		
Yes	C408.2.2.1	Air system balancing devices	Indicate devices that provide the capability to balance all supply air outlets, zone terminals and air handling equipment requiring system balancing		
Yes	C408.2.2.2	Hydronic system balancing devices	Indicate devices that provide the capability to isolate, balance and measure flow across all hydronic equipment requiring system balancing including heating and cooling coils and pumps		
Yes	C408.2.3	Functional performance testing criteria	Identify in plans and specifications the intended operation of all equipment and controls during all modes of operation, including interfacing between new and existing-to-remain systems		
Project Close Out Documentation					
Yes	C103.6	Documentation and project close out submittal requirements	Indicate in plans that project close out documentation and training of building operations personnel is required for all mechanical components, equipment and systems governed by this code; indicate close out documentation shall include: record documents, O&M manuals, applicable WSEC compliance forms and calculations	M001	

2015 Washington State Energy Code Compliance Forms for Commercial, R2 and R3 over 3 stories and all R1

Mechanical Fan System Power Allowance — MECH-FANSYS-SUM

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 — Revised January 2017

Project Title: East Bay Lot A Westman Mill | Date 5/11/2018

For Building Dept. Use

HVAC Air Distribution System Schedule

List all HVAC systems that have the capability to provide heating and/or cooling to the spaces they serve.

System or Primary Supply Fan ID	Speed Control (Note 1)	Description (Note 2)	System Total Nameplate HP (Note 3)	Fan Power Calculation Required (Note 4)
FCU-2-1	**CV**	**Fan Coil Unit**	**0.1**	**No**
FCU-2-2	**CV**	**Fan Coil Unit**	**0.1**	**No**

Note 1 - Constant Volume (CV), Variable Air Volume (VAV), or Hospital/Lab CV system that qualifies for VAV budget per C403.2.11.1 Exception 1. Single zone VAV systems shall comply as CV.
Note 2 - Describe system type and list all fans (or groups of fans) associated with the delivery and removal of conditioned air by the system. Include all supply, return/relief, exhaust and exhaust hoods (>1 hp), make-up air, dedicated outside air (DOAS), booster fans, and series fan-powered terminals. VAV parallel fan-powered terminals and economizer relief fans do not need to be included if the fans do not operate at peak conditions.
Note 3 - Enter the total nameplate hp of all fans associated with the delivery and removal of conditioned air by the system.
Note 4 - This form automatically identifies whether a MECH-FANSYS form is required to demonstrate compliance with the fan power allowance (Yes), or this information is not required because the system has a combined total nameplate motor hp that is 5 hp or less (No)

MECH-FANSYS Forms

A MECH-FANSYS form shall be provided for each system with total nameplate hp greater than 5 hp. Select (Add Fan System Form) to generate an additional form. Added forms can be deleted with button in cell E32 of the added form.

2015 Washington State Energy Code Compliance Forms for Commercial, R2 and R3 over 3 stories and all R1

Economizer Exceptions — MECH-ECONO

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 — Revised January 2017

Project Title: East Bay Lot A Westman Mill | Date 5/11/2018

For Building Dept. Use

All cooling systems shall be configured to provide air economizer operation, regardless of system capacity, for new construction and mechanical system alterations. Various exceptions to this requirement are available. Identify all systems that an economizer exception will be applied to and additional information as noted below.

Economizer Exception Summary

Refer to Section C403.3 for descriptions of economizer provisions and exceptions. For alterations refer to Section C503.4 and Table C503.4.

ECONOMIZER EXCEPTIONS - NEW CONSTRUCTION AND ADDITIONS

Exp 1 *Cooling equipment serving spaces that are provided with a dedicated outdoor air system (DOAS) per C403.6.* Spaces served shall have year-round design cooling loads from lights and equipment less than 5 watts per square foot.

System ID	Lighting + Equipment Loads (W/sf)

Exp 2 *Single zone unitary or package systems with dehumidification* that affect other systems such that air economizer would increase energy consumption.

System ID	

Exp 3 *High efficiency single zone unitary or packaged systems.* Equipment cooling efficiency shall be better than the WSEC required minimum efficiency by at least 64% in Climate Zone 4C and 59% in Climate Zone 5B per Table C403.3.

System ID	

Exp 4 *Equipment that provides hydronic chilled water for chilled beams and chilled ceiling systems* that is served by a water economizer system per C403.3.4 in lieu of air economizer.

System ID	

Exp 5 *Water-source heat pumps with heat recovery.* Heat pump efficiency shall be 15% better than WSEC required minimum efficiency. Provide at minimum 60% air economizer. Energy recovery to preheat OSA shall have at least 50% effectiveness. Additional system requirements apply.

System ID	

Exp 6 *Cooling equipment serving Group R occupancies.* Per unit limit is less than 20,000 Btu/h cooling capacity for equipment installed outdoors or in a mech room adjacent to the outdoors. For cooling equipment installed in other locations the unit limit is less than 54,000 Btu/h. Efficiency shall be 15% better than WSEC required minimum efficiency.

System ID	Equipment Location	Cooling Capacity (Btu/h)
TWHP-1	Other	12,000

Exp 7 *Variable refrigerant flow (VRF) systems with energy recovery.* Outdoor unit shall be a reverse-cycle heat pump with variable speed compressor(s) and condenser fan(s). Outdoor unit cooling capacity shall be not less than 65,000 Btu/h. Energy recovery to preheat outdoor air shall have at least 50% rated effectiveness. System shall be capable of providing simultaneous heating and cooling by tranferring recovered energy from zone(s) in cooling mode to other zone(s) that are in heating mode.

Outdoor Unit System ID	Cooling Capacity (Btu/h)
HP-1	72,000

Exp 8 *Cooling equipment serving Controlled Plant Growth Environments.* Equipment cooling efficiency shall be better than WSEC required minimum efficiency by at least 20%. Not eligible: unitary and applied heat pumps.

System ID	SEER, EER, & IEER

Exp 9 *Cooling equipment with energy recovery.* Spaces served shall have year-round design cooling loads from lights and equipment greater than 5 watts per square foot. Energy recovery system shall utilize recovered energy for on-site space heating or preheating of service hot water. Provide calculations to the code official that demonstrate the amount of recovered energy used for on-site heating purposes is equivalent to the annual energy that would be saved by the cooling system with air economizer per C403.3.

System ID	Lighting + Equipment Loads (W/sf)

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TOWNZEN & ASSOCIATES PLAN APPROVAL
The plans submitted for review are approved in accordance with local state applicable standards. This approval does not relieve the applicant of the responsibility of compliance with the applicable codes.
4 Approved as submitted. 09/25/2019

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06/05/18

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EAST BAY LOT A WESTMAN MILL

510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
4	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE
3	09/03/19	ASI-3

ENERGY COMPLIANCE FORMS

M601

Ventilation Schedule

Location	Room Type	Ventilation Requirements	Area (ft^2)	People	Ventilation CFM	Supply CFM	Ventilation %
Room 1BR - 1	Hotel Guest Room	Direct/	595	6	45	676	7%
Room 1BR - 2	Hotel Guest Room	Direct/	595	6	45	793	6%
Room 2BR - 1	Hotel Guest Room	Direct/	965	9.7	70	1,200	6%
Room 2BR - 2	Hotel Guest Room	Direct/	971	9.7	70	1,230	6%
Room Gameroom	Lounge/Bar	7.5 CFM / person 0.06 CFM / ft^2	900	30	279	796	35%
Room L1 Lobby	Lobby-Main Entry	0.06 CFM / ft^2	978	19.6	59	1,050	6%
Room Leasing Office	Office	5 CFM / person 0.06 CFM / ft^2	163	0.8	15	114	13%
Room Lounge	Lounge/Bar	7.5 CFM / person 0.06 CFM / ft^2	705	23.5	220	651	34%
Room Studio	Hotel Guest Room	Direct/	441	4.4	30	456	7%

Cooling Load Details - System

(Btu/h / % Total)

(See "Cooling Load Details - Room" for lighting, equipment, and people loads)

Location	Peak		Roof		Wall		Glass		Ventilation				Infiltration			
									Sensible		Latent		Sensible		Latent	
Room 1BR - 1	July	9:00 a.m.	101	1%	235	1%	6,740	41%	243	1%	25	0%	124	1%	13	0%
Room 1BR - 2	July	5:00 p.m.	1,010	5%	606	3%	7,910	42%	449	2%	25	0%	229	1%	13	0%
Room 2BR - 1	July	1:00 p.m.	991	3%	645	2%	11,900	41%	693	2%	39	0%	366	1%	20	0%
Room 2BR - 2	July	2:00 p.m.	1,230	4%	471	2%	12,500	42%	735	2%	39	0%	389	1%	20	0%
Room Gameroom	July	3:00 p.m.	198	1%	383	2%	2,250	10%	2,990	13%	154	1%	569	2%	29	0%
Room L1 Lobby	July	1:00 p.m.	0	0%	473	2%	8,740	32%	584	2%	33	0%	574	2%	32	0%
Room Leasing Office	July	8:00 p.m.	0	0%	387	14%	0	0%	108	4%	8	0%	72	3%	6	0%
Room Lounge	July	3:00 p.m.	198	1%	506	3%	2,250	12%	2,360	12%	121	1%	451	2%	23	0%
Room Studio	July	4:00 p.m.	717	6%	86	1%	3,370	30%	315	3%	17	0%	179	2%	9	0%

Room Information, Part 1

Values in italics have been changed from the default

Number	Name	Area	Ceiling Height	Ventilation		Infiltration		Cooling Temperature	Heating Temperature	Relative Humidity
				Cooling	Heating	Cooling	Heating			
1BR - 1	Hotel Guest Room	595 ft^2	9'	*Direct/ 45 CFM*	Same as cooling/ 45 CFM	0.25 AC / hour/ 23 CFM	Same as cooling/ 23 CFM	75° F	70° F	50%
1BR - 2	Hotel Guest Room	595 ft^2	9'	*Direct/ 45 CFM*	Same as cooling/ 45 CFM	0.25 AC / hour/ 23 CFM	Same as cooling/ 23 CFM	75° F	70° F	50%
2BR - 1	Hotel Guest Room	965 ft^2	9'	*Direct/ 70 CFM*	Same as cooling/ 70 CFM	0.25 AC / hour/ 37 CFM	Same as cooling/ 37 CFM	75° F	70° F	50%
2BR - 2	Hotel Guest Room	971 ft^2	9'	*Direct/ 70 CFM*	Same as cooling/ 70 CFM	0.25 AC / hour/ 37 CFM	Same as cooling/ 37 CFM	75° F	70° F	50%
Gameroom	Lounge/Bar	900 ft^2	14'	*7.5 CFM / person/ 225 CFM* *0.06 CFM / ft^2/ 54 CFM*	Same as cooling/ 225 CFM Same as cooling/ 54 CFM	0.25 AC / hour/ 53 CFM	Same as cooling/ 53 CFM	75° F	70° F	50%
L1 Lobby	Lobby-Main Entry	978 ft^2	14'	*0.06 CFM / ft^2/ 59 CFM*	Same as cooling/ 59 CFM	0.25 AC / hour/ 58 CFM	Same as cooling/ 58 CFM	75° F	70° F	50%
Leasing Office	Office	163 ft^2	14'	*5 CFM / person/ 5 CFM* *0.06 CFM / ft^2/ 10 CFM*	Same as cooling/ 5 CFM Same as cooling/ 10 CFM	0.25 AC / hour/ 10 CFM	Same as cooling/ 10 CFM	75° F	70° F	50%
Lounge	Lounge/Bar	705 ft^2	14'	*7.5 CFM / person/ 177 CFM* *0.06 CFM / ft^2/ 43 CFM*	Same as cooling/ 177 CFM Same as cooling/ 43 CFM	0.25 AC / hour/ 42 CFM	Same as cooling/ 42 CFM	75° F	70° F	50%
Studio	Hotel Guest Room	441 ft^2	9'	*Direct/ 30 CFM*	Same as cooling/ 30 CFM	0.25 AC / hour/ 17 CFM	Same as cooling/ 17 CFM	75° F	70° F	50%

Room Information, Part 2

Values in italics have been changed from the default

Number	Lighting Load	Equipment Load		People			Glass Zone Type
		Sensible	Latent		Sensible btuh / Person	Latent btuh / Person	
1BR - 1	1 watts / ft^2/ 2,030	2 watts / ft^2/ 4,060	0	100 ft^2 / person/ 6 people	250		200 C
1BR - 2	1 watts / ft^2/ 2,030	2 watts / ft^2/ 4,060	0	100 ft^2 / person/ 6 people	250		200 C
2BR - 1	1 watts / ft^2/ 3,290	2 watts / ft^2/ 6,590	0	100 ft^2 / person/ 9.7 people	250		200 C
2BR - 2	1 watts / ft^2/ 3,320	2 watts / ft^2/ 6,630	0	100 ft^2 / person/ 9.7 people	250		200 C
Gameroom	1.1 watts / ft^2/ 3,380	1 watts / ft^2/ 3,070	0	*30 ft^2 / person/ 30 people*	245		105 C
L1 Lobby	1.5 watts / ft^2/ 5,010	1 watts / ft^2/ 3,340	0	50 ft^2 / person/ 19.6 people	250		200 C
Leasing Office	1.3 watts / ft^2/ 721	2 watts / ft^2/ 1,110	0	*200 ft^2 / person/ 0.8 people*	250		200 C
Lounge	1.1 watts / ft^2/ 2,650	1 watts / ft^2/ 2,410	0	*30 ft^2 / person/ 23.5 people*	245		105 C
Studio	1 watts / ft^2/ 1,500	2 watts / ft^2/ 3,010	0	100 ft^2 / person/ 4.4 people	250		200 C

Supply Air Requirements

Location	Current Supply CFM	Required Supply CFM	Cooling					Heating				
			Peak	Supply Temperature	Sensible Load (btuh)	Supply CFM	OSA CFM	OSA %	Heating Temperature Difference	Load (btuh)	Supply CFM	OSA CFM	OSA %
Room 1BR - 1	0	676	July 9:00 a.m.		14,800	676	45	7%		8,900	415	45	11%
Room 1BR - 2	0	793	July 5:00 p.m.		17,300	793	45	6%		8,850	412	45	11%
Room 2BR - 1	0	1,200	July 1:00 p.m.		26,200	1,200	70	6%		11,600	542	70	13%
Room 2BR - 2	0	1,230	July 2:00 p.m.		27,000	1,230	70	6%		11,600	542	70	13%
Room Gameroom	0	796	July 6:00 p.m.		17,400	796	279	35%		7,650	357	279	78%
Room L1 Lobby	0	1,050	July 1:00 p.m.		23,000	1,050	59	6%		10,700	499	59	12%
Room Leasing Office	0	114	July 9:00 p.m.		2,500	114	15	13%		1,460	68	15	22%
Room Lounge	0	651	July 6:00 p.m.		14,200	651	220	34%		7,030	328	220	67%
Room Studio	0	456	July 4:00 p.m.		9,970	456	30	7%		4,500	210	30	14%

Wall Types

Wall Type	U-Value	ASHRAE Type	Color	Description
CON - 12" - R11	0.091		16 Dark	Concrete - 12" - R11
WD - GWB - R19	0.053		5 Dark	Wood - GWB - R19

Walls

Room Number	Length	Height	Area (Minus Doors and Glass)	Type	Facing Direction	On Perimeter
1BR - 1	3'-1"	10'	31 ft^2	WD - GWB - R19	W	
1BR - 1	3'	10'	30 ft^2	WD - GWB - R19	S	
1BR - 1	16'-1"	10'	160 ft^2	WD - GWB - R19	E	
1BR - 1	10'-2"	10'	88 ft^2	WD - GWB - R19	E	
1BR - 1	13'-11"	10'	55 ft^2	WD - GWB - R19	N	
1BR - 1	11'-2"	10'	68 ft^2	WD - GWB - R19	N	
1BR - 2	10'-11"	10'	65 ft^2	WD - GWB - R19	N	
1BR - 2	14'-2"	10'	59 ft^2	WD - GWB - R19	N	
1BR - 2	16'	10'	99 ft^2	WD - GWB - R19	W	
1BR - 2	10'-2"	10'	88 ft^2	WD - GWB - R19	W	
1BR - 2	2'-10"	10'	29 ft^2	WD - GWB - R19	S	
1BR - 2	3'	10'	30 ft^2	WD - GWB - R19	E	
2BR - 1	37'-1"	10'	190 ft^2	WD - GWB - R19	S	
2BR - 1	10'-2"	10'	88 ft^2	WD - GWB - R19	E	
2BR - 1	16'	10'	99 ft^2	WD - GWB - R19	E	
2BR - 1	3'	10'	30 ft^2	WD - GWB - R19	N	
2BR - 2	16'-1"	10'	160 ft^2	WD - GWB - R19	W	
2BR - 2	10'-2"	10'	88 ft^2	WD - GWB - R19	W	
2BR - 2	37'-1"	10'	190 ft^2	WD - GWB - R19	S	
2BR - 2	2'-10"	10'	29 ft^2	WD - GWB - R19	N	
Gameroom	25'-6"	16'	292 ft^2	WD - GWB - R19	N	
Gameroom	7'-9"	16'	124 ft^2	WD - GWB - R19	W	
L1 Lobby	3'-8"	16'	59 ft^2	WD - GWB - R19	W	
L1 Lobby	17'-2"	16'	129 ft^2	WD - GWB - R19	S	
L1 Lobby	3'-8"	16'	59 ft^2	WD - GWB - R19	E	
L1 Lobby	17'-6"	16'	234 ft^2	CON - 12" - R11	N	
Leasing Office	8'-5"	16'	135 ft^2	CON - 12" - R11	S	
Lounge	7'-8"	16'	123 ft^2	WD - GWB - R19	E	
Lounge	25'-6"	16'	292 ft^2	WD - GWB - R19	N	
Studio	16'-2"	10'	80 ft^2	WD - GWB - R19	N	
Studio	3'-1"	10'	5 ft^2	WD - GWB - R19	W	

Glass Types

Glass Type	U-Value	SHGC	Description
2013 CA Min - Fixed	0.36		0.25 2013 CA Minimum - Fixed
2015 WA Min - Entrance Doors	0.6		0.4 2015 WA Minimum - Entrance Doors
2015 WA Min - Metal - Fixed	0.38		0.4 2015 WA Minimum - Metal Framing - Fixed

Glass

Room Number	Area	Type	Facing Direction	Shaded
1BR - 1	61 ft^2	2015 WA Min - Metal - Fixed	E	
1BR - 1	14 ft^2	2015 WA Min - Metal - Fixed	E	
1BR - 1	84 ft^2	2015 WA Min - Metal - Fixed	N	
1BR - 1	44 ft^2	2015 WA Min - Metal - Fixed	N	
1BR - 2	44 ft^2	2015 WA Min - Metal - Fixed	N	
1BR - 2	82 ft^2	2015 WA Min - Metal - Fixed	N	
1BR - 2	61 ft^2	2015 WA Min - Metal - Fixed	W	
1BR - 2	14 ft^2	2015 WA Min - Metal - Fixed	W	
2BR - 1	181 ft^2	2015 WA Min - Metal - Fixed	S	
2BR - 1	14 ft^2	2015 WA Min - Metal - Fixed	E	
2BR - 1	61 ft^2	2015 WA Min - Metal - Fixed	E	
2BR - 2	61 ft^2	2015 WA Min - Metal - Fixed	W	
2BR - 2	14 ft^2	2015 WA Min - Metal - Fixed	W	
2BR - 2	181 ft^2	2015 WA Min - Metal - Fixed	S	
Gameroom	116 ft^2	2015 WA Min - Metal - Fixed	N	
L1 Lobby	145 ft^2	2015 WA Min - Metal - Fixed	S	
L1 Lobby	46 ft^2	2015 WA Min - Entrance Doors	N	
Lounge	116 ft^2	2015 WA Min - Metal - Fixed	N	
Studio	81 ft^2	2015 WA Min - Metal - Fixed	N	
Studio	25 ft^2	2015 WA Min - Metal - Fixed	W	

Project Information

Project Name:	Westman Mill - Mixed		
Project Location:	LACEY, WA		
Default Heating Temperature:	70° F	**Heating Safety Factor (Room):**	0%
		Heating Safety Factor (Ventilation):	0%
Default Cooling Temperature:	75° F	**Cooling Safety Factor (Room):**	0%
		Cooling Safety Factor (Ventilation):	0%
Default Relative Humidity:	50%	**Floor Slab Heat Loss Coefficient:**	0.54
Calculation Date:	November 21, 2017, 8:21 p.m.		

Design Conditions

OSA Low:	17° F	**Latitude:**	48° N
OSA Daily Range:	7° F	**Elevation:**	184'
	OSA High Dry Bulb	**OSA High Wet Bulb**	
July	85° F		66° F

Roof Types

Roof Type	U-Value	ASHRAE Type	Color	Description
R-38, WOOD FRAME	0.026		5 Dark	WOOD FRAME, R-38 INSULATION

Roofs

Location	Type	Area
Floor Five	R-38, WOOD FRAME	3,570 ft
Room Gameroom	R-38, WOOD FRAME	(15% of Room) 135 ft
Room Lounge	R-38, WOOD FRAME	(19.2% of Room) 135 ft

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1	01/30/19	OTHER CHANGES
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3	09/03/19	ASI-3

LOAD CALCULATIONS

M610

Load Total Summary - System
(Includes Ventilation and Plenum Loads)

Location	Area	Cooling										Heating			
		CFM	Peak		btuh			Tons			ft² / ton	CFM / ton	CFM / ft²	CFM	btuh	kW	CFM / ft²
					Total	Sensible	Latent	Total	Sensible	Latent							
Room 1BR - 1	595 ft²	676	July	9:00 a.m.	16,000	15,000	1,230	1.4	1.3	0.1	439	499	1.14	415	11,500	3.4	0.7
Room 1BR - 2	595 ft²	793	July	5:00 p.m.	19,000	17,800	1,230	1.6	1.5	0.1	375	501	1.33	412	11,400	3.3	0.69
Room 2BR - 1	965 ft²	1,200	July	1:00 p.m.	28,800	26,900	1,990	2.4	2.2	0.2	401	498	1.24	542	15,600	4.6	0.56
Room 2BR - 2	971 ft²	1,230	July	2:00 p.m.	29,700	27,700	2,000	2.5	2.3	0.2	392	498	1.27	542	15,600	4.6	0.56
Room Gameroom	900 ft²	796	July	3:00 p.m.	23,500	20,200	3,330	2	1.7	0.3	459	406	0.89	357	23,500	6.9	0.4
Room L1 Lobby	978 ft²	1,050	July	1:00 p.m.	27,600	23,600	3,980	2.3	2	0.3	426	458	1.08	499	14,100	4.1	0.51
Room Leasing Office	163 ft²	114	July	8:00 p.m.	2,780	2,600	176	0.2	0.2	0	702	493	0.7	68	2,310	0.7	0.42
Room Lounge	705 ft²	651	July	3:00 p.m.	19,200	16,600	2,610	1.6	1.4	0.2	441	407	0.92	328	19,500	5.7	0.47
Room Studio	441 ft²	456	July	4:00 p.m.	11,200	10,300	908	0.9	0.9	0.1	473	489	1.03	210	6,200	1.8	0.48

Cooling Load Details - Room
(Btu/h / % of Total)

Location	Peak	Roof	Wall	Glass	Horizontal Partitions	Lighting	Equipment		People		Infiltration	
							Sensible	Latent	Sensible	Latent	Sensible	Latent
Room 1BR - 1	July 9:00 a.m.	101 1%	235 1%	6,740 42%	0 0%	2,030 13%	4,060 25%	0 0%	1,490 9%	1,190 7%	124 1%	13 0%
Room 1BR - 2	July 5:00 p.m.	1,010 5%	606 3%	7,910 43%	0 0%	2,030 11%	4,060 22%	0 0%	1,490 8%	1,190 6%	229 1%	13 0%
Room 2BR - 1	July 1:00 p.m.	991 4%	645 2%	11,900 42%	0 0%	3,290 12%	6,590 23%	0 0%	2,410 9%	1,930 7%	366 1%	20 0%
Room 2BR - 2	July 2:00 p.m.	1,230 4%	471 2%	12,500 43%	0 0%	3,320 11%	6,630 23%	0 0%	2,430 8%	1,940 7%	389 1%	20 0%
Room Gameroom	July 6:00 p.m.	230 1%	624 3%	2,270 11%	0 0%	3,380 16%	3,070 15%	0 0%	7,350 36%	3,150 15%	485 2%	29 0%
Room L1 Lobby	July 1:00 p.m.	0 0%	473 2%	8,740 32%	0 0%	5,010 19%	3,340 12%	0 0%	4,890 18%	5,910 15%	574 2%	32 0%
Room Leasing Office	July 9:00 p.m.	0 0%	400 15%	0 0%	0 0%	721 27%	1,110 42%	0 0%	203 8%	163 6%	64 2%	6 0%
Room Lounge	July 6:00 p.m.	230 1%	551 3%	2,270 14%	0 0%	2,650 16%	2,410 14%	0 0%	5,760 34%	2,470 15%	384 2%	23 0%
Room Studio	July 4:00 p.m.	717 7%	86 1%	3,370 31%	0 0%	1,500 14%	3,010 28%	0 0%	1,100 10%	882 8%	179 2%	9 0%

Load Total Summary - Room
(Excludes Ventilation and Plenum Loads)

Location	Area	Cooling										Heating			
		CFM	Peak		btuh			Tons			ft² / ton	CFM / ton	CFM / ft²	CFM	btuh	kW	CFM / ft²
					Total	Sensible	Latent	Total	Sensible	Latent							
Room 1BR - 1	595 ft²	676	July	9:00 a.m.	16,000	14,800	1,200	1.3	1.2	0.1	447	508	1.14	415	8,900	2.6	0.7
Room 1BR - 2	595 ft²	793	July	5:00 p.m.	18,500	17,300	1,200	1.5	1.4	0.1	385	513	1.33	412	8,850	2.6	0.69
Room 2BR - 1	965 ft²	1,200	July	1:00 p.m.	28,100	26,200	1,950	2.3	2.2	0.2	412	511	1.24	542	11,600	3.4	0.56
Room 2BR - 2	971 ft²	1,230	July	2:00 p.m.	28,900	27,000	1,960	2.4	2.3	0.2	403	512	1.27	542	11,600	3.4	0.56
Room Gameroom	900 ft²	796	July	6:00 p.m.	20,600	17,400	3,180	1.7	1.5	0.3	525	464	0.89	357	7,650	2.2	0.4
Room L1 Lobby	978 ft²	1,050	July	1:00 p.m.	27,000	23,000	3,940	2.3	1.9	0.3	435	469	1.08	499	10,700	3.1	0.51
Room Leasing Office	163 ft²	114	July	9:00 p.m.	2,670	2,500	168	0.2	0.2	0	732	513	0.7	68	1,460	0.4	0.42
Room Lounge	705 ft²	651	July	6:00 p.m.	16,700	14,200	2,490	1.4	1.2	0.2	506	467	0.92	328	7,030	2.1	0.47
Room Studio	441 ft²	456	July	4:00 p.m.	10,900	9,970	891	0.9	0.8	0.1	487	504	1.03	210	4,500	1.3	0.48

Heating Load Details - System and Room
(Btu/h / % of System Total)

Location	Roof	Wall	Glass	Slab	Horizontal Partitions	Ventilation	Infiltration
Room 1BR - 1	820 7%	1,040 9%	4,090 36%	1,640 14%	0 0%	2,560 22%	1,310 11%
Room 1BR - 2	819 7%	1,040 9%	4,050 35%	1,630 14%	0 0%	2,560 22%	1,310 11%
Room 2BR - 1	1,330 9%	1,140 7%	5,160 33%	1,890 12%	0 0%	3,980 26%	2,100 13%
Room 2BR - 2	1,340 9%	1,140 7%	5,160 33%	1,890 12%	0 0%	3,980 25%	2,100 13%
Room Gameroom	186 1%	1,170 5%	2,340 10%	950 4%	0 0%	15,900 67%	3,010 13%
Room L1 Lobby	0 0%	1,820 13%	4,380 31%	1,200 9%	0 0%	3,350 24%	3,300 23%
Room Leasing Office	0 0%	652 28%	0 0%	242 10%	0 0%	853 37%	569 25%
Room Lounge	186 1%	1,170 6%	2,340 12%	950 5%	0 0%	12,500 64%	2,390 12%
Room Studio	608 10%	241 4%	2,130 34%	549 9%	0 0%	1,710 27%	967 16%

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1

EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA. 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
4	01/30/19	PERMIT COMMENT
3	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE
1	09/03/19	ASI-3

LOAD CALCULATIONS

M611

SYMBOLS

Symbol	Description
—	WASTE (W)
—PW—	PUMPED WASTE
—SR—	SUDS RELIEF PIPE
— — —	VENT (V)
—RL—	RAIN LEADER
—OL—	OVERFLOW RAIN LEADER
—CD—	CONDENSATE DRAIN
— - —	COLD WATER (CW)
— - - —	HOT WATER, POTABLE, 120°F
— - - —140—	HOT WATER, POTABLE, TEMPERATURE OTHER THAN 120°F
— - - - —	HOT WATER CIRCULATING (HWC), POTABLE, 120°F
— - - - —140—	HOT WATER CIRCULATING, POTABLE, TEMPERATURE OTHER THAN 120°F
—G—	NATURAL GAS
	PIPE CAP
	UNION
	FLANGE
	WYE STRAINER
	BALL VALVE
	CHECK VALVE
	BALANCING OR PLUG VALVE
	BUTTERFLY VALVE
	PRESSURE REDUCING VALVE (PRV)
ID	RELIEF VALVE
	BALANCING/MEASURING VALVE
ID	INDIRECT DRAIN, PIPE TO DRAIN
	FLOOR DRAIN
	HOSE BIBB
	BREAK IN PIPING OR DUCTWORK
	PUMP
	PRESSURE GAUGE
	THERMOMETER
P/T	PRESSURE/TEMPERATURE TEST PORT
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
DCVA	DOUBLE CHECK VALVE ASSEMBLY

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	HORIZ	HORIZONTAL
AHJ	AUTHORITY HAVING JURISDICTION	HP	HORSEPOWER
BOH	BACK OF HOUSE	HX	HEAT EXCHANGER
BTUH	BRITISH THERMAL UNIT PER HOUR	HW	HOT WATER
C	COMMON	ID	INDIRECT DRAIN, INSIDE DIAMETER
CAP	CAPACITY	IE	INVERT ELEVATION
CI	CAST IRON	IN	INCH
CLG	CEILING, COOLING	KW	KILOWATT
CO	CLEANOUT	L	LONG, LENGTH
COMB	COMBUSTION	LB	POUND
CONT	CONTINUE, CONTROL	MBH	THOUSAND BTU PER HOUR
CONTR	CONTRACTOR	MECH	MECHANICAL
COTG	CLEANOUT TO GRADE	MCA	MINIMUM CIRCUIT AMPACITY
CW	COLD WATER	MOCP	MAXIMUM OVER CURRENT PROTECTION
D	DIAMETER	MTD	MOUNTED
DI	DUCTILE IRON	PD	PRESSURE DROP, PUMPED DRAIN
DIM	DIMENSION	POC	POINT OF CONNECTION
DN	DOWN	PRV	PRESSURE REDUCING VALVE
DN&UP	DOWN & UP	PSIG	POUNDS PER SQUARE INCH GAUGE
DS	DOWN SPOUT	PW	PUMPED SANITARY WASTE
EFF	EFFICIENCY	PS	PUMPED STORM DRAINAGE
ELEC	ELECTRIC	RD	ROOF DRAIN
EQUIV	EQUIVALENT	REF	REFERENCE
EWC	ELECTRIC WATER COOLER	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
EXT	EXTERIOR, EXTERNAL		
FCO	FLOOR CLEANOUT	SCW	SOFTENED COLD WATER
FD	FLOOR DRAIN	SD	STORM DRAINAGE
FLR	FLOOR	SR	SUDS RELIEF
FPM	FEET PER MINUTE	SS	SANITARY SEWER
FPS	FEET PER SECOND	SQ	SQUARE
FS	FLOOR SINK	TYP	TYPICAL
FU	FIXTURE UNIT	T&P	TEMPERATURE AND PRESSURE RELIEF
G	GAS	UON	UNLESS OTHERWISE NOTED
GAL	GALLONS	V	VENT
GPM	GALLONS PER MINUTE	VTR	VENT THRU ROOF
GW	GREASE WASTE	W	WASTE, WATT, WIDE
HB	HOSE BIBB	WCO	WALL CLEANOUT
HD	HEAD	WH	WALL HYDRANT
HDPE	HIGH DENSITY POLYETHELENE		
HEDV	HOSE END DRAIN VALVE		

GENERAL NOTES

GENERAL NOTES

1. REFERENCE TO RELATED WORK: "REF" INDICATIONS DENOTE WORK COVERED ELSEWHERE (ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL, LANDSCAPE, OR KITCHEN), OR ITEM BASED ON A SPECIFIC MANUFACTURER'S DIMENSIONS (VERIFY).
2. ELECTRICAL CHARACTERISTICS: REFER TO ELECTRICAL DRAWINGS FOR ELECTRICAL CHARACTERISTICS (VOLTAGES, ETC.) OF MECHANICAL EQUIPMENT, UNLESS OTHERWISE INDICATED.
3. CODES: COMPLETE INSTALLATION OF THE PLUMBING SYSTEM SHALL BE PER THE APPLICABLE BUILDING, MECHANICAL, ENERGY, PLUMBING, FIRE, AND HEALTH CODES AND REGULATIONS AS ADOPTED BY THE LOCAL AHJ.
4. PREPARE AND SUBMIT FOR REVIEW A SHOP DRAWING BASED ON FINAL STRUCTURAL SHOP DRAWINGS FOR LOCATING AND ROUTING ALL EQUIPMENT, PIPING, ETC.
   A. COORDINATE FLOOR AND BEAM PENETRATIONS WITH STRUCTURAL.
   B. COORDINATE FINAL LOCATION AND ROUTING WITH CEILING, LIGHTS, WALLS, FIRE SPRINKLER PIPING, AND OTHER TRADES WORK.
   C. INCLUDE ADDITIONAL OFFSETS, ELBOWS, ROUTING, ECT. AS REQUIRED FOR A COMPLETE OPERATING PLUMBING SYSTEM.
   D. PROVIDE SHOP DRAWINGS AT NO ADDITIONAL COST TO THE OWNER.
5. PLUMBING CONTRACTOR SHALL LOCATE AND COORDINATE EXACT LOCATION OF ALL PLUMBING EQUIPMENT WITHIN THE STRUCTURE.
6. ACCESS DOORS: COORDINATE WITH ARCHITECT AND LOCATE ALL ACCESS DOORS ON SHOP DRAWINGS PRIOR TO BEGINNING OF CONSTRUCTION. ACCESS DOORS IN FIRE RATED STRUCTURE SHALL BE FIRE RATED. VERIFY ACCESS DOOR LOCATIONS WITH GENERAL CONTRACTOR PRIOR TO BIDDING.
7. ROOF PENETRATIONS: SEE ARCHITECTURAL DRAWINGS FOR ROOF CAP, ROOF CURB, ROOF DRAIN, AND VTR DETAILS.
8. EXPOSED PIPING: PROVIDE CHROME PLATING FOR EXPOSED PIPING IN FINISHED ROOMS.
9. PENETRATIONS: PROVIDE ESCUTCHEON PLATES FOR EXPOSED PIPING PENETRATIONS AND SHEET METAL FLASHING FOR EXPOSED DUCTWORK PENETRATIONS.
10. SHAFT AND PLENUM CONNECTIONS: SEAL CONNECTIONS TO AIR SHAFTS AIRTIGHT. PROVIDE AIRTIGHT SEAL AROUND PENETRATIONS IN AIR PLENUMS.
11. LIGHT FIXTURE CLEARANCE: COORDINATE LOCATIONS OF PLUMBING WORK TO PROVIDE CLEARANCES OVER LIGHTING FIXTURES FOR REMOVAL AND REPLACEMENT.
12. NOT USED
13. ACCESS CLEARANCES FOR MAINTENANCE AND REPLACEMENT: VERIFY PHYSICAL DIMENSIONS OF EQUIPMENT TO ENSURE THAT ACCESS CLEARANCES CAN BE MET. COORDINATE LOCATIONS OF PLUMBING WORK AND WORK OF OTHER TRADES TO PROVIDE ACCESS CLEARANCES FOR SERVICE AND MAINTENANCE.

COORDINATION REQUIREMENTS

1. IRRIGATION: COORDINATE WITH IRRIGATION CONTRACTOR FOR THEIR WATER SUPPLY REQUIREMENTS AND LOCATIONS.
2. GAS: CONTRACTOR/GAS COMPANY SHALL FINALIZE GAS METER AND GAS SERVICE LOCATIONS.
3. UTILITIES: COORDINATE WITH SITE UTILITY CONTRACTOR AND CIVIL DRAWINGS FOR UTILITY CONNECTIONS AND EXTENSIONS.
4. ROOF DRAINAGE: COORDINATE WITH GENERAL CONTRACTOR FOR ROOF DRAIN AND OVERFLOWS, SCUPPER DRAINS, AND CONDENSATE DRAINS.
5. PLUMBING FIXTURES: COORDINATE WITH ARCHITECTURAL AND OTHER TRADES EXACT LOCATION OF ALL FIXTURES.
6. PIPING: COORDINATE WITH STRUCTURAL FOR EXACT LOCATION OF ALL STRUCTURAL FRAMING AND FOOTINGS AND FINALIZE THE EXACT ROUTING OF ALL PIPES WITH STRUCTURAL AND AT THE SITE PRIOR AND DURING THE CONSTRUCTION.
7. ADJUSTMENTS: ALL EQUIPMENT, MOTORS, FANS GAS BURNERS, IGNITION DEVICES, DRIVES, ETC. SHALL BE ADJUSTED AND BALANCED TO OPERATE AT SPECIFIED RATINGS AS REQUIRED FOR THIS PROJECT SITE AND ACCOUNTING FOR ELEVATION ABOVE SEA LEVEL.
8. APPROVALS: MECHANICAL AND PLUMBING EQUIPMENT SHALL BE APPROVED FOR INSTALLATION IN THE PROJECT LOCATION AND SHALL HAVE ALL CERTIFICATIONS AND RATINGS TO MEET ALL ENERGY, POLLUTION, ENVIRONMENTAL, SEISMIC, ETC. CODES AND REGULATIONS. THE CONTRACTOR SHALL COORDINATE WITH HIS MANUFACTURE SUPPLIERS AND SHALL INCLUDE ALL COSTS REQUIRED TO MEET THESE REQUIREMENTS IN HIS BID.
9. FIRE PROTECTION: REFER TO PROJECT MANUAL FOR THE BIDDER DESIGNED FIRE PROTECTION SPRINKLER SYSTEM FOR A COMPLETE FULLY SPRINKLERED SYSTEM. LOCATION OF ALL PIPING TO BE COORDINATED WITH OTHER TRADES. PIPES, VALVES, GAUGES, AND OTHER COMPONENTS TO BE POSITIONED AS COMPACT AS POSSIBLE INTO CORNERS AND AGAINST CEILINGS TO MINIMIZE THEIR IMPACT ON THE SPACES WHERE THEY ARE INSTALLED.

PLUMBING NOTES

1. CONNECTIONS: PROVIDE PLUMBING FIXTURE CONNECTIONS TO BUILDING WASTE, VENT, COLD WATER, AND HOT WATER SYSTEM IN ACCORDANCE WITH DRAWINGS, MANUFACTURER'S RECOMMENDATIONS, AND LOCAL CODES. CONNECT TO EACH FIXTURE, EQUIPMENT, ETC. WITH ALL ACCESSORIES, VALVES, VACUUM BREAKERS, REGULATORS, UNIONS, ETC. AS REQUIRED AND AS RECOMMENDED BY THE MANUFACTURERS. REFER TO PLUMBING FIXTURE CONNECTION SCHEDULE ON PLANS.
2. HOT AND COLD: WATER PIPING CONNECTION TO EACH FIXTURE SHALL BE COLD WATER ON THE RIGHT HAND SIDE AND HOT WATER ON THE LEFT HAND SIDE.
3. HOT WATER: NON-CIRCULATING HOT WATER PIPE SHALL NOT EXCEED 10' UNLESS OTHERWISE SHOWN ON DRAWINGS.
4. VENT STACKS: COORDINATE VENT STACK WITH HVAC EQUIPMENT TO MAINTAIN MINIMUM 10' CLEARANCE FROM OUTSIDE AIR INTAKES.
5. CLEANOUTS: PROVIDE CLEANOUTS PER CURRENT UPC AND AS REQUIRED BY LOCAL JURISDICTIONS. CLEANOUTS SHALL BE LOCATED IN WALLS/FLOORS WHERE THEY ARE NOT HIGHLY VISIBLE. FLOOR CLEANOUTS IN CARPETED AREAS TO BE FITTED WITH CARPET INSERTS. LOCATIONS SHALL BE SUBMITTED TO ARCHITECT FOR APPROVAL. NOTE: NOT ALL CLEANOUTS ARE SHOWN ON THE PLUMBING DRAWINGS.
6. SUDS RELIEF: PROVIDE SUDS RELIEF IN ACCORDANCE WITH CURRENT CPC.
7. SHUT-OFFS: PROVIDE 1/4 TURN BALL VALVE ANGLE STOP SHUT-OFF VALVES AND BRAIDED STAINLESS STEEL FLEX CONNECTORS AT HOT AND COLD WATER SUPPLY TO EACH FIXTURE. EXCEPTION: PROVIDE SCREWDRIVER STOPS AT BATH/SHOWERS.
8. NOT USED
9. TRAP ARMS: PROVIDE TRAP ARMS SUCH THAT THE MAXIMUM LENGTH WILL NOT EXCEED CODE REQUIREMENTS.
10. ADA INSULATION: AT PLUMBING PIPING EXPOSED UNDER LAVATORIES, INSULATE THE EXPOSED PIPING AND TRAPS WITH PRODUCT SPECIFICALLY DESIGNED FOR THIS APPLICATION MEETING ADA REQUIREMENTS. PROVIDE HANDI-LAV GUARD OR EQUIVALENT. OFFSET P-TRAPS TO CLEAR WHEELCHAIR ACCESS.
11. GAS EQUIPMENT: GAS EQUIPMENT SHALL BE INSTALLED PER EQUIPMENT LISTINGS, LOCAL CODES, AND NFPA.
12. GAS CONNECTIONS: INSTALL FLEXIBLE QUICK DISCONNECT ASSEMBLIES FOR ALL GAS FIRED KITCHEN EQUIPMENT PER LOCAL JURISDICTIONS.
13. WATER HAMMER ARRESTERS: PROVIDE AT THE END OF HOT AND COLD WATER LINES SERVING TWO OR MORE FIXTURES; SIZE IN ACCORDANCE WITH PLUMBING AND DRAINAGE INSTITUTE (PDI) REQUIREMENTS. WATER HAMMER ARRESTORS ARE REQUIRED FOR QUICK CLOSING VALVES, SUCH AS LAUNDRY WASHERS, FLUSH VALVES (PUBLIC TOILETS), ETC.
14. TRAP PRIMERS: PROVIDE TRAP PRIMERS AND PIPING FOR DRAINS AND FLOOR SINKS. ARRANGE PIPING TO ACHIEVE EQUAL FLOW TO EACH DRAIN AND FLOOR SINK FOR TRAP PRIMERS SERVING MULTIPLE DRAINS AND FLOOR SINKS.
15. P-TRAPS: ALL EXPOSED P-TRAPS SHALL BE CHROME-PLATED BRASS.
16. PROVIDE BALL VALVES. GATE VALVES SHALL NOT BE USED. NO EXCEPTIONS.

APPLICABLE CODES

2015 INTERNATIONAL BUILDING CODE (IBC)
2015 INTERNATIONAL MECHANICAL CODE (IMC)
2015 UNIFORM PLUMBING CODE (UPC)
2014 NATIONAL ELECTRIC CODE (NEC)
2015 WASHINGTON STATE ENERGY CODE (WSEC)

PIPING MATERIALS

APPROVED PLUMBING MATERIAL:

ALL SANITARY SYSTEM MATERIALS SHALL BE LISTED BY AN APPROVED LISTING AGENCY.

1. UNDERGROUND SERVICE ENTRANCE PIPING: COPPER, TYPE K. PLASTIC WRAP UNDERGROUND WATER SUPPLY PIPING TO PREVENT CORROSION.

2a. ABOVEGROUND WATER DISTRIBUTION PIPING: COPPER, TYPE L.

2b. ABOVEGROUND WATER DISTRIBUTION PIPING IN APARTMENTS: PEX WITH VIEGA MANBLOC MANIFOLD.

NOTE: PER 2015 IBC SECTION 718.5 COMBUSTIBLE MATERIAL (INCLUDING PEX, PVC) SHALL NOT BE INSTALLED IN CONCEALED SPACES OF TYPE I CONSTRUCTION (FIRST FLOOR).

3. UNDERGROUND WASTE, VENT AND STORM PIPING: NO-HUB CAST IRON, (OR SOLID CORE PVC SCH 40) 2

4. ABOVEGROUND WASTE, VENT AND STORM PIPING: NO-HUB CAST IRON

6. CONDENSATE DRAIN PIPING: CPVC OR COPPER TYPE M.

7. TEMPERATURE AND/OR PRESSURE RELIEF VALVE DISCHARGE PIPING: COPPER TYPE M

8. GAS PIPING: STEEL PIPE, ASTM A 53; TYPE E OR S;GRADE B; SCHEDULE 40.

PRE-CON MEETING

CONTRACTORS SHALL ATTEND A PRE-CONSTRUCTION MEETING WITH THE ENGINEER FOR THE PURPOSE OF REVIEWING THE WORK PRIOR TO ORDERING ANY EQUIPMENT OR PERFORMING ANY WORK. THE MEETING SHALL BE LOCATED AT THE PROJECT SITE ON A DATE AND TIME TO BE MUTUALLY AGREED. THE MEETING WILL BE A WORKING SESSION. THE MEETING WILL BE FACILITATED BY THE ENGINEER AND THE AGENDA WILL INCLUDE A DETAILED REVIEW OF THE PLANS AND SPECIFICATIONS, CROSS CHECK WITH OTHER TRADES FOR COORDINATION ISSUES, REVIEW OF PROPOSED PRODUCTS, REVIEW OF PLANNED MEANS AND METHODS,AND ON-SITE INVESTIGATION OF FIELD CONDITIONS RELATIVE TO EXISTING CONDITIONS THAT COULD AFFECT THE WORK. PERSONS ATTENDING THE MEETING SHALL BE KNOWLEDGEABLE OF THE PROJECT AND SHALL BE THE SPECIFIC PERSONS INTENDED TO CONTINUE WITH THE PROJECT THROUGH TO COMPLETION. IF REQUIRED, REVISED PLANS WILL BE ISSUED THROUGH OFFICIAL CHANNELS. CHANGES IN THE BID PRICE WILL BE DISCUSSED, BUT NO CHANGE ORDERS WILL BE ISSUED UNLESS PROCESSED THOUGH OFFICIAL CHANNELS. IT SHALL BE UNDERSTOOD THAT THE ENGINEER HAS NO AUTHORITY TO ISSUE CHANGE ORDERS.

THE FOLLOWING TRADES SHALL BE REPRESENTED FOR THE MINIMUM TIME INDICATED:

MECHANICAL SHEET METAL	4 HOURS
PLUMBING/PIPING	4 HOURS
SPRINKLER	1 HOURS
GENERAL CONTRACTOR	ALL SESSIONS

CONTRACTOR SUBSTITUTIONS & REVISIONS

CONTRACTOR SUBSTITUTIONS & REVISIONS: PLEASE SUBMIT PROPOSALS FOR SUBSTITUTIONS OR REVISIONS FOR REVIEW AND APPROVAL PRIOR TO ORDERING MATERIAL OR DOING WORK. FOR EQUIPMENT THAT IS SCHEDULED BY MANUFACTURER'S NAME AND CATALOG DESIGNATIONS, THE MANUFACTURER'S PUBLISHED DATA AND/OR SPECIFICATION FOR THAT ITEM ARE CONSIDERED PART OF SPECIFICATION. ENGINEERING COSTS FOR REVISING MEP PLANS SHALL BE ADDRESSED IN THE COST ANALYSIS OF THE SUBSTITUTION PROPOSAL. CONTRACTOR TO COORDINATE WITH ENGINEER AND DETERMINE ASSOCIATED DESIGN AND PERMITTING COSTS. CONTRACTOR SHALL BE RESPONSIBLE FOR OTHER COSTS ASSOCIATED WITH UNFORESEEN ISSUES RESULTING FROM SUBSTITUTIONS OR REVISIONS.

INDEX OF DRAWINGS

DWG	DESCRIPTION	INCLUDED IN SET: COORDINATION SET 10/27/17	FOUNDATION PERMIT SET 11/22/17	COORDINATION SET 03/05/18	PERMIT SET 05/02/18	PERMIT SET 05/17/18	FOUNDATION PERMIT RESUBMITTAL SET 06/05/18	PERMIT RESUBMIT ADDENDUM 3 01/14/19	PERMIT RESUBMIT DELTA 1,1R 01/30/19	PERMIT RESUBMIT DELTA 2 06/14/19
P000	LEGEND, GENERAL NOTES, DRAWING INDEX	X	X	X	X	X	X	X	X	X
P001	PROJECT NOTES	X	X	X	X	X	X	X	X	X
P002	CALCULATIONS	X	X	X	X	X	X	X	X	X
P003	SCHEDULES			X	X	X	X	X	X	X
P004	TABLES			X	X	X	X	X	X	X
P200S	UNDERSLAB PLUMBING PLAN – SUPPLY	X	X	X	X	X	X	X	X	X
P200W	UNDERSLAB PLUMBING PLAN – WASTE	X	X	X	X	X	X	X	X	X
P201S	FIRST FLOOR PLAN – SUPPLY	X	X	X	X	X	X	X	X	X
P201W	FIRST FLOOR PLAN – WASTE	X	X	X	X	X	X	X	X	X
P202S	SECOND FLOOR PLAN – SUPPLY	X	X	X	X	X	X	X	X	X
P202W	SECOND FLOOR PLAN – WASTE	X	X	X	X	X	X	X	X	X
P203S	THIRD FLOOR PLAN – SUPPLY	X	X	X	X	X	X	X	X	X
P203W	THIRD FLOOR PLAN – WASTE & VENT	X	X	X	X	X	X	X	X	X
P204S	FOURTH FLOOR PLAN – SUPPLY	X	X	X	X	X	X	X	X	X
P204W	FOURTH FLOOR PLAN – WASTE & VENT	X	X	X	X	X	X	X	X	X
P205S	FIFTH FLOOR PLAN – SUPPLY	X	X	X	X	X	X	X	X	X
P205W	FIFTH FLOOR PLAN – WASTE & VENT	X	X	X	X	X	X	X	X	X
P206W	ATTIC & ROOF PLAN – WASTE & VENT	X	X	X	X	X	X	X	X	X
P300	ENLARGED PLUMBING PLANS				X				X	X
~~P301~~	~~ENLARGED PLUMBING PLANS–REMOVED~~				X					
P400	WASTE & VENT FLOW DIAGRAMS	X	X	X	X	X	X	X	X	X
P401	WASTE & VENT RISER DIAGRAMS	X	X	X	X	X	X	X	X	X
P402	REMOVED	X	X	X	X					
P403	REMOVED	X	X	X	X					
P404	REMOVED	X	X	X	X					
P500	SUPPLY DISTRIBUTION DIAGRAMS	X	X	X	X	X	X	X	X	X
P501	SUPPLY RISERS DIAGRAMS					X	X	X	X	X
P600	DETAILS & DIAGRAMS	X	X	X	X	X	X	X	X	X
P601	DETAILS & DIAGRAMS			X	X	X	X	X	X	X
P602	DETAILS & DIAGRAMS						X	X	X	X
P603	DETAILS & DIAGRAMS							X	X	X

DRAWINGS ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, LAYOUT, AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENT. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS. REFER TO MANUFACTURER'S STANDARD INSTALLATION DRAWINGS FOR EQUIPMENT CONNECTIONS AND INSTALLATION REQUIREMENTS. PROVIDE DUCTWORK, CONNECTIONS, ACCESSORIES, OFFSETS, AND MATERIALS NECESSARY FOR A COMPLETE SYSTEM.

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TOWNZEN & ASSOCIATES PLAN APPROVAL
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09/25/2019

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EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
1R	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE

LEGEND,
GENERAL NOTES,
DRAWING INDEX

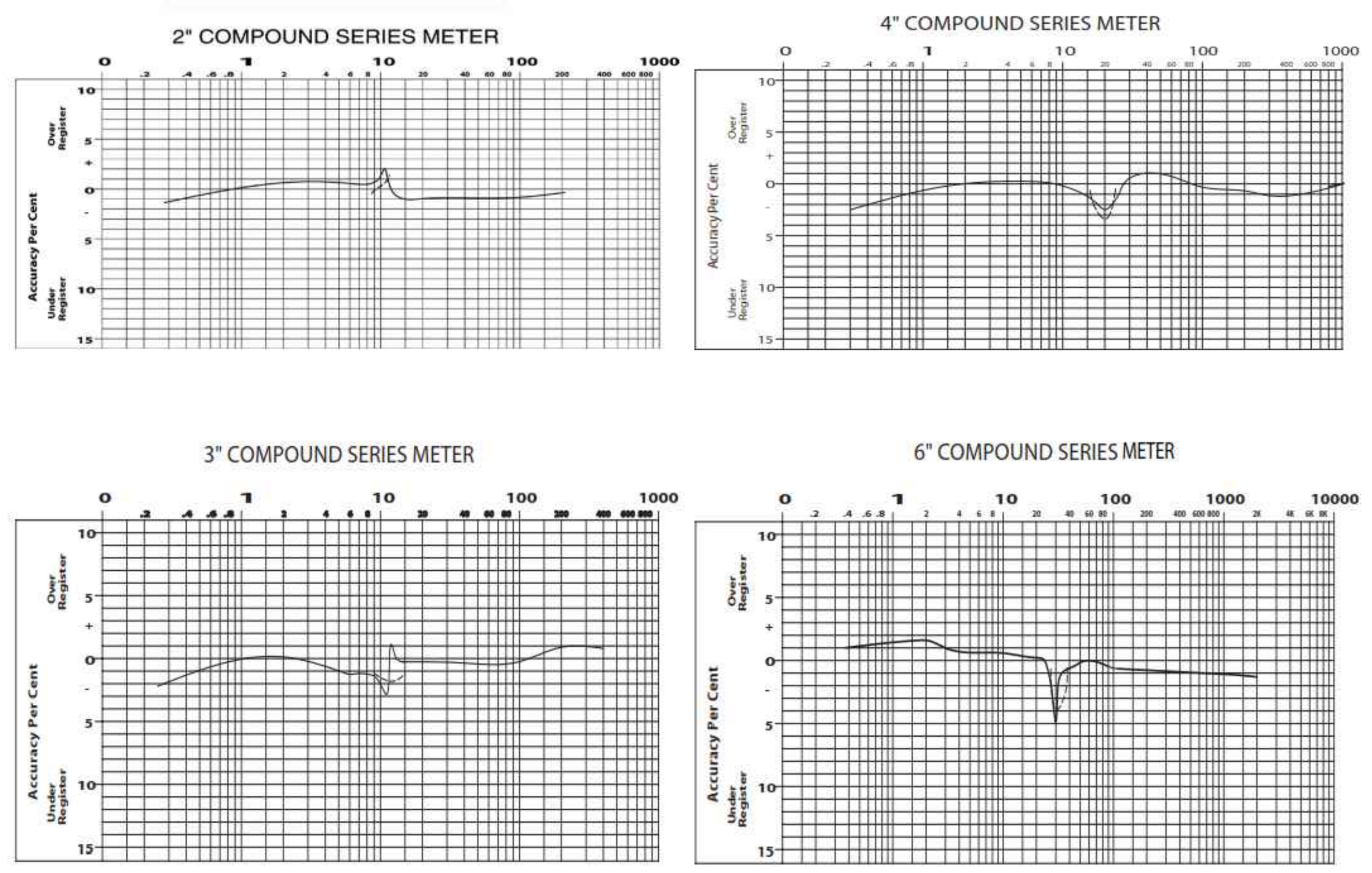
P000

PROJECT NOTES

ACCURACY CHARTS

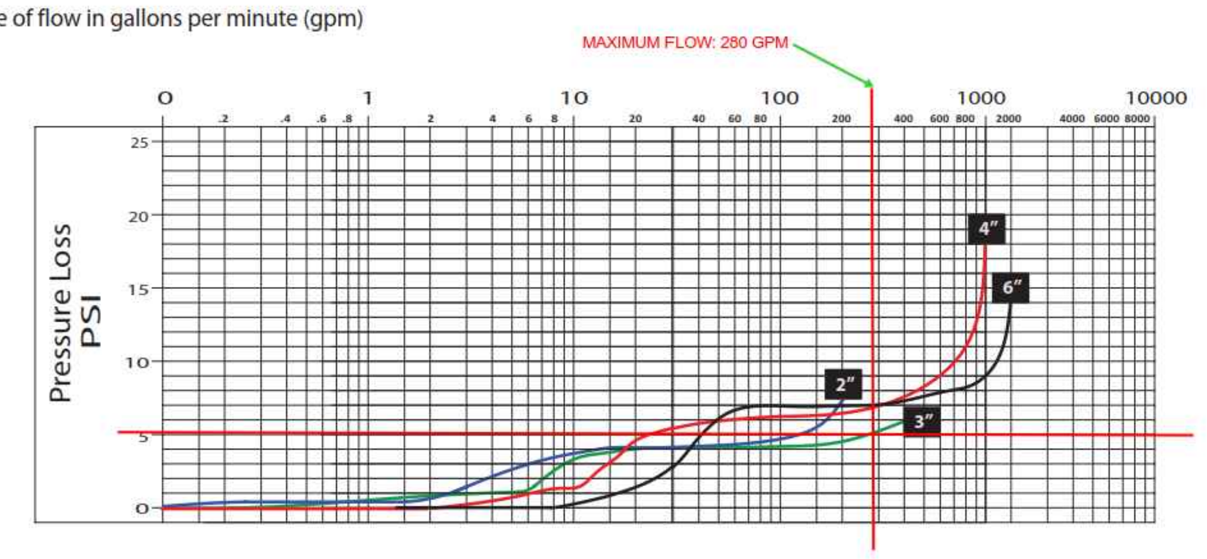
METER: 3" BADGER COMPOUND SERIES

Rate of flow in gallons per minute (gpm)



PRESSURE LOSS CHART

Rate of flow in gallons per minute (gpm)



WATER GFC CHARGES

METER SIZE	AWWA CAPACITY	GFC
¾"	1.00	$4,180
1" Residential Fire Sprinkler	1.00	$4,180
1"	1.67	$7,013
1 ½"	3.33	$13,983
2"	5.33	$22,381
3"	10.67	$43,739
4"	16.33	$68,574
6"	33.33	$139,961
8"	53.33	$223,947
10"	76.67	$325,604
12"	100.00	$419,929

STORMWATER GFC CHARGES

$1,190 per impervious unit (2,528 sq. ft. of impervious surface)

plus $4.50 per average daily vehicle trip based on the Institute of Traffic Engineers' Trip Generation Manual

WASHINGTON STATE PLUMBING NOTES (WAC 51-56)

1. PER SEC 312.6 NO WATER, SOIL, OR WASTE PIPE SHALL BE INSTALLED OR PERMITTED OUTSIDE OF THE BUILDING, IN ATTIC OR CRAWL SPACES OR IN AN EXTERIOR WALL UNLESS, ADEQUATE PROVISION IS MADE TO PROTECT SUCH PIPE FROM FREEZING. ALL HOT AND COLD WATER PIPES INSTALLED OUTSIDE OF CONDITIONED SPACE SHALL BE INSULATED TO A MINIMUM R-3.

2. PER SEC 414.3 DOMESTIC DISHWASHING MACHINE SHALL DISCHARGE INDIRECTLY THROUGH AN AIR GAP FITTING. COMMERCIAL DISH WASHING MACHINE SHALL DISCHARGE INDIRECTLY THRU AN AIR GAP.

3. PER SEC 418.3 FLOOR DRAINS SHALL BE INSTALLED IN THE FOLLOWING AREAS:

(1) TOILET ROOMS CONTAINING TWO OR MORE WATER CLOSETS OR COMBINATION OF ONE WATER CLOSET AND ONE URINAL EXCEPT IN A DWELLING UNIT. THE FLOOR SHALL SLOPE TOWARD THE FLOOR DRAINS.

(2) LAUNDRY ROOM IN COMMERCIAL BUILDINGS AND COMMON LAUNDRY FACILITIES IN MULTI FAMILY DWELLING UNIT

4. PER SEC 504.1 WATER HEATER INSTALLATION IN BEDROOM AND BATHROOMS SHALL COMPLY WITH ONE OF THE FOLLOWING:

(1) FUEL BURNING WATER HEATER SHALL BE INSTALLED IN A CLOSET LOCATED IN THE BEDROOM OR BATHROOM PROVIDED THE CLOSET IS EQUIPPED WITH A LISTED GASKETED DOOR ASSEMBLY AND A LISTING SELF CLOSING DEVICE. THE DOOR ASSEMBLY SHALL MEET THE REQUIREMENTS OF IMC SEC 505.1.2.THE CLOSET SHALL BE FOR EXCLUSIVE USE OF THE WATER HEATER.

(2) WATER HEATER SHALL BE DIRECT VENT TYPE

5. PER SEC 507.2 WATER HEATER SHALL BE ANCHORED OR STRAPPED FOR SEISMIC PROVISION. STRAPPING SHALL BE AT POINT WITHIN THE UPPER ONE THIRD AND LOWER ONE THIRD OF ITS VERTICAL DIMENSIONS. AT THE LOWER POINT, A DISTANCE NOT LESS THAN FOUR INCHED SHALL BE MAINTAINED FROM CONTROLS TO THE STRAPPING.

6. PER SEC 507.13 APPLIANCES IN GARAGES AND ADJACENT SPACED OPEN TO GARAGE AND ARE NOT PART OF LIVING SPACE OF A DWELLING UNIT SHALL BE INSTALLED SO THAT BURNER IS NOT LESS THAN 18 IN ABOVE THE FLOOR UNLESS LISTED AS FLAMMABLE VAPOR IGNITION RESISTANT.

7. PER SEC 603.5.12 A LISTED REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER SHALL BE PROVIDED FOR CARBONATED BEVERAGE DISPENSERS.

8. PER SEC 603.4.9 BACKFLOW PREVENTION DEVICE WITH ATMOSPHERIC VENT OR PORT SHALL NOT BE INSTALLED IN PITS OR SUBMURGED LOCATIONS.

9. PER SEC 603.5.10 POTABLE WATER CONNECTIONS TO STEAM OR HOT WATER BOILER SHALL BE PROTECTED BY AN AIR GAP OR A REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER.

10. PER SEC 608.5 THE DISCHARGE PIPING SERVING A TEMPERATURE RELIEF VALVE, PRESSURE RELIEF VALVE OR COMBINATION BOTH SHALL HAVE NO VALVES, OBSTRUCTIONS OR MEANS OF ISOLATION. DISCHARGE PIPE SHALL DISCHARGE INDEPENDENTLY BY GRAVITY THRU AN AIR GAP INTO DRAINAGE SYSTEM OR OUTSIDE OF THE BUILDING WITH THE END OF THE PIPE NOT EXCEEDING 2 FEET AND NOT LESS THAN 6 INCHES ABOVE GROUND POINTING DOWNWARDS. DISCHARGE FROM A RELIEF VALVE INTO WATER HEATER PAN SHALL BE PROHIBITED.

11. PER SEC 609.11 DOMESTIC WATER PIPING WITHIN COMMERCIAL BUILDINGS SHALL BE INSULATED IN ACCORDANCE WITH SEC C403.2.8 AND TABLE C403.2.9 OR SECTION C404.6 OF WSEC.

⚠ 12. PER SEC 704.3 ALL PLUMBING FIXTURE INCLUDING COMMERCIAL SINK, DRAINS, APPURTNENNCES AND APPLIANCES SHALL BE DIRECTLY CONNECTED TO THE DRAINAGE SYSTEM EXCEPT WHERE REQUIRED TO BE CONNECTED INDIRECTLY TO THE DRAINAGE SYSTEM OR WHEN FIRST APPROVED BY THE AUTHORITY HAVING JURISDICTION.

13. PER 707.4 EACH HORIZONTAL DRAINAGE PIPE SHALL BE PROVIDED WITH A CLEANOUT AT ITS UPPER TERMINAL, AND EACH RUN OF PIPING THAT IS MORE THAN 100 FEET IN TOTAL DEVELOPED LENGTH SHALL BE PROVIDED WITH A CLEANOUT AT EACH 100 FEET , OR FRACTION THEREOF, IN LENGTH OF SUCH PIPING. AN ADDITIONAL CLEANOUT SHALL BE PROVIDED IN A DRAINAGE LINE FOR EACH AGGREGATE HORIZONTAL CHANGE OF DIRECTION EXCEEDING 135 DEGREES. EXCEPTIONS:

(1) CLEANOUTS SHALL BE PERMITTED TO BE OMITTED ON A HORIZONTAL DRAIN LINE LESS THAN 5 FEET IN LENGTH UNLESS SUCH LINE IS SERVING SINKS OR URINALS.

(2) CLEANOUTS SHALL BE PERMITTED TO BE OMITTED ON A HORIZONTAL DRAINAGE PIPE INSTALLED ON SLOPE OF 72 DEGREES OR LESS FROM THE VERTICAL ANGLE.

(3) EXCEPT FOR THE BUILDING DRAIN , ITS HORIZONTAL BRANCHES =, AND URINALS A CLEAN OUT SHALL NOT BE REQUIRED ON A PIPE OR PIPING THAT IS ABOVE FLOOR LEVEL ON THE LOWEST FLOOR OF THE BUILDING.

(4) AN APPROVED TYPE OF TWO-WAY CLEANOUT FITTING, INSTALLED IN THE WALL NEAR THE CONNECTION BETWEEN THE BUILDING DRAIN AND THE BUILDING SEWER OR INSTALLED OUTSIDE OF BUILDING AT THE LOWER END OF A BUILDING DRAIN AND EXTENDED TO THE GRADE , SHALL BE PERMITTED TO BE SUBSTITUTED FOR AN UPPER TERMINAL CLEANOUT.

14. PER 707.9 EACH CLEAN OUT IN PIPING 2 INCHES OR LESS IN SIZE SHALL BE SO INSTALLED THAT THERE IS A CLEARANCE OF NOT LESS THAN 12 INCHES IN FRONTY OF THE CLEANOUT. CLEANOUTS IN PIPING EXCEEDING 2 INCHES SHALL HAVE A CLEARANCE OF NOT LESS THAN 18 INCHES IN FRONT OF THE CLEANOUT. CLEANOUT IN UNDER-FLOOR PIPING SHALL BE EXTENDED TO OR ABOVE THE FINISHED FLOOR. OR SHALL BE EXTENDED OUTSIDE THE BUILDING WHERE THERE IS LESS THAN 18 INCHES VERTICAL OVERALL ALLOWING FOR MEANS TO ACCESS SUCH CLEANOUT. NO UNDER-FLOOR CLEANOUT SHALL BE LOCATED EXCEEDING 20 FEET FROM AN ACCESS DOOR, TRAP DOOR, OR CRAWL HOLE.

PROJECT NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR FINISHING THE PROJECT BASED ON ALL APPLICABLE CODES AS SPECIFIED BY JURISDICTION.
2. IF THERE IS ANY CONFLICT BETWEEN DOCUMENTS OR IF THERE IS ANY DEVIATION FROM APPLICABLE CODES, THE CONTRACTOR SHALL REPORT THE CONFLICT OR DEVIATION TO ENGINEERING IN WRITING PRIOR TO CONSTRUCTION.
3. CLEAN OUTS ARE NOT SHOWN ON PLANS. PROVIDE CLEAN OUTS PER CODE.
4. HAMMER ARRESTORS ARE NOT SHOWN ON THE PLANS. PROVIDE HAMMER ARRESTOR FOR FAST CLOSING FIXTURES INCLUDING BUT NOT LIMITED TO FLUSH VALVES, WASHER BOXES, DISH WASHERS AND ANY FIXTURE WITH SOLENOID VALVE.
5. REFER TO TABLE 1002.2, 2012 UPC WITH **WASHINGTON STATE** AMENDMENTS FOR HORIZONTAL LENGTH OF TRAP ARMS.
6. CONTRACTOR/OWNER TO ENSURE CLOTHES WASHERS HAVE BUILT IN INTEGRAL STRAINER PER UPC 1012.0.
7. ALL SHUT OFF VALVES / STOP VALVES SHALL BE BALL VALVE OR BUTTERFLY VALVES. NO GATE VALVE OR GLOBE VALVE ALLOWED AS ISOLATION VALVE.
8. ROUTING OF CONDENSATE PIPING IS NOT SHOWN ON THE PLANS. CONTRACTOR SHALL FIELD COORDINATE ROUTING OF CONDENSATION DRAIN WITH MECHANICAL CONTRACTOR AND PLUMBING INSPECTOR. SEE P601 FOR DETAILS.
9. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL CONFIRM LOCATION OF HUB DRAINS WITH SPRINKLER CONTRACTOR. SUBMIT RFI IF ANY CHANGE IS REQUIRED.

PEX NOTES:

1. PROVIDE HANGERS AND SUPPORTS PER PIPING MANUFACTURER IN COMPLIANCE WITH LOCAL CODES. REFER TO TABLE 313.1, 2012 UPC WITH **WASHINGTON STATE** AMENDMENTS FOR MINIMUM REQUIREMENT.
2. PER SECTION 2.7.12.3, 2012 UPC WITH WASPC AMENDMENTS HOSE BIBBS SHALL BE CONNECTED ONLY TO METAL SYSTEM COMPONENT WHICH ARE ADEQUATELY ANCHORED TO THE BUILDING STRUCTURE. THE CPVC PLASTIC SYSTEM SHALL TERMINATE IN WALL.
3. TRANSITION FROM PLASTIC TO METAL PIPING OR VALVES SHALL BE MADE ONLY WITH TRANSITION FITTINGS INTENDED FOR THAT PURPOSE.
4. REFER TO TABLE 1401, 2012 UPC WITH WASPC AMENDMENT FOR APPROVED MATERIALS, EQUIPMENT, JOINTS AND CONNECTION.
5. PER A6.1, VELOCITIES SHALL NOT EXCEED 10 FT/SEC OR THE MAXIMUM VALUES GIVEN IN APPROPRIATE INSTALLATION STANDARD.
6. PEX PIPING SHALL NOT BE INSTALLED WITHIN THE FIRST 18 INCHES OF PIPING CONNECTED TO A WATER HEATER.

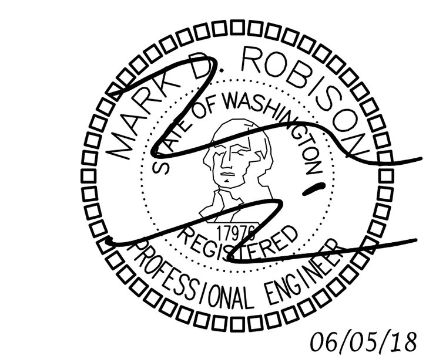
CITY OF OLYMPIA PLUMBING NOTES

1. PER CITY OF OLYMPIA BACKFLOW PREVENTION, CONTRACTOR TO PROVIDE VACUUM BREAKER ON ALL OUTDOOR FAUCETS.

TAS
THOMAS
architecture studios
525 COLUMBIA ST. | OLYMPIA, WA 98501
360.915.8775 | tasolympia.com

TOWNZEN & ASSOCIATES
PLAN APPROVAL
The plans submitted for review are approved in accordance with local state applicable standards. This approval does not relieve the applicant of the responsibility of compliance with the applicable codes.
4 Approved as submitted.
09/25/2019

ROBISON ENGINEERING, INC
19401 40TH AVE W., SUITE 302
LYNNWOOD, WA 98036
206-364-3343 TEL
CONTACT: JON ROBISON



06/05/18

Reviewed for Code Compliance
Construction Permitting Only

Olympia
Building Plans Examiner
Community Planning & Development Department
601 4th Ave East
Olympia, WA 98501
(360) 753-8248
rbalders@ci.olympia.wa.us

EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
R	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE

PROJECT NOTES

P001

PIPE SIZING CALCS

NOTE: SEE PIPING MATERIAL ON SHEET P000. PIPING SYSTEM HAS 2 ZONES. COPPER(RISERS AND MAINS) & PEX.

Robison Engineering, Inc.
19401 40th AVE W. Suite 302
Lynnwood, WA 98087

Project Name: WESTMAN MILL
Project Number: 751-001
Edited By: ML
Edit Date: 2/27/2018

SIZING IS PER 2015 UPC APPENDIX A, CHARTS and Table A 103.1, 104.4 & 105.1.

COPPER PIPE SIZING CALCULATION FORM

UTILITY SUPPLY WATER PRESSURE:	95	PSI STATIC PRESSURE
PER KEVIN BOSSARD @ FIRE DEPARTMENT- 10/16/17-WATER PRESSURE IS 95 PSI.		
MAXIMUM FLOWARTE, **280** *GPM FOR* **1,558** *FU*		
WATER METER LOSS:	5	PSI
BASED ON 3" BADGER METER @ 280 GPM FLOWRATE		
(PER MATT CRAIG @ PARAMETRIX 05/16/18 CITY OF OLYMPIA USES THE BADGER METER.)		
CIVIL PIPING LENGTH:	138	FT
CIVIL PIPING FITTING ALLOWANCE:	69	FEET
PIPE LENGTH FROM METER TO CIVIL-PLUMBING POC PER MATT CRAIG @ PARAMETRIX 05/16/18		
CIVIL PIPING FRICTION LOSS FACTOR	2.5	PSI/100FT
SAME FRICTION LOSS AS PIPING INSIDE BUILDING		
FRICTION LOSS IN CIVIL PIPING	5.2	PSI
AVAILABLE PRESSURE @ POC WITH CIVIL	84.8	PSI
BACKFLOW PREVENTER PRESSURE DROP:	7	PSI
ZURN-WILKINS 375, 4" @ 280 GPM		
AVAILABLE PRESSURE AFTER RPBP	77.8	PSI
PROVIDE PRV. SET @ 80 PSI.		

STATIC LIFT

RESIDENTIAL	50	FEET =	21.7	PSI
RETAIL SPACES (LEVEL 1)	3	FEET =	1.3	PSI
SELCTED/MAXIMUM DESIGN LIFT	50	FEET =	21.7	PSI

DESIGN PRESSURE AT FURTHEST PEX MANIFOLD (APARTMENT UNITS):	35	PSI
SEE PEX CALCULATION FOR REQUIRED/PROVIDED PRESSURE WITHIN RESIDENTIAL SECTION OF BUILDING		
PRESSURE AVAILABLE TO OFFSET FRICTION LOSSES:	21.2	PSI

RESIDENTIAL PIPING LENGTH:

PIPING SYSTEM LENGTH FROM RPBP TO FURTHEST PEX MANIFOLD:	450	FEET
FITTING ALLOWANCE:	225	FEET
TOTAL DEVELOPPED LENGTH:	675	FEET

COMMERCIAL PIPING LENGTH

PIPING SYSTEM LENGTH FROM RPBP TO TRYAIL SPACE POC:	150	FEET
FITTING ALLOWANCE:	75	FEET
TOTAL DEVELOPPED LENGTH:	225	FEET

MAXIMUM PIPING DEVELOPED LENGTH FROM RPBP TO FURTHEST FIXTURE (INCLUDING ALL FITTING ALLOWANCES)	675	FEET
MAXIMUM FRICTION LOSS FACTOR:	3.1	PSI/100 FT
SELECTED FRICTION LOSS FACTOR:	2.5	PSI/100 FT
MAX CW VELOCITY 8 FPS. MAX HW VELOCITY 5 FPS.		
PROVIDED PRESSURE		
1. @ FURTHEST PEX MANIFOLD (RESIDENTIAL)	39.3	PSI
2. @ FURTHEST RETAIL POC (COMMERCIAL)	70.9	PSI

NOTE: SEE PEX PIPING CALCULATION FOR PIPING CALCULATION FROM PEX MANIFOLD TO FIXTURE UNITS.

SUPPLY PIPE SIZING SCHEDULE — Copper Type: Type L

FLUSH TANK CW				HOT WATER				FLUSH VALVE CW			
PIPE SIZE	FLOW, GPM	VEL FPS	FIXTURE UNITS	FLOW, GPM	VEL FPS	FIXTURE UNITS	FLOW, GPM	VEL FPS	FIXTURE UNITS
1/2"	1.3	2.0	1.0	1.3	2.0	1.0	---	---	---
3/4"	4.0	2.8	4.5	4.0	2.8	4.5	---	---	---
1"	9.0	3.5	11.5	9.0	3.5	11.5	---	---	---
1-1/4"	16.0	4.0	20.0	16.0	4.0	20.0	---	---	---
1-1/2"	24.0	4.7	40.0	24.0	4.7	40.0	24.0	4.7	5.0
2"	53.0	5.6	135.0	45.0	5.0	112.0	50.0	5.6	50.0
2-1/2"	95.0	6.6	320.0	72.0	5.0	215.0	95.0	6.6	228.0
3"	150.0	7.4	650.0	100.0	5.0	350.0	150.0	7.4	564.0
4"	280.0	8.0	1600.0	175.0	5.0	800.0	280.0	8.0	1600.0
6"	650.0	8.0	5250.0	400.0	5.0	2750.0	650.0	8.0	5250.0

PRIOR TO CONSTRUCTION CONTRACTOR SHALL CONTACT CITY OF OLYMPIA-EMERGENCY PREPAREDNESS @ 360-753-8348 TO FIELD DETERMINE WATER PRESSURE. WATER PRESSURE SHALL BE MEASURED NO LATER THAN 7:00 AM PER FIRE MARSHAL. CONTRACTOR SHALL SUBMIT RFI TO ENGINEERING IMMEDIATELY IF MINIMUM STATIC PRESSURE BEFORE THE METER IS LESS THAN 95 PSI.

CONTRACTOR SHALL FIELD DETERMINE THE WATER PRESSURE AFTER THE PRV NO LATER THAN 7:00 AM. SUBMIT RFI IF STATIC PRESSURE IS LESS THAN 75 PSI.

PEX PIPE SIZING CALCULATION:
BASED ON UPONOR AQUAPEX ONLINE CALCULATION

DESIGN WATER PRESSURE BEFORE MANIFOLD: **35** PSI
DESIGN/MINIMUM AVAILABLE PRESSURE @ FIXTURE: **20** PSI
AVAILABLE PRESSURE LOSS IN PEX MANIFOLD = **3.5** PSI (SEE P601)
AVAILABLE PRESSURE LOSS FOR PEX DISTRIBUTION PIPE TO FIXTURES= **11.5** PSI
PIPING LENGTH: 50 FEET
FITTING ALLOWANCE (25%) = 12.5 FEET
TOTAL DEVELOPED LENGTH= 62.5

NOTE: MAXIMUM ALLOWABLE LENGTH FOR HOT WATER PIPING BASED ON EFFICIENT HEATED WATER SUPPLY PIPING IS 43 FEET. SEE P003 FOR SCHEDULE.

MAXIMUM AVAILABLE/SELECTED FRICTION LOSS FACTOR: **18.4** PSI/100FT
MAXIMUM VELOCITY FOR COLD WATER: **10** FT/ SEC [RECOMMENDED BY MFR]
MAXIMUM VELOCITY FOR HOT WATER: **8** FT/SEC [RECOMMENDED BY MFR]
MAXIMUM VELOCITY FOR HOT WATER RECIRC: **2** FT/SEC [RECOMMENDED BY MFR]

PEX CALCS NOTES:

(1) ROUTE DISTRIBUTION LINE FROM MANIFOLD TO EACH FIXTURE. SEE SHEET P300 AND DETAIL 9 ON SHEET P600. PIPING INSTALLATION SHALL MEET MANUFACTURER RECOMMENDATION IN COMPLIANCE WITH CODE.

(2) PEX PIPE SIZING IS BASED ON UPONOR AQUAPEX DATA. VIEGA & SHARKBITE ARE OTHER APPROVED MANUFACTURERS. VIEGA PEX RECCOMMNDED SIZES IS SHOWN ON SPECS ON SHEET P601. IF CONTRACTOR IS PROVIDING PEX PIPING OTHER THAN UPONOR AQUPEX, IT IS CONTRACTOR RESPONSIBILITY TO CONFIRM WITH MANUFACTURER THAT CALCULATION IS IN COMPLIANCE WITH THEIR PRODUCT. ALL PIPE SIZES SHALL MEET MINIMUM CODE REQUIREMENT. ⅜" PIPE IS SMALLER THAN MINIMUM FIXTURE BRANCH PIPE SIZE PER 2015 UPC TABLE 610.3 AND THEREFORE SHALL NOT BE USED.

(3) ALL PEX PIPING SHALL HAVE COLOR CODE.

(4) PER VIEGA MANABLOC RECOMMENDATION:
(A) MAXIMUM DISTRIBUTION TUBING FROM MANABLOC MANIFOLD TO FIXTURE SHALL NOT EXCEED 60 FT.
(B) HOSE BIBBS SHALL BE SUPPLIED FROM THE MAIN SERVICE LINE PRIOR TO THE MANABLOC.

(5) REFER TO EFFICIENT HEATED SUPPLY WATER PIPING TABLE FOR MAXIMUM ALLOWABLE LENGTH OF NON-RECIRCULATED HOT WATER. FOR PUBLIC LAVATORIES, LOCATE MANIFOLD UNDER THE SINK TO MEET EFFICIENT HEATED WATER SUPPLY PIPING.

Water Size Chart for Uponor AquaPEX:

Uponor AquaPEX Water Size Table
UPC - Flush Tank
100% Water @ **60°F**
18.400 PSI/100ft.
Max. Velocity = **10 ft./sec.**

Pipe Size	WSFU Range	Velocity (ft./sec.)	GPM
1/2"	1 -- 3	6.50	3.59
3/4"	4 -- 12	8.20	9.04
1"	13 -- 25	9.80	17.83
1 1/4"	26 -- 46	10.00	27.20
1 1/2"	47 -- 77	10.00	37.89
2"	78 -- 199	10.00	64.97
2 1/2"	200 -- 375	10.00	99.01
3"	376 -- 589	10.00	140.79

Uponor AquaPEX Water Size Table
UPC - Flush Tank
100% Water @ **120°F**
18.400 PSI/100ft.
Max. Velocity = **8 ft./sec.**

Pipe Size	WSFU Range	Velocity (ft./sec.)	GPM
1/2"	1 -- 3	7.10	3.92
3/4"	4 -- 11	8.00	8.82
1"	12 -- 20	8.00	14.55
1 1/4"	21 -- 33	8.00	21.76
1 1/2"	34 -- 54	8.00	30.31
2"	55 -- 134	8.00	51.97
2 1/2"	135 -- 270	8.00	79.21
3"	271 -- 443	8.00	112.63

Uponor AquaPEX Water Size Table
UPC - Flush Tank
100% Water @ **110°F**
18.400 PSI/100ft.
Max. Velocity = **2 ft./sec.**

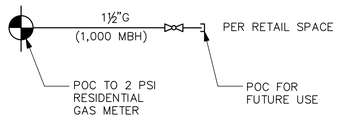
Pipe Size	WSFU Range	Velocity (ft./sec.)	GPM
1/2"	0 -- 0	2.00	1.10
3/4"	1 -- 1	2.00	2.20
1"	2 -- 3	2.00	3.64
1 1/4"	4 -- 6	2.00	5.44
1 1/2"	7 -- 9	2.00	7.58
2"	10 -- 17	2.00	12.99
2 1/2"	18 -- 29	2.00	19.80
3"	30 -- 49	2.00	28.16

GAS CALCS

MEDIUM PRESSURE GAS PIPE SIZING NOTES FOR REFERENCE ONLY

1. GAS PIPE SIZING IS PER 2015 IFGC TABLE 402.4. 2 PSI INLET PRESSURE, 1 PSI PRESSURE DROP. (400 FT COLUMN USED.)
2. PROVIDE CONNECTION TO EACH PIECE OF EQUIPMENT WITH DIRT LEG, UNION AND GAS COCK (TYPICAL). PROVIDE GAS PIPING SUPPORTS FOR ROOF MOUNTED PIPING SPACED 10' APART MAX.

PIPE SIZE:	MAX CFH/MBH
1/2"	216
3/4"	452
1"	809
1-1/4"	1,660
1-1/2"	2,490
2"	4,790
2-1/2"	7,640
3"	13,500
4"	27,500

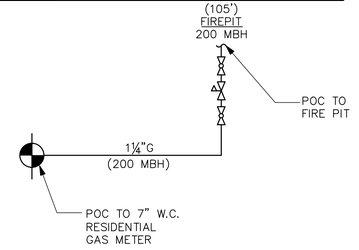


LOW PRESSURE GAS PIPE SIZING NOTES

GAS PIPE SIZING IS PER 2015 IFGC TABLE 402.4. LESS THAN 2 PSI INLET PRESSURE, 0.5" W.C PRESSURE. FURTHEST FIXTURE FROM GAS METER IS 105 FT. (125 FT COLUMN USED)

1. PROVIDE CONNECTION TO EACH PIECE OF EQUIPMENT WITH DIRT LEG, UNION AND GAS COCK (TYPICAL). PROVIDE GAS PIPING SUPPORTS FOR ROOF MOUNTED PIPING SPACED 10' APART MAX.

PIPE SIZE:	MAX CFH/MBH
1/2"	44
3/4"	92
1"	173
1-1/4"	355
1-1/2"	532
2"	1,020
2-1/2"	1,630
3"	2,890
4"	5,890



FIXTURE UNIT & UTILITIES CALCS

WASTE & VENT PIPE SIZING CHART
PER UPC TABLE 7-5

PIPE SIZE	VENT DFU	WASTE DFU HORIZ.	WASTE DFU VERT.
1½"	8	–	–
2"	24	8	16
2½"	48	14	32
3"	84	35	48
4"	256	216	256
6"	1380	720	1380
8"	3600	2640	3600

STORM DRAIN CALCS:

19,000 FT²
Q=C.I.A= 1x0.01x19,000= 190 GPM
PER 2015 UPC TABLE 1101.7
STORM DRAIN PIPE= 6" ⅛":1'
SLOPE (UPTO 222 GPM)

Table 2. AWWA Meter Capacity Ratios

AWWA Recommended Meter Capacity Ratios		
Meter Size	**Safe Max Operating Capacity for C712-10 Singlejet Type (gpm)**	**Equivalency Factor based on 3/4-inch meter**
5/8-in or 3/4-in	30	1.00
1-in	50	1.67
1-1/2-in	100	3.33
2-in	160	5.33
3-in	320	10.67
4-in	500	16.67
6-in	1000	33.33
8-in	1600	53.33

Source: AWWA's M1 Manual, Principles of Water Rates, Fees, and Charges, Sixth Edition, 2012, Table B-1

ROBISON ENGINEERING, INC.
19401 40TH AVE W.
LYNNWOOD, WA 98036

PROJ. NAME: WESTMAN MILLS
PROJ NO.: 751-001
BY: GL
DATE: 5/15/2018

FIXTURE UNIT CALCULATIONS

CALCULATIONS BASED ON 2015 UPC TABLES 610.3 AND 702.1.

NEW GUESTROOMS

FIXTURE	FIXTURE UNITS TOTAL	CW	HW	W/V	1	2	3	4	5	6	R	TOTAL QTY OF FIXTURES	TOTAL FIXTURE UNITS SERVICE	CW ONLY	HW ONLY	W/V ONLY
WASHING MACHINE	4	3	3	3	17	19	19					74	296	222	222	222
WATER CLOSET	2.5	2.5	0	3	19	21	21	21				82	205	205	0	246
KITCHEN SINK W/ DISHWASHER	3	2.25	2.25	2	17	19	19	19				74	222	166.5	166.5	148
LAVATORY	1	0.75	0.75	1	19	21	21	21				82	82	61.5	61.5	82
BATHTUB	4	3	3	2	19	21	21	21				82	328	246	246	164
EMERGENCY FLOOR DRAIN	0	0	0	0	19	21	21	21				82	0	0	0	0
SHOWER	2	1.5	1.5	2	0	0	0	0				0	0	0	0	0
													1,133	901	696	862

NEW PUBLIC SPACES / MISC.

FIXTURE	FIXTURE UNITS TOTAL	CW	HW	W/V	GW	1	2	3	4	5	6	R	TOTAL QTY OF FIXTURES	TOTAL FIXTURE UNITS SERVICE	CW ONLY	HW ONLY	W/V ONLY	W/V ONLY
FUTURE TENANT (FLUSH TANK FIXTURES)	360	360	0	200	240	1							1	360	360	0	200	240
RESERVE	50	0	50	50		1							1	50	0	50	50	0
WATER CLOSET (FLUSH TANK-PUBLIC)	2.5	2.5	0	4		0	1						1	2.5	2.5	0	4	0
LAVATORY (PUBLIC)	1	0.75	0.75	3		0	1						1	1	0.75	0.75	3	0
KITCHEN SINK W/ DISHWASHER (PUBLIC)	3	2.25	2.25	2		0	1						1	3	2.25	2.25	2	0
EMERGENCY FLOOR DRAIN	0	0	0	0			1						1	0	0	0	0	0
HUB DRAIN	0	0	0	0		4							4	0	0	0	0	0
HOSE BIB	2.5/1	2.5/1	0	0		4	1				2		7	8.5	8.5	0	0	0
														425	374	53	259	240

	TOTAL	CW	HW	W/V
TOTAL FIXTURE UNITS:	1,558	1,275	749	1,361
PEAK FLOW:	**280** GPM			
REQUIRED SERVICE SIZE IN BUILDING:	4"	N/A	N/A	8"
NOTE: 4" WATER MAIN & 3" METER				

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EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
3	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE

CALCULATIONS

P002

SCHEDULES

DOMESTIC WATER HEATER SCHEDULE – ELECTRIC 2R

	SERVICE	GPH RECOVERY @ 90°F TR	STORAGE GAL	WEIGHT LB	HEATER, KW	ELECTRICAL	DIMENSION ⌀xH OR WxDxH (IN)	CLEARANCES (COMBUSTIBLE CONSTRUCTION) TOP X SIDE X FRONT X REAR	CLEARANCES (SERVICE) TOP X SIDE X FRONT X REAR	BASIS OF DESIGN
WH–1	APARTMENTS	21	50	138	4.5	240V/1P	22"x59–3/8	0" X 0" X 0" X 0"	18" X 0" X 24" X 0"	BRADFORD WHITE RE350T6 (1)(2)
WH–2	LOUNGE	INSTANTANEOUS	TANKLESS	22	20	208V/3P/3 x 8 AWG	16x5x13	12x0x12x0x6	N/A	BOSCH TRONIC WH27 (9)

NOTE: (1) MAX DIAMETER OF WATER HEATER IS 22"
(2) RUUD, A.O. SMITH, AND RHEEM ARE ALSO ACCEPTABLE MANUFACTURERS.

WATER EXPANSION TANK SCHEDULE

EQUIP NO.	SERVICE	CAPACITY, GALLONS	TANK SIZE, IN		WEIGHT (LBS)	BASIS OF DESIGN (1)
			DIA.	HEIGHT		
ET–1	APARTMENTS	2.0	8	13	5	AMTROL ST–5

PLAN REVIEWER NOTES:

(1) PER CIVIL GRADING PLAN AND FIRST FLOOR ELEVATION TO TO MEAN HIGH WATER IS 14.80 FEET ABOVE SEA LEVEL.
PER OMC 16.80 ALL FIXTURES ON FIRST FLOOR SHALL BE CONNECTED TO A SEPARATE SEWER LATERAL EQUIPPED WITH A BACKWATER VALVE IN ORDER TO PROTECT FIXTURES BELOW 16 FEET OF MEAN HIGH WATER. SEE P200 FOR BACK WATER LOCATION. SEE GRADING PLAN ON CIVIL SET FOR ELEVATIONS.

PLUMBING FIXTURE SCHEDULE

CALL OUT	DESCRIPTION	MANUFACTURER & CAT NO.	SIZE	PIPING CONNECTIONS WASTE	VENT	C.W.	H.W.	NOTES (2)(4)(5)(6)(7)
RPBP-1	BACKFLOW PREVENTER REDUCED PRESSURE	ZURN WILKINS 375	LINE SIZE	X	X	4	X	FOR REFERENCE ONLY. REFER TO CIVIL PLANS FOR LOCATION AND DETAILS.
PRV-1	BACKFLOW PREVENTER REDUCED PRESSURE	ZURN WILKINS ZW209 ZURN WILKINS 500XL	LINE SIZE	X	X	4	X	SEE DETAIL 10/P600. SET @ 80 PSI.
FCO-1	FLOOR CLEANOUT	JAY R SMITH 4020	SIZE PER CODE	(1)	X	X	X	POUND, FINISHED FLOOR, MEADIUM DUTY, PROVIDE W/TAPERED BRONZE PLUG AND NICKLE BRONZE TOP. NOT SHOWN ON PLANS. CONTRACTOR SHALL PROVIDE AS REQUIRED BY CODE.
GCO-1	GRADE CLEAN OUT	JAY R SMITH	SIZE PER CODE	(1)	X	X	X	CAST IRON TOP, ABS PLUG WITH GASKET SEAL. SIZE TO MATCH WASTE PIPING. NOT SHOWN ON PLANS. CONTRACTOR SHALL PROVIDE AS REQUIRED BY CODE.
WCO-1	WALL CLEAN OUT	JAY R SMITH 4402	SIZE PER CODE	3"	X	X	X	STAINLESS STEEL. NOT SHOWN ON PLANS. CONTRACTOR SHALL PROVIDE AS REQUIRED BY CODE.
FD-1	FLOOR DRAIN	SIOUX CHIEF 833-2ANR	X	2"	1-1/2"	X	X	PROVIDE TRAP PRIMER (TP-1).
FD-2	FLOOR DRAIN	SIOUX CHIEF 833-4ANR	X	4"	2"	X	X	PROVIDE TRAP PRIMER (TP-1).
FFD-1	FLOOR DRAIN WITH FUNNEL	SIOUX CHIEF 833-3ANR SIOUX CHIEF 863-FN	X	3"	2"	X	X	PROVIDE TRAP PRIMER (TP-1).
FS-1	FLOOR SINK	SIOUX CHIEF 861-24X	X	4"	2"	X	X	PROVIDE WITH DOME STRAINER OR SEDIMENT BUCKET, PROVIDE TRAP PRIMER(TP-1).
FS-2	FLOOR SINK	SIOUX CHIEF 861-22X	X	2"	1-1/2"	X	X	PROVIDE WITH DOME STRAINER OR SEDIMENT BUCKET, PROVIDE TRAP PRIMER(TP-1).
TP-1	TRAP PRIMER	ZURN 1021	X	1/2"	X	X	X	OPTION 1
		PROFLO	24"X24"X9"	X	X	1/2"	X	OPTION 2. PROVIDE BALL VALVE AND ACCESS PANEL.
RD-1	ROOF DRAIN	ROOF DRAIN - ZURN Z-100-DP	X	(1)	X	X	X	
OD-1	ROOF DRAIN	OVERFLOW DRAIN-ZURN Z-100-DP-W2 OVERFLOW NOZZLE- ZURN Z-200	X	(1)	X	X	X	
GT-1	GREASE INTERCEPTOR	2,500 GALLONS. OLDCASTLE PRECAST 612-GGI-2500 OR EQUAL.	11.5'X6'X9'	4"	4"	X	X	H-20 TRAFFIC WITH DRY SOIL CONDITIONS (WATER LEVEL BELOW TANK). SUITABLE SUB-BASE BEDDED WITH GRANULAR MATERIAL SHALL BE PREPARED TO HANDLE ANTICIPATED LOADS.
HB-1	WALL HYDRANT (COLD)	WOODFORD MODEL 65	3/4"	X	X	1/2"	X	FREEZELESS, ANTI-SIPHON, INTERNAL BACKFLOW CHECK VALVE, T-HANDLE KEY, 3/4 HOSE CONNECT.
HD-1	HUB DRAIN	MIFAB MI-950-F	4"	4"	2"	X	X	
SD-1	SLOT DRAIN	PROLINE PLD-57	X	2"	1-1/2"	1/2"	1/2"	
OB-1	ICE BOX & OUTLET BOX	OATEY 38572 OR EQUAL	X	X	X	1/2"	X	OUTLET BOX W/ 1/4 TURN BALL VALVE AND HAMMER ARRESTOR. PROVIDE BRAIDED HOSE AND FITTINGS FOR FINAL CONNECTION.
WB-1	WASHER BOX	OATY ELIMINATOR WASHER BOX	X	2"	1-1/2"	1/2"	1/2"	OATEY ELIMINATOR DRAIN WASHING MACHINE OUTLET BOX WITH HAMMER ARRESTOR. PROVIDE PER WASHER.
DSN-1	DOWNSPOUT NOZZLE (COW TONGUE)	JAY R SMITH 1770-T	LINE SIZE	X	X	X	X	PROVIDE CASTE BRONZE BODY NOZZLE AND FLANGE.
WC-1	WATER CLOSET (REGULAR, PRIVATE)	TOILET: KOHLER K-3887-0 , ROUND FRONT BOW COVER(PRIVATE): BEMIS COMMERCIAL 175 TOILET SEAT-OPEN FRONT WITH COVER	X	3"	2"	1/2"	X	PROVIDE STAINLESS STEEL BRAIDED CONNECTOR, CHROMEPLATED QUARTER TURN ANGLE VALVE.
	WATER CLOSET (PUBLIC)	TOILET: KOHLER K-3887-0 , ROUND FRONT BOW COVER(PUBLIC): BEMIS 1955C FOR PUBLIC SPACES	X	4"	2"	1/2"	X	PROVIDE STAINLESS STEEL BRAIDED CONNECTOR, CHROMEPLATED QUARTER TURN ANGLE VALVE.
	WATER CLOSET (ADA, PRIVATE)	TOILET: KOHLER K-3887-0 , ROUND FRONT BOW COVER(PRIVATE): BEMIS COMMERCIAL 175 TOILET SEAT-OPEN FRONT WITH COVER	X	3"	2"	1/2"	X	PROVIDE STAINLESS STEEL BRAIDED CONNECTOR, CHROMEPLATED QUARTER TURN ANGLE VALVE.
LAV-1	LAVATORY (REGULAR, PRIVATE)	SINK: WESTER L172 FAUCET(PRIVATE): DELTA27C4874	X	2"	1-1/2"	1/2"	1/2"	PROVIDE STAINLESS STEEL BRAIDED CONNECTOR, CHROMEPLATED QUARTER TURN ANGLE VALVE.
	LAVATORY (PUBLIC)	SINK: WESTER L172 FAUCET(PUBLIC): DELTA 520-DST, PROVIDE ASSE	X	2"	1-1/2"	1/2"	1/2"	PROVIDE CHROMEPLATED QUARTER TURN ANGLE VALVE., HANDYSHIELD 3011 TRAP COVER, KOHLER CHROME P-TRAP AND CHROME FAUCET SUPPLY KIT #1. PROVIDE ASSE 1070 MIXING VALVE ON PUBLIC
	LAVATORY (ADA, PRIVATE)	SINK: WESTER L172 FAUCET(PRIVATE): DELTA27C4874	X	2"	1-1/2"	1/2"	1/2"	PROVIDE CHROMEPLATED QUARTER TURN ANGLE VALVE., HANDYSHIELD 3011 TRAP COVER, KOHLER CHROME P-TRAP AND CHROME FAUCET SUPPLY KIT #1.
BT-1	BATHTUB (REGULAR, PRIVATE)	TUB - AMERICAN STANDARD, CAMBRIDGE ROUGH - DELTA R10000 FAUCET TRIM - DELTA T13220 TUB SPOUT & DIVERTER-U1075-PK	X	1-1/2"	1-1/2"	1/2"	1/2"	PROVIDE ASSE 1070 MIXING VALVE
	BATHTUB (ADA, PRIVATE)	TUB - AMERICAN STANDARD, STUDIO SUIT ROUGH - DELTA R10000 FAUCET TRIM - DELTA T13220 TUB SPOUT & DIVERTER-U1075-PK HANDHELD SHOWER SET - OLYMPIA P-4330 SHOWN		1-1/2"	1-1/2"	1/2"	1/2"	PROVIDE ASSE 1070 MIXING VALVE
WM-1	WASHING MACHINE	SAMSUNG WF42H5000AW FRONT LOADING, HIGH EFFICIENCY	27"x33"x38.75"	2"	1-1/2"	(2)3/4"	(2)3/4"	FURNISH BY OTHERS, INSTALLATON BY CONTRACTOR. PROVIDE WB-1.
DR-1	DRYER	SAMSUNG DV42H5000EW ELECTRIC DRYER, STCKABLE	27"x32.5"x38.75"	X	X	X	X	STACKABLE. FURNISH BY OTHERS. STACKING KIT FOR NON-ADA APARTMENT SHALL BE PROVIDED BY OTHERS. DRYER QUICK CONNECT SHALL BE PROVIDED BY MECHANICAL CONTRACTOR.
DW-1	DISHWASHER	SAMSUNG DW80M2020US RESIDENTIAL 24", FRONT CONTROL DISHWASHER IN STAINLESS STEEL, ENERGY STAR (ADA COMPLIANT)	24"X24"X35"	7/8"	X	X	1/2"	FURNISH BY OTHERS, INSTALLATION BY CNTRACTOR. PROVIDE DELTA METAL STINLESS STEEL AIR GAP #72020-SS. PROVIDE APOLLO STOP VALVE AND COPPER CONNECTION. PROVIDE FLEX HOSE PER MFR'S SPEC. (9)
	DISHWASHER, DOOR TYPE, (ADA)	FRIGIDIAIRE FFBD1821MS RESIDENTIAL 18", FRONT CONTROL DISHWASHER IN STAINLESS STEEL, ENERGY STAR (ADA COMPLIANT)	18"X23"X35"	7/8"	X	X	1/2"	FURNISH BY OTHERS, INSTALLATION BY CNTRACTOR. PROVIDE DELTA METAL STINLESS STEEL AIR GAP #72020-SS. PROVIDE APOLLO STOP VALVE AND COPPER CONNECTION. PROVIDE FLEX HOSE PER MFR'S SPEC. (9)
	DISHWASHER, DOOR TYPE, (PUBLIC)	FRIGIDIAIRE FFBD1821MS RESIDENTIAL 18", FRONT CONTROL DISHWASHER IN STAINLESS STEEL, ENERGY STAR (ADA COMPLIANT)	18"X23"X35"	7/8"	X	X	1/2"	FURNISH BY OTHERS, INSTALLATION BY CNTRACTOR. PROVIDE DELTA METAL STINLESS STEEL AIR GAP #72020-SS. PROVIDE APOLLO STOP VALVE AND COPPER CONNECTION. PROVIDE FLEX HOSE PER MFR'S SPEC. (9)
KS-1	KITCHEN SINK (2 COMP SINK) DECK MOUNT FAUCET	SINK- MOEN 2000 SERIES, UNDERMOUNT STINLESS STEEL 24", DOUBLE BOWL KITCHEN SINK FAUCET-AMERICAN STANDARD QUINCE 1, HANDLE PULL OUT FAUCET	18"X23"X35"	2"	1-1/2"	1/2"	1/2"	PROVIDE UNDERMOUNT INSTALLATION KIT, PROVIDE P-TRAP, PROVIDE CHROMEPLATED 1/4 TURN ANGLE STOP VALVE, PROVIDE BRAIDED CONNECTORS. (3)(8)
	KITCHEN SINK (2 COMP SINK) DECK MOUNT FAUCET (ADA)	SINK- ELKAY LUSTERTONE, UNDERMOUNT, (ADA COMPLIANT) FAUCET-AMERICAN STANDARD QUINCE 1, HANDLE PULL OUT FAUCET (ADA COMPLIANT)	31"X19"X5-3/8"	2"	1-1/2"	1/2"	1/2"	PROVIDE UNDERMOUNT INSTALLATION KIT, PROVIDE P-TRAP, PROVIDE CHROMEPLATED 1/4 TURN ANGLE STOP VALVE, PROVIDE BRAIDED CONNECTORS. (3)(8)
	KITCHEN SINK (2 COMP SINK) DECK MOUNT FAUCET (PUBLIC)	SINK- ELKAY LUSTERTONE, UNDERMOUNT, (ADA COMPLIANT) FAUCET-AMERICAN STANDARD QUINCE 1, HANDLE PULL OUT FAUCET (ADA COMPLIANT)	31"X19"X5-3/8"	2"	1-1/2"	1/2"	1/2"	PROVIDE UNDERMOUNT INSTALLATION KIT, PROVIDE P-TRAP, PROVIDE CHROMEPLATED 1/4 TURN ANGLE STOP VALVE, PROVIDE BRAIDED CONNECTORS. (3)(8)

NOTES:
(1) PER LINE SIZE. SEE FLOOR PLANS.
(2) FOR PRICING ONLY. PRIOR TO ORDERING, CONTRACTOR SHALL RECEIVE APPROVAL FROM OWNERSHIP, ARCHITECT & INTERIOR DESIGNER.
(3) GARBAGE DISPOSALS TO BE FURNISHED BY OTHERS AND INSTALLED BY CONTRACTOR.
(4) CONTRACTOR SHALL PROVIDE A COMPREHENSIVE SUBMITTAL AND RECEIVE ENGINEERING APPROVAL PRIOR TO ORDERING. PARTIAL SUBMITTAL IS NOT ACCEPTED BY ENGINEERING. ADA REQUIREMENT SHALL BE REVIEWED BY OTHERS.
(5) FOR DIMENSIONS, MOUNTING HEIGHTS, ADA REQUIREMENT REFER TO ARCH/ID PLANS.
(6) FOR MAXIMUM FIXTURE FLOWRATE REFER TO P004.
(7) PROVIDE RED/BLUE HOT/COLD INDICATORS AT ALL FIXTURES.
(8) PROVIDE HOT WATER SUPPLY VIA BRANCH OUT FROM KITCHEN SINK STOP VALVE. PROVIDE FLEX CONNECTION FOR DISHWASHER DRAIN TO KITCHEN SINK P-TRAP VIA AIR GAP.

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TITLE

EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
2R	01/30/19	PERMIT COMMENT
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SCHEDULES

P003

TABLES

WASHINGTON STATE–COMMERCIAL ENERGY CODE EFFICIENT HEATED WATER SUPPLY PIPING (1)(2)(3)(8)

NOMINAL PIPE SIZE (IN)	PIPE LENGTH METHOD (RECOMMENDED)		PIPE VOLUME METHOD		
	MAXIMUM ALLOWABLE PIPING LENGTH (4)(7) (FT)		PIPE VOLUME (7) (FLUID OZ / FEET)	MAXIMUM ALLOWABLE PIPING LENGTH (5)(6) (FT)	
	PUBLIC LAVATORY FAUCET	OTHER FIXTURES		PUBLIC LAVATORY FAUCET	OTHER FIXTURES
~~3/8~~	~~3~~	~~50~~	~~0.75~~	~~0.67~~	~~85~~
1/2	2	43	1.5	**0.33**	**43**
5/8	1	32	2	**0.25**	**32**
3/4	0.5	21	3	**0.17**	**21**
7/8	0.5	16	4	**0.13**	**16**
1	0.5	13	5	**0.10**	**13**
1-1/4	0.5	8	8	**0.06**	**8**
1-1/2	0.5	6	11	**0.05**	**6**
2 OR LARGER	0.5	4	18	**0.03**	**4**

NOTES:

(1) CONTRACTOR MAY USE METHOD 1 OR 2 TO DETERMINE MAXIMUM ALLOWABLE PIPING LENGTH FROM SOURCE OF HEATED WATER.

(2) PER 2015 WASEC SECTION C404.3 WATER HEATER, CIRCULATING WATER SYSTEM & HEAT TRACE TEMPERATURE MAINTENANCE SHALL BE CONSIDERED SOURCE OF HEATED WATER.

(3) THIS TABLE IS BASED ON MINIMUM CODE REQUIREMENT. CONTRACTOR SHALL FOLLOW OWNERSHIP/DEVELOPER REQUIREMENT AND/OR BRAND STANDARD REGARDING MAXIMUM WAITING TIME FOR HOT WATER DELIVERY [OR ALLOWABLE NON-CIRCULATING HOT WATER PIPING LENGTH] AS LONG AS IT IS STRICTER THAN CODE MINIMUM. CONTACT ENGINEERING AS NECESSARY.

(4) PIPE LENGTH METHOD ONLY: WHERE THE PIPING CONTAINS MORE THAN ONE SIZE OF PIPE, THE LARGEST SIZE OF PIPE SHALL BE USED FOR DETERMINING THE MAXIMUM ALLOWABLE LENGTH OF PIPING.

(5) PIPE VOLUME METHOD ONLY: PER WASEC SECTION C404.3.2 THE VOLUME FROM HEATED WATER TO THE TERMINATION OF FIXTURE SUPPLY PIPE SHALL NOT EXCEED 2 FLUID OUNCES FOR PUBLIC LAVATORIES AND 0.5 GALLON (64 FLUID OUNCES) FOR OTHER FIXTURES.

(6) PIPE VOLUME METHOD ONLY: PER C404.3.2.1 WATER VOLUME SHALL BE THE SUM OF INTERNAL VOLUMES OF PIPE, VALVES, METERS AND MANIFOLD BETWEEN THE NEAREST SOURCE OF HEATED WATER AND TERMINATION OF THE FIXTURE SUPPLY PIPE. PROVIDED CALCULATION DOES NOT INCLUDE VALVES, METERS, MANIFOLDS.

(7) PER WASEC TABLE C404.3.1

(8) REFER TO MANUFACTURER RECOMMENDATIONS AND PLUMBING FIXTURE SCHEDULE IN COMPLIANCE WITH 2015 UPC SECTION A106 AND TABLES 610.3 & A2.1 FOR MINIMUM BRANCH PIPE SIZES.

REQUIRED STANDARDS FOR PLUMBING FIXTURES AND FIXTURE FITTINGS

WATER CLOSETS – FLUSHOMETER VALVE TYPE	ASME A 112.19.2/CSA B45.1 1.28 GAL (4.8 L)
WATER CLOSETS – TANK TYPE	U.S. EPA WATERSENSE TANK-TYPE HIGH-EFFICIENCY TOLIET SPECIFICATION
PUBLIC LAVATORY FAUCETS: MAXIMUM FLOW RATE – 0.5 GPM (1.9 L/MIN)	ASME A 112.18.1/CSA B125.1
SHOWERHEADS: MAXIMUM FLOW RATE – 2.5 GPM (9.5 L/MIN)	ASME A 112..18.1/CSA B125.1
THERMOSTATIC MIXING VALVE	ASSE 1070/CSA B125.3 (1)

NOTE: (1) APPLICABLE TO THE NON-RESIDENTAL PORTIONS OF THE BUILDING
(2) REFER TO 2015 UPC SECTION 421.2.

2015 WASHINGTON STATE PIPE INSULATION SCHEDULE (1)(2)

SERVICE	OPTION 1		OPTION 2		VAPOR RETARDER REQUIRED	NOTES
	MATERIAL	THICKNESS	MATERIAL	THICKNESS		
DOMESTIC COLD WATER, IRRIGATION WATER, CONDENSATE DRAINS, STORM DRAIN (IN CONDITIONED SPACE)	MINERAL-FIBER WITH JACKET	ALL SIZES: ½"	PVC/NBR	ALL SIZES: ⅜"	YES	(9)(10)
DOMESTIC COLD WATER, IRRIGATION WATER, CONDENSATE DRAINS, WASTE (OUTSIDE THE CONDITIONED SPACE)	MINERAL-FIBER WITH JACKET	(R-3) ½" PIPE: ½" ALL OTHER SIZES: 1"	PVC/NBR	(R-3) ½" PIPE: ½" ALL OTHER SIZES: ¾"	YES	(5)(6)(8)
ROOF DRAIN BODIES	MINERAL-FIBER OR CELLULAR GLASS WITH JACKET	1"	PVC/NBR	1"	YES	(9)
DOMESTIC HOT WATER AND RECIRCULATED HOT WATER (RESIDENTIAL)	MINERAL-FIBER WITH JACKET	(R-3) ½" PIPE: ½" ALL OTHER SIZES: 1"	PVC/NBR	(R-3) ½" PIPE: ½" ALL OTHER SIZES: ¾"	NO	(3)(8)
DOMESTIC HOT WATER AND RECIRCULATED HOT WATER (NONRESIDETIAL)	MINERAL-FIBER WITH JACKET	½"-1¼" PIPE: 1" 1½"-4" PIPE:1.5"	PVC/NBR	½"-1¼" PIPE: 1" 1½"-4" PIPE:1.5"	NO	(4)(7)
EXPOSED SANITARY DRAINS AND DOMESTIC WATER SUPPLIES AND STOPS FOR ADA FIXTURES.	TRUEBRO LAV-GUARD	N/A	N/A	N/A	NO	P-TRAP AND SUPPLY COVERS

NOTES:

(1) FOR APPLICABLE CODES REFER TO PLUMBING COVER SHEET.

(2) PIPING INSULATION EXPOSED TO WEATHER SHALL BE PROTECTED FROM DAMAGE. CONTRACTOR SHALL PROVIDE SHIELDING FROM SOLAR RADIATION THAT CAN CAUSE DEGRADATION OF THE MATERIAL. ADHESIVE TAPE SHALL NOT BE PERMITTED.

(3) PER 2015 WSEC SECTION R403.5.3 (RESIDENTIAL-PERSPECTIVE) INSULATION FOR HOT WATER PIPE SHALL HAVE A MINIMUM R-VALE OF R-3.

(4) PER 2015 WSEC SECTION C404.6 (NON-RESIDENTIAL):
(4.1) PIPING FROM WATER HEATER TO THE TERMINATION OF HEATED WATER SUPPLY PIPE SHALL BE INSULATED IN ACCORDANCE WITH TABLE C403.2.9.
(4.2) ON BOTH THE INLET AND OUTLET PIPING OF A STORAGE HOT WATER HEATER, THE FIRST 8 FEET OF PIPING OR PIPING FROM WATER HEATER TO HEAT TRAP SHALL BE INSULATED.
(4.3) HEAT TRACED PIPING SHALL BE INSULATED IN THE SAME MANNER AS NOT HEAT TRACED PIPING OR PER HEAT TRACE MANUFACTURER SPEC.
(4.4) TUBULAR PIPING INSULATION SHALL NOT BE REQUIRED FOR THE FOLLOWING:
A. TUBING FROM FROM THE CONNECTION AT THE TERMINATION OF THE FIXTURE PIPING TO A PLUMBING FIXTURE SUPPLY PIPING TO A PLUMBING FIXTURE.
B. VALVES, PUMPS, STRAINERS AND THREADED UNIONS IN PIPING THAT IS 1 INCH OR LESS.
C. PIPING FROM USER CONTROLLED SHOWER AND BATH MIXING VALVES TO THE WATER OUTLET.
D. COLD WATER PIPING OF A DEMAND RETICULATION WATER SYSTEM
E. TUBING FROM A HOT DRINKING WATER UNIT TO THE WATER OUTLET.
F. PIPING AT LOCATION WHERE A VERTICAL SUPPORT OF PIPING IS INSTALLED.
G. PIPING SURROUNDED BY BUILDING INSULATION WITH R-VALUE OF NOT LESS THAT R-3.

(5) PER 2015 WSPC, SECTION 312.6 NO WATER, SOIL OR WASTE PIPE SHALL BE INSTALLED OR PERMITTED OUTSIDE OF THE BUILDING, IN ATTIC OR IN AN EXTERIOR WALL UNLESS ADEQUATE PROVISION IS MADE TO PROTECT SUCH PIPE FROM FREEZING. ALL HOT AND COLD WATER PIPES OUTSIDE THE CONDITIONED SPACE SHALL BE INSULATED TO MINIMUM R-3.

(6) HEAT TRACING SHALL BE PROVIDED FOR COLD WATER AND IRRIGATION WATER IN UNCONDITIONED SPACES. REFER TO HEAT TRACING SCHEDULE FOR DETAIL. CONTACT ENGINEERING IF NECESSARY. PER 2015 WSEC SECTION C403.2.4.6 FREEZE PROTECTION SYSTEMS, SUCH AS HEAT TRACING OF OUTDOOR PIPING SHALL INCLUDE AUTOMATIC CONTROLS CONFIGURED TO SHUT OFF THE SYSTEM WHEN OUTDOOR AIR TEMPERATURES ARE ABOVE 40°F.

(7) PER 2015 WSEC TABLE C403.2.9 (FOR NON-RESIDENTIAL) INSULATION FOR HOT WATER AND HOT WATER RETICULATION SHALL HAVE CONDUCTIVITY OF 0.21-0.28 (BTU.IN/H.FT².°F) AT OPERATING TEMPERATURE.

(8) INSULATION R-VALUE SHALL MEET MINIMUM REQUIREMENT. THICKNESS IS BASED ON GRAINGER SAMPLE DATA FOR K-FLEX(PVC/NBR) AND OWENS CORNING(FIBER GLASS).

(9) REQUIRED BY ENGINEERING BASED ON BEST PRACTICE.

(10) INSULATION IS NOT REQUIRED ON PLASTIC PIPING.

PIPING SUPPORTS

ALL SUSPENDED WATER SUPPLY PIPE SHALL BE SUPPORTED AS FOLLOWS:

MATERIAL	MAX. HORIZONTAL SPACING	MAX. VERTICAL SPACING
COPPER PIPE	12 FT.	10 FT.
COPPER TUBING ≤1¼"	6 FT.	10 FT.
COPPER TUBING >1½"	10 FT.	10 FT.
CPVC ≤1"	3 FT.	10 FT.
CPVC ≥1¼"	4 FT.	10 FT.

ALL SUSPENDED SANITARY AND VENT PIPE SHALL BE SUPPORTED AS FOLLOWS:

MATERIAL	MAX. HORIZ. SPACING	MAX. VERT. SPACING
ABS	4 FT.	10 FT.
PVC (TYPE DWV)	4 FT.	10 FT.
CAST-IRON (<10 FT. PIPE SECTIONS)	5 FT.	15 FT.
CAST-IRON (10 FT. PIPE SECTIONS)	10 FT.	15 FT.

MAXIMUM FIXTURE FLOW RATES (1)

FIXTURE	FLOW RATE
SHOWERHEADS	2.5 GPM
LAVATORIES – RESIDENTIAL	2.5 GPM
LAVATORIES – PUBLIC (NON-METERING)	0.5 GPM
LAVATORIES – PUBLIC (2)	0.5 GPM
KITCHEN FAUCETS	2.5 GPM
WATER CLOSETS	1.6 GAL/FLUSH

NOTES: (1) FLOW RATES PER 2015 WAC 51-56-0400
(2) PER 2015 WAC 51-56 SECTION 407.4 LAVATORY FAUCET INTENDED FOR USE BY THE GENERAL PUBLIC SHALL BE EQUIPPED WITH SELF CLOSING METERING VALVE.

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MARK D. ROBISON — STATE OF WASHINGTON — 17976 — REGISTERED PROFESSIONAL ENGINEER
06/05/18

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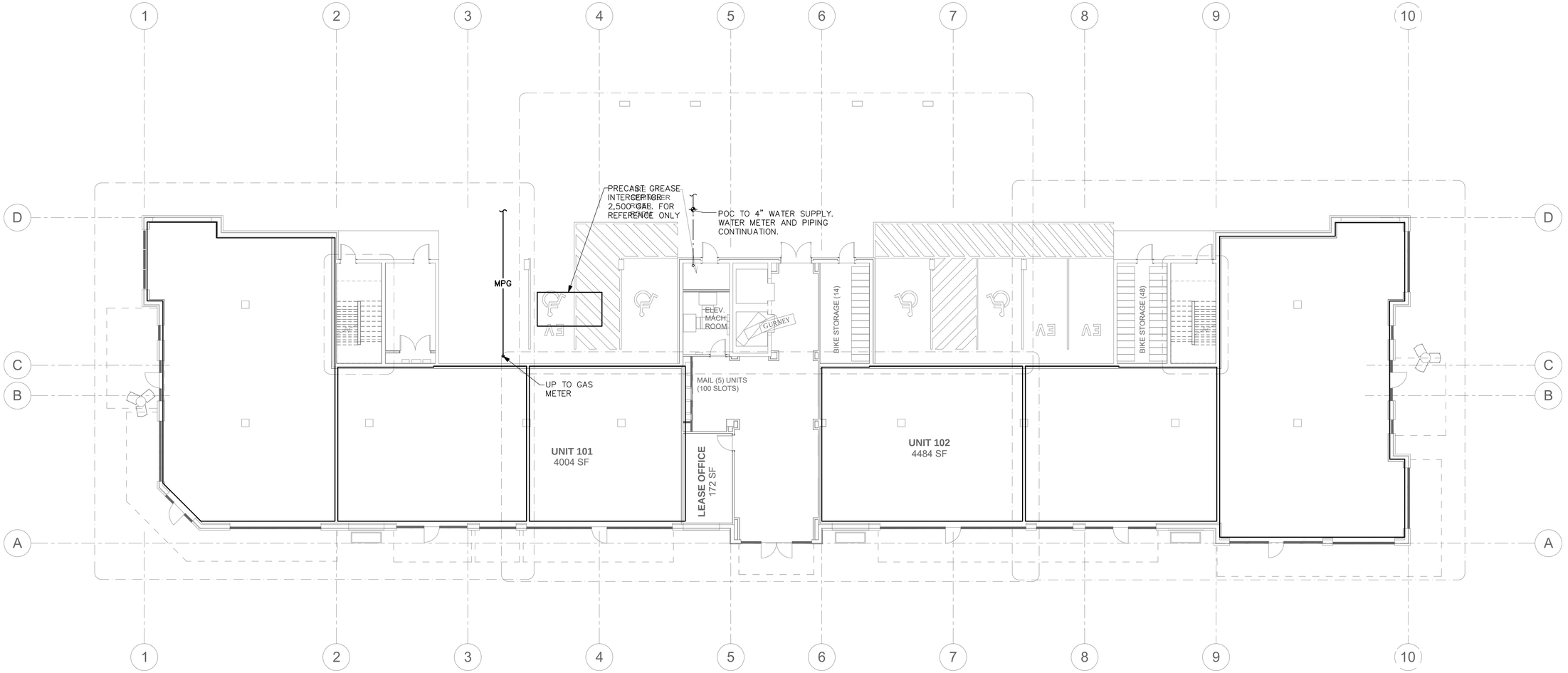
EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
1R	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE

TABLES

P004



SUPPLY PIPE SIZING SCHEDULE							Copper Type:		Type L
	FLUSH TANK CW			HOT WATER			FLUSH VALVE CW		
PIPE SIZE	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS
1/2"	1.3	2.0	1.0	1.3	2.0	1.0	---	---	---
3/4"	4.0	2.8	4.5	4.0	2.8	4.5	---	---	---
1"	9.0	3.5	11.5	9.0	3.5	11.5	---	---	---
1-1/4"	16.0	4.0	20.0	16.0	4.0	20.0	---	---	---
1-1/2"	24.0	4.7	40.0	24.0	4.7	40.0	24.0	4.7	5.0
2"	53.0	5.6	135.0	45.0	5.0	112.0	50.0	5.6	50.0
2-1/2"	95.0	6.6	320.0	72.0	5.0	215.0	95.0	6.6	228.0
3"	150.0	7.4	650.0	100.0	5.0	350.0	150.0	7.4	564.0
4"	280.0	8.0	1600.0	175.0	5.0	800.0	280.0	8.0	1600.0
6"	650.0	8.0	5250.0	400.0	5.0	2750.0	650.0	8.0	5250.0

UNDERSLAB SUPPLY PLAN

SCALE: 3/32" = 1'-0"

0' 4' 8' 16' N

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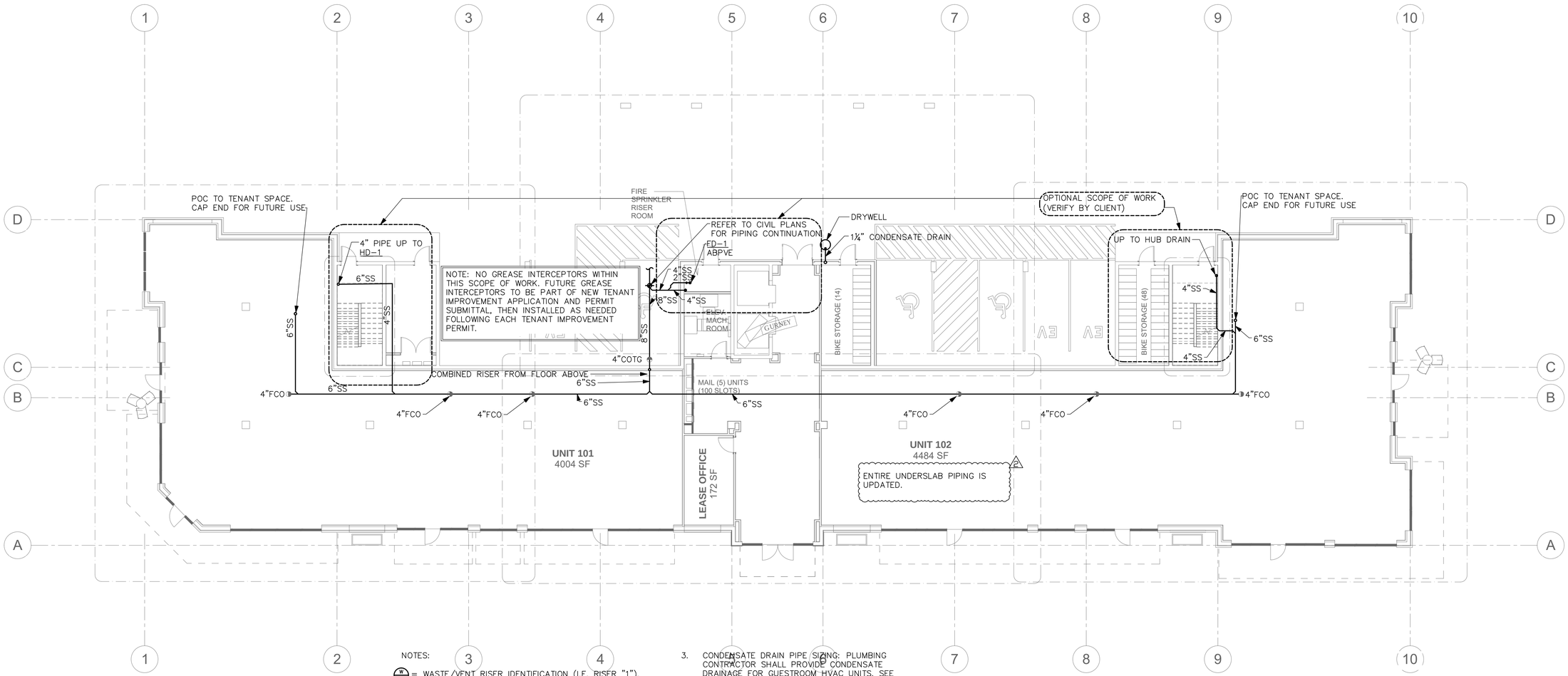
EAST BAY LOT A WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
3	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE

UNDERSLAB PLUMBING PLAN-SUPPLY

P200S



NOTES:

(W-1) = WASTE/VENT RISER IDENTIFICATION (I.E. RISER "1"). REFER TO P400–P401 FOR RISER DETAILS AND SIZING.

1. STORM DRAIN SIZING: STORM DRAINAGE PIPING SIZED PER 2015 UPC TABLE 1101.7, FOR 1.0" PER HOUR RAINFALL RATE, AT 1/8" PER FOOT SLOPE:

PIPE SIZE	VERTICAL	HORIZONTAL
3"	8,800 SF	3,288 SF
4"	18,400 SF	7,520 SF
6"	54,000 SF	21,400 SF
8"	116,000 SF	46,000 SF
10"	116,000 SF	82,800 SF

2. WASTE & VENT SIZING: WASTE & VENT PIPING SIZED PER 2015 UPC TABLE 703.2. PIPING SHALL BE SLOPED AT 1/4" PER FOOT:

PIPE SIZE	VERT.	HORIZ.	VENT
1½"	2 DFU	1 DFU	8 DFU
2"	16 DFU	8 DFU	24 DFU
3"	48 DFU	35 DFU	84 DFU
4"	256 DFU	216 DFU	256 DFU
6"	1,380 DFU	720 DFU	1,380 DFU
8"	3,600 DFU	2,640 DFU	3,600 DFU

3. CONDENSATE DRAIN PIPE SIZING: PLUMBING CONTRACTOR SHALL PROVIDE CONDENSATE DRAINAGE FOR GUESTROOM HVAC UNITS. SEE MECHANICAL DRAWINGS FOR EXACT QUANTITY OF UNITS. SEE P601 FOR CONDENSATE RISER DIAGRAMS. CONDENSATE DRAIN PIPING SHALL BE SLOPED AT ⅛" PER FOOT. CONDENSATE DRAIN PIPING SIZED PER 2015 UPC TABLE 814.1:

PIPE SIZE	(TONS OF COOLING)
¾"	20
1"	40
1¼"	90
1½"	125
2"	250

4. PROVIDE TRAP PRIMERS FOR ALL FLOOR DRAINS, HUB DRAINS SEE DETAIL 8 ON SHEET P600.

5. PROVIDE FLOOR DRAINS AT ALL ROLL-IN SHOWER BATHROOMS.

6. REFER TO ARCH PLANS LOCATION AND REQUIREMENT ON ADA TYPE A AND TYPE B UNITS.

UNDERSLAB PLUMBING WASTE PLAN

SCALE: 3/32" = 1'–0"

0' 4' 8' 16' N

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EAST BAY LOT A WESTMAN MILL

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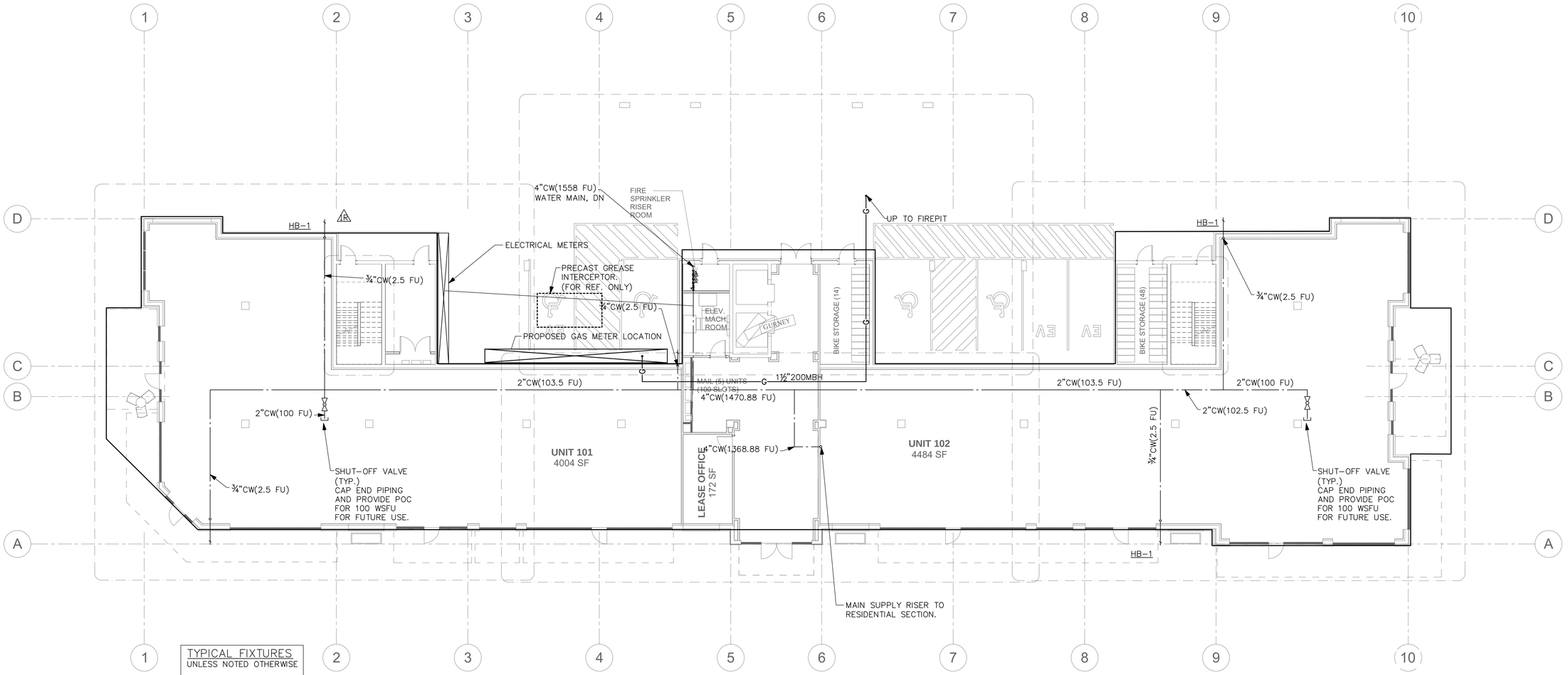
2	06/12/19	GREASE WASTE

UNDERSLAB PLUMBING PLAN- WASTE & VENT

P200W



TYPICAL FIXTURES
UNLESS NOTED OTHERWISE

- WH–1
- KS–1
- KR–1
- LAV–1
- WM–1
- BT–1
- SH–1
- WC–1
- HB–1
- FD–1
- HD–1
- DW–1
- RF–1
- MS–1

SUPPLY PIPE SIZING SCHEDULE — Copper Type: Type L

	FLUSH TANK CW			HOT WATER			FLUSH VALVE CW		
PIPE SIZE	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS
1/2"	1.3	2.0	1.0	1.3	2.0	1.0	---	---	---
3/4"	4.0	2.8	4.5	4.0	2.8	4.5	---	---	---
1"	9.0	3.5	11.5	9.0	3.5	11.5	---	---	---
1-1/4"	16.0	4.0	20.0	16.0	4.0	20.0	---	---	---
1-1/2"	24.0	4.7	40.0	24.0	4.7	40.0	24.0	4.7	5.0
2"	53.0	5.6	135.0	45.0	5.0	112.0	50.0	5.6	50.0
2-1/2"	95.0	6.6	320.0	72.0	5.0	215.0	95.0	6.6	228.0
3"	150.0	7.4	650.0	100.0	5.0	350.0	150.0	7.4	564.0
4"	280.0	8.0	1600.0	175.0	5.0	800.0	280.0	8.0	1600.0
6"	650.0	8.0	5250.0	400.0	5.0	2750.0	650.0	8.0	5250.0

FIRST FLOOR SUPPLY PLAN
SCALE: 3/32" = 1'–0"

0' 4' 8' 16' N

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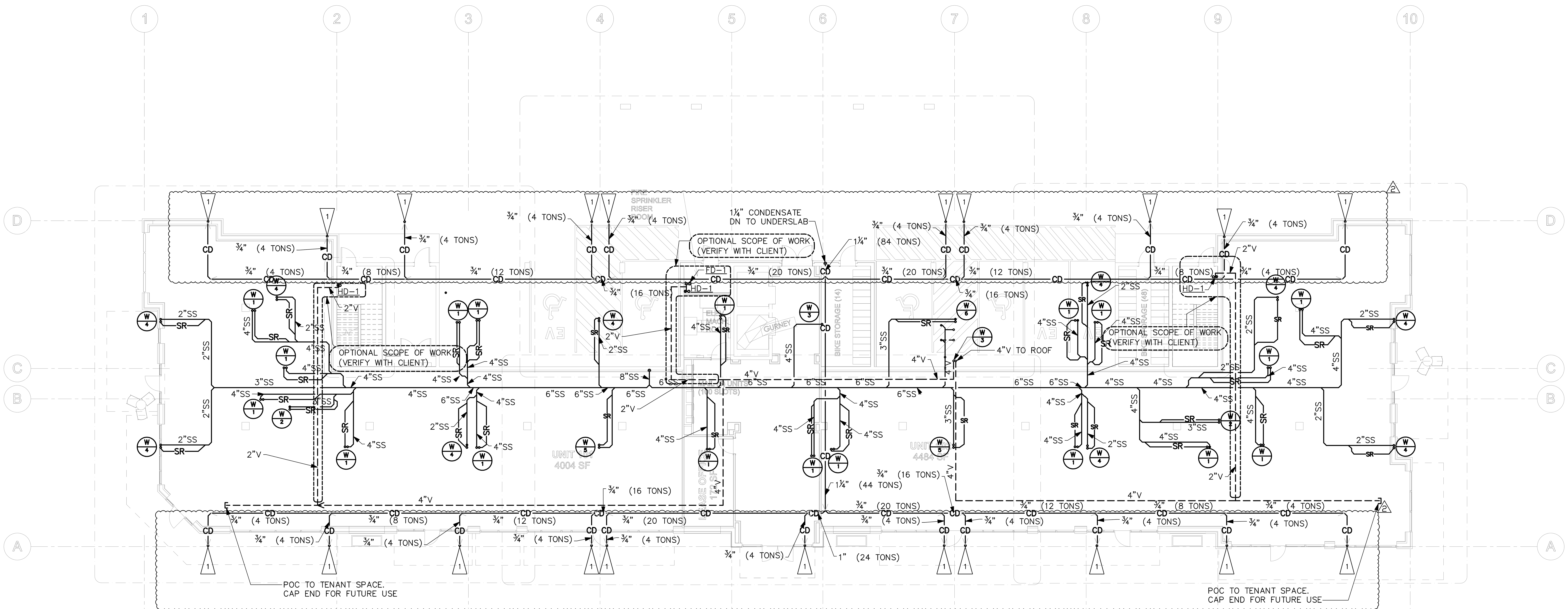
FIRST FLOOR PLUMBING PLAN- SUPPLY

P201S



FIRST FLOOR WASTE PLAN

SCALE: 3/32" = 1'-0"

TYPICAL FIXTURES
UNLESS NOTED OTHERWISE

- WH-1
- KS-1
- KR-1
- LAV-1
- WM-1
- BT-1
- SH-1
- WC-1
- HB-1
- FD-1
- HD-1
- DW-1
- RF-1
- MS-1

NOTES:

(W/1) = WASTE/VENT RISER IDENTIFICATION (I.E. RISER "1"). REFER TO P400-P401 FOR RISER DETAILS AND SIZING.

1. STORM DRAIN SIZING: STORM DRAINAGE PIPING SIZED PER 2015 UPC TABLE 1101.7, FOR 1.0" PER HOUR RAINFALL RATE, AT 1/8" PER FOOT SLOPE:

PIPE SIZE	VERTICAL	HORIZONTAL
3"	8,800 SF	3,288 SF
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2. WASTE & VENT SIZING: WASTE & VENT PIPING SIZED PER 2015 UPC TABLE 703.2. PIPING SHALL BE SLOPED AT 1/4" PER FOOT:

PIPE SIZE	VERT.	HORIZ.	VENT
1½"	2 DFU	1 DFU	8 DFU
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4"	256 DFU	216 DFU	256 DFU
6"	1,380 DFU	720 DFU	1,380 DFU
8"	3,600 DFU	2,640 DFU	3,600 DFU

3. CONDENSATE DRAIN PIPE SIZING: PLUMBING CONTRACTOR SHALL PROVIDE CONDENSATE DRAINAGE FOR GUESTROOM HVAC UNITS. SEE MECHANICAL DRAWINGS FOR EXACT QUANTITY OF UNITS. SEE P601 FOR CONDENSATE RISER DIAGRAMS. CONDENSATE DRAIN PIPING SHALL BE SLOPED AT ⅛" PER FOOT. CONDENSATE DRAIN PIPING SIZED PER 2015 UPC TABLE 814.1:

PIPE SIZE	(TONS OF COOLING)
¾"	20
1"	40
1¼"	90
1½"	125
2"	250

4. PROVIDE TRAP PRIMERS FOR ALL FLOOR DRAINS, HUB DRAINS SEE DETAIL 8 ON SHEET P600.

5. PROVIDE FLOOR DRAINS AT ALL ROLL-IN SHOWER BATHROOMS.

6. REFER TO ARCH PLANS LOCATION AND REQUIREMENT ON ADA TYPE A AND TYPE B UNITS.

FLAG NOTES (1)

1. PROVIDE ¾" CONDENSATE DRAIN CONNECTION FROM 1 TON PTHP TO ¾" RISER.

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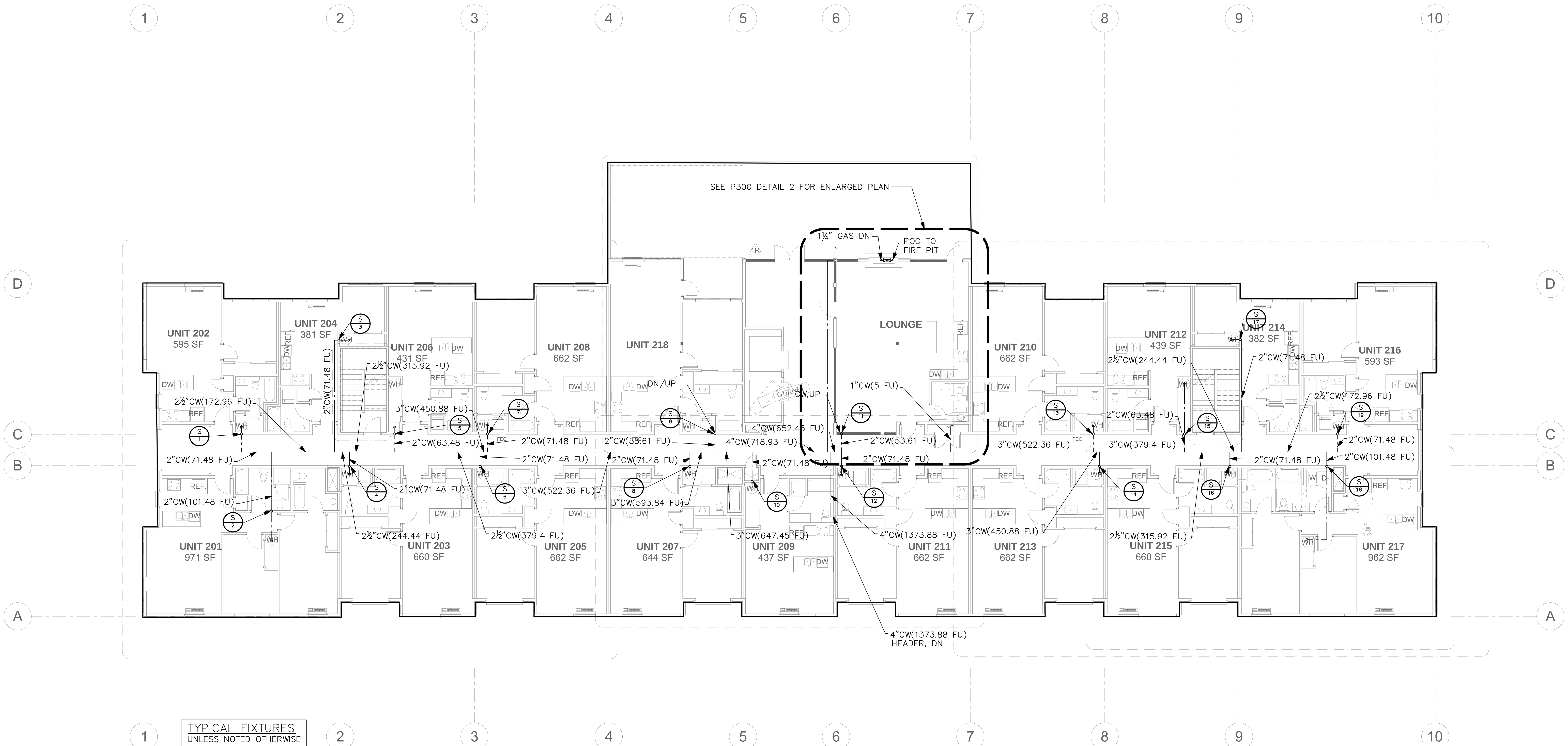
FIRST FLOOR PLUMBING PLAN- WASTE & VENT

P201W

ADD GAS 200MBH



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- HD–1
- DW–1
- RF–1
- MS–1

NOTES:

(S 1) = SUPPLY RISER IDENTIFICATION (I.E. RISER "1"). REFER TO P501 FOR RISER DETAILS AND SIZING.

SUPPLY PIPE SIZING SCHEDULE							Copper Type:		Type L
	FLUSH TANK CW			HOT WATER			FLUSH VALVE CW		
PIPE SIZE	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS
1/2"	1.3	2.0	1.0	1.3	2.0	1.0	---	---	---
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4"	280.0	8.0	1600.0	175.0	5.0	800.0	280.0	8.0	1600.0
6"	650.0	8.0	5250.0	400.0	5.0	2750.0	650.0	8.0	5250.0

SECOND FLOOR SUPPLY PLAN

SCALE: 3/32" = 1'-0"

0' 4' 8' 16'

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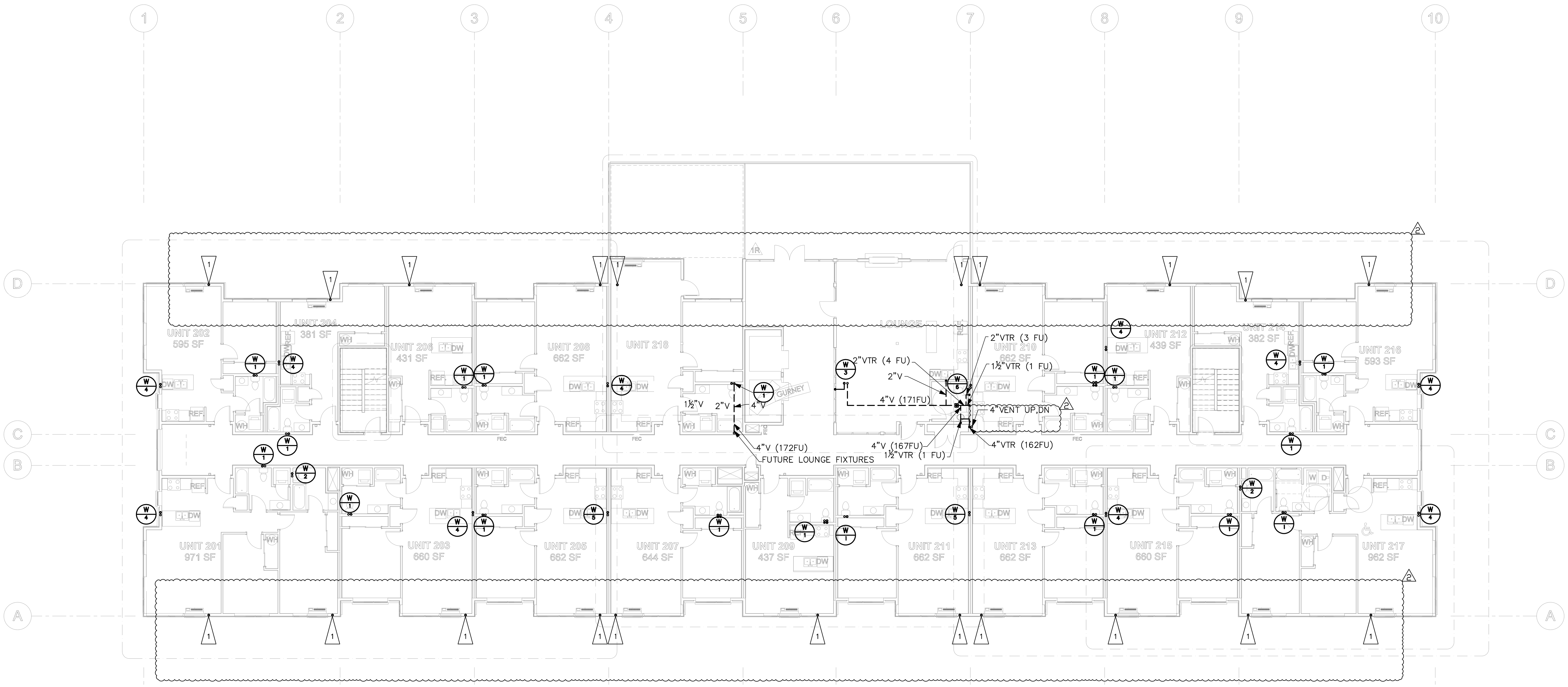
SECOND FLOOR PLUMBING PLAN-SUPPLY

P202S



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1½"	2 DFU	1 DFU	8 DFU
2"	16 DFU	8 DFU	24 DFU
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1¼"	90
1½"	125
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5. PROVIDE FLOOR DRAINS AT ALL ROLL–IN SHOWER BATHROOMS.

6. REFER TO ARCH PLANS LOCATION AND REQUIREMENT ON ADA TYPE A AND TYPE B UNITS.

FLAG NOTES (1)

1. PROVIDE ¾" CONDENSATE DRAIN CONNECTION FROM 1 TON PTHP TO ¾" RISER.

SECOND FLOOR WASTE PLAN

SCALE: 3/32" = 1'–0"

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06/05/18

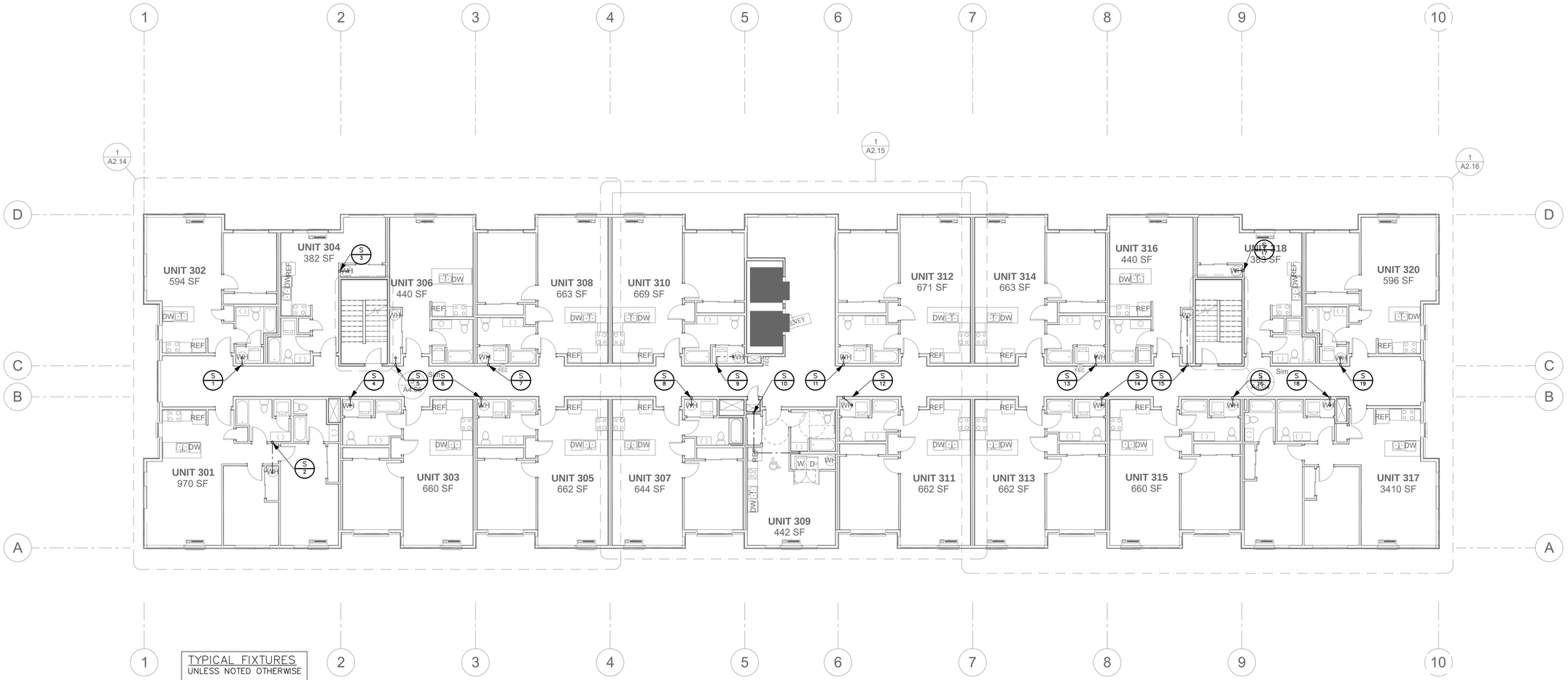
EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
R	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE

SECOND FLOOR PLUMBING PLAN-WASTE & VENT

P202W



TYPICAL FIXTURES
UNLESS NOTED OTHERWISE

- WH–1
- KS–1
- KR–1
- LAV–1
- WM–1
- BT–1
- SH–1
- WC–1
- HB–1
- FD–1
- HD–1
- DW–1
- RF–1
- MS–1

NOTES:

(S 1) = SUPPLY RISER IDENTIFICATION (I.E. RISER "1"). REFER TO P501 FOR RISER DETAILS AND SIZING.

SUPPLY PIPE SIZING SCHEDULE							Copper Type:		Type L
FLUSH TANK CW			HOT WATER			FLUSH VALVE CW			
PIPE SIZE	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS
1/2"	1.3	2.0	1.0	1.3	2.0	1.0	---	---	---
3/4"	4.0	2.8	4.5	4.0	2.8	4.5	---	---	---
1"	9.0	3.5	11.5	9.0	3.5	11.5	---	---	---
1-1/4"	16.0	4.0	20.0	16.0	4.0	20.0	---	---	---
1-1/2"	24.0	4.7	40.0	24.0	4.7	40.0	24.0	4.7	5.0
2"	53.0	5.6	135.0	45.0	5.0	112.0	50.0	5.6	50.0
2-1/2"	95.0	6.6	320.0	72.0	5.0	215.0	95.0	6.6	228.0
3"	150.0	7.4	650.0	100.0	5.0	350.0	150.0	7.4	564.0
4"	280.0	8.0	1600.0	175.0	5.0	800.0	280.0	8.0	1600.0
6"	650.0	8.0	5250.0	400.0	5.0	2750.0	650.0	8.0	5250.0

THIRD FLOOR SUPPLY PLAN
SCALE: 3/32" = 1'–0"

0' 4' 8' 16' N

THOMAS architecture studios
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360.915.8775 | tasolympia.com

TOWNZEN & ASSOCIATES PLAN APPROVAL
The plans submitted for review are approved in accordance with local state applicable standards. This approval does not relieve the applicant of the responsibility of compliance with the applicable codes.
4 Approved as submitted.
09/25/2019

ROBISON ENGINEERING, INC
19401 40TH AVE W., SUITE 302
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CONTACT: JON ROBISON

MARK D. ROBISON — STATE OF WASHINGTON — 17906 — REGISTERED PROFESSIONAL ENGINEER
06/05/18

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THIRD FLOOR PLUMBING PLAN- SUPPLY

P203S

TAS
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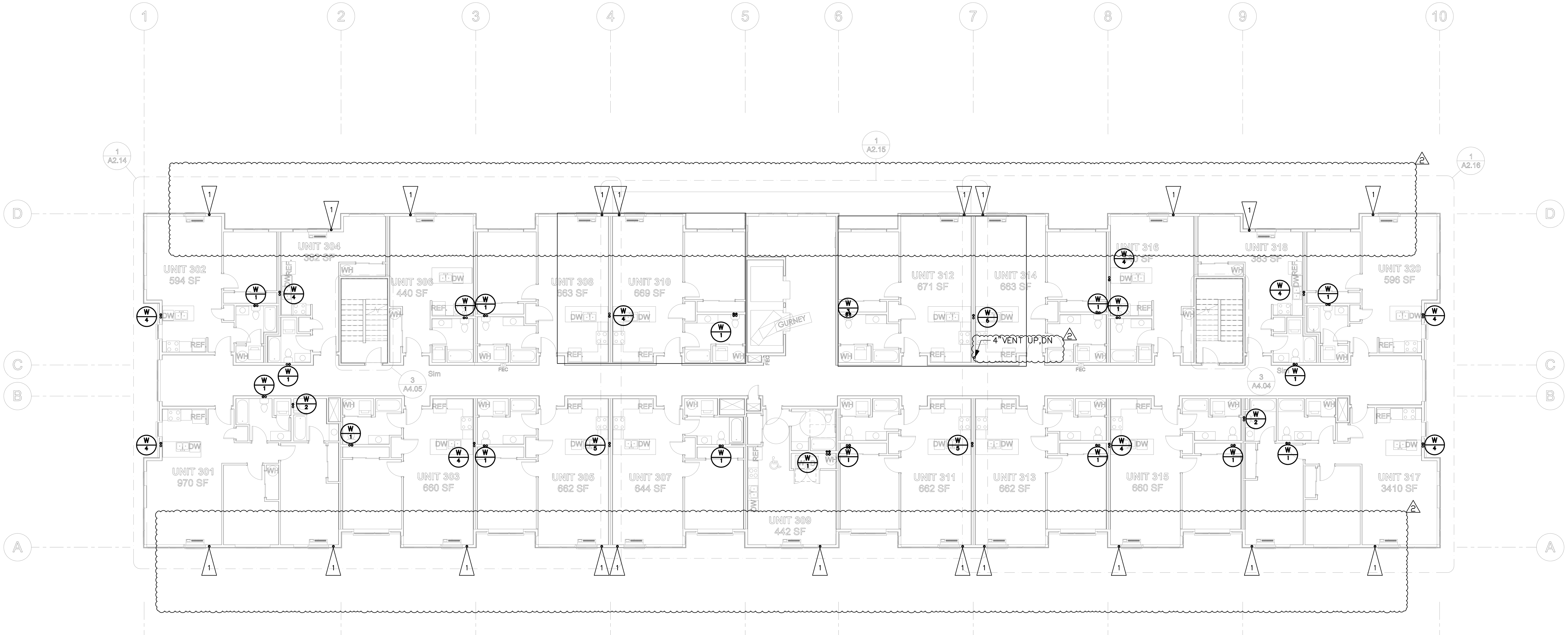

TYPICAL FIXTURES
UNLESS NOTED OTHERWISE

- WH-1
- KS-1
- KR-1
- LAV-1
- WM-1
- BT-1
- SH-1
- WC-1
- HB-1
- FD-1
- HD-1
- DW-1
- RF-1
- MS-1

NOTES:

(W/1) = WASTE/VENT RISER IDENTIFICATION (I.E. RISER "1"). REFER TO P400–P401 FOR RISER DETAILS AND SIZING.

1. STORM DRAIN SIZING: STORM DRAINAGE PIPING SIZED PER 2015 UPC TABLE 1101.7, FOR 1.0" PER HOUR RAINFALL RATE, AT 1/8" PER FOOT SLOPE:

PIPE SIZE	VERTICAL	HORIZONTAL
3"	8,800 SF	3,288 SF
4"	18,400 SF	7,520 SF
6"	54,000 SF	21,400 SF
8"	116,000 SF	46,000 SF
10"	116,000 SF	82,800 SF

2. WASTE & VENT SIZING: WASTE & VENT PIPING SIZED PER 2015 UPC TABLE 703.2. PIPING SHALL BE SLOPED AT 1/4" PER FOOT:

PIPE SIZE	VERT.	HORIZ.	VENT
1½"	2 DFU	1 DFU	8 DFU
2"	16 DFU	8 DFU	24 DFU
3"	48 DFU	35 DFU	84 DFU
4"	256 DFU	216 DFU	256 DFU
6"	1,380 DFU	720 DFU	1,380 DFU
8"	3,600 DFU	2,640 DFU	3,600 DFU

3. CONDENSATE DRAIN PIPE SIZING: PLUMBING CONTRACTOR SHALL PROVIDE CONDENSATE DRAINAGE FOR GUESTROOM HVAC UNITS. SEE MECHANICAL DRAWINGS FOR EXACT QUANTITY OF UNITS. SEE P601 FOR CONDENSATE RISER DIAGRAMS. CONDENSATE DRAIN PIPING SHALL BE SLOPED AT ⅛" PER FOOT. CONDENSATE DRAIN PIPING SIZED PER 2015 UPC TABLE 814.1:

PIPE SIZE	(TONS OF COOLING)
¾"	20
1"	40
1¼"	90
1½"	125
2"	250

4. PROVIDE TRAP PRIMERS FOR ALL FLOOR DRAINS, HUB DRAINS SEE DETAIL 8 ON SHEET P600.

5. PROVIDE FLOOR DRAINS AT ALL ROLL–IN SHOWER BATHROOMS.

6. REFER TO ARCH PLANS LOCATION AND REQUIREMENT ON ADA TYPE A AND TYPE B UNITS.

FLAG NOTES (1)

1. PROVIDE ¾" CONDENSATE DRAIN CONNECTION FROM 1 TON PTHP TO ¾" RISER.

THIRD FLOOR WASTE PLAN

SCALE: 3/32" = 1'-0"

0' 4' 8' 16' N

EAST BAY LOT A
WESTMAN MILL

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THIRD FLOOR PLUMBING PLAN-WASTE & VENT

P203W

TYPICAL FIXTURES
UNLESS NOTED OTHERWISE

- WH–1
- KS–1
- KR–1
- LAV–1
- WM–1
- BT–1
- SH–1
- WC–1
- HB–1
- FD–1
- HD–1
- DW–1
- RF–1
- MS–1

NOTES:

(S 1) = SUPPLY RISER IDENTIFICATION (I.E. RISER "1").
REFER TO P501 FOR RISER DETAILS AND SIZING.

SUPPLY PIPE SIZING SCHEDULE							Copper Type:		Type L
FLUSH TANK CW			HOT WATER			FLUSH VALVE CW			
PIPE SIZE	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS
1/2"	1.3	2.0	1.0	1.3	2.0	1.0	---	---	---
3/4"	4.0	2.8	4.5	4.0	2.8	4.5	---	---	---
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1-1/4"	16.0	4.0	20.0	16.0	4.0	20.0	---	---	---
1-1/2"	24.0	4.7	40.0	24.0	4.7	40.0	24.0	4.7	5.0
2"	53.0	5.6	135.0	45.0	5.0	112.0	50.0	5.6	50.0
2-1/2"	95.0	6.6	320.0	72.0	5.0	215.0	95.0	6.6	228.0
3"	150.0	7.4	650.0	100.0	5.0	350.0	150.0	7.4	564.0
4"	280.0	8.0	1600.0	175.0	5.0	800.0	280.0	8.0	1600.0
6"	650.0	8.0	5250.0	400.0	5.0	2750.0	650.0	8.0	5250.0

FOURTH FLOOR SUPPLY PLAN
SCALE: 3/32" = 1'–0"

0' 4' 8' 16' N

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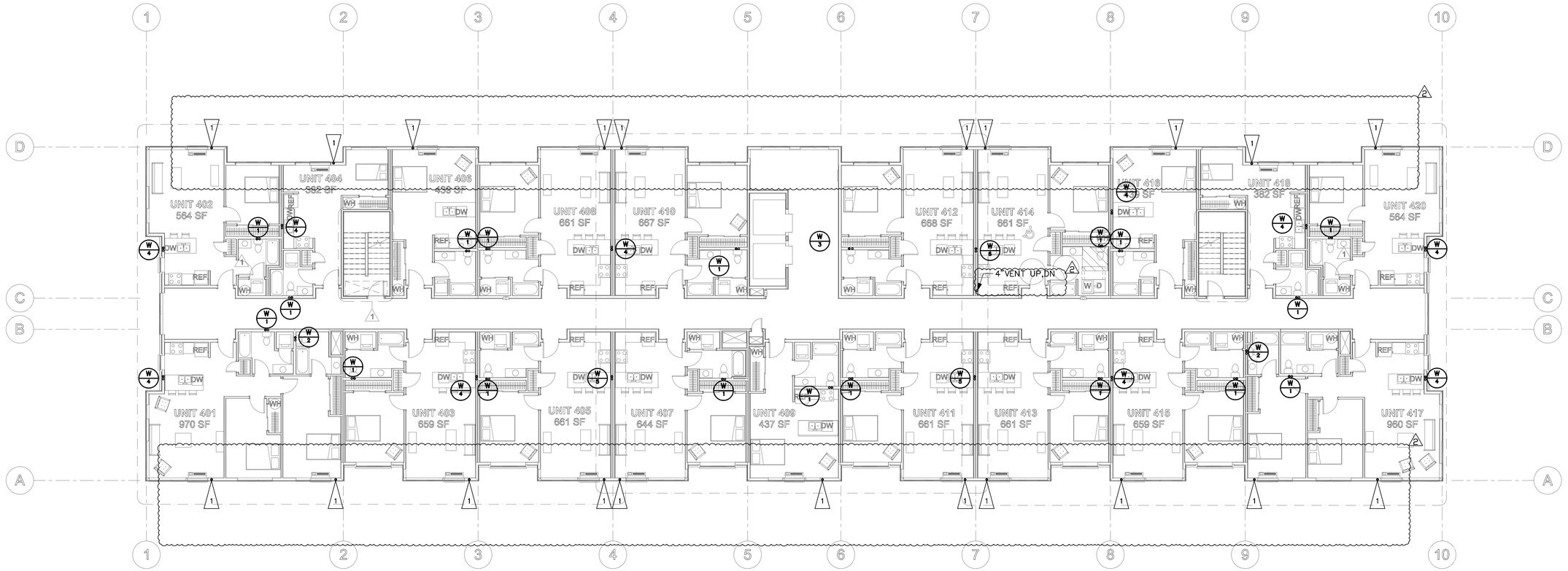
FOURTH FLOOR
PLUMBING PLAN-
SUPPLY

P204S



TYPICAL FIXTURES
UNLESS NOTED OTHERWISE

- WH–1
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- LAV–1
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- WC–1
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- FD–1
- HD–1
- DW–1
- RF–1
- MS–1

NOTES:

(W-1) = WASTE/VENT RISER IDENTIFICATION (I.E. RISER "1"). REFER TO P400–P401 FOR RISER DETAILS AND SIZING.

1. STORM DRAIN SIZING: STORM DRAINAGE PIPING SIZED PER 2015 UPC TABLE 1101.7, FOR 1.0" PER HOUR RAINFALL RATE, AT 1/8" PER FOOT SLOPE:

PIPE SIZE	VERTICAL	HORIZONTAL
3"	8,800 SF	3,288 SF
4"	18,400 SF	7,520 SF
6"	54,000 SF	21,400 SF
8"	116,000 SF	46,000 SF
10"	116,000 SF	82,800 SF

2. WASTE & VENT SIZING: WASTE & VENT PIPING SIZED PER 2015 UPC TABLE 703.2. PIPING SHALL BE SLOPED AT 1/4" PER FOOT:

PIPE SIZE	VERT.	HORIZ.	VENT
1½"	2 DFU	1 DFU	8 DFU
2"	16 DFU	8 DFU	24 DFU
3"	48 DFU	35 DFU	84 DFU
4"	256 DFU	216 DFU	256 DFU
6"	1,380 DFU	720 DFU	1,380 DFU
8"	3,600 DFU	2,640 DFU	3,600 DFU

3. CONDENSATE DRAIN PIPE SIZING: PLUMBING CONTRACTOR SHALL PROVIDE CONDENSATE DRAINAGE FOR GUESTROOM HVAC UNITS. SEE MECHANICAL DRAWINGS FOR EXACT QUANTITY OF UNITS. SEE P601 FOR CONDENSATE RISER DIAGRAMS. CONDENSATE DRAIN PIPING SHALL BE SLOPED AT ⅛" PER FOOT. CONDENSATE DRAIN PIPING SIZED PER 2015 UPC TABLE 814.1:

PIPE SIZE	(TONS OF COOLING)
¾"	20
1"	40
1¼"	90
1½"	125
2"	250

4. PROVIDE TRAP PRIMERS FOR ALL FLOOR DRAINS, HUB DRAINS SEE DETAIL 8 ON SHEET P600.

5. PROVIDE FLOOR DRAINS AT ALL ROLL–IN SHOWER BATHROOMS.

6. REFER TO ARCH PLANS LOCATION AND REQUIREMENT ON ADA TYPE A AND TYPE B UNITS.

FLAG NOTES (1)

1. PROVIDE ¾" CONDENSATE DRAIN CONNECTION FROM 1 TON PTHP TO ¾" RISER.

FOURTH FLOOR WASTE PLAN
SCALE: 3/32" = 1'–0"

0' 4' 8' 16' N

THOMAS
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FOURTH FLOOR PLUMBING PLAN- WASTE & VENT

P204W

TYPICAL FIXTURES
UNLESS NOTED OTHERWISE

- WH — WH–1
- KS — KS–1
- KR — KR–1
- LAV — LAV–1
- WM — WM–1
- BT — BT–1
- SH — SH–1
- WC — WC–1
- HB — HB–1
- FD — FD–1
- HD — HD–1
- DW — DW–1
- REF — RF–1
- MS — MS–1

NOTES:

(S-1) = SUPPLY RISER IDENTIFICATION (I.E. RISER "1").
REFER TO P501 FOR RISER DETAILS AND SIZING.

SUPPLY PIPE SIZING SCHEDULE							Copper Type:		Type L
	FLUSH TANK CW			HOT WATER			FLUSH VALVE CW		
PIPE SIZE	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS
1/2"	1.3	2.0	1.0	1.3	2.0	1.0	---	---	---
3/4"	4.0	2.8	4.5	4.0	2.8	4.5	---	---	---
1"	9.0	3.5	11.5	9.0	3.5	11.5	---	---	---
1-1/4"	16.0	4.0	20.0	16.0	4.0	20.0	---	---	---
1-1/2"	24.0	4.7	40.0	24.0	4.7	40.0	24.0	4.7	5.0
2"	53.0	5.6	135.0	45.0	5.0	112.0	50.0	5.6	50.0
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3"	150.0	7.4	650.0	100.0	5.0	350.0	150.0	7.4	564.0
4"	280.0	8.0	1600.0	175.0	5.0	800.0	280.0	8.0	1600.0
6"	650.0	8.0	5250.0	400.0	5.0	2750.0	650.0	8.0	5250.0

FIFTH FLOOR SUPPLY PLAN
SCALE: 3/32" = 1'–0"

0' 4' 8' 16' N

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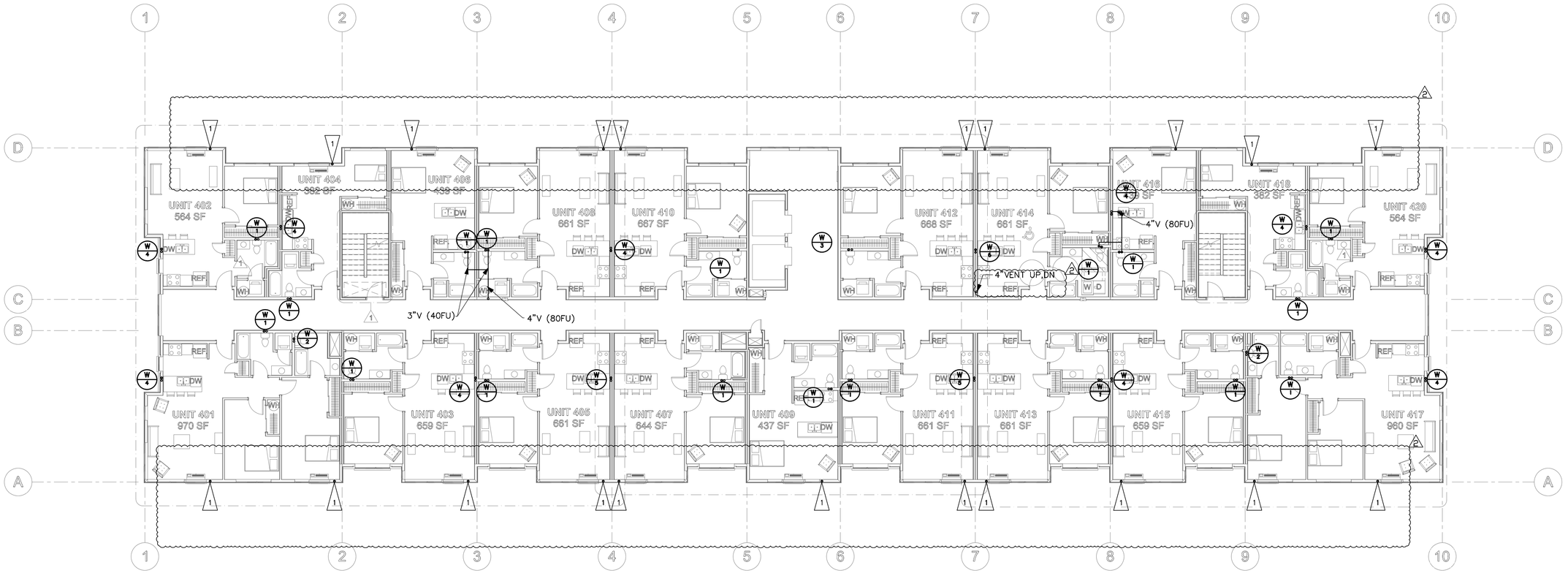
FIFTH FLOOR PLUMBING PLAN- SUPPLY

P205S



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PIPE SIZE	VERTICAL	HORIZONTAL
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6"	54,000 SF	21,400 SF
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10"	116,000 SF	82,800 SF

2. WASTE & VENT SIZING: WASTE & VENT PIPING SIZED PER 2015 UPC TABLE 703.2. PIPING SHALL BE SLOPED AT 1/4" PER FOOT:

PIPE SIZE	VERT.	HORIZ.	VENT
1½"	2 DFU	1 DFU	8 DFU
2"	16 DFU	8 DFU	24 DFU
3"	48 DFU	35 DFU	84 DFU
4"	256 DFU	216 DFU	256 DFU
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PIPE SIZE	(TONS OF COOLING)
¾"	20
1"	40
1¼"	90
1½"	125
2"	250

4. PROVIDE TRAP PRIMERS FOR ALL FLOOR DRAINS, HUB DRAINS SEE DETAIL 8 ON SHEET P600.

5. PROVIDE FLOOR DRAINS AT ALL ROLL–IN SHOWER BATHROOMS.

6. REFER TO ARCH PLANS LOCATION AND REQUIREMENT ON ADA TYPE A AND TYPE B UNITS.

FLAG NOTES (1)

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FIFTH FLOOR WASTE PLAN
SCALE: 3/32" = 1'–0"

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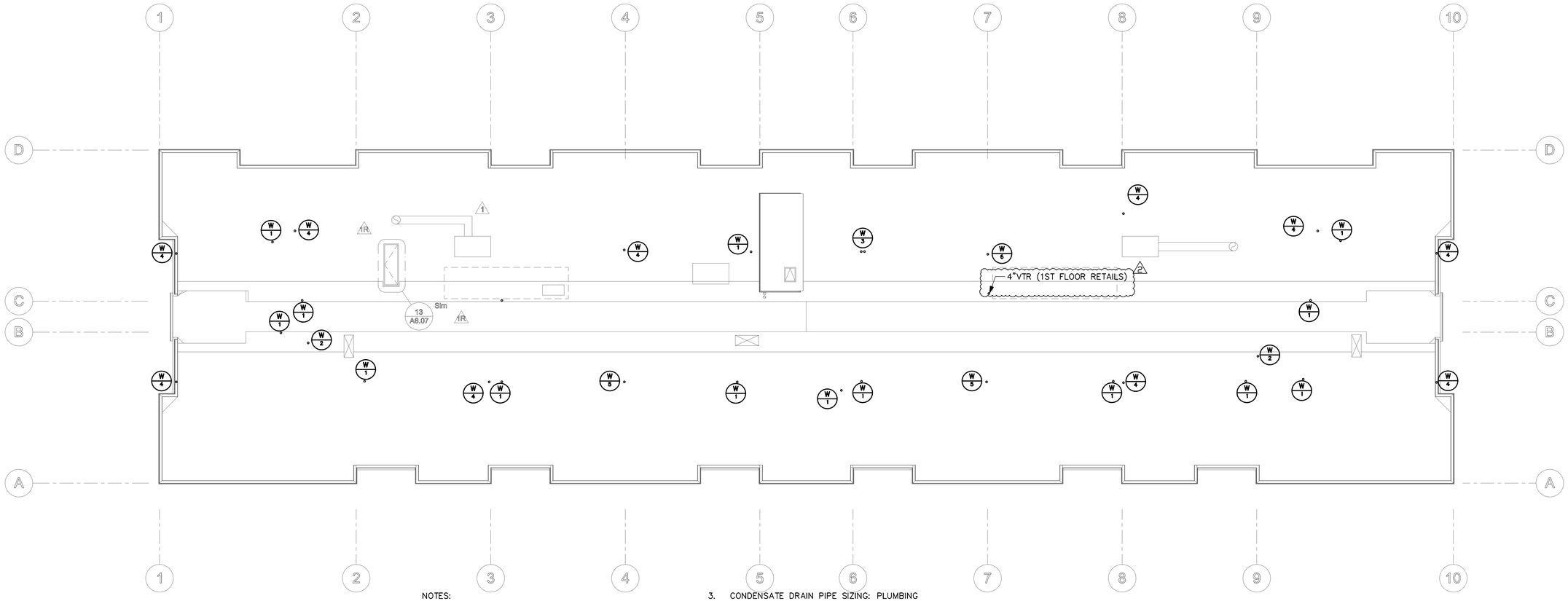
FIFTH FLOOR PLUMBING PLAN- WASTE & VENT

P205W



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2"	16 DFU	8 DFU	24 DFU
3"	48 DFU	35 DFU	84 DFU
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1¼"	90
1½"	125
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4. PROVIDE TRAP PRIMERS FOR ALL FLOOR DRAINS, HUB DRAINS SEE DETAIL 8 ON SHEET P600.

5. PROVIDE FLOOR DRAINS AT ALL ROLL–IN SHOWER BATHROOMS.

6. REFER TO ARCH PLANS LOCATION AND REQUIREMENT ON ADA TYPE A AND TYPE B UNITS.

ATTIC & ROOF PLAN

SCALE: 3/32" = 1'–0"

0' 4' 8' 16' N

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4 Approved as submitted.
09/25/2019

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06/05/18

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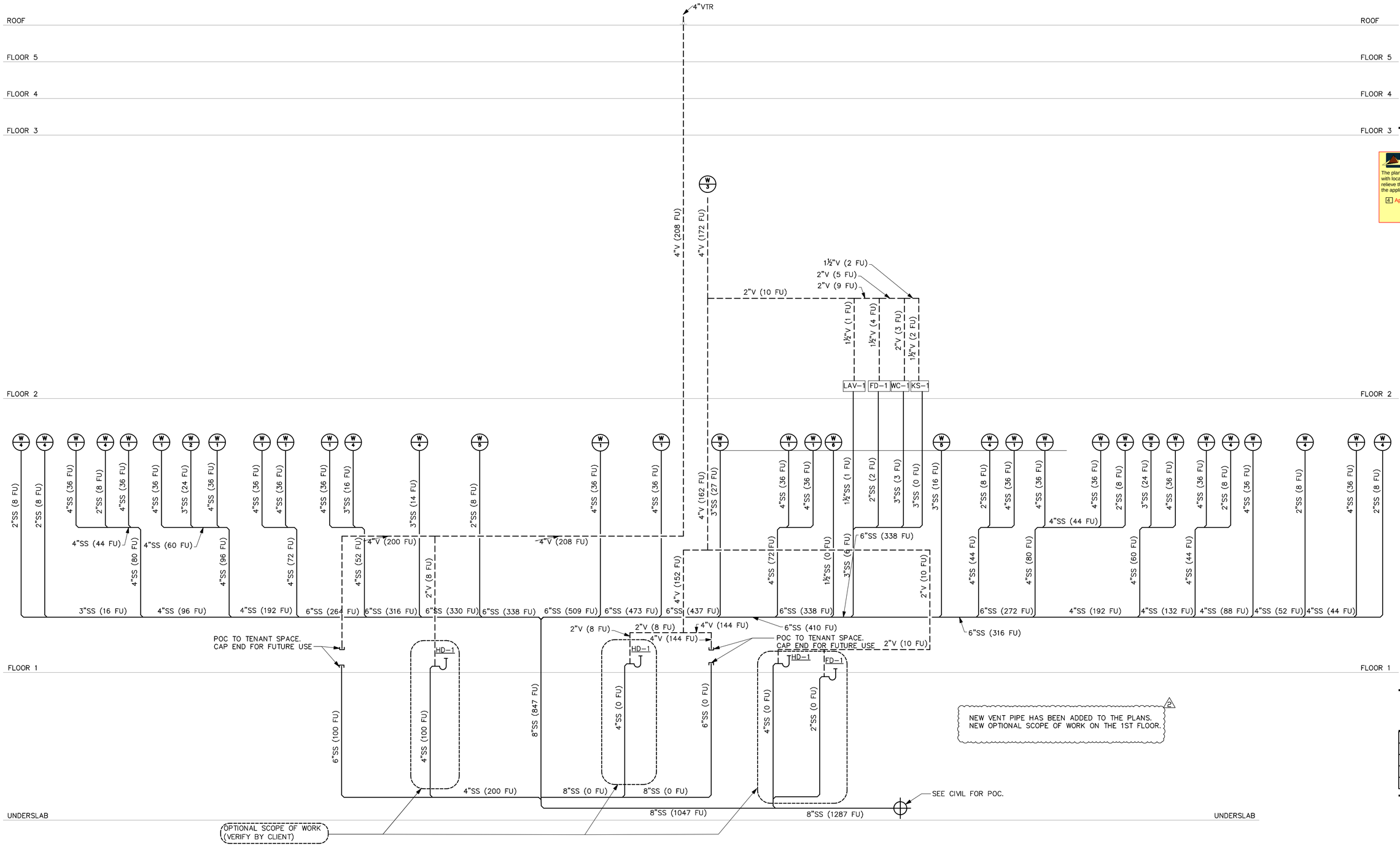
EAST BAY LOT A WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
2R	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE

ATTIC & ROOF PLAN- WASTE & VENT

P206W



GENERAL NOTES

W / 1 — RISER IDENTIFICATION. SEE RISER DIAGRAM ON P401. FOR EXAMPLE SEE RISER W/1 ON SHEET P4001.

FLAG NOTES: #

1. OFFSET PIPING AS REQUIRED. SEE FLOOR PLANS (P2.X) FOR DETAIL.

NOTE: WASTE & VENT SIZING: WASTE & VENT PIPING SIZED PER 2016 UPC TABLE 703.2. PIPING SHALL BE SLOPED AT 1/4" PER

PIPE SIZE	VERT.	HORIZ.	VENT
1½"	2 DFU	1 DFU	8 DFU
2"	16 DFU	8 DFU	24 DFU
~~2½"~~	~~32 DFU~~	~~14 DFU~~	~~48 DFU~~
3"	48 DFU	35 DFU	84 DFU
4"	256 DFU	216 DFU	256 DFU
6"	1,380 DFU	720 DFU	1,380 DFU
8"	3,600 DFU	2,640 DFU	3,600 DFU

TUB = BATHTUB (2 FU)
LAV = LAVATORY (1 FU)
WC = WATER CLOSET (3 FU)
KS = SINK WITH DISHWASHER (2 FU)
SH = SHOWER (2FU)
WM = WASHING MACHINE (3 FU)
FD = FLOOR DRAIN (1 FU)
PWM = PUBLIC WASHING MACHINE (6 FU)

WASTE & VENT FLOW DIAGRAMS

SCALE: NONE

NOTE: SEE FIRE STOP SYSTEM ON SHEET P603 FOR PIPING PENETRATING THE 3HR FLOOR (2ND FLOOR SLAB)

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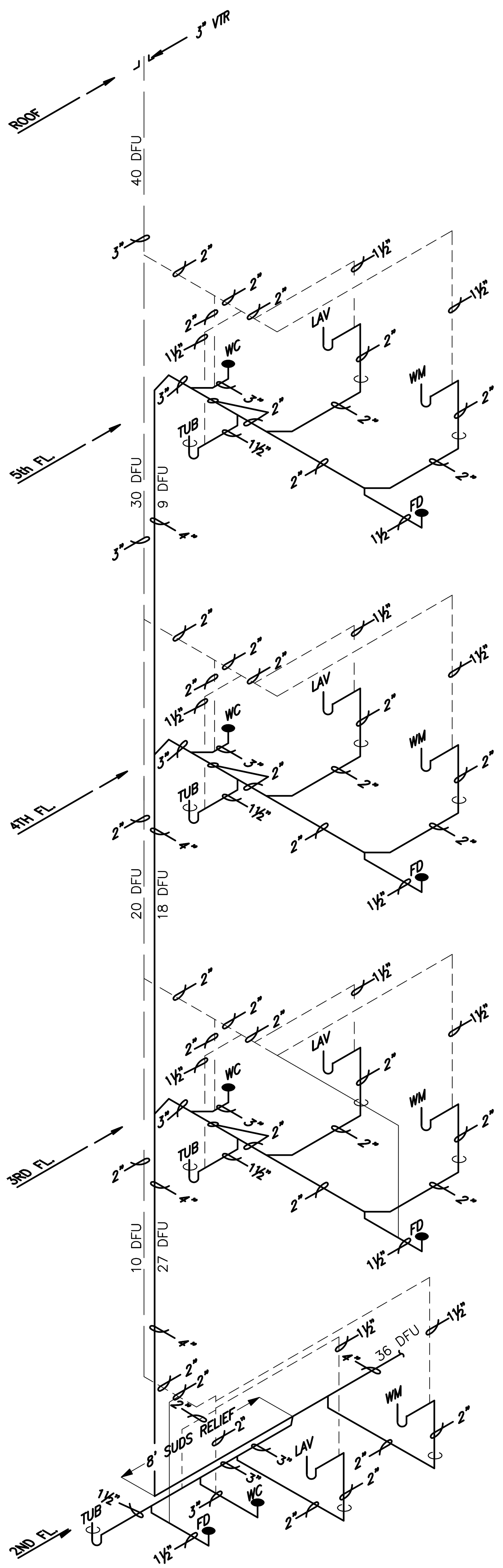
EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

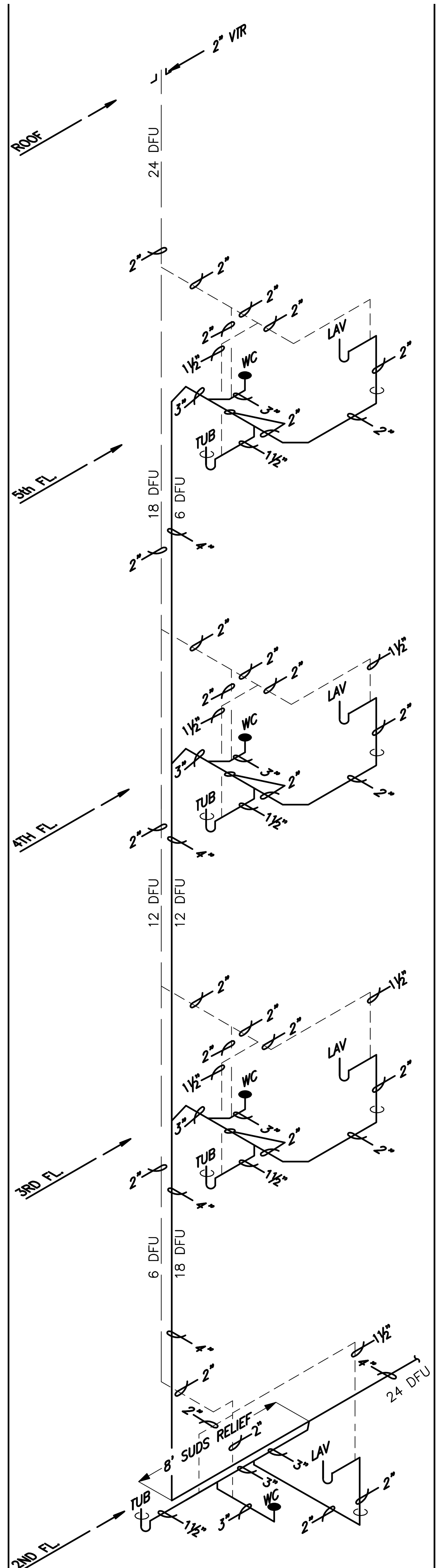
Rev#	Date	Description
1A	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE

WASTE & VENT FLOW DIAGRAM

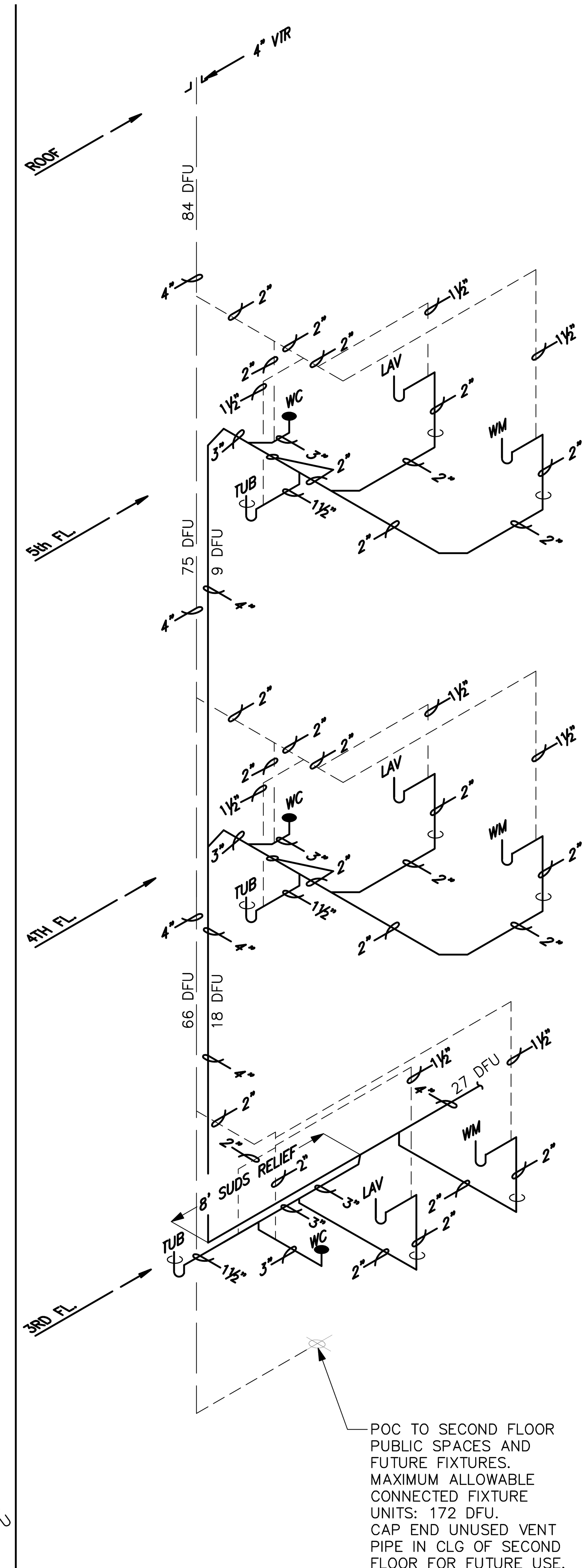
P400



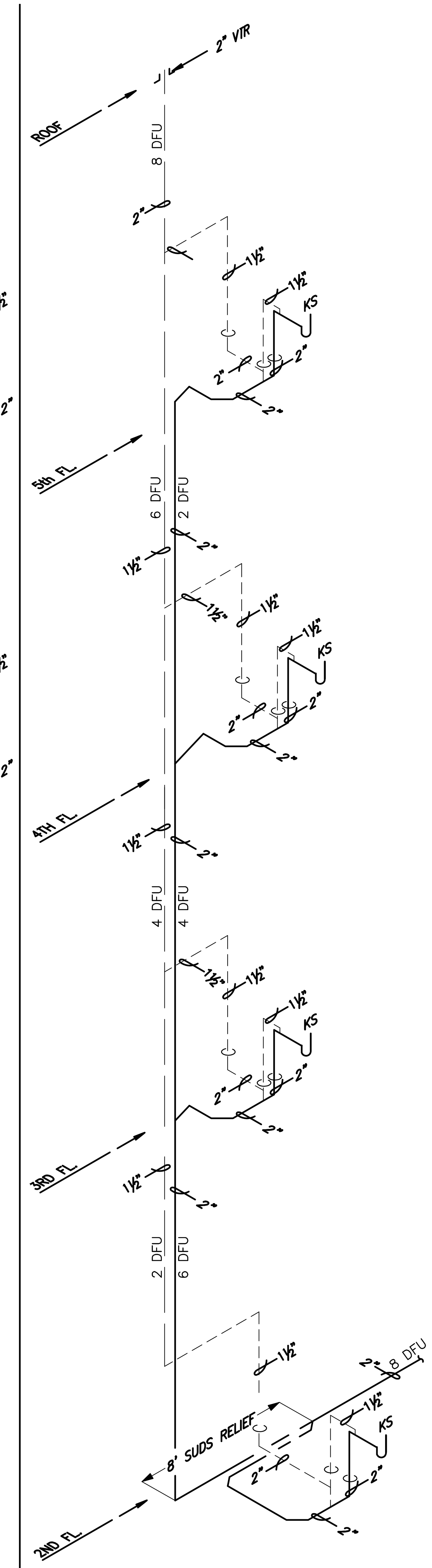
WASTE RISER
W 1
SCALE: NONE



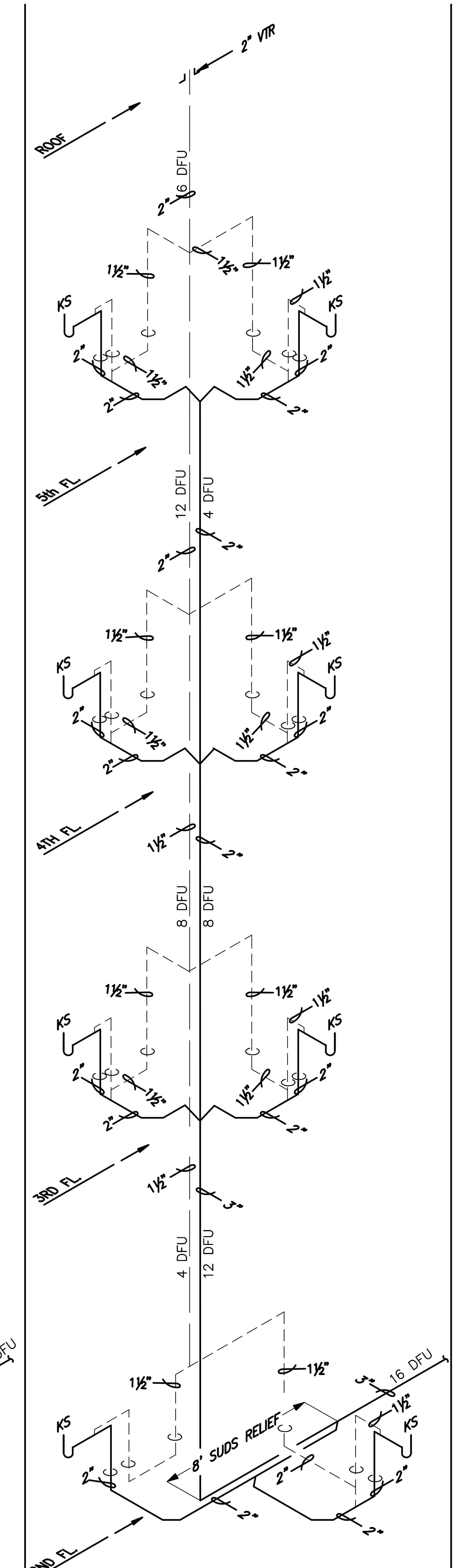
WASTE RISER
W 2
SCALE: NONE



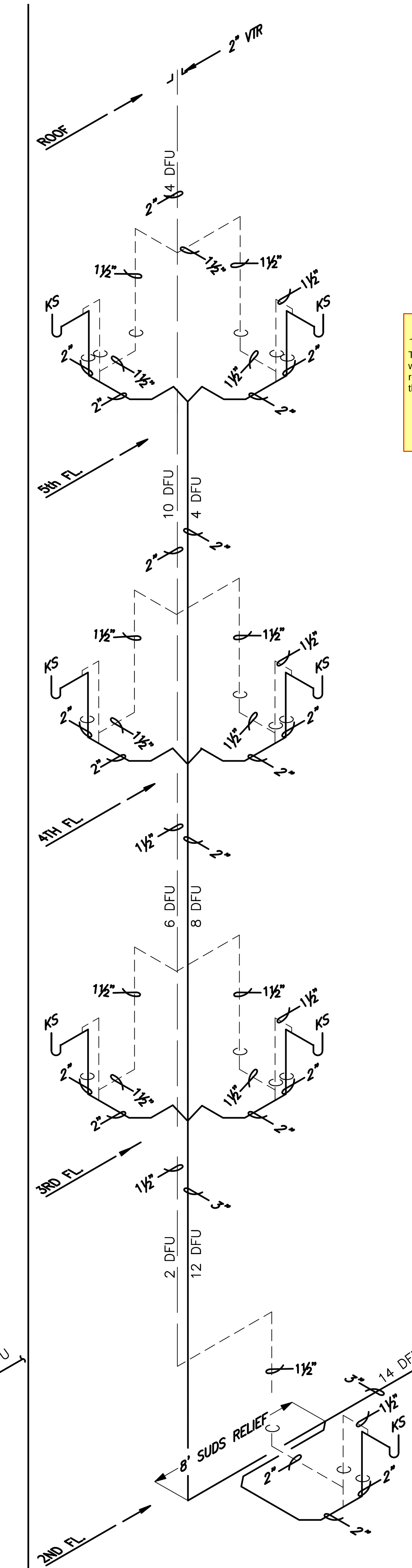
WASTE RISER
W 3
SCALE: NONE



WASTE RISER
W 4
SCALE: NONE



WASTE RISER
W 5
SCALE: NONE



WASTE RISER
W 6
SCALE: NONE

NOTE

C/O ARE NOT SHOWN ON THE PLANS. CONTRACTOR SHALL PROVIDE CLEANOUTS AS

FLAG NOTES: #

1. REFER TO FLOOR PLANS (P2.X) FOR CONTINUATION.
2. OFFSET PIPING AS REQUIRED. SEE FLOOR PLANS (P2.X) FOR CONTINUATION.

NOTE: WASTE & VENT SIZING: WASTE & VENT PIPING SIZED PER 2016 UPC TABLE 703.2. PIPING 4" AND LARGER SHALL BE SLOPED. AT 1/8" PER FOOT. PIPING SMALLER THAN 4" SHALL BE SLOPED AT 1/4" PER FOOT:

PIPE SIZE	VERT.	HORIZ.	VENT
1½"	2 DFU	1 DFU	8 DFU
2"	16 DFU	8 DFU	24 DFU
~~2½"~~	~~32 DFU~~	~~14 DFU~~	~~48 DFU~~
3"	48 DFU	35 DFU	84 DFU
4"	256 DFU	172 DFU	256 DFU
6"	1,380 DFU	576 DFU	1,380 DFU
8"	3,600 DFU	2,112 DFU	3,600 DFU

TUB = BATHTUB (2 FU)
LAV = LAVATORY (1 FU)
WC = WATER CLOSET (3 FU)
KS = SINK WITH DISHWASHER (2 FU)
SH = SHOWER (2FU)
WM = WASHER BOX (3 FU)
FD = FLOOR DRAIN (1 FU)
PWM = PUBLIC WASHING MACHINE (6 FU)

WASTE & VENT RISER DIAGRAMS
SCALE: NONE

NOTE: SEE FIRE STOP SYSTEM ON SHEET P603 FOR PIPING PENETRATING THE 3HR FLOOR (2ND FLOOR SLAB)

TAS
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06/05/18

Olympia
Building Plans Examiner
Community Planning & Development Department

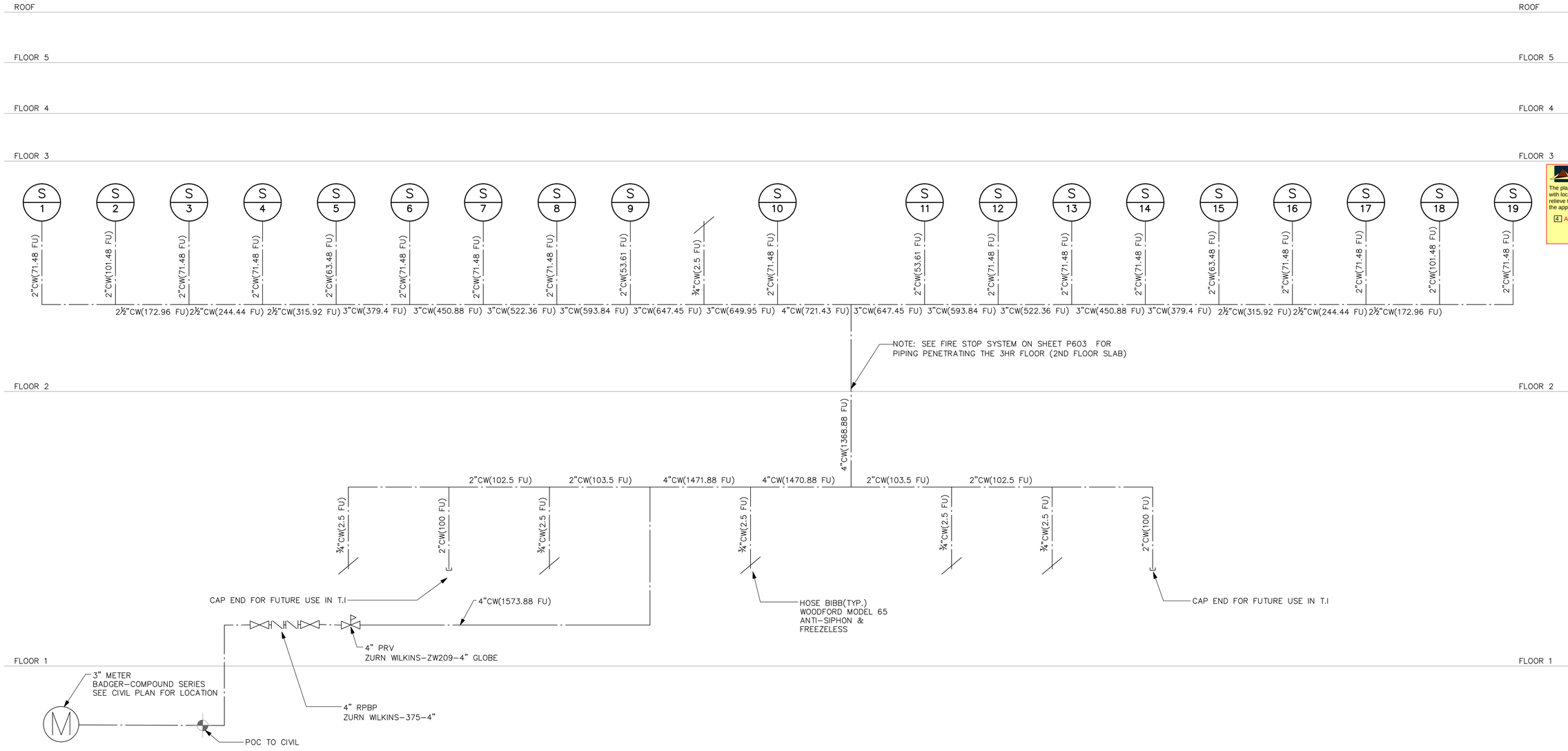
EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
R	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE

WASTE & VENT RISER DIAGRAM

P401



SUPPLY PIPE SIZING SCHEDULE							Copper Type:		Type L
	FLUSH TANK CW			HOT WATER			FLUSH VALVE CW		
PIPE SIZE	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS
1/2"	1.3	2.0	1.0	1.3	2.0	1.0	---	---	---
3/4"	4.0	2.8	4.5	4.0	2.8	4.5	---	---	---
1"	9.0	3.5	11.5	9.0	3.5	11.5	---	---	---
1-1/4"	16.0	4.0	20.0	16.0	4.0	20.0	---	---	---
1-1/2"	24.0	4.7	40.0	24.0	4.7	40.0	24.0	4.7	5.0
2"	53.0	5.6	135.0	45.0	5.0	112.0	50.0	5.6	50.0
2-1/2"	95.0	6.6	320.0	72.0	5.0	215.0	95.0	6.6	228.0
3"	150.0	7.4	650.0	100.0	5.0	350.0	150.0	7.4	564.0
4"	280.0	8.0	1600.0	175.0	5.0	800.0	280.0	8.0	1600.0
6"	650.0	8.0	5250.0	400.0	5.0	2750.0	650.0	8.0	5250.0

GENERAL NOTES

S/1 RISER IDENTIFICATION. SEE RISER DIAGRAM ON P501. FOR EXAMPLE SEE RISER S/1 ON SHEET P501.

TUB = BATHTUB
LAV = LAVATORY
WC = WATER CLOSET
KS = SINK WITH DISHWASHER
SH = SHOWER
WM = WASHING MACHINE
FD = FLOOR DRAIN
WH = WATER HEATER

SUPPLY
DISTRIBUTION DIAGRAM
SCALE: NONE

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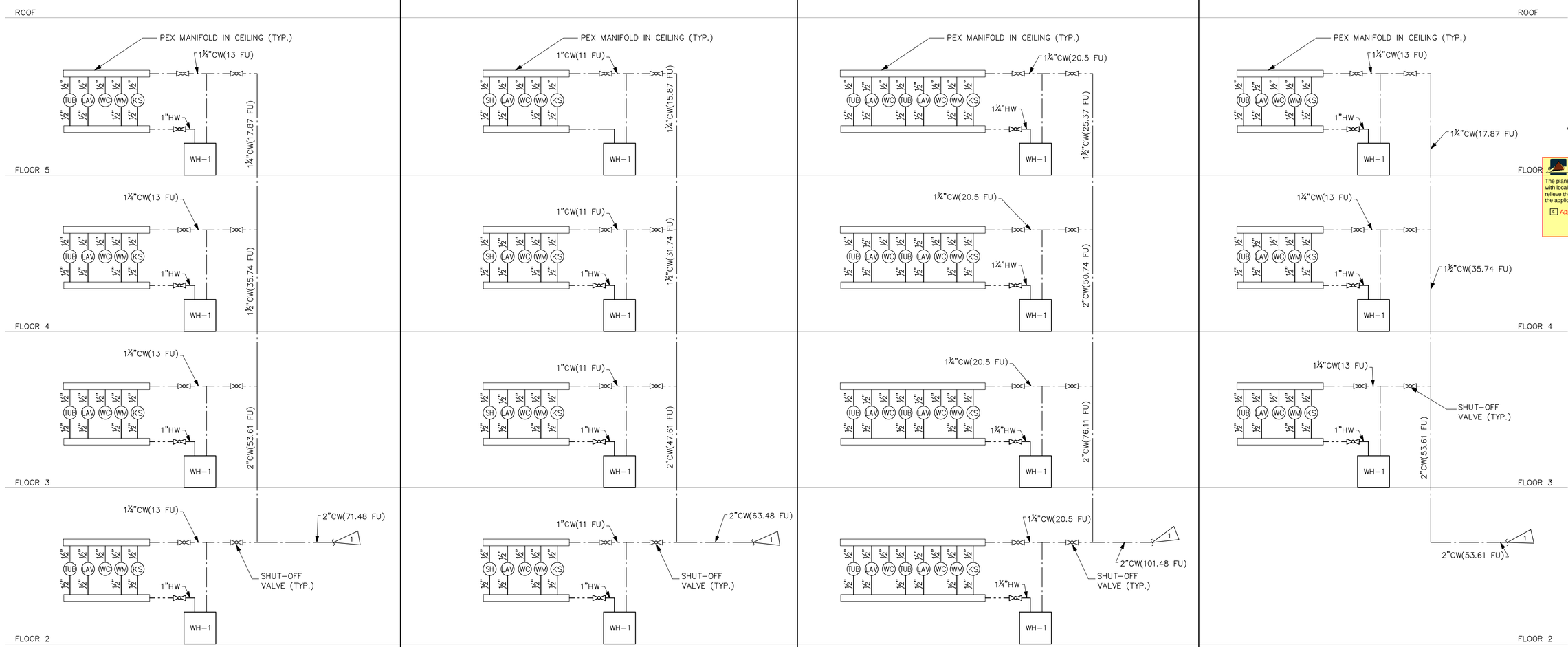
EAST BAY LOT A
WESTMAN MILL
510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
3	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE

SUPPLY
DISTRIBUTION
DIAGRAM

P500



S 1 | S 3 | S 4 | S 6 | S 7 | S 8 | S 10

SUPPLY RISER DIAGRAM

SCALE: NONE

S 14 | S 16 | S 17 | S 19 | S 12 | S 13

SUPPLY RISER DIAGRAM

SCALE: NONE

S 5 | S 15

SUPPLY RISER DIAGRAM

SCALE: NONE

S 2 | S 18

SUPPLY RISER DIAGRAM

SCALE: NONE

S 9 | S 11

SUPPLY PIPE SIZING SCHEDULE — Copper Type: Type L

	FLUSH TANK CW			HOT WATER			FLUSH VALVE CW		
PIPE SIZE	FLOW, GPM	VEL FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS
1/2"	1.3	2.0	1.0	1.3	2.0	1.0	---	---	---
3/4"	4.0	2.8	4.5	4.0	2.8	4.5	---	---	---
1"	9.0	3.5	11.5	9.0	3.5	11.5	---	---	---
1-1/4"	16.0	4.0	20.0	16.0	4.0	20.0	---	---	---
1-1/2"	24.0	4.7	40.0	24.0	4.7	40.0	24.0	4.7	5.0
2"	53.0	5.6	135.0	45.0	5.0	112.0	50.0	5.6	50.0
2-1/2"	95.0	6.6	320.0	72.0	5.0	215.0	95.0	6.6	228.0
3"	150.0	7.4	650.0	100.0	5.0	350.0	150.0	7.4	564.0
4"	280.0	8.0	1600.0	175.0	5.0	800.0	280.0	8.0	1600.0
6"	650.0	8.0	5250.0	400.0	5.0	2750.0	650.0	8.0	5250.0

FLAG NOTES: #

1. REFER TO FLOOR PLANS (P202S) FOR CONTINUATION.

TUB = BATHTUB
LAV = LAVATORY
WC = WATER CLOSET
KS = SINK WITH DISHWASHER
SH = SHOWER
WM = WASHING MACHINE
FD = FLOOR DRAIN
WH = WATER HEATER

SUPPLY RISER DIAGRAMS

SCALE: NONE

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06/05/18

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EAST BAY LOT A WESTMAN MILL

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PERMIT SET
5/16/18

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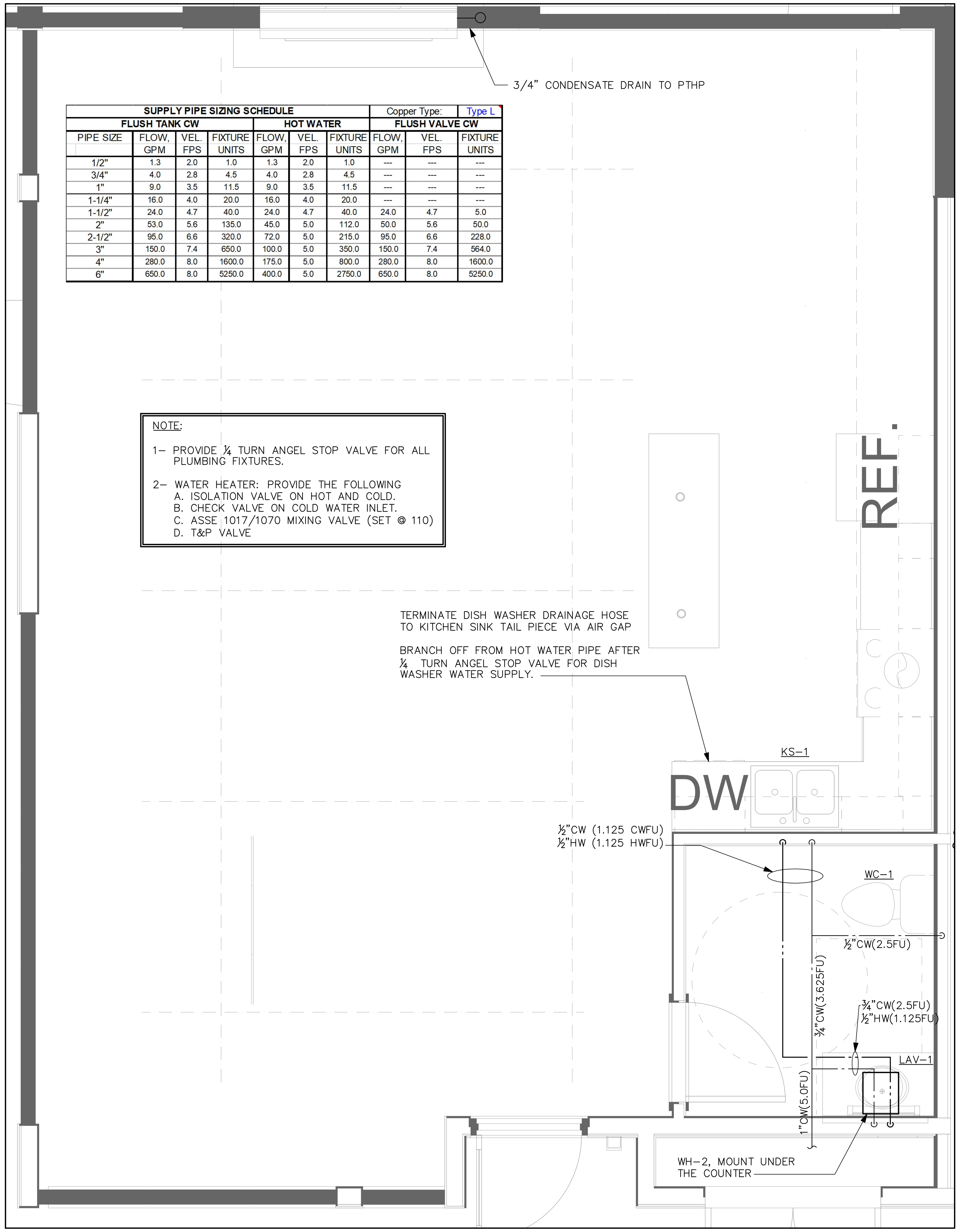
2	06/12/19	GREASE WASTE

SUPPLY RISER DIAGRAMS

P501



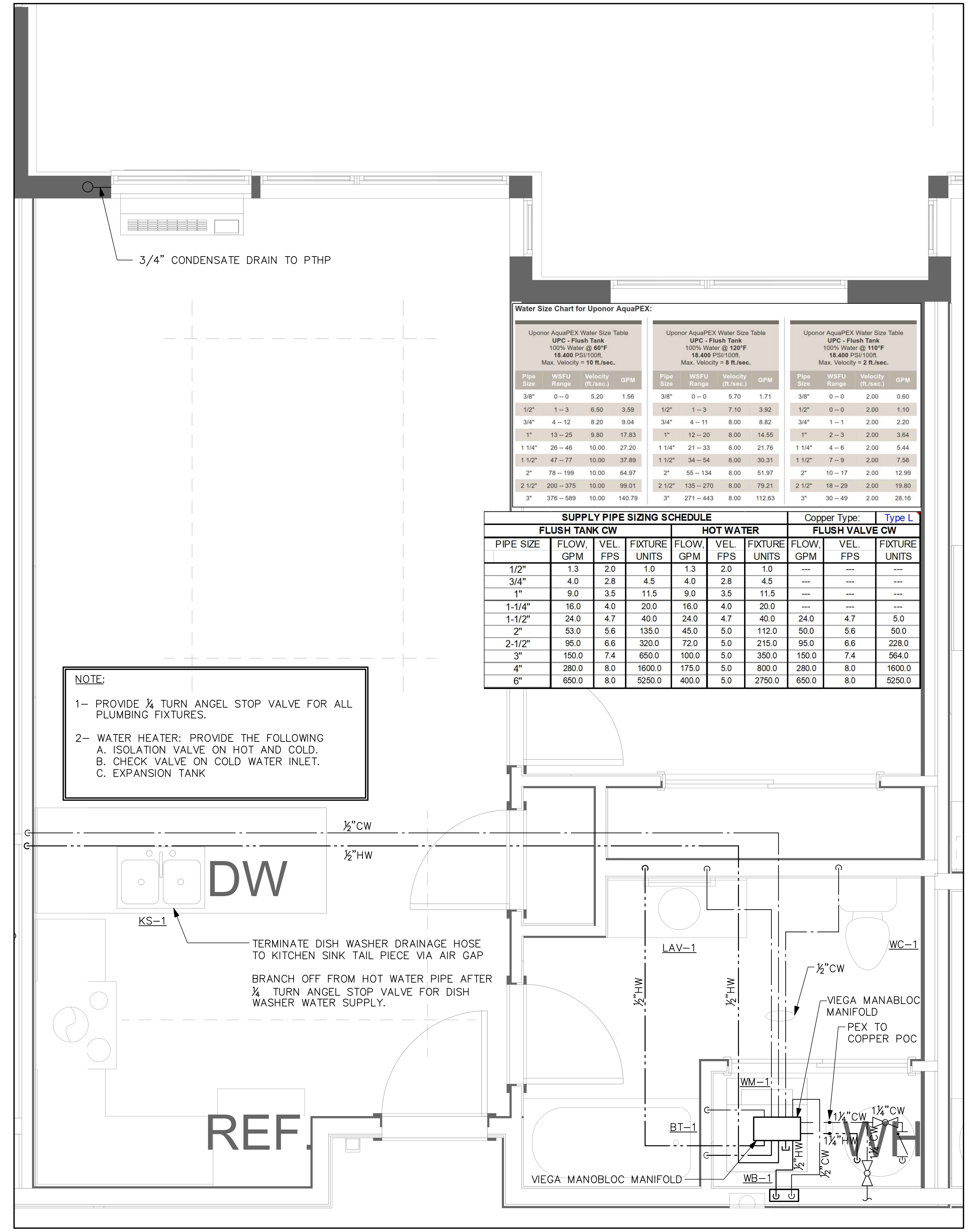
SUPPLY PIPE SIZING SCHEDULE							Copper Type:		Type L
	FLUSH TANK CW			HOT WATER			FLUSH VALVE CW		
PIPE SIZE	FLOW, GPM	VEL FPS	FIXTURE UNITS	FLOW, GPM	VEL FPS	FIXTURE UNITS	FLOW, GPM	VEL FPS	FIXTURE UNITS
1/2"	1.3	2.0	1.0	1.3	2.0	1.0	---	---	---
3/4"	4.0	2.8	4.5	4.0	2.8	4.5	---	---	---
1"	9.0	3.5	11.5	9.0	3.5	11.5	---	---	---
1-1/4"	16.0	4.0	20.0	16.0	4.0	20.0	---	---	---
1-1/2"	24.0	4.7	40.0	24.0	4.7	40.0	24.0	4.7	5.0
2"	53.0	5.6	135.0	45.0	5.0	112.0	50.0	5.6	50.0
2-1/2"	95.0	6.6	320.0	72.0	5.0	215.0	95.0	6.6	228.0
3"	150.0	7.4	650.0	100.0	5.0	350.0	150.0	7.4	564.0
4"	280.0	8.0	1600.0	175.0	5.0	800.0	280.0	8.0	1600.0
6"	650.0	8.0	5250.0	400.0	5.0	2750.0	650.0	8.0	5250.0

NOTE:

1– PROVIDE ¼ TURN ANGEL STOP VALVE FOR ALL PLUMBING FIXTURES.

2– WATER HEATER: PROVIDE THE FOLLOWING
A. ISOLATION VALVE ON HOT AND COLD.
B. CHECK VALVE ON COLD WATER INLET.
C. ASSE 1017/1070 MIXING VALVE (SET @ 110)
D. T&P VALVE

ENLARGED PLAN
LOUNGE
2
P300
SCALE: 1/2" = 1'–0"
0 4' 8' 16'



Water Size Chart for Uponor AquaPEX:

Uponor AquaPEX Water Size Table UPC - Flush Tank 100% Water @ 60°F 18.400 PSI/100ft. Max. Velocity = 10 ft./sec.			
Pipe Size	WSFU Range	Velocity (ft./sec.)	GPM
3/8"	0 -- 0	5.20	1.56
1/2"	1 -- 3	6.50	3.59
3/4"	4 -- 12	8.20	9.04
1"	13 -- 25	9.80	17.83
1 1/4"	26 -- 46	10.00	27.20
1 1/2"	47 -- 77	10.00	37.89
2"	78 -- 199	10.00	64.97
2 1/2"	200 -- 375	10.00	99.01
3"	376 -- 589	10.00	140.79

Uponor AquaPEX Water Size Table UPC - Flush Tank 100% Water @ 120°F 18.400 PSI/100ft. Max. Velocity = 8 ft./sec.			
Pipe Size	WSFU Range	Velocity (ft./sec.)	GPM
3/8"	0 -- 0	5.70	1.71
1/2"	1 -- 3	7.10	3.92
3/4"	4 -- 11	8.00	8.82
1"	12 -- 20	8.00	14.55
1 1/4"	21 -- 33	8.00	21.76
1 1/2"	34 -- 54	8.00	30.31
2"	55 -- 134	8.00	51.97
2 1/2"	135 -- 270	8.00	79.21
3"	271 -- 443	8.00	112.63

Uponor AquaPEX Water Size Table UPC - Flush Tank 100% Water @ 110°F 18.400 PSI/100ft. Max. Velocity = 2 ft./sec.			
Pipe Size	WSFU Range	Velocity (ft./sec.)	GPM
3/8"	0 -- 0	2.00	0.60
1/2"	0 -- 0	2.00	1.10
3/4"	1 -- 1	2.00	2.20
1"	2 -- 3	2.00	3.64
1 1/4"	4 -- 6	2.00	5.44
1 1/2"	7 -- 9	2.00	7.58
2"	10 -- 17	2.00	12.99
2 1/2"	18 -- 29	2.00	19.80
3"	30 -- 49	2.00	28.16

SUPPLY PIPE SIZING SCHEDULE							Copper Type:		Type L
	FLUSH TANK CW			HOT WATER			FLUSH VALVE CW		
PIPE SIZE	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS	FLOW, GPM	VEL. FPS	FIXTURE UNITS
1/2"	1.3	2.0	1.0	1.3	2.0	1.0	---	---	---
3/4"	4.0	2.8	4.5	4.0	2.8	4.5	---	---	---
1"	9.0	3.5	11.5	9.0	3.5	11.5	---	---	---
1-1/4"	16.0	4.0	20.0	16.0	4.0	20.0	---	---	---
1-1/2"	24.0	4.7	40.0	24.0	4.7	40.0	24.0	4.7	5.0
2"	53.0	5.6	135.0	45.0	5.0	112.0	50.0	5.6	50.0
2-1/2"	95.0	6.6	320.0	72.0	5.0	215.0	95.0	6.6	228.0
3"	150.0	7.4	650.0	100.0	5.0	350.0	150.0	7.4	564.0
4"	280.0	8.0	1600.0	175.0	5.0	800.0	280.0	8.0	1600.0
6"	650.0	8.0	5250.0	400.0	5.0	2750.0	650.0	8.0	5250.0

NOTE:

1– PROVIDE ¼ TURN ANGEL STOP VALVE FOR ALL PLUMBING FIXTURES.

2– WATER HEATER: PROVIDE THE FOLLOWING
A. ISOLATION VALVE ON HOT AND COLD.
B. CHECK VALVE ON COLD WATER INLET.
C. EXPANSION TANK

ENLARGED PLAN
TYPICAL APT
1
P300
SCALE: 1/2" = 1'–0"
0 4' 8' 16'

TAS
THOMAS architecture studios
525 COLUMBIA ST. | OLYMPIA, WA 98501
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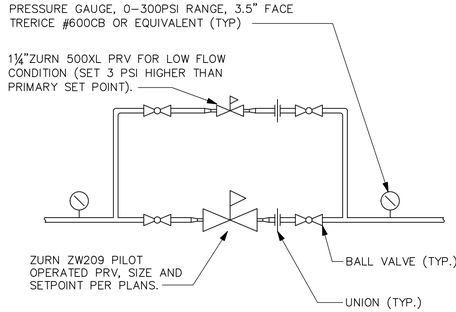
Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
3	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE

ENLARGED PLUMBING PLAN

P300



PRV STATION PIPING DIAGRAM

SCALE: NONE

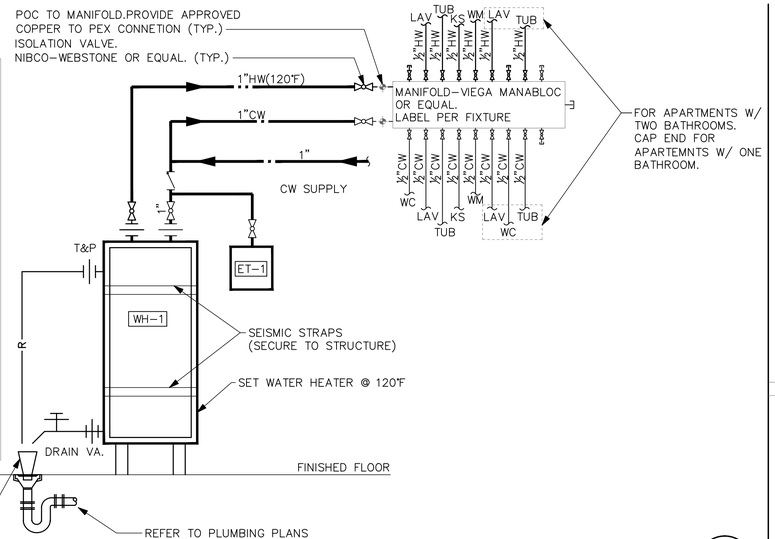
10 / P600

COPPER TYPE L

PEX (UPONOR AQUAPEX)

NOTES:

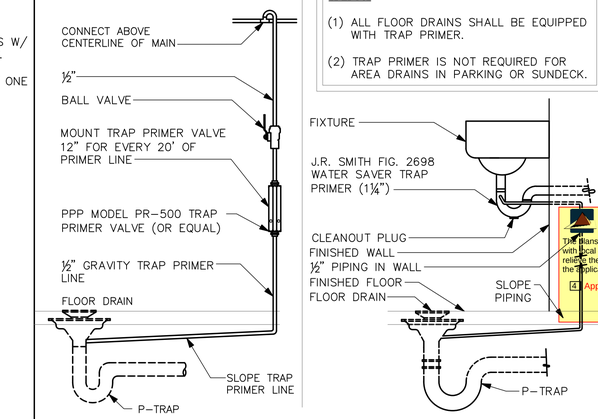
1. THE SEISMIC STRAPS SHALL BE AT POINTS WITHIN THE UPPER 1/3 AND LOWER 1/3 OF THE WATER HEATER. AT THE LOWER POINT A MINIMUM OF 4" SHALL BE MAINTAINED ABOVE THE CONTROLS WITH THE STRAP.
2. INSTALL MANIFOLD ON THE WALL IN THE WATER HEATER CLOSET.
3. PER 2015 UPC SECTION 608.5, DISCHARGE PIPING SERVING A TEMPERATURE RELIEF VALVE, PRESSURE RELIEF VALVE OR COMBINATION OF BOTH SHALL HAVE NO VALVES, OBSTRUCTION, OR MEANS OF ISOLATION AND BE PROVIDED WITH THE FOLLOWING:
   - 3.1. EQUAL TO THE SIZE OF THE VALVE OUTLET AND SHALL DISCHARGE FULL SIZE TO THE FLOOD LEVEL OF THE AREA RECEIVING THE DISCHARGE AND POINTING DOWN.
   - 3.2. DISCHARGE PIPE SHALL DISCHARGE INDEPENDENTLY BY GRAVITY THROUGH AND AIR GAP INTO THE DRAINAGE SYSTEM OR OUTSIDE OF THE BUILDING WITH THE END PIPE NOT EXCEEDING 2 FEET AND NOT LESS THAN 6 INCHES ABOVE THE GROUND AND POINTING DOWNWARDS.
   - 3.3. NO PART OF DISCHARGE SHALL BE TRAPPED OR SUBJECT TO FREEZING. THE TERMINATION OF THE END PIPE SHALL NOT BE THREADED.
   - 3.4. DISCHARGE FROM A RELIEF VALVE INTO A WATER HEATER PAN SHALL BE PROHIBITED.



WATER HEATER PIPING DETAIL

SCALE: NONE

9 / P0.0



TRAP PRIMER DETAIL

SCALE: NONE

8 / P600

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Approved as submitted. 09/25/2019

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06/05/18

Reviewed for Code Compliance Construction Permitting Only

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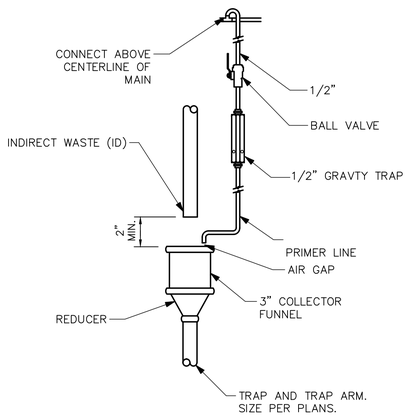
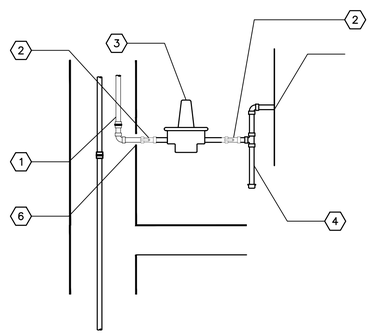


HUB DRAIN DETAIL

SCALE: NONE

4 / P600

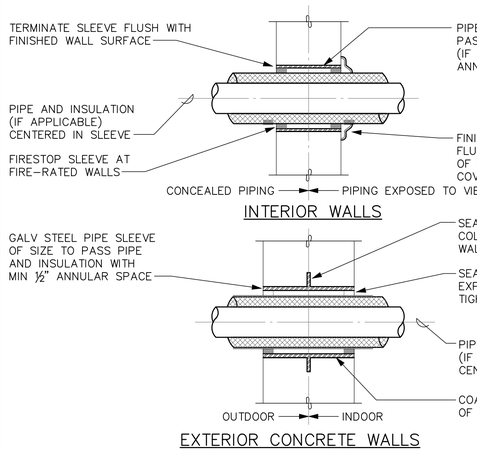
KEYED NOTES:
1. GAS PIPING
2. SHUT–OFF VALVE
3. GAS REGULATOR. PROVIDE VENT.
4. DIRT LEG.
5. TO APPLIANCE
6. TYP. PIPE THROUGH WALL PENETRATION.



GAS REGULATOR ASSEMBLY DETAIL

SCALE: NONE

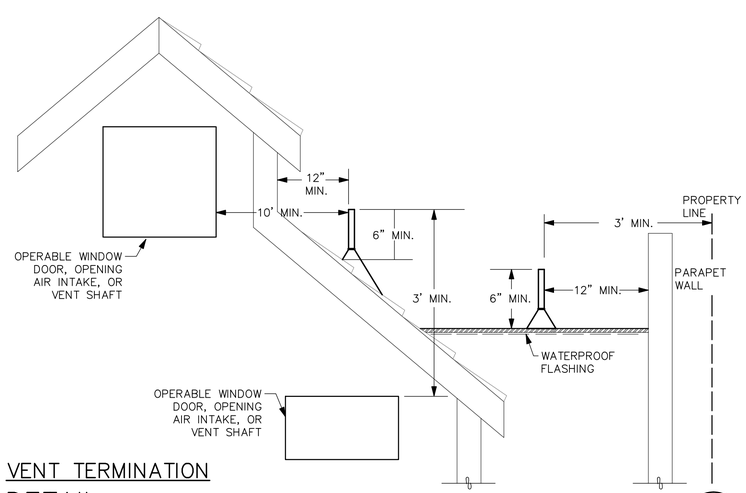
5 / P600



PIPE SLEEVES THROUGH WALLS DETAIL

SCALE: NONE

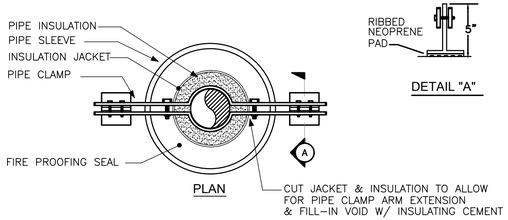
6 / P600

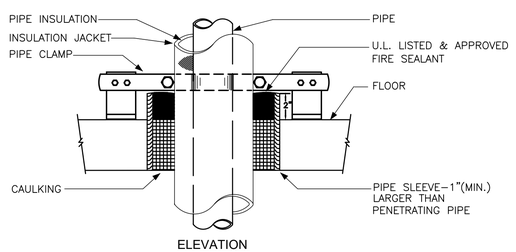


VENT TERMINATION DETAIL

SCALE: NONE

7 / P600

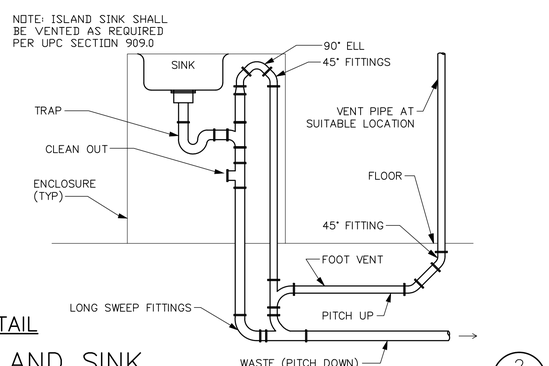




RISER PIPE SUPPORT DETAIL

SCALE: NONE

1 / P600



DETAIL

ISLAND SINK

SCALE: NONE

2 / P600

EAST BAY LOT A WESTMAN MILL

510 STATE AVE OLYMPIA, WA, 98501

Project No: 1514
PERMIT SET
5/16/18

Rev#	Date	Description
3	01/30/19	PERMIT COMMENT
1	01/30/19	OTHER CHANGES
2	06/12/19	GREASE WASTE

DETAILS & DIAGRAMS

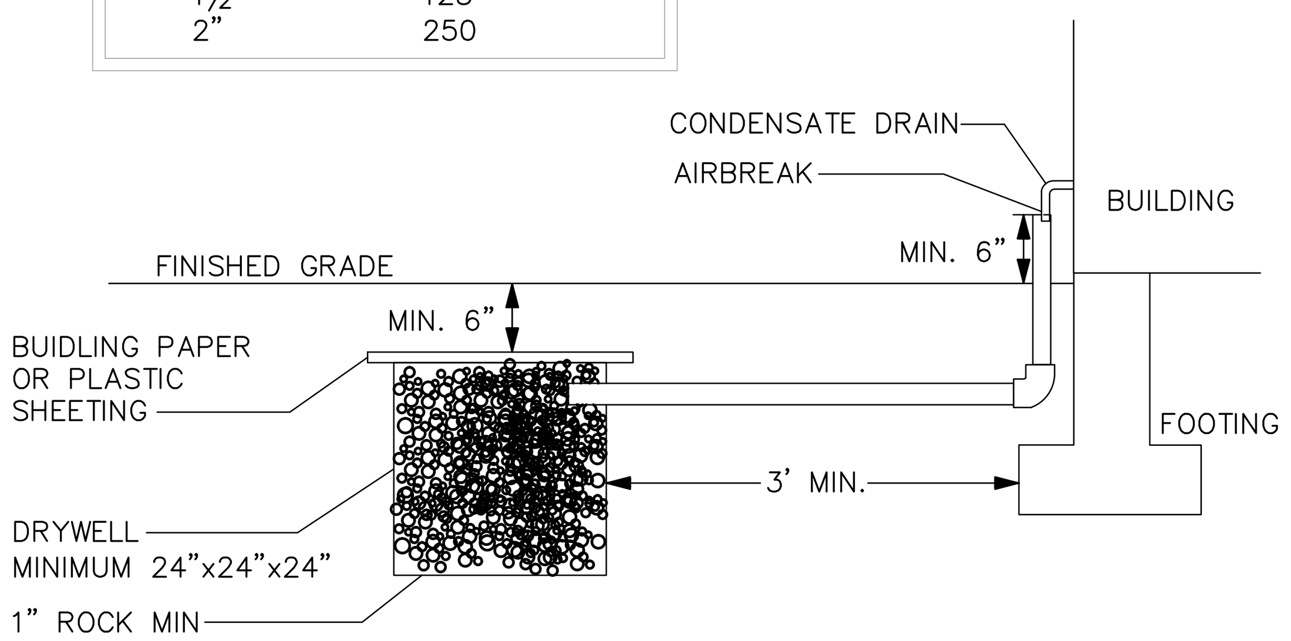
P600

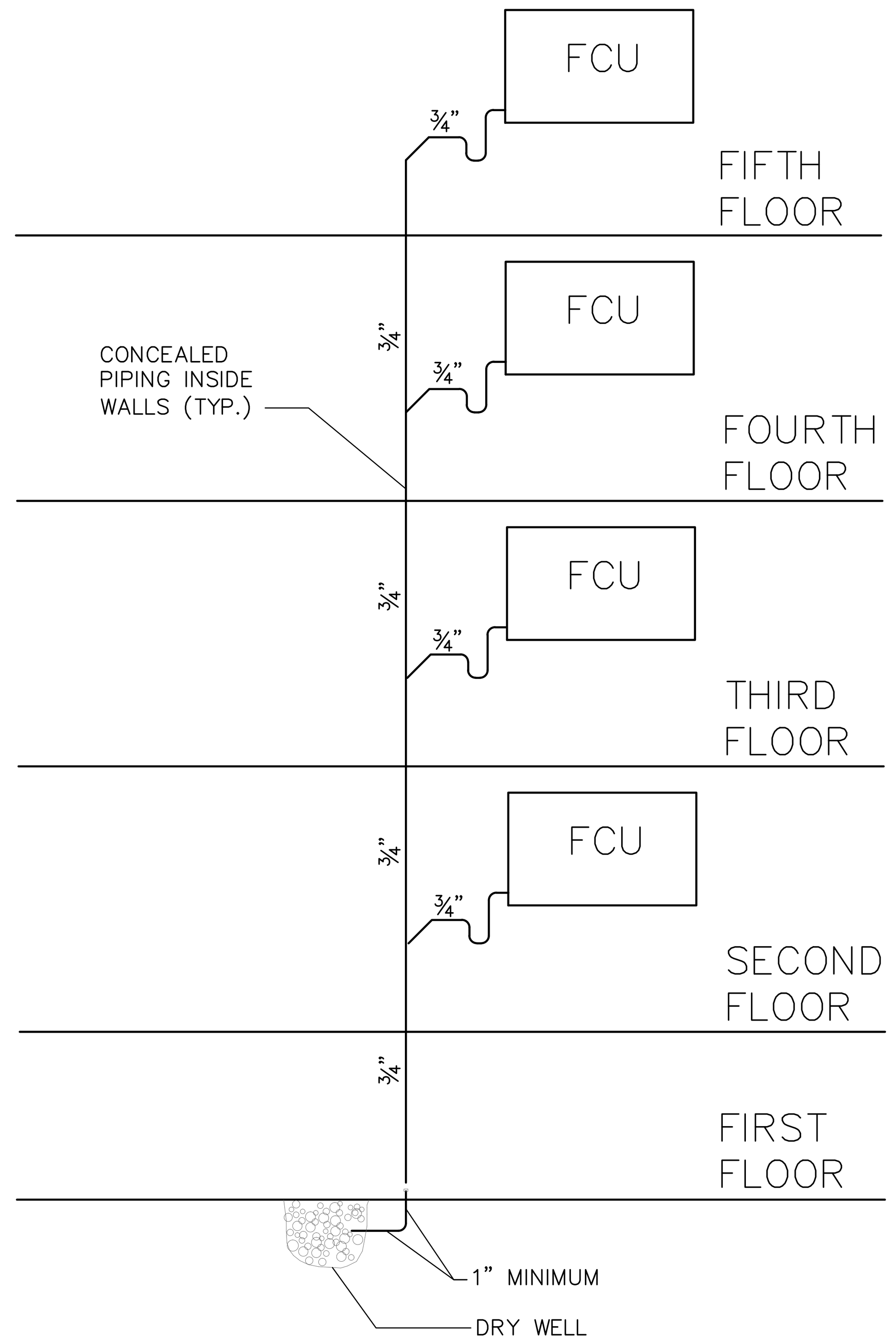
NOTE:

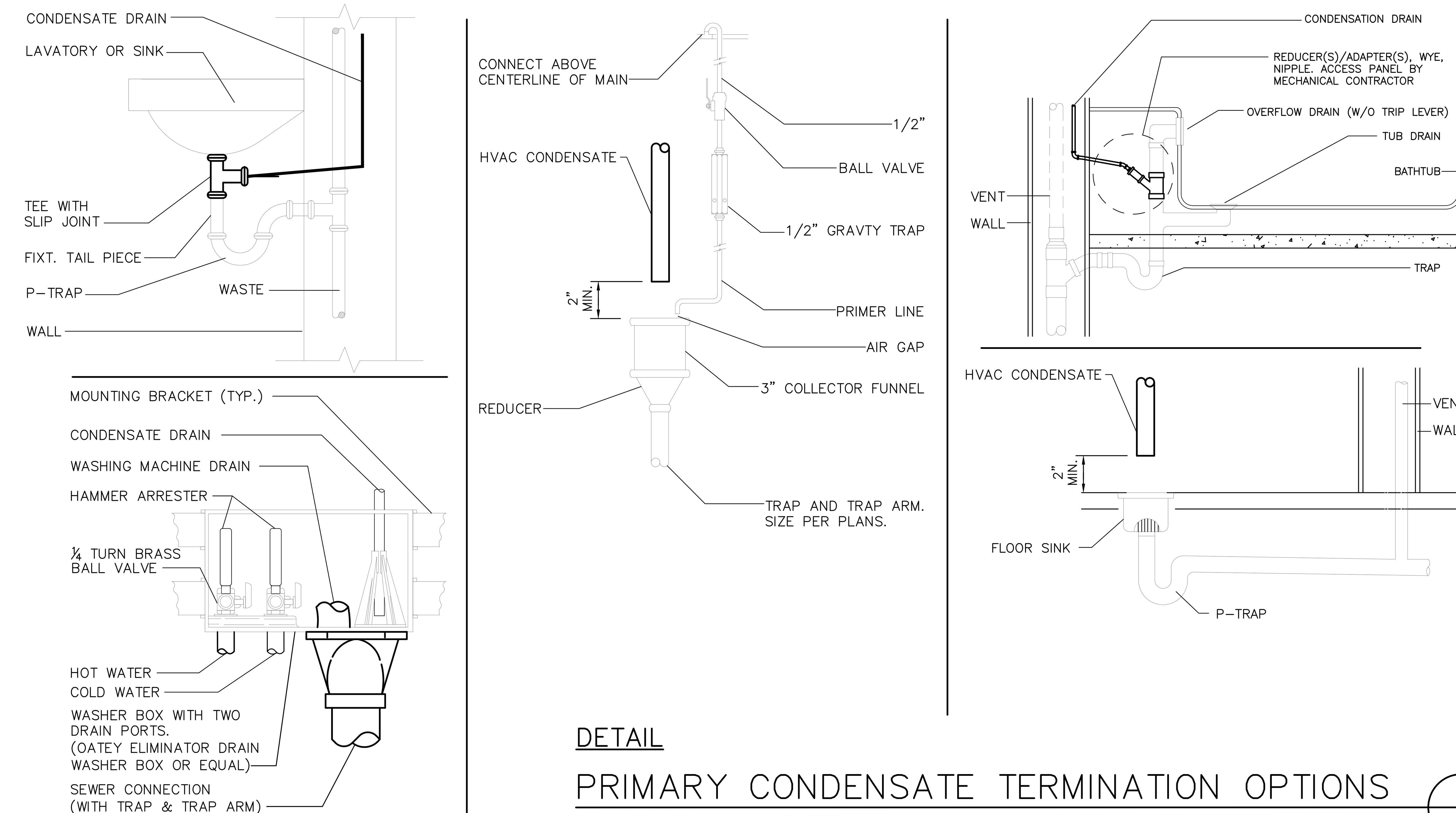
1. PER 2016 CPC SECTION 814.6 (AND 807.2 UPC) WHERE CONDENSATE WASTE FROM AIR CONDITIONING COILS DISCHARGE BY DIRECT CONNECTION TO A LAVATORY TAILPIECE OR TO AN APPROVED ACCESSIBLE INLET ON A BATHTUB OVERFLOW, THE CONNECTION SHALL BE LOCATED IN THE AREA CONTROLLED BY THE SAME PERSON CONTROLLING THE AIR CONDITIONING SPACE.
2. ROUTING OF CONDENSATION DRAIN IS NOT SHOWN ON THE PLANS. CONTRACTOR SHALL FIELD TERMINATE CONDENSATION DRAIN. REFER TO 2015 UPS TABLE 814.1 FOR PIPING SIZING. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL CONFIRM ROUTING OF CONDENSATION DRAIN WITH MECHANICAL CONTRACTOR & PLUMBING INSPECTOR.

CONDENSATE PIPE SIZING
PER 2015 UPC TABLE 814.1

PIPE SIZE	CAPACITY (TONS)
¾"	20
1"	40
1¼"	90
1½"	125
2"	250







DETAIL

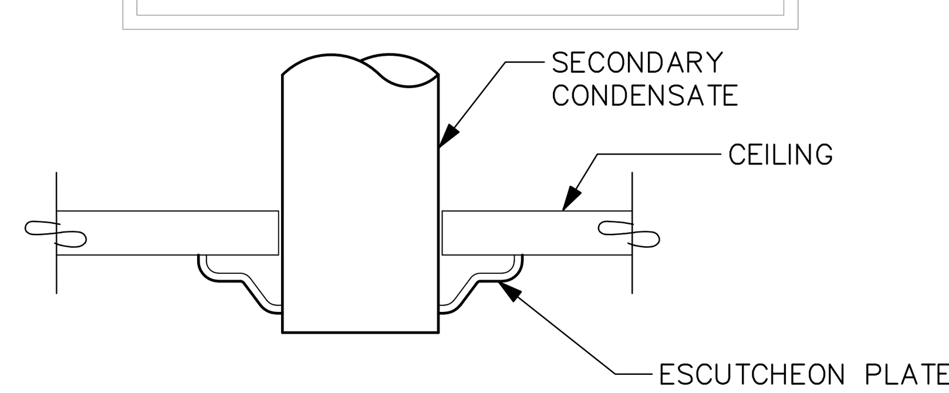
PRIMARY CONDENSATE TERMINATION OPTIONS 1 P601

SCALE: NONE

NOTES

1. PROVIDE SECONDARY DRAINS AS REQUIRED PER SECTION 307.2.3 OF THE 2015 IMC.
2. FOR CONCEALED FAN COIL UNITS TERMINATE SECONDARY DRAIN ON CEILING ABOVE LAUNDRY TRENCH, OR MECHANICAL ROOM.
3. SECONDARY CONDENSATE DRAIN IS NOT REQUIRED FOR PTACS AND FAN COIL UNITS WITH FLOAT SWITCH THAT SHUTS DOWN THE EQUIPMENT BEFORE THE PAN OVERFLOWS.
4. PROVIDE CONDENSATION PUMP AS NECESSARY.

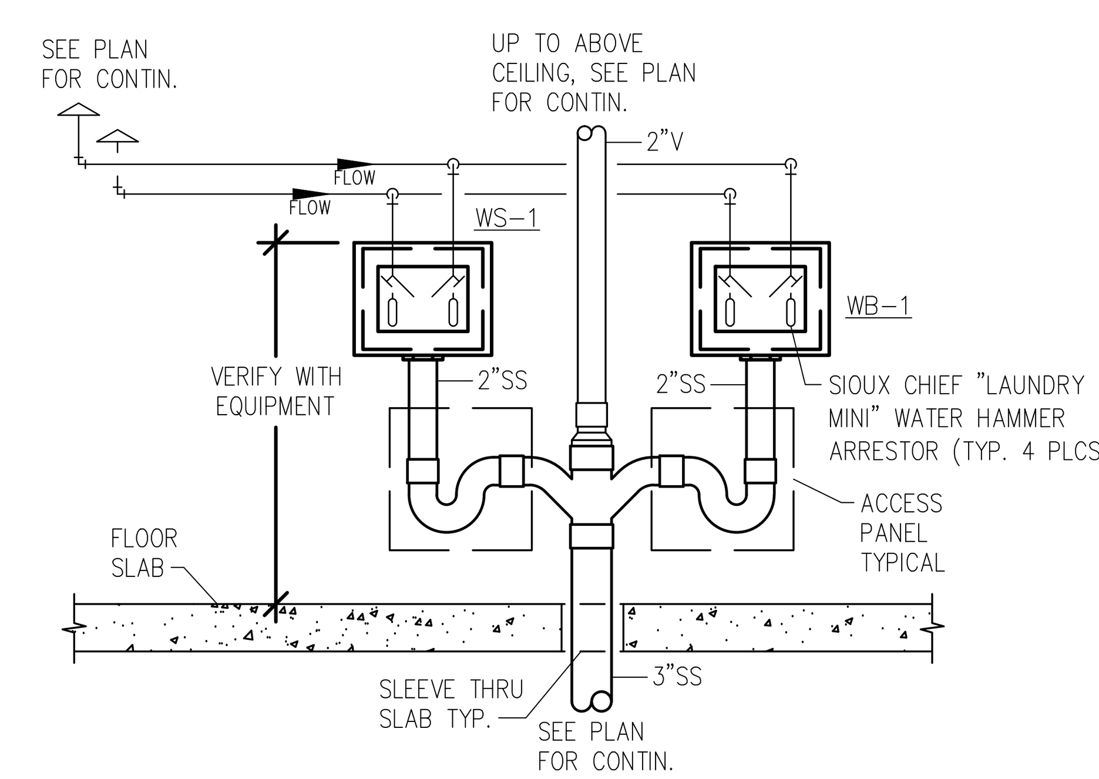
NOTE: COORDINATE LOCATION OF HVAC UNITS WITH MECHANICAL DRAWINGS. ROUTE SECONDARY CONDENSATE TO TERMINATE AT CEILING ABOVE BATHTUB.



DETAIL

SECONDARY CONDENSATE TERMINATION 2 P601

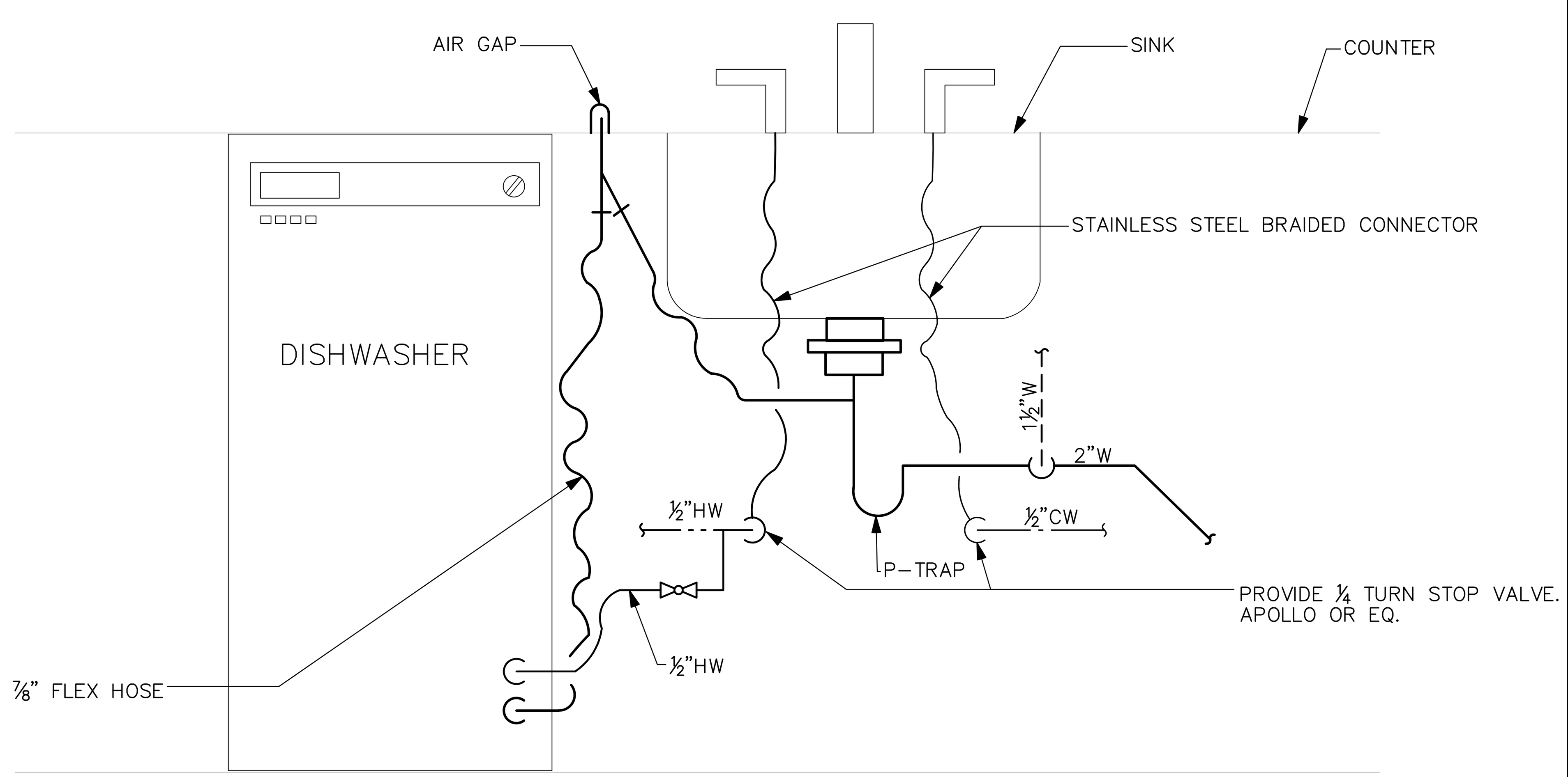
SCALE: NONE



WASHER SUPPLY AND DRAIN

DETAIL 3 P600

SCALE: NONE



DETAIL

RESIDENTIAL DISHWASHER CONNECTION 3 P601

SCALE: NONE

TAS
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DETAILS & DIAGRAMS

P601