Governing Codes and Standards:

- 2018 International Building Code (and local amendments)
- 2018 International Residential Code (and local amendments) Routt County Zoning Regulations
- "Minimum Design Loads for Buildings and Other Structures" ASCE 7-16
- "Steel Construction Manual" AISC Fourteenth Edition
- "National Design Specification for Wood Construction" ANSI/AF&PA-NDS 2018 G. "Building Code Requirements for Structural Concrete" - ACI318-14

<u>Design Loads</u>

Building Risk Category:

Floor Load:

A. Live Load (Light Storage) B. Dead Load

NOTE:

ONLY FLOOR LOADS WERE ANALYZED AS PART OF THIS PROJECT TO INSTALL FOOTINGS UNDER AN EXISTING LOAD BEARING WALL. NO ANALYSIS WAS DONE ON THE EXISTING ROOF STRUCTURE OR EXISTING STEEL BUILDING

Project General Notes

- A. Material and design specifications cited herein shall be those conforming with the version of the applicable specification or code most recently adopted by the permitting authorities. These structural notes are to be used as a supplement to the specifications, unless noted otherwise.
- B. Refer to the architectural documents for all dimensions not shown on the structural contract documents. Do no scale the structural contract documents.
- C. The general contractor shall verify all dimensions, elevations, and conditions with architectural, mechanical, electrical, plumbing, and civil drawings and notify the architect/engineer of any discrepancies or inconsistencies.
- D. The size, weights and locations of all equipment pads, roof mounted mechanical units, and penetrations required for mechanical, electrical, and plumbing work shall be verified by the contractor. All penetrations are subject to approval by the architect/engineer.
- E. Any contractor inducing loads on the structure not specified on the contract documents must obtain approval from the architect/engineer prior to erection. Field alterations for any structural member shall not be executed without approval from the architect/engineer
- F. Architect/engineer's approval shall be secured for all substitutions.
- G. The structure and all of its parts must be adequately braced against wind, lateral earth, and seismic forces until the permanent lateral-force resisting systems have been constructed and all of its parts have been installed.
- H. Shop drawings, vendor drawings, or any material prepared and submitted by the contractor or subcontractor are not considered part of the structural contract documents. Any engineering design provided by others and submitted for review shall bear the seal of an engineer registered in the state where the project is being built.
- I. During construction the contractor may encounter existing conditions which were not known during design or are at variance with the project documentation. Such conditions may interfere with new construction, require protection and/or support of existing work, or may consist of damaged or deterioration of structural materials/components which could jeopardize the structural integrity of the building. The contractor shall notify the engineer of record of all discoveries he believes may interfere with proper execution of the work or jeopardize the integrity of the building prior to proceeding with work related to such discoveries.
- J. The structural engineer shall not have control or charge of and shall not be responsible for construction means, methods, techniques, sequences, procedures, nor
- K. The structural drawings have been prepared using available information regarding the existing conditions. No attempt has been made to verify any existing conditions against information provided by others. The contractor shall compare the existing documents and notify the architect of any differences before proceeding with work.
- L. Items, in the opinion of the contractor, that appear to be deficiencies. omissions, contradictions, or ambiguities in the plans and / or specifications shall be brought to the attention of the structural engineer. Plans and / or specifications will be corrected or written interpretations of the alleged deficiency, omission, contradiction or ambiguity will be made by the structural engineer. Work shall not proceed in these areas before a response in received from the structural engineer.
- M. All products and materials used by the contractor shall be installed in strict accordance with the manufacturer's instructions.
- N. The general contractor shall determine from the local building official when the permit is obtained whether any letters of construction compliance will be requested from the structural engineer, if so, the contractor shall notify the engineer in writing before the start of construction.
- O. Provide passive radon gas control system per IRC AF103 on new single family homes - Install passive submembrane depressurization system during construction.

<u>Foundations</u>

- A. Foundations designs are based on owner accepted recommendations provided by NWCC, INC. in soils report No. 20-11872, dated June 20th, 2020.
- B. Spread footing foundation designs are based on the following: Maximum Bearing Pressure = 3,500 psf 2. Minimum Bearing Pressure = 900 psf
- C. All over excavation and fill shall be placed per the soils report.
- D. All foundations and slabs shall be placed on undisturbed or compacted control fill as per the soils report.
- E. All forms and organic debris shall be removed prior to backfilling.
- F. The owner must be willing to accept risk of potential movement per soils

Concrete - Cast-In-Place

A. Structural concrete shall be type 1, and have a minimum 28 day strength of 3,000 psi, exterior concrete slabs shall be type 1 and have a minimum 28 day strength of 4,000 psi. All concrete shall have a min 6% (+/- 1.5%) entrained air for durability and a 4" (+/- 1") slump. The maximum aggregate size shall be 3/4". Concrete shall not be placed on frozen ground and shall be protected from freezing for a minimum of 7 days. During cold weather the methods and specifications set forth in ACI318-14 shall be followed to prevent frost

B. All concrete work shall conform to the requirements of ACI318-14 and 301, latest edition.

- C. All exposed edges shall have a 3/4" chamfer.
- D. Concrete shall be adequately consolidated/vibrated during placement to ensure it is thoroughly placed around all reinforcing steel and embedded fixtures.
- E. Unless noted otherwise, slabs, footings, and walls shall not have any horizontal 'cold joints. All construction joints shall be detailed or reviewed by the engineer of record.
- F. Interior concrete slab finish shall be steel trowel finished and exterior concrete slabs shall be broom finished.
- G. All concrete shall be normal weight aggregate unless noted otherwise.
- Concrete topping for metal decks shall not include any add mixtures containing chloride
- All lightweight aggregate concrete shall have a maximum unit weight of 110 pcf. Concrete Reinforcing Steel:
- A. Reinforcing bars shall conform to ASTM spec. A615-79 and shall be grade 60.
- B. At splices, lap bars a minimum of 38 diameters. At corners and intersections, make horizontal continuous or provide matching corner bars. Around openings in walls and slabs, provide (2) #5 bars extending a minimum of 2 feet beyond the edge of any openings in concrete walls and slabs which are greater than 1'-6" in any direction. Continuous top bars in walls shall be spliced at mid-span. Continuous bottom bars in walls shall be spliced at supports
- C. Welded wire fabric shall conform to ASTM 185 and shall be lapped one full mesh at splices and tied together.
- D. Concrete reinforcing steel shall conform with ASTM A615 deformed grade 60 (weldable reinforcement shall be ASTM A706, grade 60) unless noted otherwise.
- E. Place $2'-0'' \times 2'-0''$ bars at corners and intersections for walls and foundations equal in
- F. All reinforcing steel shall be detailed, fabricated and placed in accordance with ACI
- detailing manual 315.
- G. All reinforcing steel shall be accurately and securely placed.

size and number to horizontal reinforcing, unless notes otherwise.

- H. Minimum cover from concrete surfaces to reinforcing steel shall conform to ACI318-14, 7.7 unless a greater cover is required and shall be:
- 1. 3" to bottom of footing/grade beams cast against earth
- 2.2" to earth face or exposed face of wall for No. 6 bar \$ greater 3.1½" to earth face or exposed face of wall for No. 5 bar \$ smaller
- 4.1%" to inside face of wall
- 5.1%" to inside faces of main beams and columns
- 6.1" to top and bottom of concrete slab surfaces of slab-on-grade
- 1. Start first rebar 3" in from the edge, where slab rebar is called out as On-Center (O.C.) spacing.
- J. All welded wire fabric shall maintain a minimum lab splice of 6".
- Install rebar chairs with appropriate material for anticipated concrete exposure
- L. Concrete foundation walls shall be dampproofed on the exterior surface with either bituminous material, acrylic modified cement (3 lb/sq, yard), or surface-bonding mortar ($\frac{1}{8}$) thick), per IBC 1805.2.2

Post Installed Anchors

- A. Expansion anchors shall be ICC-approved (zinc plated in accordance with ASTM B633, hot-dipped galvanized in accordance with ASTM A153, AISI 304 stainless steel) and conform with FS-S-325, group II, type 4, class 1
- B. Expansion bolts called for on the drawings shall be Simpson "Weg-All", "Strong-Bolt 2" or approved wedge type anchors with the following minimum embedment's: $\frac{3}{2}$ " diameter bolts - $3\frac{5}{8}$ ", $\frac{5}{8}$ " diameter bolts - $2\frac{3}{4}$ ", $\frac{1}{2}$ " diameter bolts - $2\frac{1}{4}$ "

C. Adhesive anchors shall be ICC-approved and shall consist of all-thread anchor rod, nut

- washer and adhesive capsule. Anchor rods shall comply with ASTM A307. (not used at PT
- D. All epoxy shall be Simpson "Set-XP" and shall be installed per the "Anchoring and Fastening Systems for Concrete and Masonry" Simpson Catalog #C-A-2018 by a qualified
- E. Heavy duty screw anchors shall be stainless steel: Simpson Titen HD or approved equal. Structural Wood Framing
- A. Unless noted otherwise, all 2" lumber shall be Douglas-Fir S4S No. 2 and better. All solid timber beams and posts shall be DF-1 No. 1 or better B. Unless noted otherwise, minimum nailing shall be provided as specified in table No.
- for Structural Members", of the 2018 IRC. C. Wall and floor sheathing shall be APA rated with exterior glue and graded in accordance

2304.10.1, "Fastening Schedule", of the 2018 IBC or table No. R602.3(1), "Fastener Schedule"

- with APA standards. Panel identification and thickness shall be as noted on the drawings. D. Where light gauge framing anchors are shown or required, they shall be Simpson
- type of fasteners recommended by the manufacturer to develop the rated capacity. E. Floor joists shall be plant fabricated I series with LVL or solid wood flanges and plywood or OSB webs, and shall carry ICBO approval for a complete section. Joists shall be designed to carry full live and dead loads of the roof(s), floor(s), and any superimposed

"Strong Tie" (or equal approved by ICBO). they shall be installed with the number and

- F. Roof overframing shall be 2x6 rafters @ 24" o.c. w/ 2x6 studs @ 24" o.c. to stack over rafters or purlins below.
- G. All members 3x or less (least dimensions) shall be kiln-dry with 19% moisture content,
- H. Provide solid blocking (same depth of member) at all points of bearing.
- I. All plates and ledgers in contact with concrete or masonry shall be pressure treated in accordance with AWPA standard C-2. Pressure-treated lumber shall bear the AWPB (American Wood Preservers Bureau) quality mark.
- J. Plywood sheathing shall be laid with end joints staggered.
- K. Block all shear wall sheathing with 2x6 flat blocking at all edges.
- L. Nailing indicated on plans and details are "common" nails as defined by the National Design Specification for Wood Construction (NDS), unless noted otherwise. The minimum nail sizes are as follows:
- $8d = 0.131'' dia \times 2\frac{1}{9}'' long$ 10d = 0.148" dia x 3" lona
- c. $16d = 0.162^{"} dia \times 3\frac{1}{2}^{"} long$

Structural Wood Framing Continued

- M. Lay out plywood to eliminate any width less than 1'-0'', except at plywood floors where minimum dimension shall be $2^{1}-0^{1}$, unless all edges of the undersized sheets are supported
- N. Oriented strand board conforming with IBC and manufactured with exterior glue may be substituted for plywood provided it has equal load/span rating index and bears the APA trademark of the American Plywood Association.
- O. Solid bridging at maximum of 8'-0'' on center shall be required where joists have a five-to-one or greater depth-to-thickness ratio and where one edge is not held in line by sheathing, wallboard, bracing, etc.
- P. Double up stude at corners of bearing walls, unless noted otherwise, see plans for bearing wall locations.
- Q. Provide (3) 2x studs nailed together under all bearing points of roof girder trusses, concentrated loads and beam bearings, unless noted otherwise. Studs shall extend from top of foundation to bottom of members.
- R. Contractor is to protect floor and roof sheathing from extreme wet conditions to limit movements due to expansion caused by moisture. Additionally, provide proper panel spacing per the American Plywood Association recommendations.
- S. Where pressure-treated plywood is indicated on the drawings, it shall conform with AWPA standard C-9 and shall exceed the AWPB (American Wood Preservers Bureau) apality
- T. Joists shall be treated if w/in 18" above arade \$ beams shall be treated if w/in 12"
- U. All lumber exposed to weather shall be naturally durable, preservative treated or pressure treated if not covered by a roof overhang or covering to prevent moisture or water accumulation on the surface.
- V. All fasteners (nails, screws, anchor bolts, etc.) in contact with pressure treated or FRT lumber shall be corresion resistant in accordance with IBC 2304.10.5.
- W. All connectors used with pressure treated material or exposed to weather shall be stainless steel or have a Simpson Z-Max/HDG coating or equal. All connectors exposed to the exterior shall be G185 galvanized or approved equal.
- X. Provide 2x6 blocking around all openings in roof. Nail the panels to blocking with 10d nails at 4" O.C around the opening. Provide 2x8 blocking around all openings in floors. Nail the panels to the blocking with 10d nail at 4" O.C. around the opening.
- Y. Provide solid blocking under all columns from top of foundation or beam bearing to the bottom of column or post.
- Z. Provide one $\frac{1}{4}$ "x3"x3" minimum galvanized plate washer (conforming to the 2018 National Design Specification Special Design Provisions for Wind and Seismic) under all shear wall anchor bolts. Plate washers shall extend to within $\frac{1}{2}$ " of the edge of the bottom plate on the side with shear wall sheathing. Where sheathing occurs on both sides of wall, stagger plate washers
- AA. All floor decking shall be glued and nailed to joists. All floor decking shall be tongue and groove with glued joints.
- BB. Engineered wood beams shall be as manufactured by I-level, or approved equal.

approved for rim joist applications.

CC. Glue laminated beams shall be as manufactured by Weverhaeuser, or approved equal. DD. All rim joists shall be as noted on plans and details. Rim material shall be ICC

ISTRUCTURE LEGEND ☐ = COLUMN BELOW = COLUMN ABOVE BEARING = COLUMN CONTINUOUS ARROW -THIS LEVEL RAFTER = JOIST = LEDGER = TYPICAL HEADER = CLOSURE WALL = HANGER → CLIP = TYPICAL 2X6 BEARING WALL = 2X4 OR 2X8 BEARING WALL = SHEAR WALL = BALLOON FRAMED WALL

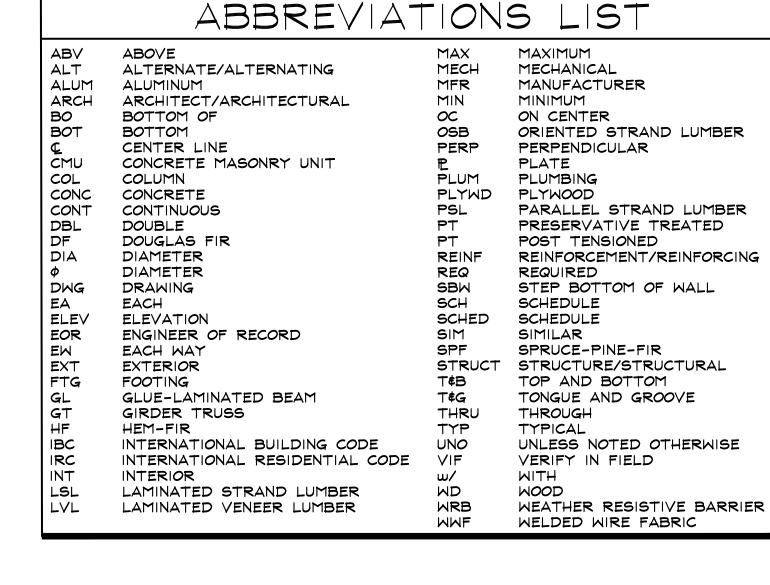
= ROOF OVERFRAMING

Structural Steel and Miscellaneous Iron

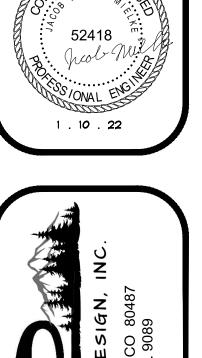
- A. Structural steel shall be detailed and fabricated in accordance with the latest version of the AISC manual of steel construction.
- B. All bolts, including anchor bolts, shall conform to ASTM spec. A307.
- C. Structural steel rolled shapes, including plates and angles, shall be ASTM spec. A570, gr. 50ksi.
- D. Field welded connections must be inspected by the engineer of record.
- E. Fillet welds indicated on the plans shall be of E70xx electrodes and shall be the minimum size specified in the AISC manual of steel construction, table J2.4. All other welds shall be made with E70xx electrodes.
- F. All welding shall conform to AWS specifications.
- G. All welds shall be performed by a certified welder under AWS specifications.
- H. Steel shall be thoroughly cleaned of mill scale prior to application of the primer in accordance with SSPC SP-3.
- I. All steel plates and angles in contact with concrete and exposed to weather shall have a protective coating as specified by the architect.
- J. Sections of equal or greater strength may be substituted subject to the enameer's written approval.
- K. Shop and erection drawings shall be submitted for engineers review prior to fabrication. Fabricator proceeds at his own risk without receipt of above review.
- L. The contractor shall coordinate with the mechanical drawings the location of all openings cut through the roof or floors.
- AISC specifications. N. Anchor rods are to be located by means of a template. Do not hand set or wet set.

M. All fabrication, erection, identification and painting of structural steel shall conform to

- O. Anchor rods and embedded items shall be set in accordance with the code of standard, practice section 7.5.
- P. All boits shall be snug tight, unless noted otherwise on the plans.
- Q. Anchor bolts shall conform with ASTM A307 or F1554 and shall be provided with plate washers and heavy hex nuts. Bolts in contact w/ pressure treated material or are exterior bolts shall be galvanized in accordance with ASTM A153, class C. Nuts shall be over-tapped to class 2A fit before galvanizing, in accordance with ASTM A563. Bolt heads or nuts bearing on sloping flanges shall be equipped with beveled washers.







UNITED STATES

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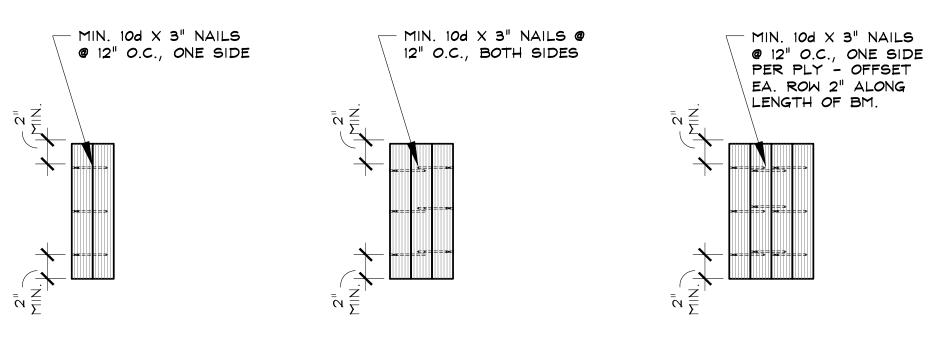
DRAWN BY: SWS REVIEWED BY: CW PROJECT # 22064 STRUCTURAL NOTES

REVIEWED FOR CODE COMPLIANCE

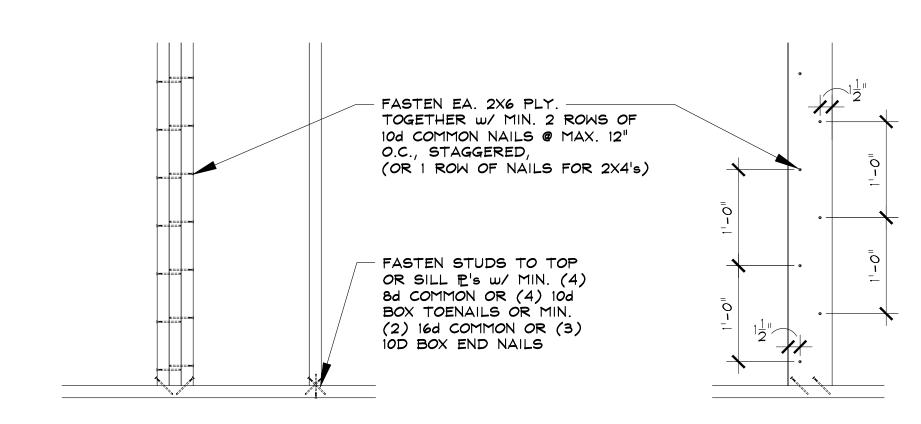
NOTE: ADHESIVE SHALL BE APPLIED BETWEEN EA. PLY

NOTE: ADD A ROW OF NAILS IF BEAM IS DEEPER THAN 14"

NOTE: IF USING 16d X 3" NAILS, CAN REDUCE BY A ROW

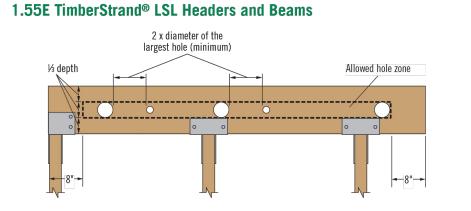


TYPICAL MULTI PLY BEAM FASTENING PER WEYERHAEUSER MARCH 2021 SPECIFIER'S GUIDE #TJ-4500 ADHESIVE SHALL BE APPLIED BETWEEN EA. PLY SCALE: 1/2" = 1'-0"



TYPICAL BUILT-UP WOOD COLUMN

ALLOWABLE HOLES



General Notes

- Allowed hole zone suitable for headers and beams with uniform and/or concentrated loads anywhere along member.
- Round holes only. No holes in headers or beams in plank orientation.

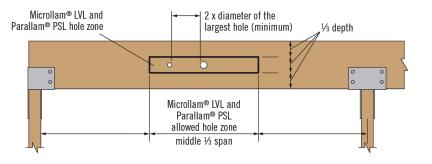
1.55E TimberStrand® LSL See illustration for allowed hole zone.

Allowed hole zone suitable for headers and beams

Microllam® LVL and Parallam® PSL Headers and Beams

composite lumber may be possible;

refer to Forte®WEB or Javelin® software.



General Notes

with **uniform loads only**. Round holes only. No holes in cantilevers.

No holes in headers or beams in plank orientation.

Microllam® LVL and Parallam® PSL Header or Beam Depth Maximum Round Hole Size

 See illustration for allowed hole zone. DO NOT cut, notch, or drill holes in headers or beams except as indicated in the illustrations and tables

REVIEWED FOR CODE COMPLIANCE 04/27/2023

SCALE: 1" = 1'-0"

ALLOWABLE HOLES IN LSL/LVL/PSL BMS. PER WEYERHAEUSER MARCH 2020 SPECIFIER'S GUIDE #TJ-9505

VERIFY WITH OTHER MANUFACTURER SPECIFICATIONS IF OTHER THAN WEYERHAEUSER JOISTS USED

DRAWN BY: SWS PROJECT # 22064



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REVIEWED BY: CWM

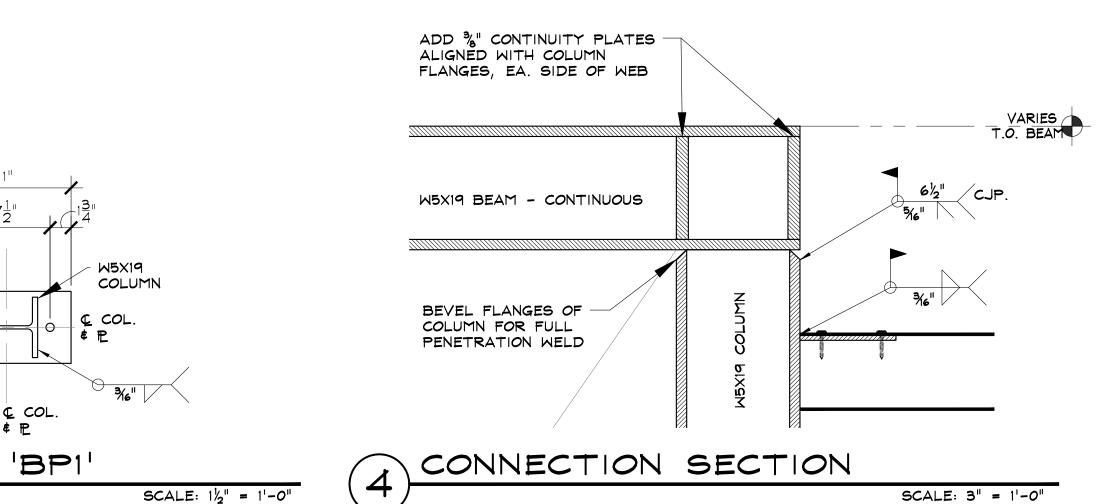
GENERAL WOOD FRAMING DETAILS

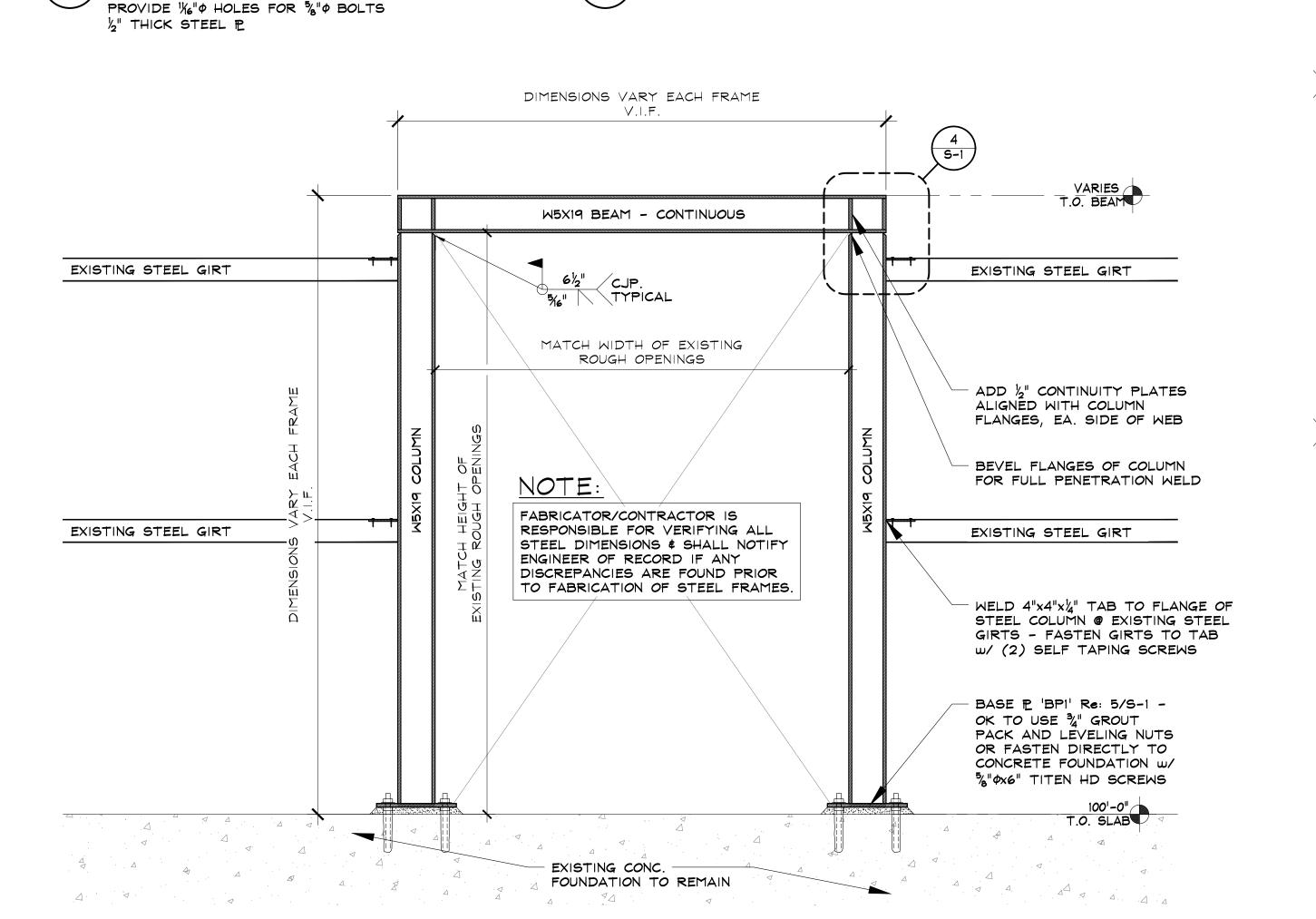
FOOTING NOTES

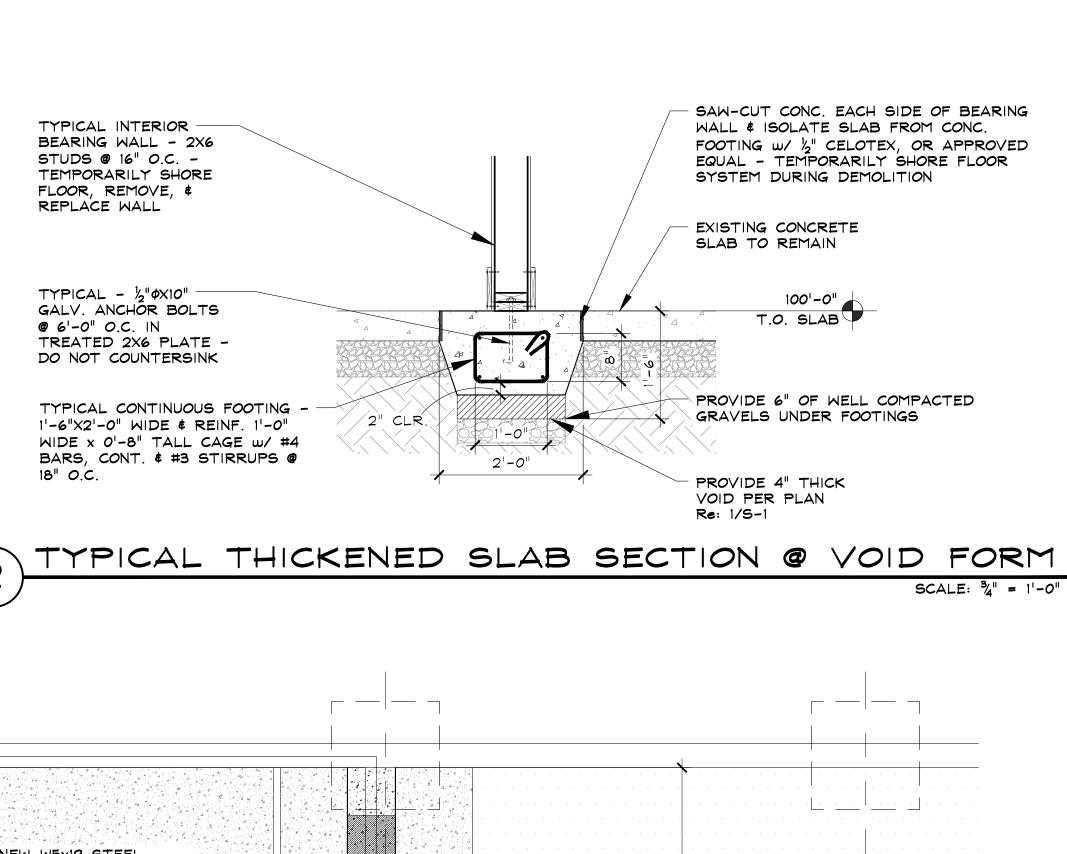
(ELEV)/ ELEVATION @ TOP OF CONCRETE FOOTING INDICATED THUS: ((ELEV)) 2. ELEVATION @ BOTTOM OF CONCRETE FOOTING INDICATED THUS: . SHAPE EXCAVATIONS FOR FOOTINGS & FLOOR SLABS TO ALLOW WATER TO FLOW TO LOW POINT Re: SOILS REPORT.

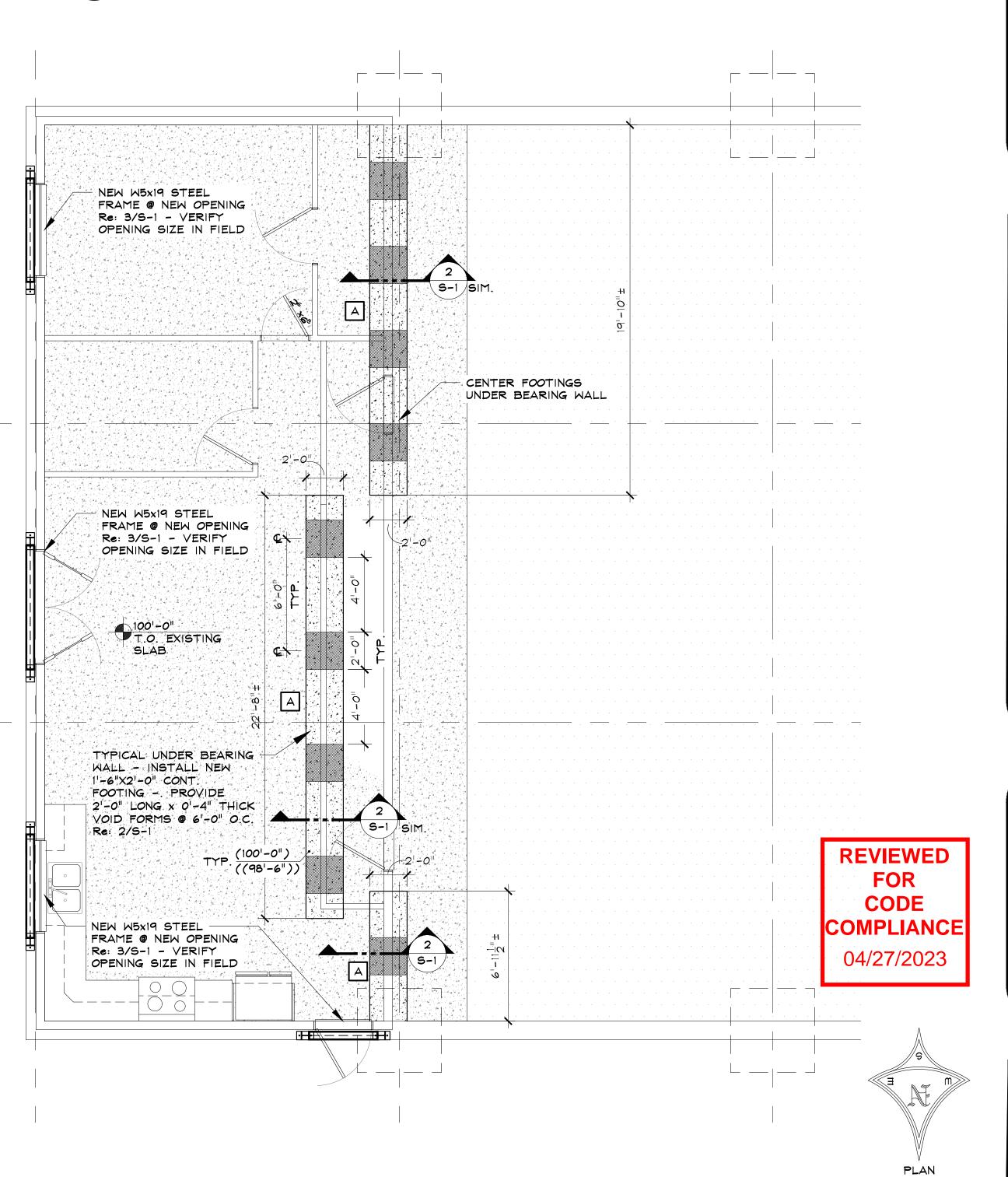
| FOOTING SCHEDULE | | | | |
|------------------|----------------------------|--|--|--|
| × MARK | SZE | REINFORCING | | |
| А | 1'-6" × 2'-0" × CONTINUOUS | 1'-0" WIDE X 0'-8" TALL CAGE w/ #4 BARS, CONT. \$ #3 STIRRUPS @ 18" O.C. | | |

SCALE: 1'' = 1' - 0''









STEEL FRAME SECTION

C COL.

BASE P

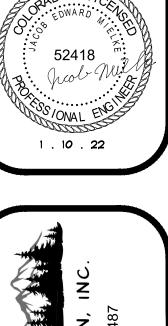
(8) EACH

PARTIAL FOUNDATION REPAIR PLAN

SCALE: 1/4" = 1'-0"

52418





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DRAWN BY: SWS REVIEWED BY: CWM PROJECT # 22064 FOUNDATION PLAN STEEL FRAMES, \$ FOUNDATION

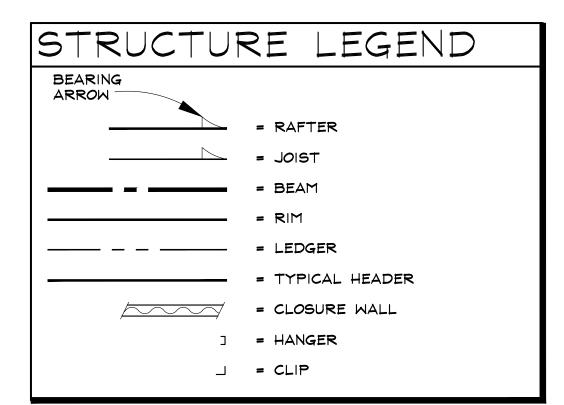


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REVIEWED . 10 . 23 REVISION 1 1 **FOR** CODE COMPLIANCE 04/27/2023

> DRAWN BY: SWS REVIEWED BY: CWM PROJECT # 22064 STORAGE FLOOR FRAMING PLAN

SCALE: $\frac{1}{4}$ " = 1'-0"



WALL KEY = EXISTING WALLS TO REMAIN - VERIFY/PROVIDE FIRE BLOCKING @ 4'-0" O.C. = EXISTING WOOD FRAMED WALL TO BECOME 1-HR FIRE RATED WALL - WALL IS LOAD BEARING = PROPOSED WOOD FRAMED 1-HR FIRE RATED WALL = EXISTING CONCRETE FOUNDATION TO REMAIN

FRAMING NOTES 1. PROVIDE $\frac{3}{4}$ " APA RATED EXPOSURE 1 T&G STURD-1-FLOOR SHEATHING 2. ELEVATION @ TOP OF BEAM INDICATED THUS: (ELEV) 3. COLUMNS THAT BEGIN THIS LEVEL ARE INDICATED ON PLAN. 4. TYPICAL @ MULTI-PLY BEAMS & HEADERS - FASTEN EA. PLY W/ADHESIVE & FASTENING PER 1/S-0.1 5. PROVIDE FIRE BLOCKING IN WOOD WALLS @ MAX. 4'-0" O.C.

| HEADER SCHEDULE | | | | | | | |
|---|------------------------|-------------------|-------------------|---------|--|--|--|
| MARK | SIZE | TRIMMER | KING | REMARKS | | | |
| H1 | MIN. (2) 11%" LVL's | (2) 2X6 OR 2x4 | (1) 2×6 OR 2×4 | TYPICAL | | | |
| NOTES: 1. HEADER SCHEDULE IS FOR ENTIRE PROJECT 2. N/A DENOTES HEADER IS NOT USED THIS SHEET 3. TRIMMER & KING STUDS ARE PER EA. END OF HEADER, U.N.O. | | | | | | | |

