

Village of Menomonee Falls

Commercial Building Plan Submittal List

The village of Menomonee Falls only accepts electronic submittals for commercial plan review.

1. The electronic copy of the cover sheet and associated calculations must be stamped with the seal & signature of the designer(s). When conditionally approved, the submitter is responsible to print and bind full plan sets as needed for the job site set and local building permit set.
2. One set of specifications, if not included on the drawings themselves, stamped with the seal & signature of the designer if the building volume exceed 50,000 cubic ft.
3. Completed application form SBD-118 with signatures as needed.
4. Fees as determined from schedule page 4 (use the lower chart) note the work sheet on page 6 adds \$100 to the fees.

NOTE; fees are to be made payable to the Village of Menomonee Falls and need to be paid before your plan will be submitted for review.

5. Sufficient calculations and information to substantiate that the documents conform to the code for structural, energy, and HVAC as appropriate.
6. The following is offered as a guideline of what may be needed for submittal and does not limit department authority to request additional information as necessary to determine code compliance.

FOOTING/FOUNDATION SUBMITTAL (Optional as separate submittal prior to full plans.)

A. Design Load Key Plan (Ensure thorough coordination of structural design before construction begins.)

1. Live loads.
2. Dead loads.
3. Wind loads.
4. Snow loads.
5. Seismic design category and design loads if seismic design category is other than 'A'.
6. Special loads (snow drift, equipment, steeples, shear walls, etc.).
7. Indication of load transfer down to the foundation.

B. Site Plan

1. Distances to property lines, existing buildings, streets, etc.
2. Pertinent recorded easements on adjoining property.
3. Type of construction and occupancies of existing buildings on this site within 60'.

C. Schematic Floor Plans, Elevations, Wall Sections

1. Exit stair and exit door locations.
2. Fire wall locations.
3. Window and fire department access openings.

D. Calculations or Reference Tables

See Section J under building submittal on following pages and Section F below.

If submitting reference tables, please highlight loading and member used in copy of that table.

E. Footing/Foundation Requirements

1. Soil properties (type of soil and bearing capacity of soil).
2. Footing and foundation sizes (width, length, thickness, depth below grade).

3. Reinforcing steel (location, size, grade, details of hooks and splices, etc.).
4. Anchor bolt sizes, locations, embedment length and type (hooked, tack-welded nut, etc.,), projections above top of footings/foundations, and calculated capacities of anchor bolts.
5. Retaining wall details as applicable (width, length, depth, and reinforcement).
6. Pile foundation details and determination of pile capacity using appropriate safety factors (type of piles used, depth, size, and material strengths), as applicable.
7. Consideration of special loads such as buoyancy and hydrostatic loads, as applicable.
8. Perimeter insulation and vapor retarders.
9. Blasting permits, if needed.

F. Footing Sizing Calculation

1. Calculation using critical load case for each different size footing shown on the plans.
2. If it is a pole building, then at least one sample pole embedment calculation must be shown for the side wall poles and end wall poles, as well as the footing sizing calculation for such poles.
3. Calculations must include a check of soil bearing capacity as well as shear and bending resistance of the footing.

BUILDING SUBMITTAL – (New and Addition)

A. Footing/Foundation Plans

See Sections E and F from footing and foundation submittals above.

B. Site Plans (plan size plus 8½" x 11" file copy for malls)

1. Distances to property lines, buildings, streets, etc.
2. Pertinent recorded easements on adjoining property.
3. Show type of construction and occupancies of existing building (s) being added onto or also located on
this site within 60'.
4. Barrier-free parking and access paths (include slopes).
5. Court widths and assumed imaginary lot line locations.
6. Site slopes for at least first 10 feet from building and site erosion and sediment control measures.

C. Floor Plans & Related Plan Sheets

1. Uses and sizes of rooms.
2. Exit location(s), exit lights, door swing directions, ramp, and stair details.
3. If partial automatic fire sprinkler coverage, show protected areas, type of system/design standard and required separations between sprinkler and unsprinkled protected areas.
4. Fire rated assemblies, including hourly rating, assembly source and design specifications; required for issues such as area limits, occupancy, class of construction, incidental uses, sprinkler limits (specify each as fire wall, smoke barrier, fire barrier, or fire partition).
5. Window and door information (sizes, fire ratings, safety glazing, undercutting, hardware, etc.).
6. Sanitary facilities (types, numbers, and locations).
7. Stair and shaft enclosures.
8. Type, amount, and location of hazardous materials and related control areas.
9. Smoke and carbon monoxide detectors.
10. Fire alarms.
11. Fire extinguishers.

12. Barrier-free requirements (see additional separate list).
13. Occupancy special requirements (usually in IBC Chapter 4).
14. Emergency egress lighting locations (see additional separate list).

D. Elevations/Sections

1. Footing, exterior grade, floor levels, and roof elevations.
2. Accessibility features
3. Exterior openings.
4. Egress details including stairs and areas of refuge.
5. Exterior finish and drainage planes.
6. Stair, ramp, handrail, and guard construction.
7. Headroom clearances.
8. Construction materials used (structure, insulation, vapor retarders, sheathings, and finishes).
9. Structural connections required for load transfer at members (hangers, clips, and fasteners needed).
10. Lateral load resisting elements (systems and details).
11. Structural loadings shown on the plans for vertical and horizontal applied loads and dead loads.
12. See separate structural lists below in Sections J, K, L, M, and N.

E. Fire-Resistive Details

1. Design and listing of walls, floor/ceilings, and roof/ceiling (if required to be rated).
 - a. Location and extent (horizontally and vertically).
 - b. Materials used in the assembly.
 - c. Assembly listing source (UL or Table 720.1(2) item#...).
 - d. Hourly rating (on plan and section/detail).
2. Complete section through the assembly (including required attachments).
3. Firestopping and fire safing.
4. Opening protective assemblies (label, size limits in IBC section 715).
5. Draftstopping (IBC Section 717).
6. Tested and listed fire-resistant joint assemblies between fire resistance rated assemblies (IBC 713).

7. Calculated fire resistance per IBC 721, include calculations and details of the assembly.

F. Building Envelope and Thermal Calculations – Note that these are considered a part of the building plan submission, not the HVAC plan, as building design determines the amounts and location of all building insulation; thus the building plans cannot be approved without this portion of the submittal.

1. Building envelope thermal compliance calculations.
2. Insulation amounts and location on plans must match the calculations.
3. Fenestrations (windows, doors, and skylights) must use default values or include NFRC test data.
4. Wisconsin also accepts thermal performance calculation generated by the COM check computer program for commercial buildings and residential building 4 stories above grade and taller. Wisconsin accepts the use of RES check program for residential buildings 3 stories or less above grade with 3 dwellings or more. These programs are available to be downloaded for free at: www.energycodes.gov.

G. Schedules

1. Door schedule with sizes, hardware, fire rating (if required), etc.
2. Window schedule with sizes and amount of openings.
3. Floor, ceiling, and wall finish schedule.

H. Miscellaneous Calculations:

1. Occupant load and exit width calculations, especially for large buildings.
2. Grade plane, height, and number of stories above grade plane.
3. Sanitary fixture determination, minimum number of each fixture type.
4. Hazardous materials control area quantities, if applicable.
5. Percentage of exterior openings relative to the floor area in all living spaces (specific to residential occupancies).
6. Exit distance or fire extinguisher distance calculations for large buildings.

I. Lighting Plans – See separate reminder list

J. Building Plan Structural Submittals:

1. Live loads (floor, roof, crane, partition, etc.).
2. Itemized dead loads.
3. Snow loads (including unbalanced and drifting).
4. Wind loads for main wind-force-resisting system and components and cladding loads.
5. Seismic design category and design loads if other than seismic design category 'A'.
6. Special loads (drifting snow, equipment, steeples, signs, shearwalls, etc.).
7. Continuous load transfer path to foundations – required connections and consideration for uplift and overturning.
8. Footing and foundation information noted in previous list Sections E and F.
9. All design loads shall be shown on the plans and within the calculations. Sample calculations submitted shall show how the design loads were calculated. The following information, as a minimum, must be provided on the plans and/or calculations in order to determine the snow, wind, and seismic design loads (where applicable):
 - a. Terrain category and minimum wind design speed
 - b. Exposure category and factors (snow & wind)
 - c. Importance categories and factors (seismic, snow & wind)
 - d. Soil site class determination
 - e. Seismic use group and design category
 - f. Design ground snow load, thermal factor and roof snow loadings
 - g. Component & cladding wind pressures

K. Framing (Floor and Roof Framing)

1. Member sizes, spacing, material properties, and bridging requirements.
2. Materials (wood, steel, trusses, pre-cast, etc.), applicable adjustment factors, and allowable stresses of materials used (bending, shear, compressive, etc.) shall be noted or in specifications.
3. Critical bearing, anchorage, and connections needed (when over code table minimum).

4. Shear wall details, if applicable, with at least: location, connector spacing, materials, design capacity of shear

wall, and connections of shear wall to roof diaphragm, drag struts, and footings/foundations.

5. Calculations verifying capacity of floor/roof joists and headers supporting joists.

6. Calculations verifying capacity of diaphragms (include any adjustments) or highlighted table.

7. Structural calculations corresponding to framing plans.

8. Stud and pole design calculations, as applicable.

9. Calculations for load transfer to foundations from roof and/or floor framing elements to the foundations,

including design of all transferring elements (i.e.: columns, foundations, etc.).

10. Typical (for each joist size/span) joist sizing calculations under the critical loading condition and typical

supporting member/element sizing calculation must be included in the submitted structural calculations.

Typical door/window header calculations taken at the worst case must be submitted. If diaphragm design is

utilized, then typical horizontal diaphragm and shearwall design calculations must be submitted showing loading is less than system design capacity for the system/materials and connections shown on the plan.

L. Masonry Construction

1. Compliance with all empirical masonry requirements or submitted engineered masonry calculations.

2. Masonry properties [material, thickness, and type (hollow or solid)].

3. Mortar type and properties of grout.

4. Lateral supports of masonry walls.

5. Reinforcement details (type, location, and strength).

6. Bonding requirements (type of bond and type of tie assemblies).

7. Anchorage of masonry to structural elements (for lateral support of masonry), roof or floor anchorage to

masonry bearing walls, and non-load bearing exterior or interior masonry anchorage to structural frame.

8. Details of bearing on masonry or of masonry bearing on other materials (type and size needed).

9. Veneer details (material, thickness, backing/bearing supports, attachment method, weeps).

10. If using engineered masonry, then complete masonry calculations shall be submitted.

M. Structural Component Plan Submittals - General

Structural components are those parts of a building structure that are typically pre-engineered and pre-manufactured

prior to arrival at the construction site. These may be submitted as a separate (delayed) submittal or may be included

with the architectural and foundation plans initially submitted. Components include:

1. Wood trusses.
2. Precast concrete.
3. Pre-engineered metal buildings.
4. Laminated wood.
5. Steel joist girders (and special loaded steel joists).
6. Structural steel.

The Division of Industry Services requires plans and calculations for these components to be submitted prior to their installation. All component plans submitted to the Department must be complete erection drawings "For Construction". There are two options available for component plan submittals:

1. Submit component plans with the building plans. If the component plans are submitted with the initial building plan set, then one component plan shall be attached to each building plan, creating full plan sets.
2. Since, in many cases, the manufacturer of the components is not known at the time of original plan submission, the component plans and calculations may be submitted at a later date. If this option is chosen, the following procedure must be followed:
 - a. Submit one set of a properly signed and sealed structural component plans and applicable calculations. The signature and seal on the component drawings is to be that of the component designer (not the building designer). A component designer need not be a state of Wisconsin registered professional.
 - b. Submit a completed SBD-118 application form and preferably a copy of the original building plan application form to the office designated in conditions listed in the building plan approval letter.
 - c. If different from the structural component designer and if the building is over 50,000 cubic feet in volume, the building designer indicate review of the plans by either providing an original signature on the component submittal line (line 9 b.) of the SBD-118 application form OR provide a statement on the component plans to the effect, "I have reviewed against my overall building design and intent and find the component plan acceptable" with the designer's signature. A signed cover letter to this effect is also acceptable. The original seal and signature of the building designer on component plans designed by someone else is NOT appropriate.
 - d. An identical component set (also bearing indication of review by the building designer) shall be maintained at the job site. It must be available to state or municipal inspectors and others who have need of this information. Designer should attach state letter of review (or non-review) to this set.

Owners and designers should also be prepared to present a third similarly noted component plan to the local authority when required by that municipality.

Specific Component Submittals

1. Wood Truss Submittals

- A. Truss plans – Individual truss plans for each truss type/designation including the following:
 - a. Truss geometry and member locations:
- B. Truss shape, member configuration, and member and bracing sizes.
- C. Truss pitch, span and joint locations.
- D. Bearing locations and sizes.
- E. Truss spacing, number of truss plies, and required connections between plies or truss types such as piggyback trusses.
- F. Metal connector plate type, size/gage, location, and orientation.
- G. Permanent bracing requirements (individual members and/or continuous lateral bracing).
- H. Truss material and manufacturing specifications.
- I. Lumber species and grade of truss and bracing members.
- J. Metal connector plate capacity OR material approval number (WI material approval or independent third-party evaluation service approval ie. ICC ES). The plans shall also include all information required by the WI or third-party approval.
- M. Fabrication tolerance or quality control factor, C_q, per ANSI/TPI I-2002.
- N. Other connector specifications – size, strength and number of bolts, nails, or other timber connectors.
- P. Calculations:
 - a. Applicable design loads (dead, live, snow, wind, and special loads [snow drift, equipment, etc.]).
 - b. Calculation of member loads and stresses including applicable adjustment factors for wood design
 - c. considering all applicable loading conditions and combinations.
 - d. Combined stress index of less than or equal to 1.0 for applicable members.
 - e. Vertical and horizontal reactions at bearing locations.
 - f. At least one of the following:
 - g. Calculations to determine the allowable capacities of nails, bolts, or other timber connectors.
 - h. A report of test results to determine metal connector place capacities.
 - i. A metal plate connector material approval number, which provides the plate capacities(WI material approval or independent third-party evaluation service approval i.e. ICC ES).
 - j. At least two of the following:
 - i. Required metal connector plate area (or number of nails, bolts, etc.) for each member at each joint.
 - ii. The metal connector plate area (or number of nails, bolts, etc.) for each member at each joint.
 - iii. The Joint Stress Index (JSI) for each joint which must be less than or equal to 1.0 component designer considering all applicable loading conditions and combinations, i.e. truss or joist hangars for jack trusses, connection of piggyback trusses, etc.

Q. Analysis and design of all connections between members and trusses supplied by the component designer considering all applicable loading conditions and combinations, i.e. truss or joist hangars for jack trusses on girder truss, connection of piggyback trusses, etc.

2. Precast Concrete plan requirements

- A. Width, depth/thickness, lengths, and camber of precast member.
- B. Strand or reinforcement sizes, locations, and concrete cover thickness.
- C. Embedment's for connections to other structural members/systems.
- D. Stirrup sizes and locations, if required.
- E. Bearing and anchorage conditions/details (clearly show restrained or non-restrained ends in accordance with ASTM E119).
- F. Fire resistive rating of pre-cast members based on restraint condition, if applicable.

3. Metal building plan requirements

- A. All primary and secondary member (beam/rafter, column, girt, purlin, bracing, etc.) locations, designations, and material specifications/properties for all structural members.
- C. Details of all connections of primary and secondary structural members and components and cladding.
- D. Critical dimensions and section properties for all structural members including webs and flanges
- E. of frame members at the base, haunch, ridge, and any other location where member size changes.
- F. Providing part numbers or designations without section properties is not sufficient information.
- G. Vertical, horizontal, and moment reactions at all bearing locations.
- H. Connection to the foundation required to safely transmit applied loads.

4. Laminated wood plan requirements

- A. Width, depth/thickness, length, and camber of members.
- B. Lumber species and grade or specification of member combinations of all members.
- C. Sketch showing member geometry.
- D. Bearing locations and vertical, horizontal, and moment reactions.
- E. Adjustment factors used in design (load duration, wet service, repetitive member factors, etc.).
- F. Bearing and anchorage conditions/details.

5. Steel joist girder plan requirements

- A. Depth and camber of girder trusses.
- B. Span of girder trusses.
- C. Sketch showing girder truss geometry, connections, member sizes, and material properties.
- D. Joist girder designation per Steel Joist Institute.
- E. Bridging sizes, locations, connections and material properties.

6. Structural steel plan requirements (if not fully designed and detailed including connections on the building plans or the structural steel framework plans submitted in advance of the architectural plans)

- A. Plans shall show the size, section, material grade, and location of all members, floor levels, column centers and offsets, and member camber.
- B. Plans shall also show the location of and provide details for wind bracing, welded and bolted connections, column and bearing stiffeners, web reinforcement, etc.
 - a. Bearing and anchorage conditions/details and vertical, horizontal, and moment reactions.
 - b. Clearly show number and location of bolts or size and type of welds.
- C. Structural steel shop drawings, signed and sealed by the building designer of record or the structural steel fabricator if appropriately registered, and when the building volume exceeds 50,000 cubic feet will be considered sufficient plans for structural steel component submittal.
- D. Structural calculations should pay particular attention to any rack storage system that imparts loads to the steel members/supports of the building or supports the building (consult the Rack Manufacturers Institute standard for scope and design information).

BUILDING SUBMITTAL- Initial Tenant Space Alterations. – See IEBC Check list for subsequent tenant space alterations, and other alterations or changes of use.

A. Tenant Space Plans

1. Schematic plan indicating existing conditions (this plan should show the complete existing facility):
 - a. Complete building exiting plan showing all common exits and stairways.
 - b. All fire-resistive walls (ratings and locations).
 - c. Location and number of public sanitary facilities.
 - d. Location of project within the building.
2. Pertinent documents (such as code variances previously approved and condition of past plan approval that restrict this space or other spaces that affect or are affected by this space).
3. Building submittal requirements (all applicable items from previous building submittal list)