DEPARTMENT OF SAFETY AND INSPECTIONS
Ricardo X. Cervantes, Director

CITY OF SAINT PAUL
Christopher B. Coleman, Mayor

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GARAGE INSPECTION PROCEDURE

(YOUR INSPECTOR'S NAME AND PHONE NUMBER IS INDICATED ON THE PERMIT CARD)

1. **Footing / Concrete Slab-**
   To be made after all form work is set up and reinforcement is in place, but ***PRIOR TO POURING OF CONCRETE***. Property owner/contractor is responsible for providing proof of property boundaries by locating existing property markers or by a registered land surveyor.

2. **Framing-**
   To be made after all framing, blocking, bracing, bolts, and rough electrical (if applicable see electrical handout attached) are in place and secured. Engineered certified truss drawings shall be on site at the time of inspection.

3. **Fire Rated Wall Assembly (if applicable)-**
   To be made after all Fire-Resistive materials are in place and before the sheathing and siding is placed on the exterior of the rated wall.

4. **Final-**
   To be made upon completion of the garage and finish grade.

5. **Other Inspections-**
   In addition to the inspections above, the inspector may make or require other inspections to ascertain compliance with the provisions of the code or to assist you with questions or concerns during the construction process.

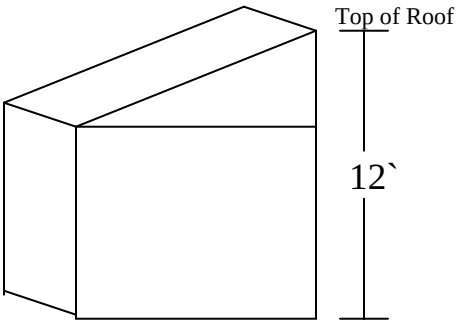
ELECTRICITY IN YOUR NEW GARAGE?

AN ELECTRICAL PERMIT IS REQUIRED. SEE SEPARATE HANDOUT ATTACHED.

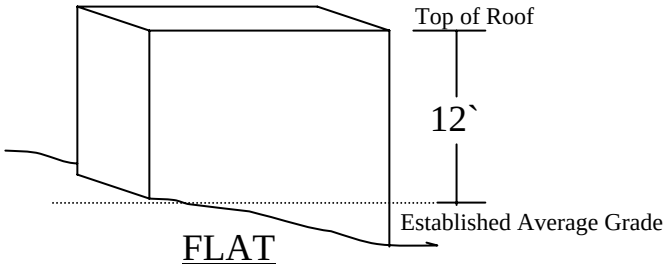
Any electrical questions, please call, 651-266-9003.

Building Height Measurements (63.501)

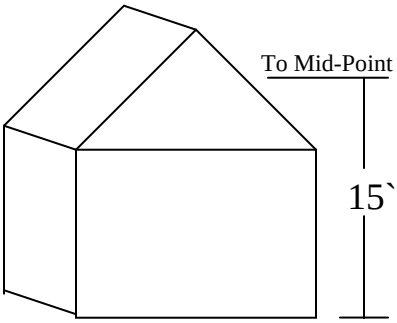
(Detached Garages and other Accessory Structures.)



SHED



FLAT



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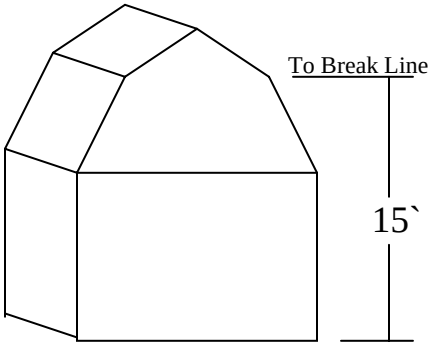
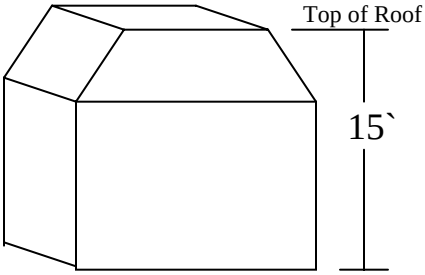
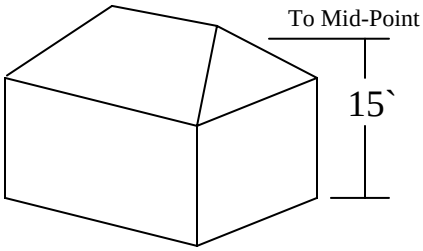


GAMBREL



MANSARD



HIP

(Sec. 60.203) Building height. The vertical distance measured from the established grade to the highest point of the roof surface for flat and shed roofs; to the break line of mansard and gambrel roofs; and to the average height between eaves and ridge for gable and hip roofs. Where a building is located on sloping terrain, the height may be measured from the average ground level of the grade at the building wall. The existing grade of the property may not be raised around a new building or foundation in order to comply with the height requirements of this code. When there is a dormer build into the roof, the height is measured to the midpoint of the dormer roof if the dormer(s) exceeds fifty (50) percent or more of the width of any side of the building.

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DETACHED GARAGES
SHEDS & RESIDENTIAL ACCESSORY STRUCTURES
(Sec. 63.501 Accessory buildings)

1. Accessory buildings, structures or uses shall not be erected in or established in a required yard except a rear yard. Passenger vehicles may be parked in front yards providing they are located on an approved driveway that leads to a legal parking space.

On corner lots, accessory buildings, structures or uses shall be set back from the street a distance equal to that required of the principal structure.

When an accessory building, structure or use is constructed in a rear yard which adjoins a side yard or front yard, the accessory building, structure or use shall be set back from the interior lot line a distance equal to the minimum side yard required of the principal structure.

On all other lots, accessory buildings shall be set back at least three (3) feet from all interior lot lines, and overhangs shall be set back at least one-third (1/3) the distance of the setback of the garage wall or one (1) foot, whichever is greater.

This setback requirement from all interior lot lines for accessory buildings in rear yards shall be waived when a maintenance easement is recorded as to the affected properties, when proof of such recorded easement is provided at the time of application for a building permit and when the accessory building is located at least three (3) feet from any building on an adjoining lot. The recording of the maintenance easement shall be interpreted to mean that the following intents and purposes of this setback requirement are met:

(a) Adequate supply of sunlight and air to adjacent property;

(b) Sufficient space for maintenance of the building from the same lot; and

(c) Prevention of damage to adjoining property by fire or runoff from roofs.

A recorded common wall agreement is permitted in lieu of a maintenance easement if the accessory structure is attached to an accessory structure on an adjoining lot.

2. In any residential area, accessory buildings shall not exceed fifteen (15) feet in height; provided, however, that accessory buildings with a flat or shed roof style shall not exceed twelve (12) feet in height. Carriage house dwellings shall not exceed twenty-five (25) feet in height.

Exception: Accessory building heights shall not apply to property within designated heritage preservation districts or to designated historic sites. In these cases appropriate building heights for accessory structures shall be determined through the design review process to ensure that heights are acceptable and in keeping with scale and style of development on the property.

3. Accessory buildings on a zoning lot may occupy up to thirty-five (35) percent of the rear yard. Rear yards which adjoin alleys may include half the area of the alley to calculate the area of the rear yard which may be occupied by accessory buildings.

On zoning lots containing one- and two-family dwellings, there shall be a maximum of three (3) accessory buildings, the total of which shall not occupy more than one thousand (1,000) square feet of the zoning lot. On zoning lots containing all other uses, accessory buildings may occupy the same percent of the zoning lot as main buildings are allowed to occupy in the zoning district.

4. In those instances where a lot line adjoins an alley right-of-way, the accessory building shall not be closer than one foot to such lot line.

5. On through lots, where frontage is clearly established within a given block, rear yard setbacks shall be equal to the side yard setback required of the principal structure.

6. Accessory buildings shall be located at least six (6) feet from the principal structure or shall be considered attached for purposes of the zoning code.

8/2007

(See Reverse for Fire Ratings)

Section R302, Exterior Wall Location.

Exterior walls: Exterior walls with a fire separation distance less than 5' shall have not less than 1-hour fire-resistive rating with exposure from both sides. Projections shall not extend beyond the distance determined by the following two methods, whichever results in the lesser projections:

1. A point 1/3 the distance to the property line from an assumed vertical plane located where protected openings are required.
2. More than 12" into areas where openings are prohibited.

Projections extending into the fire separation distance shall have not less than 1-hour fire-resistive construction on the underside. The above provisions shall not apply to walls which are perpendicular to the line used to determine the fire separation distance.

(Clarification: 1-hour fire-resistive rating with exposure from both sides is a layer of 5/8" TYPE X gypsum on the interior and exterior of the wall assembly.(see description below) All projections into the 5'separation distance must have 5/8" TYPE X gypsum on the soffit and a solid fascia board at the end of the rafters. No projections are allowed to be closer than 2' from the property line.)

Exception: Tool and storage sheds, playhouses and similar structures exempted from permits by Minnesota Rules, Chapter 1300 are not required to provide wall protection based on location on the lot. Projections beyond the exterior wall shall not extend over the lot line.

Openings: Openings shall not be permitted in the exterior wall of a dwelling unit or accessory building with a fire separation distance less than 3'. This distance shall be measured perpendicular to the line used to determine the fire separation distance.

Exceptions:

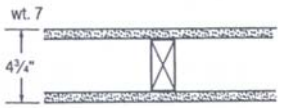
1. Openings shall be permitted in walls that are perpendicular to the line used to determine the fire separation distance.
2. Foundation vents installed in compliance with this code are permitted.

Penetrations: Penetrations located in the exterior wall of a dwelling with a fire separation distance less than 5 feet shall be protected in accordance with Section R317.3

Exception: Penetrations shall be permitted in walls that are perpendicular to the line used to determine the fire separation distance.

Example:

EXTERIOR WALLS 1 Hour Fire-rated Construction	WOOD FRAMED

Construction Detail	Description	Test Number	ARL	Index
	-5/8" Sheetrock brand type X exterior sheathing or 5/8 Firerock brand aqua-tough exterior sheathing -5/8" Sheetrock brand firecode core gypsum panels or Sheetrock brand water resistant firecode core gypsum panels, interior side -2x4 wood studs 16" o.c. -joints exposed or finished	**UL Des U305, U314**	SA700	**F-23**

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REQUIREMENTS FOR CONSTRUCTION OF A DETACHED GARAGE

(Per 2006 International Residential Code [IRC])

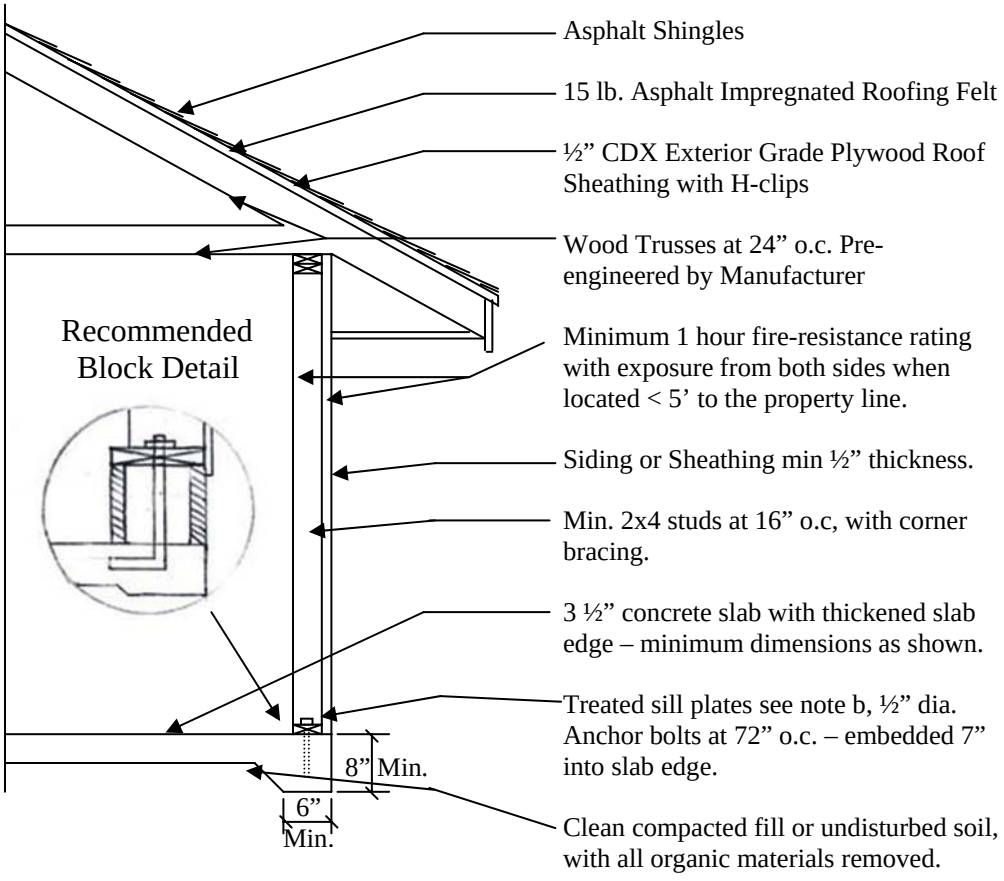
A permitted detached accessory building may be constructed on a floating slab or an approved foundation provided:

1. All organic material is removed from the construction limits.
2. All concrete exposed to freezing or salt must be air-entrained. Code requires 5%-7% air-entrainment. Tell the dispatcher when you order ready-mix.
3. Calcium chloride setting accelerator in concrete may not be used in concentrations greater than 1/10%. Recommended practice is none. Non-chloride accelerators are allowed.
4. Concrete slab shall be a minimum of 3 1/2" thick with the perimeter of the slab 8" thick, and 6" wide poured in a monolithic manner. The garage floor area used for vehicular parking must be sloped to provide drainage toward the vehicle entry doorway or to a drainage system approved by this Office.
5. Concrete slab to be at least 3500 P.S.I. compressive strength with air entrainment per Item 2. If wire mesh is used it should be epoxy coated. Fiber-reinforced concrete is allowed.
6. Anchor bolts shall be a minimum 1/2" diameter, maximum 1' from the corner with a minimum of 2 anchor bolts per plate. The anchor bolts shall be spaced a maximum of 6' on center, embedded 7" into poured concrete or grouted into concrete block. Anchor straps are acceptable when installed according to the manufacturer's specifications.
7. NOTE: Garages with unbalanced fill against the outer wall (i.e.- finished grade higher than the top of the slab) will require a plan showing a cross-section through the wall that indicates how the wall is connected to the footing or slab and how the wall will be reinforced. This is especially important when the wall is not continuous (ex: ½ concrete block and ½ wood frame) since the lower portion must act as a retaining wall.
8. Bottom plates less than 8" from exposed ground are to be minimum 2" X 4" redwood or decay resistive treated. Top plates (2) must be double-lapped at corners and splices must be staggered a minimum of 24". Maintain 6" minimum clearance between the soil and wood.
9. Walls shall be sheathed with 11/16" nominal thickness boards, or 1/2" fiberboard, ½" nominal composite wood panels or other material approved by Code.
10. Roof trusses, when used, shall be engineered and pre-manufactured.
11. Roof sheathing may be 1" nominal thickness lumber, 7/16" CDX plywood, or other approved material. 7/16" plywood or similar with span rating of 24/0, supported on 24"centers, requires H-clips on all horizontal joints centered in each rafter bay.
12. Approved shingles or wood shingles to be applied according to Chapter 9 of the IRC or to the manufacturer's recommendation.
13. Garages which front on an alley are required to have contrasting house numbers posted, visible from the alley, the same as the house has on the street side.
14. Garage walls and eave projections closer than 5 feet to an interior property line must be of 1-hour fire-resistive construction with exposure from both sides. Eaves are not allowed closer than 2 feet to the line.

ATTACHED GARAGES

1. Garages attached to the principal structure (house) shall be constructed per the house's construction requirements and have continuous footings 42" below grade. Complete construction plans are required for attached garages.
2. On an attached garage a fire wall between the house and garage shall not be less than ½" gypsum wallboard applied on the garage side. Doors opening into the dwelling shall not be less than tight-fitted 1 3/8" solid core door or 1 3/8" honeycombed steel doors.

ALL CONSTRUCTION MUST MEET THE REQUIREMENTS OF THE 2006 IRC. (See below)



Typical Slab-On-Grade Detached Garage

Garage Door Headers:
(For 16'-0" Door Opening)

No Roof Load = (2)-2x12's

Hip Roof = (2)-2x14's

Full Roof Load = (3)-2x14's (#1 Douglas fir or Engineered Beam)

Note: 18'-0" or larger garage door openings require special design.

Narrow Wall Design:
Walls adjacent to garage door openings that are less than 48" in width require consideration to bracing.

Walls adjacent to garage door openings that are 24" or less in width require consideration to bracing and hold downs.
(See narrow wall detail)

Other Notes to Garage Construction:

A) New "curb cuts" in the public way require a permit from Public Works. Public Works: (651) 266-6120.

B) Wood on concrete or masonry in direct contact with the earth shall be treated or decay resistant, as well as sills or plates less than 8" from exposed ground, and siding, sheathing or wall framing less than 6" from grade.

C) Garages adjacent to alleys are required to have contrasting house numbers posted, clearly visible from the alley.

D) Alterations to existing topography shall provide drainage on-site to the public way.

E) Contractors/owners are responsible for controlling erosion and run-off during construction and until landscaping is stabilized.

F) Roof eave/overhangs must be at least 2 feet from adjacent private property. Roof run-off shall be controlled within the owner's property.

G) Roof eave/overhangs closer than 5' to the property lines must have 5/8" type X gypsum sheathing on the under side for fire protection.

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RESIDENTIAL GARAGE WIRING

This handout attempts to answer the questions asked most often by homeowners. The information in this is NOT all you need to know to do your project, it is only to assist you in the project. The wiring must be done to the standards of the 2005 National Electrical Code (NEC). We do not have copies available for sale, and they are expensive- running about $60-$70. Libraries and electrical supply dealers have so-called "wiring made easy" books available that will assist you.
An Electrical Permit is required for all electrical work, including wiring a garage. In a single-family residence, the owner-homesteader may obtain the permit to do the work his/herself. For other residential occupancies, with a few small exceptions, an electrical contractor must be hired to do the work and obtain the permit.

Some basic rules:

1. Most homeowners choose to run the electrical underground. The two most popular methods are direct-burial cable and PVC (plastic) conduit. Direct burial cable is designated as UF (**U**nderground **F**eeder) or for larger sizes, USE(**U**nderground **S**ervice **E**ntrance). These cables may be buried directly in the ground at 24 inches below grade. They must have mechanical protection such as PVC conduit wherever they are closer than 24" below grade. The most common points that this happens is where the run is brought up above grade to enter the house and garage. PVC conduit is the other popular method used. The PVC MUST be approved as conduit-other types such as PVC plumbing pipe is **not** acceptable. Standard insulated conductors may then be pulled inside the PVC. These single conductors must have a "W"(for water-resistant) in their designation that is stamped on the jacket of the wire. Examples of this designation would be: TH**W**N, XHH**W**, etc. PVC conduit may be buried at 18 inches below grade (this is measured to the top of the conduit, so the trench will have to be deeper than 18").

2. A disconnect must be installed in the garage to shut off all power to the building. This disconnect must be immediately inside the garage at the entrance point of the feed from the house. If you are using a multi-circuit panelboard in the garage and have no more than 6 breakers in the panel, these breakers may be used as the disconnecting means. More than 6 breakers, you must have a main breaker in the panelboard. If you are running a single 15 or 20 ampere circuit from the house to feed a minimum number of lights and outlets, you may use a separate single-pole switch (such as a standard light switch) as a disconnect. This switch must be the first device that is on the circuit once it enters the garage, and it may be used only as a disconnect-it cannot be used to control lights or other equipment. This disconnect must be marked as the disconnecting means on its box cover. (see figure 1 on diagram pages)

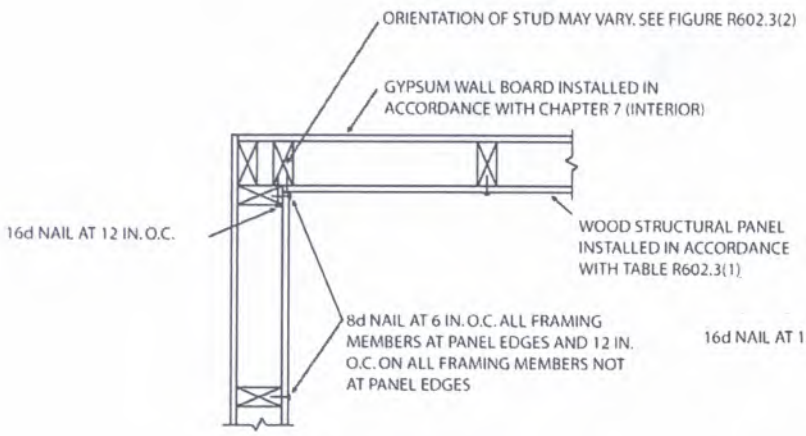
3. "Romex" or Non-Metallic Cable (NM-B) may be used inside the garage. It must be drilled through the studs, not run on the face of them. Also, never drill through factory roof trusses, run the romex on the top edge in a location where it will not be damaged. If you run Romex horizontally, such as between boxes on a wall, if the wall is not enclosed by sheetrock the Romex cannot be run horizontally lower than 8 feet above the floor. As an example, to run between two boxes on an unfinished wall, you would have to run the Romex up from one box to a height of 8' or more, run horizontally until you are even with the other box, and then run back down to the second box. This method is required because there is too much chance of physical damage to the cable by hanging tools, etc on the horizontal runs if they were lower than 8'. Other installation requirements in the National Electrical Code, including Article 334 also apply
Another wiring method is metal conduit, such as EMT. This method may be run on the face of the studs, and does not have to be drilled into the studs. There are other requirements in the NEC, especially Articles 342-362, depending on the type of conduit.

4. In general, all 120 volt general-purpose outlets below 6' 7''must be Ground Fault Circuit Interrupter (GFCI) type. Outlets for a specific appliance, such as a refrigerator or freezer do NOT have to be GFCI, but must be a single outlet for the appliance. Several standard outlets may be protected by one GFCI outlet. See the manufacturer's instructions for details.

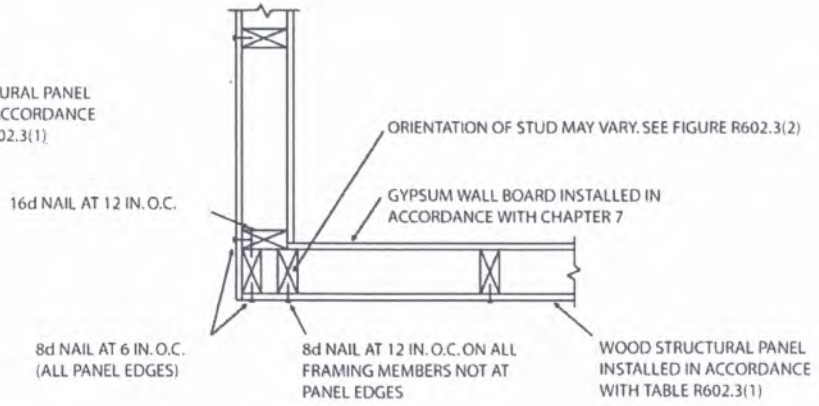
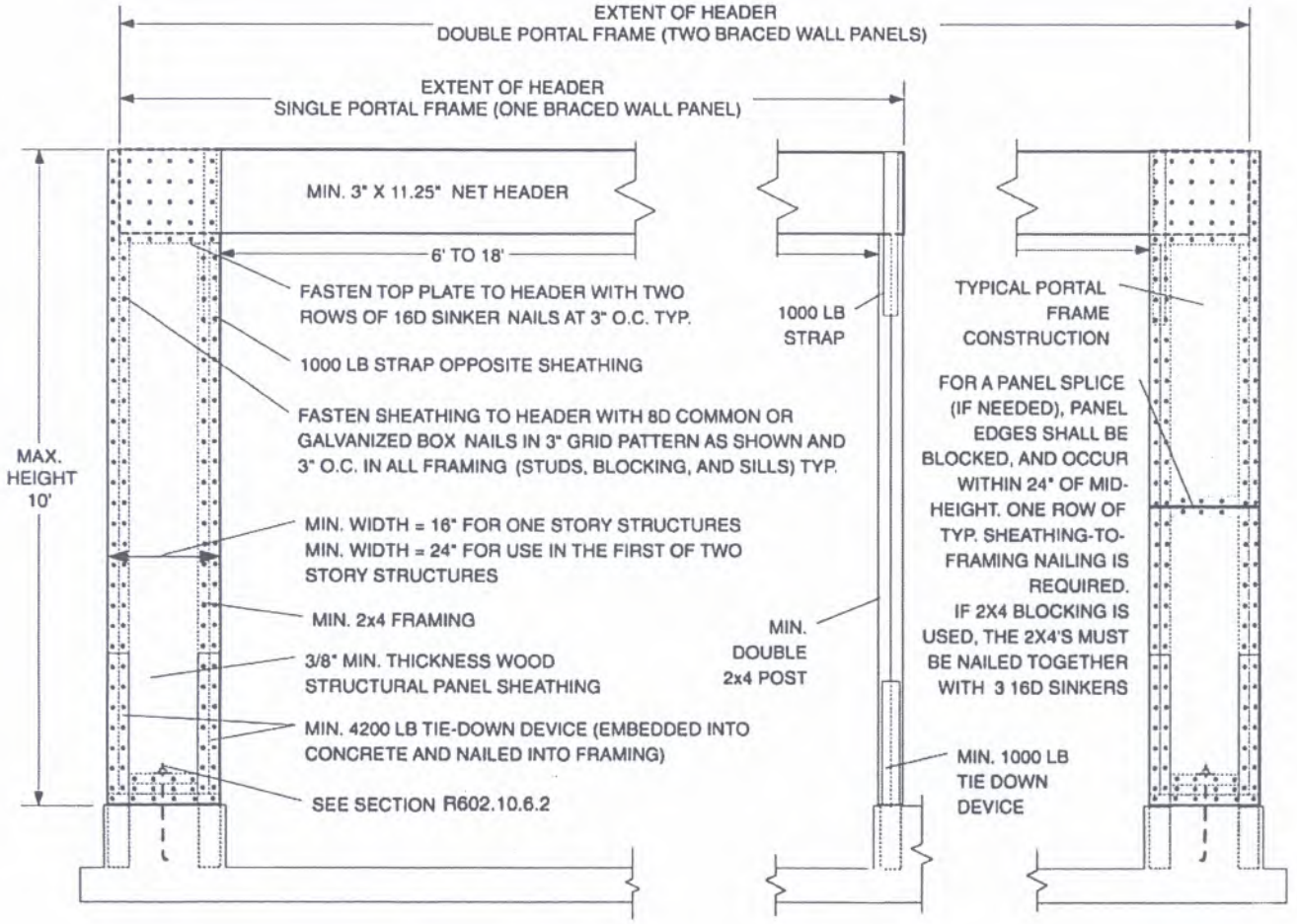
5. The 2005 NEC allows either a single circuit or feeder from the house to the garage. No more multiple circuits between buildings are allowed.

6.If a <u>single circuit with a grounding conductor</u> (either green or bare and attached to the grounding system in the house) is run from the house to the garage, no ground rod is required at the garage (see Figure 1). For feeders from the house to the garage, an 8-foot ground rod must be driven at the garage. If a grounding conductor is run with the feeder, or if there is metal conduit from the house to garage, the ground rod is used for bonding the ground system in the garage (see Figure 2) . If there is no grounding conductor or metal conduit, then the neutral must be re-grounded to the ground rod conductor (see Figure 3). This ground rod may be driven right outside the garage, and a #6 copper ground wire attached to it. If the wire is subject to physical damage on the outside or inside of the garage, it must be protected by conduit. ½ inch PVC is usually the easiest method of protection. The #6 wire must be attached to the grounding system for the electrical in the garage. See the diagrams for connection requirements.(Including the previously mentioned neutral re-grounding requirements)

Again, please be aware that these are NOT all the requirements for wiring a garage, they are the questions that are asked most often.
If you have other questions after consulting the wiring books available, call the Electrical Inspector for your area. In St. Paul, they can be reached at (651)266-9003 between 7:30 and 9:00am Monday through Friday.



(b) INSIDE CORNER DETAIL



(a) OUTSIDE CORNER DETAIL