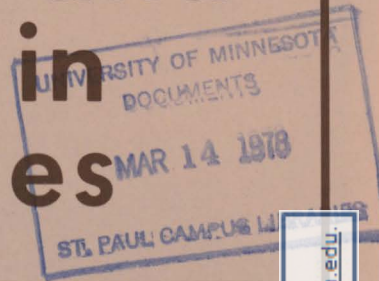


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Extension Bulletin 411 - 1978

evaluating structural and exterior components in older minnesota homes



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evaluating structural and exterior components in older minnesota homes

The single most important consideration when buying or remodeling an older home is the evaluation of the structure. If the house is structurally unsound, it is unwise to invest in improving the interior decorating, plumbing, wiring, or heating. Likewise, the roof, walls, windows, and doors should be sound before painting or making other improvements. Serious structural and exterior deficiencies may not only be costly to correct but also a source of inconvenience and a threat to your safety and comfort. Therefore, buyers of older homes should become familiar with the basic structural and exterior components and common deficiencies in older Minnesota homes.

Evaluating structural and exterior components can be fairly easy if one becomes familiar with a few basics and is systematic in the evaluation process. Remember to **be complete** in your evaluation since some serious defects such as defective foundation walls and support beams may be evident on the first and second floor or even on the roof. The information contained in this folder will help buyers of older homes and remodelers determine if serious defects exist and if additional help is needed from a building inspector, private home inspector, competent contractor, or engineer.

Remodelers should realize that it is desirable and legally mandatory in most areas of Minnesota to obtain a building permit from local community or county government before making any major home improvements such as reroofing, building an addition, or finishing an attic or basement. (Routine maintenance such as painting, papering, and replacing one storm win-

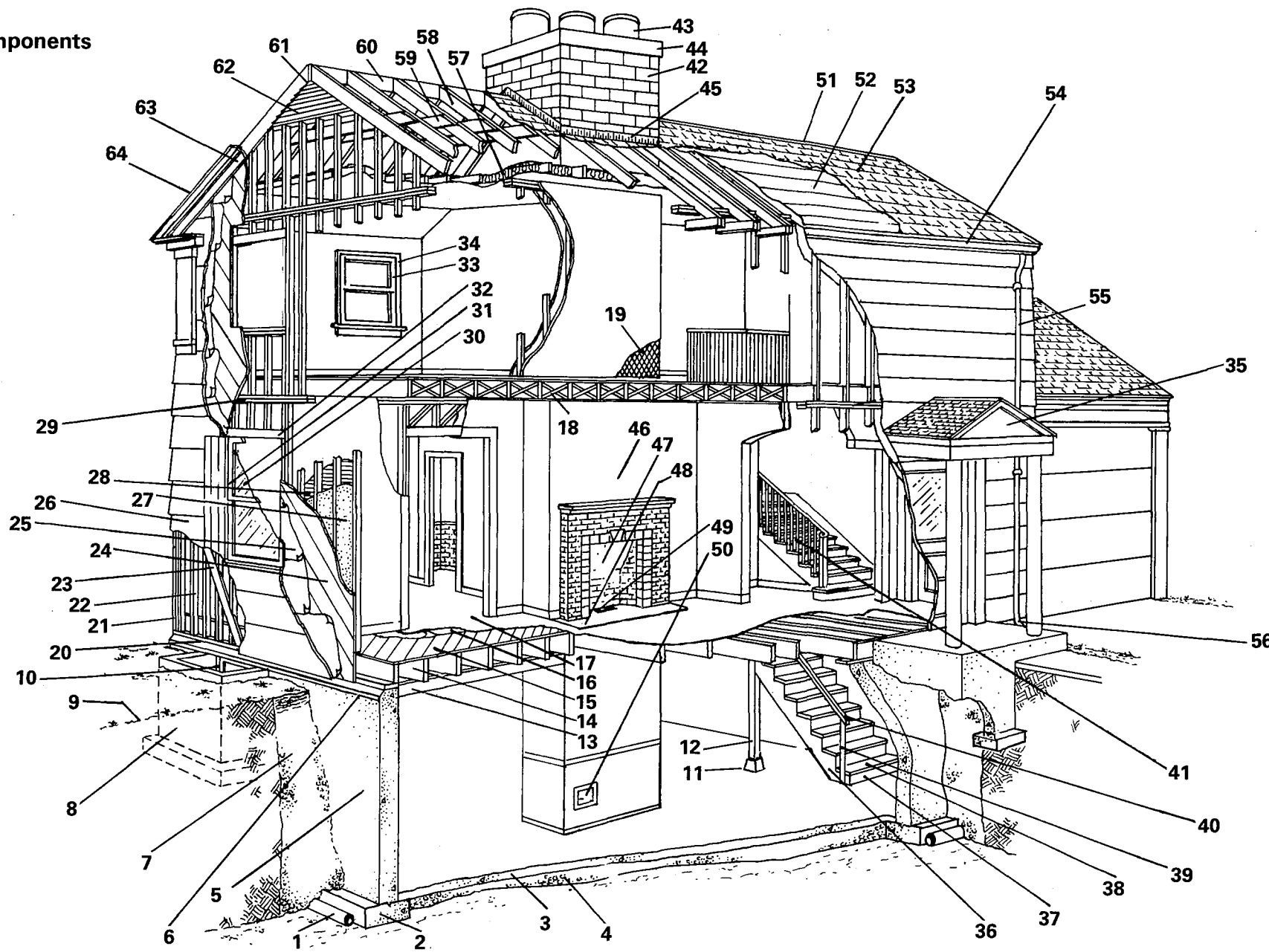
dow does not require a permit.) Local inspectors will be happy to tell remodelers if a local housing code or the Minnesota Building Code applies to their situation. Since these codes are designed as guidelines for one's safety, they must always be followed. **REMEMBER, FOR SAFETY, ALL MAJOR HOME IMPROVEMENTS, ESPECIALLY STRUCTURAL WORK, SHOULD BE STARTED ONLY AFTER A PERMIT IS OBTAINED.**

The information presented in this folder is intended to help the buyer of an older home and remodeler work with building inspectors, private home inspectors, competent contractors, or engineers. It is not intended as a guide for untrained individuals attempting to correct serious structural defects on their own. Consult qualified individuals before doing any major structural work. Please realize that most local inspectors have schedules which do not allow them to do individual or on-site consultation and teaching. If a person desires this training, he or she should contact a vocational school.

STRUCTURAL AND EXTERIOR COMPONENTS

A home's structural and exterior elements are relatively simple to understand although common building terms may be a hurdle to some consumers. The following items and diagram 1 are, therefore, presented to help you understand how an older home is generally "held together". Common problems are also noted. These will be further explained in the following checklist.

Diagram 1 .
Structural and exterior components of an older home



Foundation and Basement

1. FOOTING DRAIN TILE—pipe with openings to drain water away from basement. Necessary when a wet basement is a recurring problem.
2. FOOTING—concrete pad carrying entire weight of house.
3. BASEMENT FLOOR SLAB—approximate 4-inch concrete layer forming basement floor.
4. GRAVEL FILL—gravel under slab for drainage and to eliminate a damp floor.
5. FOUNDATION WALL—poured concrete (shown) or concrete block wall resting on footings and supporting house.
6. TERMITE SHIELD—metal baffle to prevent termites from entering frame. Not common in most areas of Minnesota.
7. BACKFILL—earth dug out around foundation that has been replaced and tamped down.
8. AREA WALL—metal or concrete wall forming open area below ground.
9. FINISHED GRADE LINE—top of ground at foundation wall.
10. AREA OR WINDOW WELL—open space allowing light and air to a below-ground window.
11. PLINTH BLOCK—concrete pedestal or stool necessary to prevent moisture damage to wood posts (see diagram 3.)
12. POST—major wood or steel vertical support upon which girder, floor, and interior walls rest.

Floors and Ceilings

13. GIRDER—main beam, usually steel or wood, on which floor joists rest. Girder is often supported by one or more posts.
14. JOISTS—horizontal wood members supporting floors or ceilings, usually 2" x 6"s to 2" x 12" spaced 16 inches apart.
15. SUBFLOORING—plywood or diagonal rough boards laid over floor joists.
16. FLOORING PAPER—asphalt felt paper laid over subflooring to reduce air infiltration.
17. FINISH FLOORING—top visible floor covering, often tongue and grooved hardwood strips, tile, or carpet.
18. BRIDGING (CROSS OR SOLID)—diagonal members in middle of joist spans which brace one joist to the next, preventing joists from twisting. Not required in new construction with 2" x 10" or smaller joists.

Walls

19. FURRING—framework used to level a rough, uneven surface such as a basement wall.
20. SILL PLATE—horizontal board resting on foundation and supporting floor joists.
21. CORNER POST—vertical wood members, usually three 2" x 4" at the corners of frame to which inner and outer covering materials are nailed.
22. STUDS—vertical wood members, usually 2" x 4", spaced every 16 or 24 inches.
23. CORNER BRACING—diagonal strips to keep frame square and plumb. (NOTE: not generally necessary and not found on newer homes with plywood sheathing).
24. SHEATHING—nailed to studs and providing structural base for the exterior siding.
25. BUILDING PAPER—asphalt felt paper placed on the exterior side of sheathing

26. BEVELED SIDING OR CLAPBOARDS—horizontal exterior material with a thick lower butt and thin upper edge which is overlapped to shed water. Stucco and brick are also common in Minnesota.
27. WALL INSULATION—loose-fill or blanket of insulating material placed between studs. In many older homes there are two serious problems: First, an absence of any insulation, or insulation which has settled. The only ways to tell if these problems may exist is by examining heating bills or opening up the wall. Second, many older homes do not have vapor barriers. Exterior paint problems, waterstains on lower interior walls, and deterioration at the bottom of exterior walls are symptoms.
28. LATH—wood strips or sheet metal mesh to which plaster or stucco is applied.
29. PLATES—horizontal board or boards laid across top (top plate) and bottom (sole) of studs to hold them even and rigid.

Windows and Doors

30. WINDOW—glass opening allowing natural lighting and often ventilation.
31. WINDOW FRAME—part of window opening in which the sash fits.
32. LINTEL—structural beam over a window or door opening.
33. WINDOW SASH—inner frame, usually movable, that holds glass.
34. WINDOW CASING—decorative strips surrounding interior or exterior window opening.
35. CANOPY—roof extending over door or window.

Stairs

36. STAIR STRINGER—notched sloping board supporting steps.
37. STAIR RISER—vertical board connecting one tread to the next.
38. STAIR TREAD—horizontal step.
39. NEWEL—post that terminates stair railing.
40. STAIR RAILING—safety bar used for a handhold along the stairs.
41. BALUSTERS—vertical rods or spindles supporting a railing.

Fireplace and Chimney

42. CHIMNEY—vertical shaft, masonry or other approved material, to vent combustion appliances.
43. FLUE LINER—lining usually terra cotta, protecting chimney passage from deterioration caused by smoke, gases, and heat.
44. CHIMNEY CAP—cover, usually concrete, that protects chimney from weathering.
45. CHIMNEY FLASHING—usually sheet metal material that provides weather-tight joint between chimney and roof.
46. CHIMNEY BREAST—inside front wall of a fireplace chimney.
47. FIREBRICK—a brick that withstands the heat of direct fire which ordinary brick cannot.
48. HEARTH—fireplace floor extending into the room for safety.
49. ASH DUMP—pit below fireplace from which ashes can be cleaned out.
50. CLEANOUT DOOR—door through which the ash pit may be cleaned.

Roof

51. RIDGE—top intersection of two roof surfaces.
52. ROOF SHEATHING—boards nailed to rafters to provide base for roof covering. (NOTE: On newer homes plywood usually is used.)
53. ROOFING—outer weather protection, generally wood, asphalt, or asbestos shingles, or tile, slate, or metal covering.
54. GUTTER—trough attached to fascia that gathers roof rainwater.
55. DOWNSPOUTS—pipe that carries rainwater from the roof gutter to the ground.
56. STORM SEWER TILE - underground pipe that carries rainwater from downspouts to sewer. (NOTE: Splash blocks are more common. Often wet basements are caused by not discharging roof water far enough away from the home.)
57. CEILING INSULATION—a blanket or loosefill insulating material (often vermiculite, wool, or fiber glass) placed against heated area of home either between roof rafters or ceiling joists depending on which is closest to heated area. (NOTE: It is important that space be provided between the insulation and roof sheathing for proper ventilation. To prevent ice-damming, both adequate insulation and ventilation are necessary.)
58. RAFTERS—sloping timbers supporting the roof.
59. COLLAR BEAM—horizontal tie between similar rafters on opposite sides of roof to keep rafters from spreading.
60. RIDGE BOARD—board under the ridge to which rafters are fastened.
61. GABLE—triangular end of a building with a sloping roof.
62. LOUVERS—series of slanted slots allowing ventilation and excluding rain. (NOTE: In finished attics with insulated rafters it may be necessary to have a continuous ridge vent and louvers between each rafter under the overhang to prevent ice damming.)
63. BARAGE BOARD—sloping board under gable edge of roof.
64. CORNICHE—connection between roof overhang and side walls containing ventilators.

STRUCTURAL AND EXTERIOR EVALUATION

Once familiar with how an older home is generally "held together", it is possible to systematically "walk through" a home, step-by-step, to determine its soundness. The following checklist is designed to help you in your evaluation. Items marked with an asterisk (*) indicate serious problems which should be corrected. If you have any questions about what appears to be a serious problem, you should contact a private home inspector, competent contractor, or structural engineer. While most building inspectors are anxious to help you, their schedules usually do not allow them to do individual consultation.

CHECK OK (No deficiencies) or DEF (Deficiencies). * = Serious Deficiency

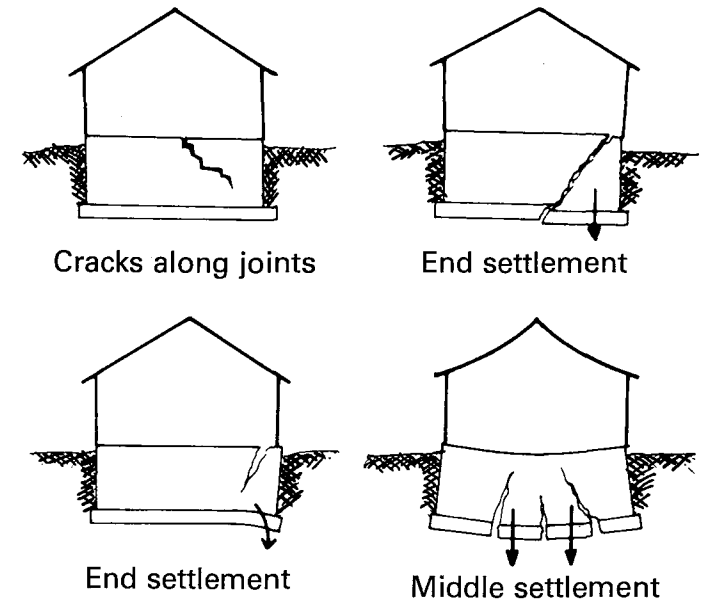
Basement and Foundation

- | | | |
|----|-----|---|
| OK | DEF | |
| — | — | 1. Does the foundation show evidence of settlement problems (see diagram 2) such as . . . |
| — | — | —cracks in masonry foundation wall along the masonry joints? |

OK DEF

- | | | |
|---|----|--|
| — | —* | —differential settlement at the end of the wall? |
| — | —* | —differential settlement of the middle portion of the wall? Most foundation problems result from soil conditions: sand, rock, and gravel are most desirable; unconsolidated sand and clay are less desirable (subject to sliding and settling); and peat is least desirable. |

Diagram 2.
Types of serious foundation failure



OK DEF

- | | | |
|---|----|--|
| — | —* | 2. Do the foundation walls appear straight and not bowing inward? |
| — | —* | 3. Is the mortar between stone or concrete block sound? If flaky, a moisture problem may exist. |
| — | — | 4. Are there low spots in the basement floor? If so, deficiency may exist. |
| — | — | 5. Does the basement have signs of periodic flooding such as . . . |
| — | — | —rust spots? |
| — | — | —mildew on walls? |
| — | — | —bricks used to store material above floor level? |
| — | — | 6. Does basement have a floor drain and does floor slope toward it? |
| — | —* | 7. Do foundation walls in crawl spaces extend below the frost line? A minimum of 42 inches is necessary, sometimes more, depending on soil characteristics and frost depth. |
| — | —* | 8. Is an apparent poured concrete foundation wall really a thin plaster coating over dirt that may not sufficiently support the structure? |
| — | — | 9. Do unheated basement and crawl space areas have adequate ventilation (1½ square feet per 25 lineal feet of foundation wall)? It is desirable to have a polyethylene or asphalt felt paper laid over the earth floor in crawl spaces to prevent moisture problems. (See diagram 4.) |
| — | —* | 10. Is the main support beam free from rotting (especially at end in contact with concrete), straight, and not bowing up or down? The main support beam in many older homes generally consists of short sections of 6" x 6" or 6" x 8" wood timbers spliced over each support post. Major problems develop when there are inadequate footings under the posts (footings should be at least 24" x 24" x 12"). |
| — | —* | 11. Are support posts under main beam (see diagram 3) . . . |
| — | —* | —placed on a concrete footing, rather than directly on the concrete floor? |
| — | —* | —with a 12-inch capital block at the top of the post if the main beam is spliced over the post? |
| — | —* | —(if wood post) free from rotting, especially at the lower end? |
| — | —* | —(if wood post) set on a concrete block or stool to prevent rotting? |
| — | —* | —(if steel) stable with threads welded or peened to prevent slippage? |
| — | —* | —(if steel) anchored (top plate) to the beam or capital block? |
| — | — | *12. Are beams and support posts free from large checks or twists? |

Diagram 3. Support post details

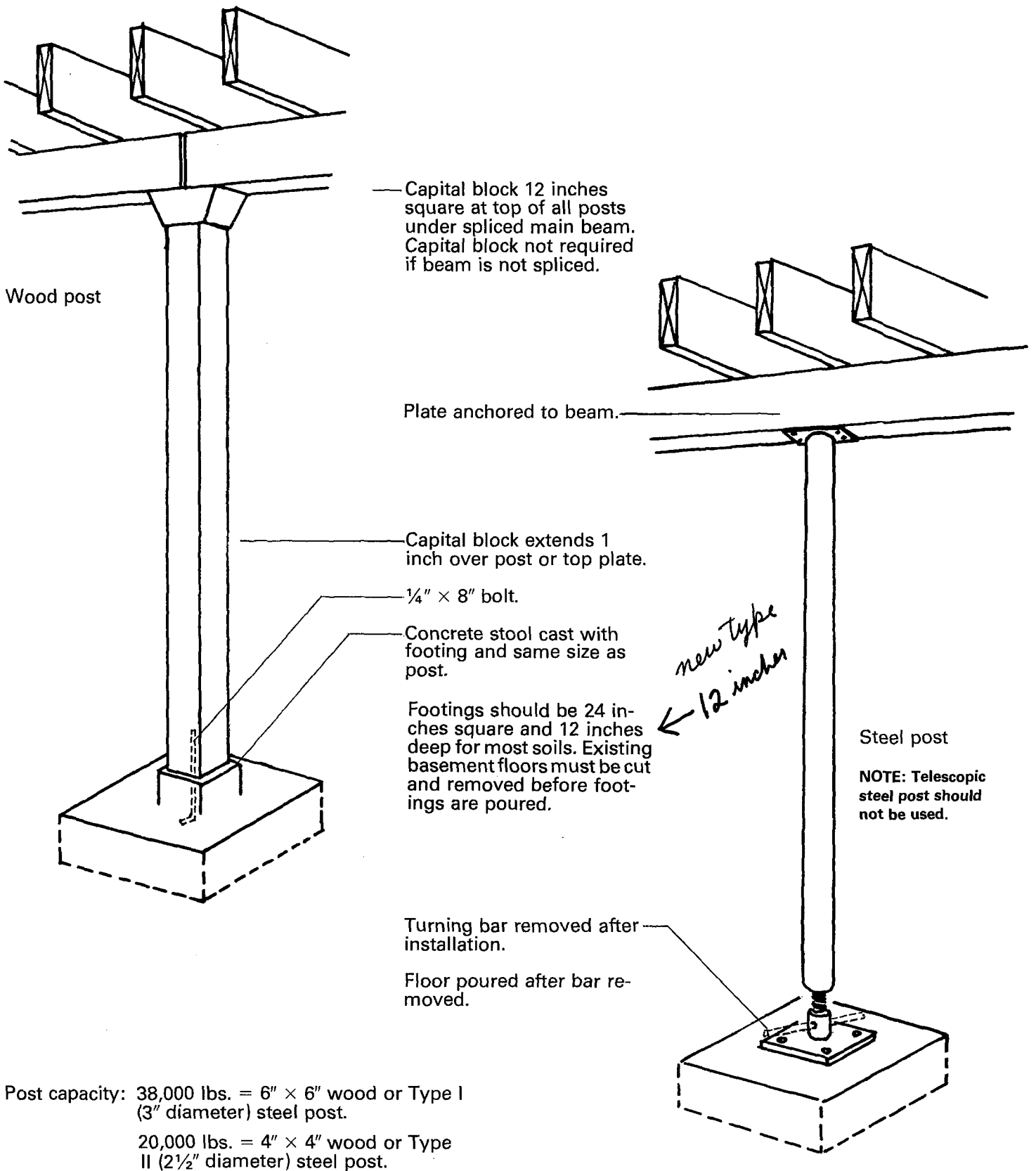
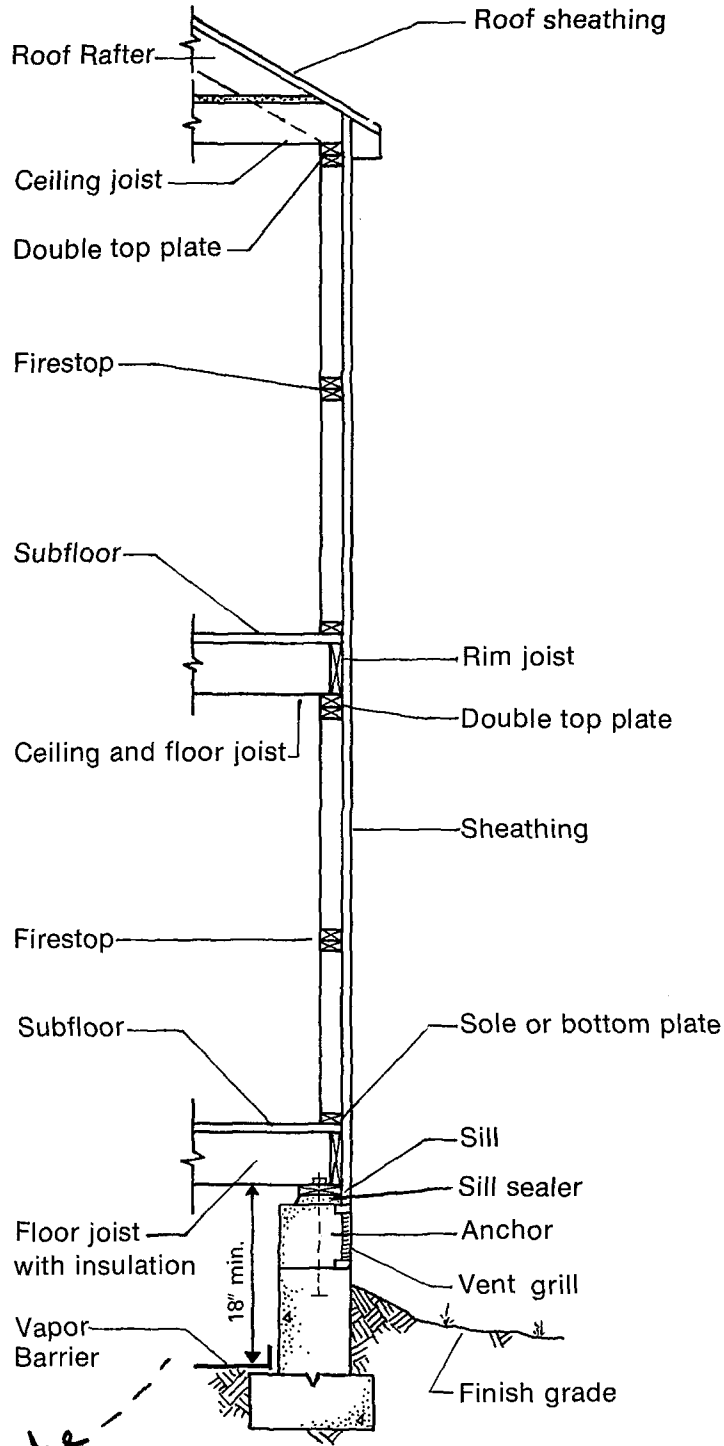
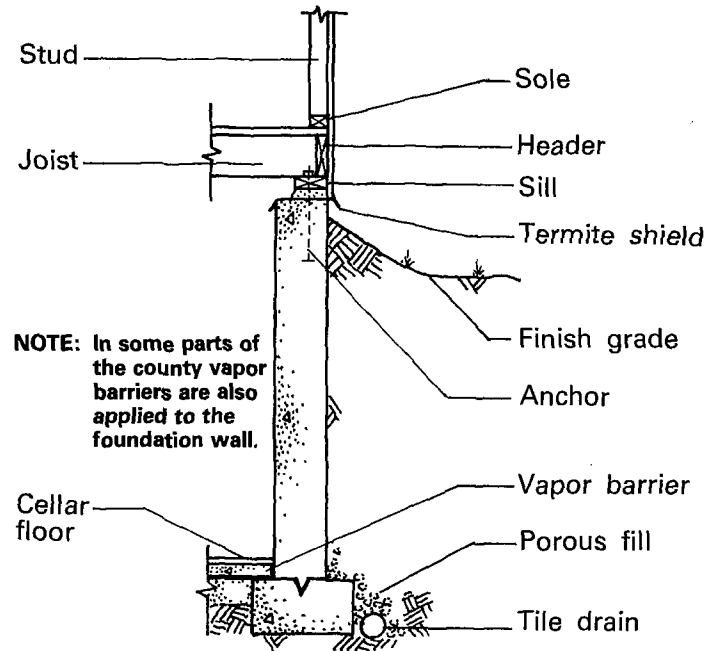


Diagram 4. Exterior wall section with crawl space



NOTE: Firestops are not common in the "platform frame" method of construction (illustrated) used in newer homes. In older "balloon frame" construction or when studs are 10 feet or more in height, firestops will be found. In many older homes, horizontal bracing in exterior sidewalls will complicate reinsulation.

Diagram 5. Exterior basement wall section



NOTE: In some parts of the county vapor barriers are also applied to the foundation wall.

NOTE: Termite shields are not common in most areas of Minnesota. A minimum of 6 inches between the finish grade and sill or any wood is necessary. Drain tile, either placed around the exterior (as illustrated) or interior of the footings, is necessary to correct wet basement problems caused by periodic high-water tables.

OK DEF

- ___ ___* 13. Is basement headroom sufficient? A minimum of 7 feet is desirable. In new or rebuilt basements, 11 courses of concrete block are desirable. It is also desirable to fur-out and insulate walls when finishing areas.
- ___ ___* 14. Are all floor joists in crawl spaces free from contact with the ground? (See diagram 4 for proper clearance.)
- ___ ___* 15. Have original floor joists been weakened by notching for new plumbing, heating, or for other reasons? If so, deficiencies exist. (See diagram 5.)
- ___ ___* 16. Do floor joists bow downward? If so, deficiencies exist. Check areas under the bathroom and kitchen which are usually exposed to the heavi-

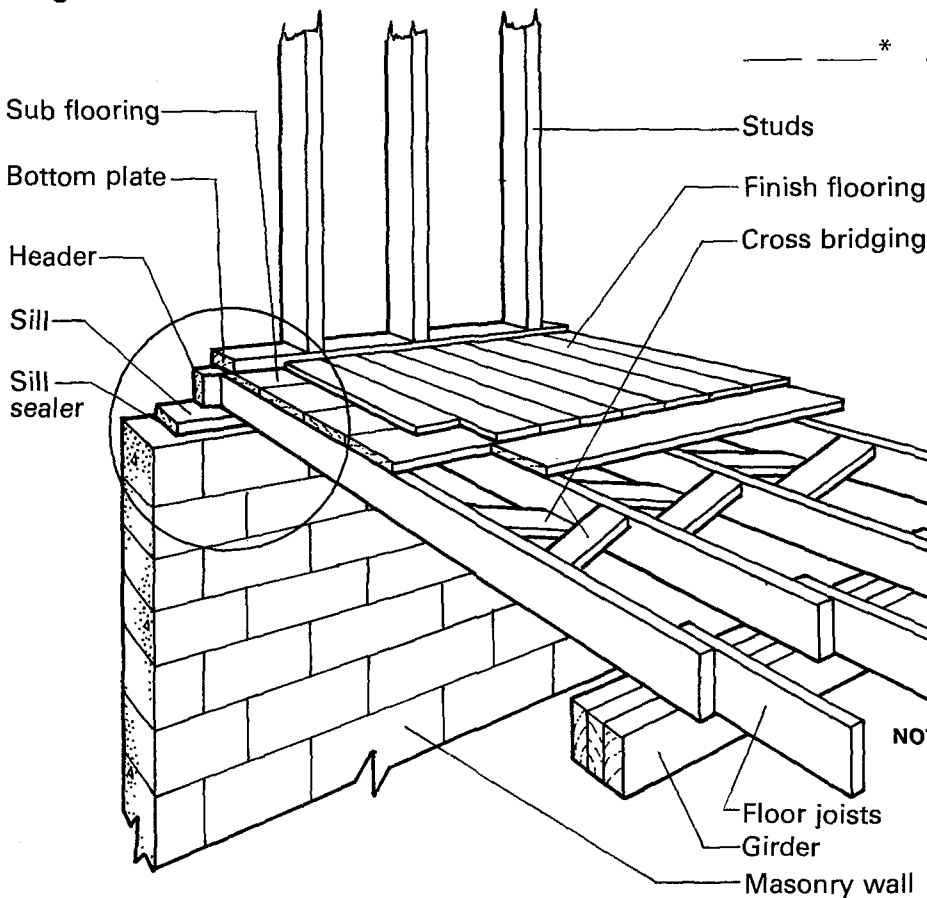
• Striper strip in type 18" min.

OK DEF

est loads. Check also for notches, splits, or excessive knots in joists. (See diagram 6.)

- ___ ___* 17. If concrete beam fill was used around the top perimeter of the basement, do floor joists show signs of dry rot (discoloration) where ends rest on wall? If so, deficiency exists. (See circled area in diagram 6.)
- ___ ___* 18. Do floor joists sag around stairway opening? If so, deficiency exists. Sagging may be due to insufficient headers or overspanned joists.
- ___ ___ 19. Is the subfloor waterstained or rotting under kitchen and bathroom areas? Stain or rot indicate a possible plumbing leak.
- *20. Is the chimney (if masonry) . . .

Diagram 6. Floor detail

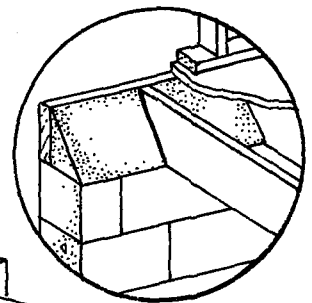


OK DEF

- ___ ___* —solid and free from crumbling, especially at the base?
- ___ ___* —completely supported on its own footings?
- ___ ___ 21. Are stairways wide enough, not too steep, and with sufficient headroom? Desired measurements include minimum width of 30 inches, maximum step riser of 8 inches, minimum step tread of 9 inches, and minimum headroom of 6½ feet.
- ___ ___ 22. Are stairways wide enough to move appliances, especially the washer, dryer, and furnishings?

First and Second Floor Construction

- ___ ___* 23. Are floors rigid and free from a bouncy effect and are windows free from rattle when you jump on the floor? If not, joists may be undersized or cracked, or bridging may be missing.
- ___ ___* 24. Do door jambs appear level, and are doors free from binding or scraping when being closed? If not, it indicates a possible severe settlement problem.



NOTE: In some older homes, solid beam fill was used around the top perimeter of the basement (lower right) rather than the more conventional box header (left). Dry rot is a common problem affecting the floor joists in solid beam fill construction. Symptoms to look for include dark discoloration or deterioration of the joists near the area they rest on the masonry wall.

- | OK | DEF | |
|-----|------|--|
| ___ | ___ | 25. Does wall and ceiling plaster have large cracks or loose areas? Check ceiling and walls in the corners of the top story for signs of damp or waterstained plaster which indicates a roof leak, absence of vapor barrier and/or inadequate attic ventilation. |
| ___ | ___ | 26. Are the bathroom and kitchen sink area walls waterstained or damp? If so, possible plumbing leak may be indicated. |
| ___ | ___* | 27. Are carpeted and linoleum floors smooth? Bulges could mean deteriorated floor underneath. (Note: Most wood floors cannot be sanded more than 3 times without adversely affecting structural integrity; check thickness before refinishing.) |
| ___ | ___ | 28. Do windows give enough light and ventilation in the living room, dining room, bedrooms, and kitchen? |
| ___ | ___* | 29. Do window sashes operate freely (not "paintbound") and free from rotting? Look for peeling paint or discolored and flaking varnish at meeting rail or bottom or lower sash. Worn and inadequate windows are a common problem and expensive to correct since new windows come in "standard sizes" different than found in older homes. (See diagram 9.) |
| ___ | ___ | 30. Are windows weather-stripped and tight-fitting in jamb? If not, heating bills may be excessive. |
| ___ | ___* | 31. Does house have adequate insulation over the ceiling and in the walls separating the heated area from the exterior? Most older houses have inadequate insulation. While ceiling insulation is usually easy to check and, if necessary, increase, it is usually necessary |

- | OK | DEF | |
|-----|------|---|
| ___ | ___ | to either open up an exterior wall or have an infrared study done to determine wall insulation deficiencies. |
| ___ | ___* | 32. Are roof rafters properly supported? Many older homes have badly sagged roofs, due to rafters with large splits and knots. Kneewalls, in such cases, may be a necessity. (See diagram 7.) Also check for sagging sheathing between rafters which indicates deteriorated sheathing or rafters too widely spaced. |
| ___ | ___ | 33. Are roof boards waterstained? If so, this indicates a possible leaky roof. |
| ___ | ___* | 34. Does attic have adequate ventilation? Ventilators in the overhang as well as gable or ridge ventilators are necessary to prevent ice-dams and condensation damage to attic insulation. |
| ___ | ___* | 35. Does the ridgeboard bow downward? If so, sagging rafters are a likely problem. |
| ___ | ___ | 36. Is the chimney structurally sound in the attic? |

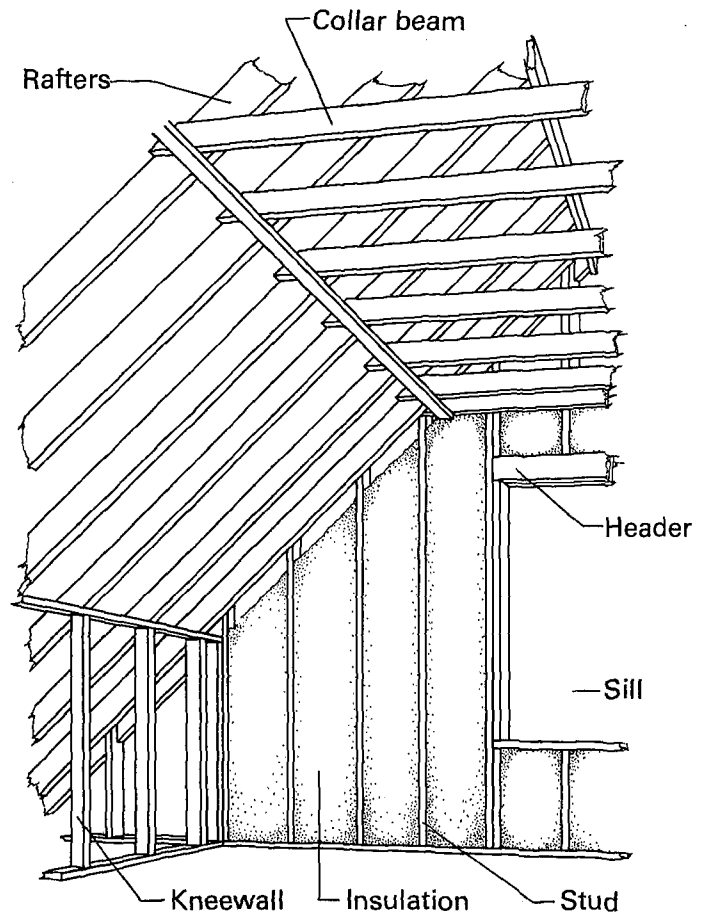
Exterior Inspection

- | | | |
|-----|-----|---|
| ___ | ___ | 37. Are roof shingles in good shape? (If you cannot get next to roof, binoculars come in handy.) If granules are missing from shingles or shingles are curling, shingles may need replacing shortly. Three layers of roofing on a house are considered maximum. The average life of roofing material in Minnesota is 15 to 20 years for asphalt shingles, up to 30 years for wood shakes, and 15 to 30 years for built-up (flat) roofs if properly installed. |
| ___ | ___ | 38. Does the house have an adequate overhang? An 18- to 24-inch overhang is considered minimum in new homes. (See diagram 8.) |

OK DEF

- ___ ___ 39. If the overhang is small, does roof have gutters? A good gutter system should eliminate many moisture problems in the basement as well as help prevent siding and trim deterioration.
- ___ ___ 40. Are chimney bricks and mortar above roof line sound? (Binoculars will be handy here again.)
- ___ ___ 41. Are the window units:
 - ___ ___ —free from loose or missing putty?
 - ___ ___ —free from loose or broken glass panes?
 - ___ ___ —complete with tight-fitting storm windows and screens?
- ___ ___ 42. Are the tops of the window and door units covered with metal drip caps? Metal drip caps help reduce deterioration.
- ___ ___ *43. If exterior finish is . . .
 - ___ ___ * —brick veneer, are all mortar joints solid and is the wall free from areas that "bow out"?
 - ___ ___ * —wood siding, is paint peeling, blistering, or siding curling or splitting? These may be indications of a serious water problem; either a leak or lack of vapor barrier in the wall.
 - ___ ___ * —wood shingles or shakes, is there curling or cupping? These may indicate a water problem.
 - ___ ___ * —stucco, is the surface cracked or bowed out? These may indicate rotted lath or sheathing due to water leakage.
- ___ ___ * 44. Is ground around the foundation more than 6 inches from the rim joist or siding? (See diagram 5.) Check rim joist or siding with pen knife for rotting. This is one of the first areas of decay.

Diagram 7. Kneewall and collar beam detail



OK DEF

- ___ ___ * 45. Do exterior walls bow out, especially at the sill plate area? (See diagram 5.) If bowing occurs in this area, rotted sill, header, plate, or studs may be involved
- ___ ___ 46. Do gutters and downspouts convey the roof water at least 3 to 4 feet from foundation? If not, moisture in the basement may be a problem.
- ___ ___ 47. Does ground around foundation slope away from house?
- ___ ___ 48. Do adjoining properties drain water away from lot?
- ___ ___ 49. Are houses far enough apart so roof water from neighbors will not present a problem?
- ___ ___ * 50. If house has porches, are they pulling away from house or badly sagging? Both of these problems may indicate inadequate footings.

OK DEF

- ___ ___* 51. Are porch floors springy? Spring may indicate rotted joists. (Note: porches are highly vulnerable to decay.)
- ___ ___ 52. If a sidewalk is next to the house, does it slope away from the house? Sloping toward the house may create basement moisture problems.
- ___ ___ 53. Are entrance steps in good shape?

A NOTE ABOUT CODES

There are four codes or standards which may influence the maintenance, purchase, and improvement of older homes:

Local Housing Codes. Most larger communities in Minnesota have regulations requiring property owners to maintain a minimum level of health and safety. These regulations frequently

Diagram 9. Window detail

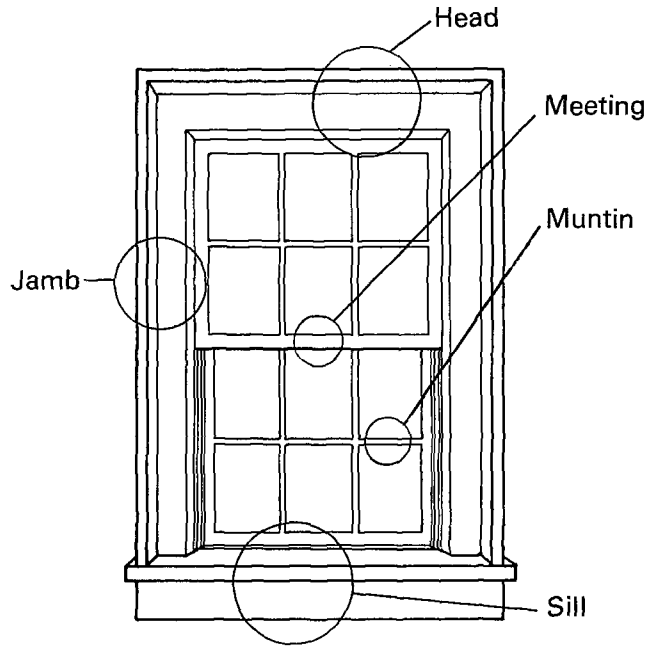
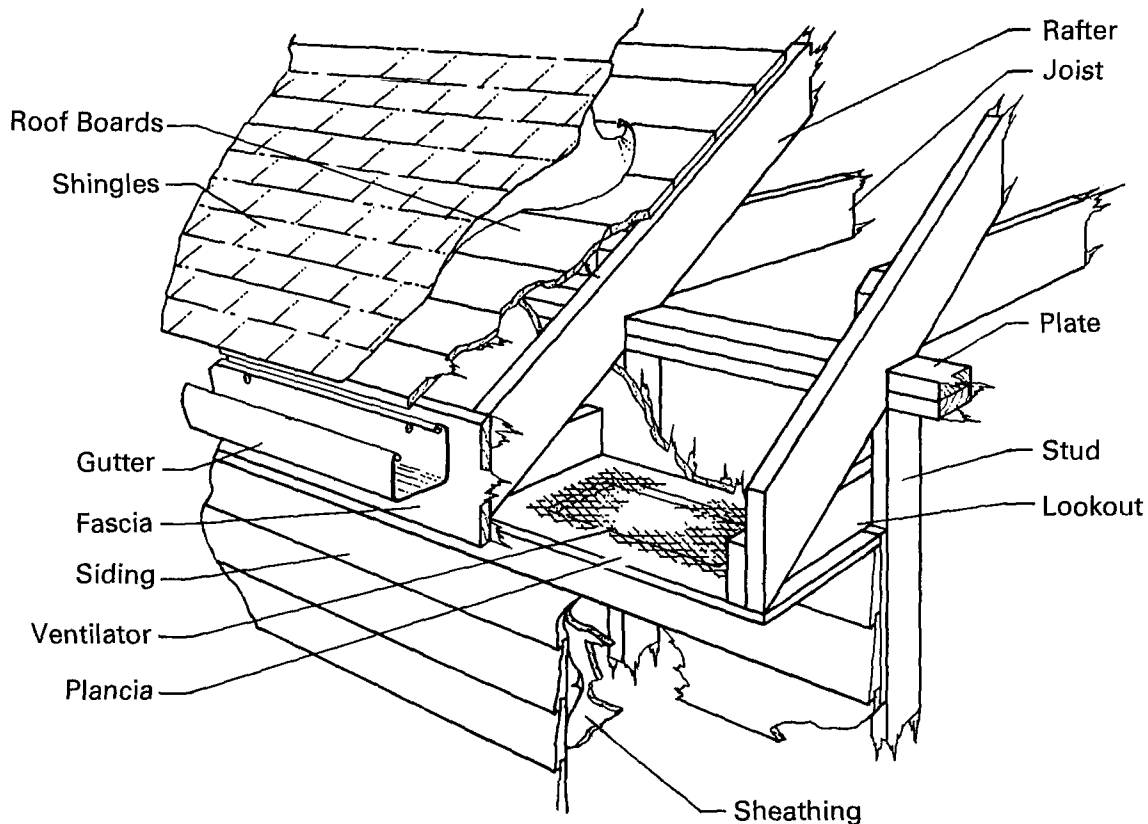


Diagram 8. Roof overhang detail



relate to such items as structural and foundation adequacy, room ventilation, room sizes, siding maintenance, rodent control, and so on. Local housing codes always relate to health and safety although the specific regulations may vary somewhat between communities. Generally, local housing codes are enforced only on a complaint basis. In a few communities, however, "Truth-in-Housing" regulations require that homes be inspected (before being sold) by either a:

- licensed "municipal evaluator" whose report is given to the buyer for his or her own information.
- municipal "building inspector" whose inspection, at the request of the owner, requires that the home be brought up to the local housing code before a "Certificate of Code Compliance" is issued.

Many observers recommend and lenders require that the home seller furnish a "Certificate of Code Compliance" since most deficiencies must be corrected before the certificate is issued.

FHA-VA Minimum Standards. If a home buyer applies for an FHA, FmHA, MHFA, or VA mortgage, the home is inspected and must meet minimum FHA-VA standards. These standards are similar to or the same as most local housing codes. The FHA or VA inspection may be conducted by local inspectors or FHA-VA appraisers.

State Building Code. In most areas of the state, remodelers of older homes will be required to meet the Minnesota Building Code (adopted from the Uniform Building Code) for new work in the home. The building code is enforced by local inspectors and covers minimum safety and energy conservation standards for new home construction as well as for interior rehabilitation, interior additions (e.g. attics, basements, and exterior additions. Even in areas where the local unit of government has not adopted the State Building Code, it is desirable to follow the minimum standards and to specify in remodeling contracts that all work will meet or exceed the code. Questions and information requests about the code may be directed to State Building Code Division, Metro Square Building, St. Paul, MN 55101.

Local Zoning Codes. Individuals planning certain types of remodeling should check with local zoning officials before beginning work. Local zoning codes, for example, may:

- restrict changing a single family dwelling into apartments or into a commercial establishment.
- establish height requirement for garages, additions, and fences.
- restrict removal of boulevard trees.
- require that garages and additions be set back a certain distance from the street, alley, and side property lines.
- establish standards affecting septic tank and drainfield placement.

CODE SUMMARY. A home should always meet local housing code (if any) requirements for safety and health. It must meet the local housing code if a "Certificate of Compliance" is requested. If the local community does not have a housing code and FHA, FmHA, MHFA, or VA mortgage application is made, the home that must meet the FHA-VA minimum standards. If the home is remodeled, the work must meet the *State Building Code*. (Structural standards are enforced only in communities adopting the code.)

REMODELING PROCEDURES AND PERMIT REQUIREMENTS

The following steps will help insure that remodeling work is safe, adequate, and legal. By following these steps, exposing one's family to hazards and being "ripped-off" by incompetent fly-by-night operators will be avoided. (For more information on remodeling see Extension Folder 268.)

FIRST, DECIDE HOW MUCH WORK YOU SHOULD DO YOURSELF. Most structural and finish remodeling is "labor-intensive"; more costly for labor than for materials. Although codes allow a homeowner to do the remodeling work, thereby potentially saving money, the homeowner should weigh the following considerations very carefully:

- "Do we want to sacrifice the time to do this project ourselves?"
- "Do we know or can we learn the basic minimum code requirements?"
- "Do we have the tools and experience?"
- "How much money can we save (actually earn)?"
- "How much self-satisfaction can we gain by doing it ourselves?"
- "Where can we turn if we run into unexpected problems or need help?"

Tackle only what is comfortable and learn as much as possible before remodeling. The two

most serious problems in remodeling are: do-it yourselfers who overextend and overestimate their abilities and individuals who blindly turn over all their expectations to unethical contractors. Remodeling is a major undertaking. Protect yourself. Prepare and learn.

REMEMBER, A PERMIT IS BOTH DESIRABLE AND (USUALLY) REQUIRED BEFORE WORK BEGINS! Even competent do-it-yourselfers and experienced contractors occasionally make mistakes. By obtaining a building permit, the remodeler will receive assistance from the inspector who will do everything possible to help and protect the consumer. When the job is completed, the inspector will make a final check to make sure everything is safe.

WHAT IF YOU DECIDE TO HIRE A REMODELING CONTRACTOR? The most important consideration becomes how to select a competent contractor. To select a remodeling contractor:

- First, check with the local building inspector to insure the contractor is licensed and bonded as required in many communities such as Minneapolis and St. Paul.
- Ask material suppliers, neighbors, friends, and co-workers for their recommendations.
- Check the Better Business Bureau about the contractor's record.
- Avoid contractors with temporary post office box addresses, no telephone, and no established office. They may be difficult to reach after being paid if problems arise.
- If the remodeling job will cost more than \$100, it is desirable to request itemized, written bids from at least three contractors. When comparing bids, make sure the contractors were bidding on the same amount of work.
- If the remodeling job will cost more than \$100, it is desirable to have a written contract which specifies: the total and itemized costs; all necessary building permits will be obtained in the contractor's name; the contractor's work will meet or exceed all applicable codes; the final payment will be made after the final inspection by a building inspector and the contractor has furnished lien waivers from all material suppliers and subcontractors (as required by Minnesota law).

SPECIAL CONSIDERATIONS FOR INSTALLING A BASEMENT

If a house has a partially excavated basement area and installation of a full basement is desired, remember this can be quite expensive.

To avoid problems, consider these points before starting:

- Will excavating create a problem to neighboring properties?
- Does location of the house on the lot present a problem for removing dirt from the excavation?
- Will the house have to be raised?
- Are floor joist ends around perimeter of house solid or rotted? If rotted, doubling up of joists may have to be undertaken.
- Will existing sewer line be above the floor after basement is completed? If the answer is yes, a lift pump will have to be installed or the sewer line will have to be replaced.
- New support posts and possibly a main beam will likely be needed.
- If furnace and water heater are located in basement excavated area, they may have to be disconnected and reinstalled.
- Does the existing chimney need to be extended into the basement? If so, headering of floor joists will be necessary.
- New basement stairs may be required.

ADDITIONAL THOUGHTS ON REMODELING

The Kitchen. If new cabinets are to be installed, check the size and shape of doorways and halls to make sure problems will not be encountered in moving new cabinets into kitchen area. Pre-built cabinets are usually made in sections of 4 feet or less while custom-built cabinets may come in 8-, 10-, and 12-foot lengths. In some situations, a window may have to be removed to get the cabinets into the kitchen.

Second Floor. If any walls or ceilings are to be redone with sheetrock, do stairways have any short turns where even 8-foot lengths could not be moved through? Sheetrock does not bend as easily as 1/4-inch plywood.

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