

Osage Beach Fire Protection District

Residential Construction Handout

573-348-1221



THIS MEMORANDUM IS A GENERAL, BRIEF STATEMENT FOR THE CONVENIENCE OF THE BUILDERS, ARCHITECTS, AND OTHER INTERESTED PERSONS. FULL PROVISIONS ARE DECLARED TO BE THE FIRE DISTRICT CODE.

Application for Residential Permits

1. A Residential Permit application must be obtained from the Fire Prevention Department and be completely filled out, including the following:
 - A. Type of construction
 - B. Breakdown of the square footage (Including your estimated cost of construction)
 - C. Lot #, Subdivision, 911 address
2. Along with the application you must submit the following:
 - A. 2 complete set of the building plans.
 - B. 1 copy of the plat showing the location of the building, according to the streets neighboring property lines and easements on the property.
 - C. The roof construction details are required. Spec sheet from Truss Company or the specs on the built on-site rafters.
3. After all of the required information has been submitted, reviewed, and approved a **Fire Prevention Building Permit** will be issued. A sign off sheet from Camden County Planning and Zoning must be submitted before a permit will be issued.

Inspections

A 4-hour notice must be given on all inspections.

1. **Temporary electrical inspection:** This is done before Utility Company connects power to the temporary meter base.
2. **Permanent electrical inspection:** This done before Utility Company connects power to the home meter base.
3. **Footing and foundation inspection:** shall be done before concrete is poured.
4. **Slab inspection:** Shall be done before the slab is poured.
5. **Shear wall inspection:** Shall be done before any siding is mounted.
6. **Drywall inspection:** Shall be done for the Sheetrock in the garage.
7. **Rough in inspection:** shall be done after all electrical, plumbing, and mechanical is done, but before any insulation or Sheetrock is installed.
8. **Fireplace inspection:** this inspection is required after the unit is set in place and installed per this handout and the manufacture's manual. The flue must be strapped as required. The area over the firebox and the flue chase must be left open until after the inspection has been approved.
9. **Final inspection:** This inspection is required after the structure is complete with all electric, drywall, taping, doors hung, address, flashing, smoke detector, etc. is finished. The electric must be turned on or a portable generator must be connected to the service panel for this inspection.

Special Note: A re-inspection fee of \$25.00 will be charged if any inspection fails. All reinspection fees must be paid before a reinspection is performed.

FEES:

Residential (one and two family): Minimum Permit Fee is \$35.00
Permit Fee will be calculated at \$1.25 per \$1000 over and above \$35,000.

The following is a list of permit fees that may or may not pertain to this permit.

Ordinance Number 2001-4 108.7

Reinspection (must be paid prior to re-inspection)	\$ 25.00
Electrical inspection	\$ 25.00
Permit renewal	\$ 25.00
Firework stands/Displays	\$ 35.00
Swimming Pools	\$ 35.00
Commercial Hood and Suppression Permits	\$ 35.00
Use and Storage of Explosive	\$150.00
Permit Refunds	Up to 25% retained for administrative Services
Surcharge for building without permit	\$50 + permit fee for first \$75,000. \$10 For each \$1,000 over; or as may be Determined by litigation

R-110.4 Temporary Occupancy:

Temporary occupancy is not allowed at any time for new construction unless approved by the Fire Marshal.

Garages and Carports

R-309.1 Opening protection

Openings from a private garage directly into a room for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with a solid core wood doors no less than 1 ¾" in thickness or a 20 minute labeled fire-rated door.

R-309.1.1 Duct Penetration

Ducts in the garage and ducts penetrating the walls or ceilings are not allowed to be left exposed. They must be covered with the same material covering the walls ceiling. Opening from the ductwork into the garage is not allowed.

R-309.2 Separation required

The garage shall be separated from the residence and its attic area by not less than 1 layer of 5/8" type X gypsum board applied to the garage side. Drywall seams must be taped and covered with joint compound, and nail heads covered with joint compound. Garage door brackets must be installed over the drywall. Where the separation is a floor-ceiling assembly, the structure supporting the separation shall also be protected by not less than 5/8" inch Type X gypsum board or equivalent.

R-309.4 Carports

Carports must be separated from the residence and attic by 1 layer of 5/8" inch type X gypsum board or equivalent. This allowed to be installed under the siding if inspected by the Fire Marshal. The floor must slope away from the residence to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway. Windows are not allowed in the separation wall. Doors in this wall must be 1 ¾" solid core door or 20 minute labeled steel door. Glass panels cannot be in the door.

Attic Access

R-807.1 Attic Access (Diagram # 1)

In buildings with combustible ceiling or roof construction, an attic access opening shall be provided to attic areas that exceed 30 square feet and have a vertical height of 30 inches or greater. The rough-framed opening shall not be less than 22 inches by 30 inches and shall be located in a hallway or other readily accessible location. A 30-inch minimum unobstructed headroom in the attic space shall be provided at some point above the access opening. See Section M1305.1.3 for success requirements where mechanical equipment is located in attics. Accesses are not to located in any closet unless the dimension of the closet is greater than eight feet by ten feet. When access is located in closet area the access must be centrally located.

Emergency Egress Openings (Diagram # 2)

R310.1 Emergency escape and rescue

Basements with habitable space and every sleeping room shall have at least one operable emergency escape and rescue window or exterior door opening for emergency escape and rescue. Where opening are provided as a means of escape and rescue they shall have a sill height of not more than 44 inches above the floor. Where a door opening having a threshold below the adjacent ground elevation serves as an emergency escape and rescue opening and is provided with a bulkhead enclosure, the bulkhead enclosure shall comply with section R310.3. The net clear opening dimensions required by this section shall be obtained by the normal operation of the window or door opening from the inside. Escape and rescue window openings with a finished sill height below the adjacent ground elevation shall be provided with a window well in accordance with Section R310.2.

R310.1.1 Minimum opening area. All emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet.

Exception: Grade floor openings shall have a minimum net clear opening of 5 square feet.

R310.1.2 Minimum opening height. The minimum net clear opening height shall be 24 inches.

R310.1.3 Minimum opening width. The minimum net clear opening width shall be 20 inches.

R310.1.4 Operational constraints. Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools.

R310.2 Window wells. Windows wells required for emergency escape and rescue shall have horizontal dimensions that allow the door or window of the emergency escape and rescue opening to be fully opened. The horizontal dimensions of the window well shall provide a minimum net clear area of 9 square feet with a minimum horizontal projection and width of 36 inches.

Exception: The ladder or steps required by Section R310.2.1 shall be permitted to encroach a maximum of 6 inches into the required dimensions of the window well.

R310.2.1 Ladder and steps. Window wells with a vertical depth greater than 44 inches below the adjacent ground level shall be equipped with a permanently affixed ladder or steps usable with the window in the fully open position. Ladders or steps required by this section shall not be required to comply with Section R314 and R315. Ladders or rungs shall have an inside width of at least 12 inches, shall project at least 3 inches from the wall and shall be spaced not more than 18 inches on center vertically for the full height of the window well.

R310.3 Bulkhead enclosures. Bulkhead enclosures shall provide direct access to the basement. The bulkhead enclosure with the door panels in the fully open position shall provide the minimum net clear opening required by Section R310.1.1. Bulkhead enclosures shall also comply with Section R314.9.

R310.4 Bars, grills, covers and screens. Bars, grills, covers, screens or similar devices are permitted to be placed over emergency escape and rescue openings, bulkhead enclosures, or window wells that serve such openings, provided the minimum net clear opening size complies with Sections R310.1.1 to R310.1.2, and such devices shall be releasable or removable from the inside without the use of a key, tool, or force greater than that which is required for normal operation of the escape and rescue opening.

EXITS (Diagram # 3)

R311.1 Exit door required. Not less than one exit door conforming to this chapter shall be provided from each dwelling unit. The required exit door shall provide for direct access from the habitable portions of the dwelling to the exterior without requiring travel through a garage.

R311.2 Type of lock or latch. All egress doors shall be readily openable from the side from which egress is to be made without the use of a key or special knowledge or effort.

R311.3 Type and size. The required exit door shall be a sidehinged door not less than 3 feet in width and 6 feet, 8 inches in height.

R311.4 Hallways. The minimum width of a hallway shall be not less than 3 feet.

R311.5 Exit facilities. Exterior exit balconies, stairs, and similar exit facilities shall be positively anchored to the primary structure to resist both vertical and lateral forces. Such attachment shall not be accomplished by use of toenails or nails subject to withdrawal.

STAIRWAYS (Diagram # 4)

R-303.4 Stairway illumination. All interior and exterior stairways shall be provided with a means to illuminate the stairs, including the landing.

R-303.4.1 Light activation. The control for activation of the required interior stairway lighting shall be accessible at the top and bottom of each stair without traversing any step of the stair. The illumination of exterior stairs shall be controlled from the inside of the dwelling unit. This switch must be a self-illuminating switch.

Exception: Lights that are continuously illuminated or automatically activated.

R-314.1 Width (stairways). Stairways shall not be less than 36 inches in clear width at all points excluding the handrail width.

R-314.8 under stair protection. Enclosed accessible space under stairs shall have walls and soffits protected on the enclosed side with 5/8 inch Type X gypsum board.

HANDRAILS

R-315.1 Handrails. (Diagram # 5). Handrails are required on one side of the stairs with two or more steps and on one side of every ramp. Handrails shall have a minimum and maximum heights of 34 inches and 38 inches.

R-315.2 Handrail grips sizes (Diagram # 5). The hand grip portion of handrails shall have a circular cross section of 1 1/4 inches minimum to 2 5/8 inches maximum.

GUARDS

R-316.1 Guards required (Diagram # 5) Porches, balconies or raised floor surfaces located more than 30 inches above the floor or grade below shall have guards not less than 36 inches in height. Open sides of stairs with a total rise of more than 30 inches above the floor or grade below shall have guards not less than 34 inches in height measured vertically from the nosing of the treads.

R-316.2 Guards opening limitations (Diagram # 5) Required guards on open sides of stairways, raised floor areas, balconies and porches shall have intermediate rails or ornamental closures that do not allow passage of a sphere 4 inches in diameter. Required guards shall not be constructed with horizontal rails or ornamental pattern that results in a ladder effect.

SMOKE ALARMS

R-317.1 Single-and multiple-station smoke alarms. The smoke alarms shall be placed in the following locations. All alarms must be AC/DC with battery backup and each unit must sound upon activation of one alarm.

1. Outside each sleeping area on the ceiling or wall and within ten feet of each bedroom door.
2. Within each room used for sleeping purposes. Where sleeping rooms ceilings slope is greater than one foot rise in eight foot horizontal, the upper edge of the smoke detector shall be located within 3 feet of the highest point of the ceiling.

3. In each story within a dwelling unit, including basements and cellars but not including crawl spaces and uninhabitable attics.
4. Additional smoke alarms may be required by the Fire Marshal, where necessary for adequate safety due to additional walls or ventilation system.

(When more than one alarm is required to be installed within an individual dwelling unit the alarm devices shall be interconnected in such a manner the actuation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed. All smoke alarms shall be listed and installed in accordance with the provisions of this code and the household fire warning equipment provisions of NFPA 72.

FOAM PLASTICS

R-318.2.3 Attics and Crawlspace. Within attics and crawlspaces foam plastics shall be protected against ignition by 1 ½ inch thick mineral fiber insulation or ½ gypsum board.

INSULATION

R-320.1.1 Insulation facing (garage or basement walls) Paper faced insulation shall be covered with ½ inch gypsum board or 3/8 plywood or as directed by the Fire Marshal. This wall does not need to be taped and until the wall is finished, receptacles are not required to be installed. This does not delete the requirement of one GFCI in the basement.

R-320.1.2 Exposed Insulation (Garage or basement walls) Insulation that is left exposed with plastic, insulation must be covered with a minimum of ½ inch drywall or 3/8 plywood or as directed by the Fire Marshal.

R-611.1 Insulating concrete form wall construction Insulating concrete form walls shall be covered when exposed to the interior of the structure including the attic area. They must be covered with ½ inch gypsum board, 3/8 inch plywood or other material approved by the fire marshal.

PREMISES IDENTIFICATION

R-325.1 Premises identification. (Diagram # 6) Approved numbers or addresses shall be provided for new and existing buildings in such a position as to be clearly visible and legible from the street or roadway fronting the property.

Ordinance 2001-6 Residential building shall be clearly marked with their numerical address. Minimum height is three and half inches in height.

Written and/or Script type numbers shall not be accepted. Color of numbers must be contrasting to the exterior of the building. No gold, Silver, or Brass numbers accepted. Numbers must be permanently affixed, no stick-on or Velcro numbers accepted. Numbers must be located either over the garage door or within six feet of the front door. If not visible from the street the address must be posted next to the street by the driveway on a post four feet high or an approved by the Fire Marshal.

DRAFTSTOPPING

R502.12 Draftstopping required (Floor truss or Drop Ceiling) (Diagram # 7) When there is usable space both above and below the concealed space of a floor/ceiling assembly, draftstops shall be installed so that the area of the concealed space does not exceed 500 square feet. Draftstopping shall divide the concealed space into approximately equal areas. Where a floor membrane above encloses the assembly and a ceiling membrane below draftstopping shall be provided in floor/ceiling assemblies under the following circumstances

1. Ceiling is suspended under the floor framing.
2. Floor framing is constructed of truss-type open web or perforated members.

FIREBLOCKING

R-602.8 Fireblocking required. Fire blocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories and between a top story and the roof space. Fire blocking shall be provided in wood-frame construction in the following locations.

1. In concealed spaces of stud walls and partitions, including furred spaces, at the ceiling and floor level at 10 foot intervals both vertical and horizontal. Batts or blankets of mineral or glass fiber or other approved non-rigid material shall be allowed as fire blocking in walls constructed using parallel rows of studs or staggered studs.
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stairs stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with R314.8.
4. At openings around vents, pipes (copper and plastic), wiring or conduit, at each penetration of the top or bottom plate whether at the ceiling or floor. Materials used must resist the free passage of flame and products of combustion. When flashing is used it must be tight to the pipe or caulked with approved fire chalk. When caulk is used it must be placed in the annular space around the pipe, duct or wire. Materials approved are metal flashing and a fire rated caulk designed to stop the spread of flame and smoke as stated in the UL design manual. **(Diagram # 8)**
5. For the fire blocking of chimneys and fireplaces, see R1001.16. **(Diagram # 9)**
6. Fire blocking of cornices of a two-family dwelling is required at the line of dwelling unit separation.

R602.8.1 Materials. Fire blocking shall consist of 2-inch nominal lumber, or two thickness of 1 inch nominal lumber with broken lap joints, 23/32 inch wood structural panels with joints backed by 23/32 inch wood structural panel or one thickness of 3/4 inch particle board with backed by 3/4 particle board, 5/8 inch type X gypsum board, or 1/4 inch cement-based millboard. Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as an acceptable fire block. Loose fill insulation material shall not be used as a fire block unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.

FIREPLACES

R1004.1 General (Diagram # 10, 11, 12)

All pre-fabricated fireplaces shall be approved and listed by Underwriter's Laboratories or any other nationally recognized testing agency, installed in accordance with the manufactures instructions and in addition thereto:

1. All pre-fabricated fireplaces shall be set on approved non-combustible material which shall extend from the back of the unit to the outer edge of the hearth before any finished materials are installed. Materials acceptable are masonry or 5/8 Type X drywall with sheet metal, or equivalent, as approved by the Fire Marshal.
2. All pre-fabricated fireplace chases shall be protected on the inside of the chase walls and ceilings with one layer of 5/8 inch Type X drywall or equivalent, all as approved by the Fire Marshal. Drywall shall extend to the ceiling level except when chase extends more than one story or floor then drywall shall be installed in addition to the above to the chase wall next to the building unit until the chase extends past the attic area.
3. All chimney chases shall be firestopped at each floor/ceiling line and the entire chimney chase shall be closed off to the attic areas or concealed spaces.
4. The aforesaid shall be inspected at the time of the required framing inspection and new construction or installations and before applying any facing material to the fireplace area. All Backing material are to be approved and inspected by the Fire Marshal before facing or finish material such as brick, stone, etc. is applied so as to prevent combustible materials from being installed where they will be exposed to high heat.
5. The manufacturers installation instruction booklet shall be with the fireplace until the final inspection is approved by the Fire Marshal.

R-1004.2 Hearth extensions: (Diagram # 11)

Hearth extension extensions of approved factory-built fireplaces shall be installed in accordance with the listing of the fireplace. They shall set on 5/8ths inch Type X drywall or sheet metal. The hearth extension shall be readily distinguishable from the surrounding floor area.

R-1004.4 Unvented gas log heaters:

An unvented gas log heater shall not be installed in a factory-built fireplace unless the fireplace system has been specifically tested, listed and labeled for such use in accordance with UL 127.

R-1006.1.5 Gas piping in Fireplace: (Diagram # 13)

When gas piping is installed in the firebox the gas logs must also be installed at the same time and operational. If the piping is removed from the fire box the hole must be repaired or the side of the firebox must be replaced according to the manufacturer's instructions.

RG-2432 (603) Log lighters

Gas log lighters are not allowed.

IFGC Section 409 (Diagram #13)

Each appliance shall be provided with a shutoff valve separate from the appliance. The shut off valve shall be located in the same room as the appliance, not further than 6 feet from the appliance, and shall be installed upstream from the union, connector or quick disconnect device it serves. Such shutoff valves shall be provided with ready access.

Exception: Shutoff valves for vented decorative appliances and decorative appliances for installation in vented fireplaces shall not be prohibited from being installed in an area remote from the appliance where such valves are provided with ready access. Such valves shall be permanently identified and shall serve no other equipment.

The quarter turn valves in **(Diagram #38)** are acceptable for concealed locations if used with CTSS or Black Iron piping. If using copper the valve must be in an access panel that is approved by the inspector. The installation must be inspected and signed off on by the Fire Inspector.

R-1006.1 Solid Fuel Burning Appliances:

All solid fuel burning appliances shall be installed as follows: All solid fuel burning appliances shall be listed by a nationally recognized testing agency, shall be installed per the manufactures installation instructions.

R-1006.1.1 Manufactured homes:

All solid fuel burning appliances installed in manufactured homes (homes built in compliance with the Federal Manufactured Home Construction and Safety Standards – 24 CFR 3280) shall be listed for installation in manufactured homes and according to the manufactures installation instructions.

R-1006.1.3 Modular homes:

All solid fuel burning appliances installed in modular homes (factory built homes) must be an approved stove and be tested by a testing laboratory.

R-1006.1.4 Other use groups:

All solid fuel burning appliances installed in all other use groups shall be installed where permitted by appropriate section of the fire code. All solid fuel burning appliances shall be listed by a nationally recognized testing agency, shall be installed per the manufacturers installation instructions.

RG-2426.5 (503.5.6) Inspection of chimneys:

Before replacing an existing appliance or connecting a vent connector to a chimney, the chimney passageway shall be examined to ascertain that it is clear and free of obstructions and it shall be cleaned if previously used for venting solid or liquid fuel burning appliances or fireplaces. Certified chimney sweep or local Gas Company shall do such inspection and approval.

RG-2426.5.5.3 (503.5.6.3) Unsafe chimneys:

Where inspection reveals that an existing chimney is not safe for the intended application, it shall be repaired, rebuilt, lined, relined, or replaced with a vent or chimney to conform to M1805 and chapter 10, and it shall be suitable for the equipment to be vented or permanently sealed or removed from service.

RG-2426.5.7 (503.5.8) Support of chimney:

All portions of chimneys shall be supported for the design and weight of the materials employed. Factory-built chimneys shall be supported and spaced in accordance with their listings and the manufacturers instructions.

CLOTHES DRYERS

G2437.1 (612.1) Installation: (Diagram # 15)

Clothes dryers shall be exhausted in accordance with the manufacture’s instructions. Dryer exhaust systems shall be independent of all other systems and shall convey the moisture and any products of combustion to the outside of the building.

G2437.3 (613.4) Exhaust material:

Dryer exhaust ducts for clothes dryers shall terminate on the outside of the building and shall be equipped with a back draft damper. Screens shall not be installed at the duct termination. Ducts shall not be connected or installed with sheet metal screws or other fasteners that will obstruct the flow. Clothes dryer exhaust ducts shall not extend into or through ducts or plenums.

G2437.5 (613.6) Clothes dryer ducts:

Exhaust ducts for domestic clothes dryers shall have a smooth interior finish. The exhaust duct shall be a minimum nominal size of 4 inches in diameter. The entire exhaust system shall be supported and secured in place.

G2437.5.1 (613.6.1) Maximum length:

The maximum length of a clothes dryer exhaust duct shall not exceed 25 feet from the dryer location to the outlet terminal. The maximum length of the duct shall be reduced 2 ½ feet for each 45-degree bend and 5 feet on each 90-degree bend.

ELECTRICAL

**Service Entrance Conductors, Grounding Electrode Conductors and Equipment Grounding Conductors
NEC-Table 310-15(B)(6), NEC-Table 250.66, NEC-Table 250.122 and IRC-Table E3503.1**

SERVICE ENTRANCE CONDUCTORS 120/240 VOLT, 3WIRE SINGLE PHASE

	COPPER	ALUMINUM
100 AMP SERVICE-----	#4	#2
200 AMP SERVICE-----	#2/0	#4/0
 GROUNDING ELECTRODE CONDUCTOR		
100 AMP SERVICE-----	#8	#6
200 AMP SERVICE-----	#4	#2
 EQUIPMENT GROUNDING CONDUCTOR		
100 AMP SERVICE-----	#8	#6
200 AMP SERVICE-----	#6	#4

GROUNDING METHODS

NEC-250-50 Grounding Electrode system (Diagram #16, 17, 18)

System shall be grounded to the first disconnect and not to the meter base. The following is a list of approved ways to ground the electrical system.

- (a) **Metal underground water pipe.** A metal underground water pipe in direct contact with the earth for ten feet or more.
- (b) **Supplemental electrode required.** A metal underground water pipe shall be supplemented by an additional electrode. Metal underground gas piping shall not be used as a grounding electrode.
- (c) **Rod and Pipe Electrodes.** Rod and pipe electrodes shall not be less than 8 feet in length, shall consist of the following materials, and shall be installed in the following manner.
 - (1) Electrodes of pipe or conduit shall not be smaller than ¾ inch trade size and, where of iron or steel, shall have the outer surface galvanized or otherwise metal-coated for corrosion protection.
 - (2) Electrodes of rods of iron or steel shall be at least 5/8th inch in diameter. Stainless steel rods less than 5/8th inch in diameter, nonferrous rods (copper), or their equivalent shall be listed and shall not be less than ½ inch in diameter.
 - (3) The electrode shall be installed such that at least 8 feet of length is in contact with the soil. It shall be driven to a depth of not less than 8 feet except that, where rock bottom is encountered, the electrode shall be driven at an oblique angle not to exceed 45 degrees from the vertical or shall be buried in a trench that is at least 2 ½ feet deep. The upper end of the electrode shall be flush with or below the grounding electrode conductor attachment are protected against physical damage as specified in Section 250-10.

NEC 250-64 (a) Aluminum or Copper Clad Aluminum Conductors.

Insulated or bare aluminum or copper-clad aluminum grounding conductors shall not be used where in direct contact with masonry or the earth or where subject to corrosive conditions. Where used outside conductors shall not be installed within 18 inches of the earth.

NEC 225.32 Location of disconnects. (Local Ordinance 2001-7) (Diagram # 16)

The service disconnect means shall be installed outside of every new building and structure. Each occupant shall have access to the disconnect serving the building, structure, or space they occupy.

NEC 230.70 (b) Marking. (Diagram # 19)

Each service disconnect shall be permanently marked to identify it as a service disconnect.

UNDERGROUND WIRING METHODS

NEC 300.5 (a) and IRC Table E3703.1 Minimum Cover Requirements.

Direct buried cable or conduit or other raceways shall be installed to meet the minimum cover requirements of tables NEC 300.5 and IRC Table E3703.1.

NEC 300-5 (d) and IRC E3703.3 Protection from damage. (Diagram #20)

Direct-buried conductors and cables emerging from the ground shall be protected by enclosures or raceways extending from the minimum cover distance required by section 330-5(a) below grade to a point at least 8 feet above finished grade. In no case shall the protection be required to exceed 218 inches below finished grade. Service laterals that are not encased in concrete and that are buried 18 inches or more below grade shall have their location identified by a warning ribbon that is placed in the trench at least 12 inches above the underground installation.

BRANCH CIRCUIT REQUIREMENTS

Table 210-24. Summary of Branch-Circuit Requirements

Circuit Rating	15A	20A	30A	40A	50A
Conductors(min. size):					
Circuit wires 1	14	12	10	8	6
Taps	14	14	14	12	12
Fixture wires and cords-see section 240-4					
Overcurrent Protection	15A	20A	30A	40A	50A
Outlet Devices:					
Lampholders permitted	Anytype	Any type	Heavy Duty	Heavy Duty	Heavy Duty
Receptacle rating 2	15 max. A	15 or 20 A	30 A	40 or 50 A	50A
Maximum Load	15A	20A	30A	40A	50A
Permissible Load	for all circuits see section 210-23(a)				

NEC 210-52 Dwelling Unit Receptacle Outlets.

Spacing of Outlets. (Diagram #21)

Receptacles shall be installed so that no point along the floor line in any wall space more than 6 feet measured horizontally, from an outlet in that space.

Small Appliances (Diagram # 22)

In the kitchen, pantry, breakfast room, dining room is required two 20-ampere small appliance branch circuits. These two circuits are to have no connections to any other equipment such as dish washer, garbage disposal or range hood.

Bathrooms (Diagram #23)

At least one wall receptacle outlet shall be installed in bathrooms within 36 inches of the outside edge of each basin. The receptacle outlet shall be located on a wall that is adjacent to the basin location.

Outdoor outlet. (Diagram #24)

At least one receptacle outlet accessible at grade level and not more than 6 ½ feet above grade shall be installed at the front and back of the dwelling.

Laundry Areas (Diagram # 25)

At least one receptacle outlet shall be installed for the laundry. This should be on a circuit by itself.

Basements and Garages. (Diagram # 25, 26)

One receptacle outlet, in addition to any provided for the laundry equipment, shall be installed in each basement and in each attached garage and in each detached garage with electric power. Where the basement is finished in a habitable room. The receptacle outlet required by this section shall be installed in the unfinished portion.

Hallways. (Diagram #27)

In hallways of 10 feet or more in length without passing by a doorway shall have at least one receptacle outlet.

NEC 210-12 Arc-Fault Circuit- Interrupter Protection (Diagram # 34, 35)

All branch circuits that supply 125-volt, single-phase, 15- and 20-ampere receptacle outlets installed in dwelling unit bedrooms shall be protected by an arc-fault circuit interrupter(s)

LIGHTING OUTLETS

NEC 210-70 Lighting outlets required.

Lighting outlets shall be installed where specified in the following.

Habitable Rooms. (Diagram #28)

At least one wall switch controlled lighting outlet shall be installed in every habitable room and bathrooms.

Additional Locations. (Diagram # 28)

At least on wall switch controlled-lighted outlet shall be installed in hallways, stairways, attached garages, and detached garages with electric power. And to provide illumination on the exterior side of outdoor entrances or exits with grade level access. A vehicle door in a garage shall not be considered as an outdoors entrance or exit. Where lighting outlets are installed in interior stairways, there shall be a wall switch at each floor level to control the lighting outlets where the difference between floor levels is 6 steps of more.

Storage and equipment spaces. (Diagram #25)

For attics, under floor spaces, utility rooms, and basements at least on lighting outlet containing a switch or controlled by a wall switch shall be installed where these spaces are used for storage or contain equipment-requiring servicing.

NEC 240 OVERCURRECNT PROTECTION

Protection of 20-Ampere Circuit. (Diagram # 39)

All equipment on a 20-ampere circuit protected by a 20-ampere overcurrent device must be rated for a 20-ampere circuit.

GROUND FAULT RECEPTACLES

NEC 210-8 Ground Fault Circuit Interrupter

Dwelling Units.

All 125-volt, single-phase, 15 and 20-ampere receptacles installed in the locations specified below shall have ground fault circuit interrupter protection for personnel. All receptacles on a GFCI circuit shall be labeled.

All receptacles in Bathrooms **(Diagram #29)**

All receptacles in Garages **(Diagram #26)**

All receptacles in outdoors **(Diagrams # 24)**

All receptacles in Kitchens: Where the receptacles are installed to serve the countertop surfaces. This excludes receptacles for refrigerators, freezers and washers. **(Diagram # 30, 30A)**

All wet bar sinks: Where the receptacles are installed to serve the counter-top surfaces and are located within 6 feet.

All receptacles in unfinished basement areas. **(Diagram #31)**

RECEPTACLES

NEC 370.1b Make up of Receptacles.

For the proper way receptacles are to be wired. NOTE: Wire nuts on ground wires. **(Diagram #32)**

CLEARANCE FROM OPENINGS

NEC 230-9 Clearance from Building Openings (Diagram # 33)

Service conductors installed as open conductors or multiconductor cable without an overall outer jacket shall have a clearance of not less than 3 feet from windows that are designed to be opened, doors, porches, balconies, ladders, stairs, fire escapes, or similar locations. Vertical clearance of final spans above, or within 3 feet measured horizontally of platforms, projections, or surfaces from which they might be reached shall be maintained in accordance to NEC 230-24(b).

CLEARANCE FROM GROUND

NEC 230-24 (B) Vertical clearance from Ground (Diagram #33A)

Service drop conductors where not in excess of 600 volts, nominal, shall have the following minimum clearance from final grade.

10 feet-at the electric service entrance to buildings, also at the lowest point of the drip loop of the building electric entrance, and above areas or sidewalks accessible only to pedestrians, measured from final grade or other accessible surface only for service-drop cables supported on and cabled together with a grounded bare messenger where the voltage does not exceed 150 volts to ground.

12 feet over residential property and driveways and those commercial areas not subject to truck traffic where the voltage does not exceed 300 volts to ground.

15 feet- for those areas listed in the 12-foot classification where the voltage exceeds 300 volts to ground.

18 feet-over public streets, alleys, roads, parking areas subject to truck traffic, driveways on other than residential property, and other land such as cultivated, grazing, forest, and orchard.

NON-METALLIC SHEATHED CABLE (ROMEX)

NEC 336.6.1 Protection of Non-Metallic Sheathed Cable.

All non-metallic sheathed cable shall be protected when installed in or on walls, or in the studs.

PLACEMENT OF PROPANE TANKS

NFPA 58 - All propane tanks will be placed to the standard set down by NFPA 58 or the Fire Marshal. **(Diagram #36, 37)**