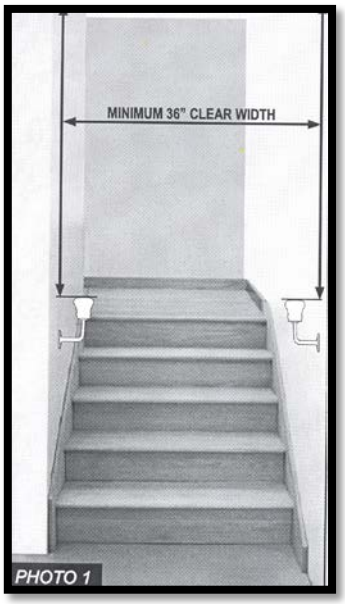
Stairs/Handrails/Guards

City of Mount Clemens
Community Development Department
One Crocker Boulevard
Mount Clemens, MI 48043
586-469-6818 x903

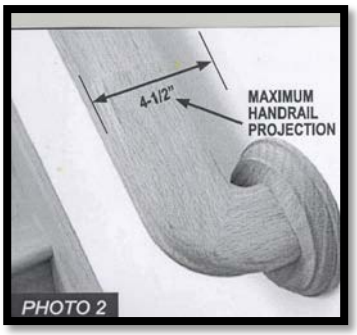
SECTION R311.7 STAIRWAYS

R311.7.1 Width.



Stairways shall not be less than 36 inches (914 mm) in clear width at all points above the permitted handrail height and below the required headroom height. **PHOTO 1**. Handrails shall not project more than 4.5 inches (114 mm) on either side of the stairway **PHOTO 2** and the clear width of the stairway at and below the handrail height, including treads and landings, shall not be less than 31.5 inches (787 mm) where a handrail is installed on one side and 27 inches (698 mm) where handrails are provided on both sides **PHOTO 3**.

Exception: The width of spiral stairways shall be in accordance with Section R311.7.10.1

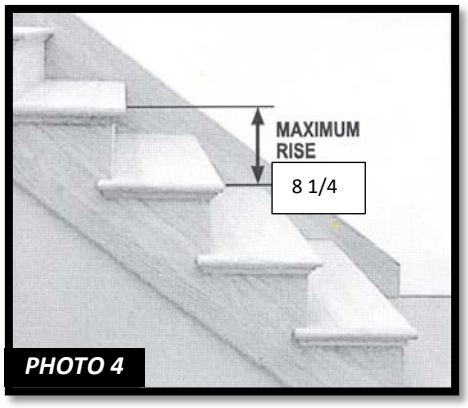


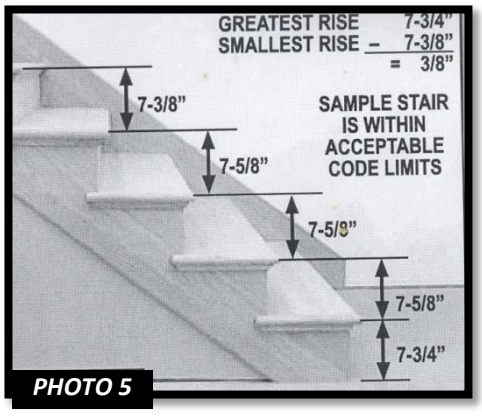
R311.7.2 Headroom. The minimum headroom in stairway shall not be less than 6 feet 8 inches (2036 mm) measured vertically from the sloped line adjoining the tread nosing or from the floor surface of the landing or platform on that portion of the stairway.

R311.7.4 Stair treads and risers.

R311.7.4.1 Riser height.

The maximum riser height shall be 8 1⁄4 inches (210 mm). The riser shall be measured vertically between leading edges of the adjacent treads. **PHOTO 4**. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3⁄8 inch (9.5 mm). **PHOTO 5**.





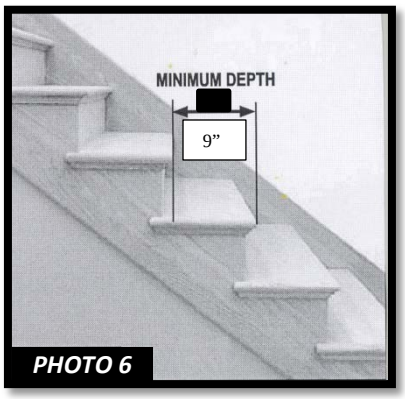


PHOTO 6

R311.7.4.2 Tread depth.

The minimum tread depth shall be 9 inches (229 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. **PHOTO 6**. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3⁄8 inch (9.5 mm). **PHOTO 7**. Winder treads shall have a minimum tread depth of 10 inches (254 mm) measured as above at a point 12 inches (305 mm) from the side where the treads are narrower. **DRAWING 1**. Winder treads shall have a minimum tread depth of 6 inches (152 mm) at any point. **DRAWING 2**. Within any flight of stairs, the greatest winder tread depth at the 12 inch (305 mm) walk line shall not exceed the smallest by more than 3⁄8 inches (9.5 mm).

HANDRAILS

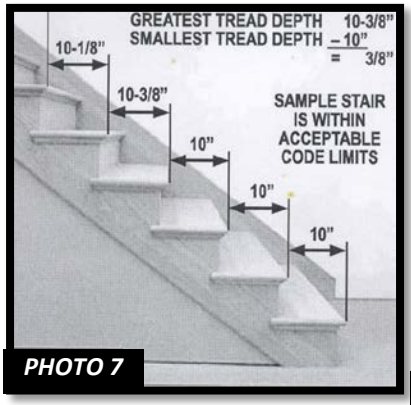
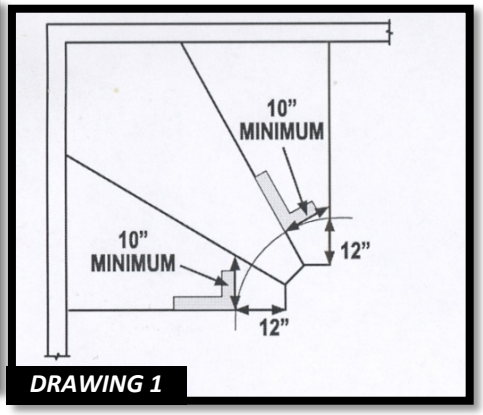
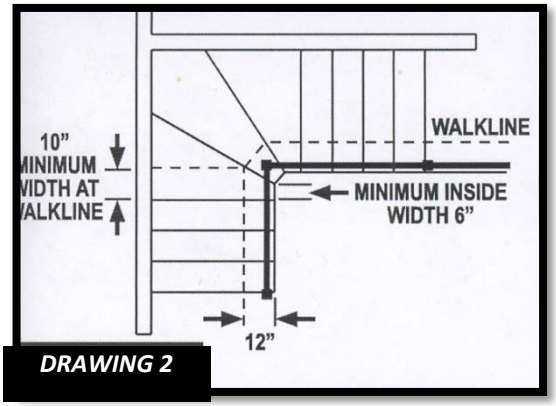


PHOTO 7



DRAWING 1



DRAWING 2

REPAIRS TO EXISTING:

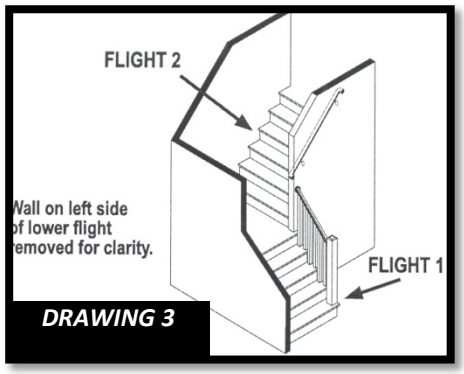
307.1 Handrails and Guardrails

Every exterior and interior flight of stairs having more than four risers shall have a handrail on one side of the stair and every open portion of a stair, landing, balcony, porch, deck, ramp or other walking surface which is more than 30 inches above the floor or grade below shall have guards. Handrails shall not be less than 30 inches high or more than 42 inches high measured vertically above the nosing of the tread or above the finished floor of the landing or walking surfaces. Guards shall not be less than 30 inches in height above the floor of the landing, balcony, porch, deck, or ramp or other walking surface

NEW INSTALLATION**NEW CONSTRUCTION** OR IF MISSING:

R311.7.8 Handrails.

Handrails shall be provided on no less than one side of each continuous run of treads or flight with four or more risers. **DRAWING 3**



DRAWING 3

R311.7.8.1 Height.

Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or finish surface of ramp slope, shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm). **PHOTO 8**.

Exceptions:

1. The use of a volute, turnout or starting easing shall be allowed over the lowest tread.
2. Where handrail fittings or bendings are used to provide continuous transition between flights, transitions at winder treads, the transition from handrail to guard, or used at the start of a flight, the handrail height at the fittings or bendings shall be permitted to exceed 38 inches (956 mm).

PHOTO 8

R311.7.8.2 Continuity.

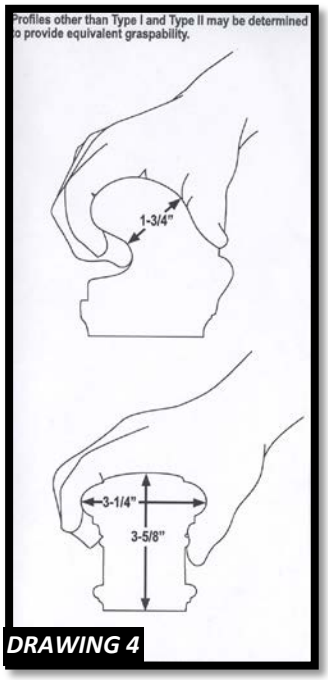
Handrails for stairways shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1½ inches (38 mm) between the wall and the handrails.

Exceptions:

1. Handrails shall be permitted to be interrupted by a newel post at the turn.
2. The use of a volute, turnout, starting easing or starting newel shall be allowed over the lowest tread.

R311.7.8.3 Handrail grip size.

Required handrails shall be of one of the following types or provide equivalent graspability. **DRAWING 4**.



DRAWING 4

1. Type I. Handrails with a circular cross section shall have an outside diameter of at least 1 1⁄4 inches (32 mm) and not greater than 2 inches (51 mm). If the handrail is not circular, it shall have a perimeter dimension of not less than 4 inches (102 mm) and not greater than 6 1⁄4 inches (160 mm) with a cross section of dimension of not more than 2 1⁄4 inches (57 mm). **PHOTO 9**. Edges shall have a radius of not less than 0.01 inches (0.25 mm).

2. Type II. Handrails with a perimeter greater than 6 1⁄4 inches (160mm) shall provide a graspable finger recess area on both sides of the profile. **PHOTO 10**. The finger recess shall begin within a distance of 3⁄4 inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of not less than 5/16 inch (8mm) within 7⁄8 inch (22mm) below the widest portion of the profile. **PHOTO 11**. This required depth shall continue for not less than 3⁄8 inch (10mm) to a level that is not less than 13⁄4 inches (45 mm) below the tallest portion of the profile. **PHOTO 12**. The width of the handrail above the recess shall be not less than 1 1⁄4 inches (32 mm) and not more than 2 3⁄4 inches (70 mm). **PHOTO 13**. Edges shall have a radius of not less than 0.01 inches (0.25 mm). **PHOTO 13**

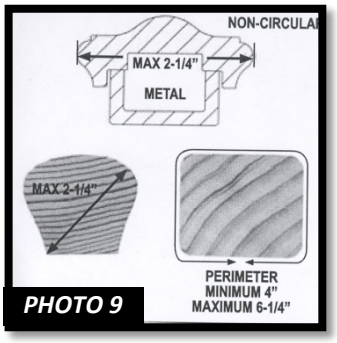


PHOTO 9

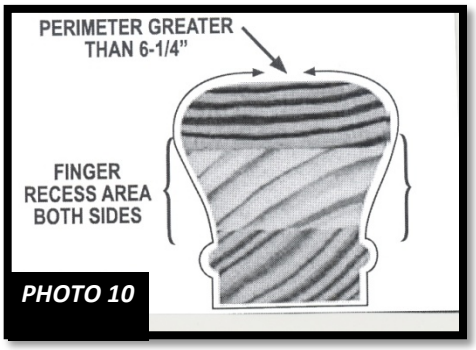


PHOTO 10

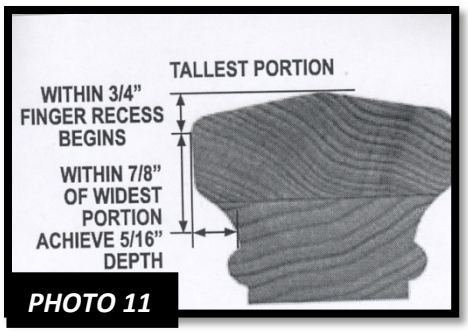


PHOTO 11

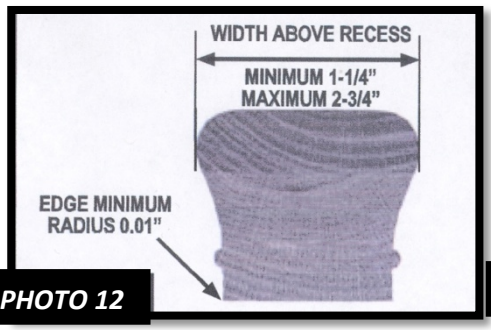


PHOTO 12

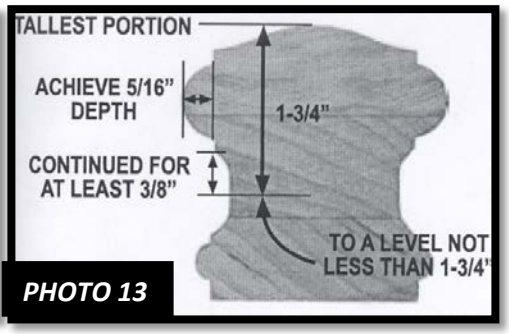


PHOTO 13

SECTION R312 GUARDS AND WINDOW FALL PROTECTION

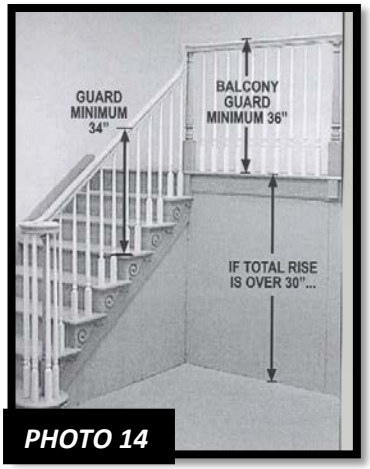


PHOTO 14

R312.1.1 Guards – Where Required.
Guards shall be located along open-sided walking surfaces, including stairs, ramps, and landings, that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Insect screening shall not be considered as a guard.

R312.1.2 Guard height.
Required guards at open-sided walking surfaces, including stairs, porches, balconies or landings, shall be not less than 36 inches (914 mm) in height as measured vertically above the adjacent walking surface or the line connecting the leading edges of the treads **PHOTO 14.**

Exceptions:
1. Guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the tread.
2. Where the top of the guard serves as a handrail on the open sides of the stairs, the top of the guard shall be not less than34 inches (864 mm) and not more than 38 inches (965 mm) as measured vertically from a line connecting the leading edges of the treads.

PHOTO 15

R312.3 Guard opening limitations.
Required guards shall not have openings from the walking surface to the required guard height that allow passage of a sphere 4 inches (102 mm) in diameter.. **PHOTO 15**.

Exception:
1. The triangular openings at the open side of stair, formed by the riser, tread and bottom rail of a guard, shall not allow passage of a sphere 6 inches (153 mm) in diameter. **PHOTO 16**.

2. Guards on the open side of stairs shall not have openings that allow passage of a sphere 4 3/8 inches (111 mm) in diameter. **PHOTO 16**.

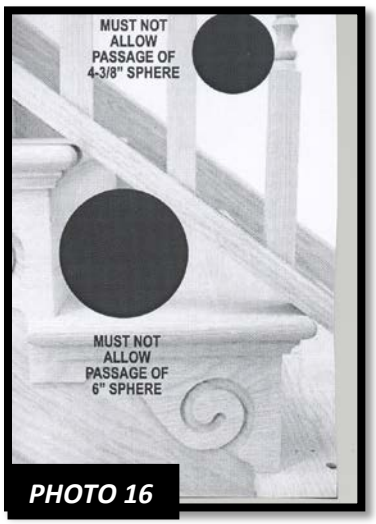


PHOTO 16

R312.2 Window fall protection.
Window fall protection shall be provided in accordance with Section R312.2.1 and R312.2.2.

R312.2.2.1 Window sills.
In dwelling units, where the top of the sill of an operable window opening is located less than 24 inches (610 mm) above the finished floor and greater than 72 inches (1829 mm) above the finished grade or other surface below on the exterior of the building, the operable window shall comply with one of the following:
1. Operable windows with openings that will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening where the opening is in its largest opened position.
2. Operable windows that are provided with window fall prevention devices that comply with ASTM F2090.
3. Operable windows that are provided with window opening control devices that comply with Section R312.2.2.