

**CALL BEFORE YOU DIG**



**DIGGERS  
HOTLINE  
OF NEBRASKA**

---

**1-800-331-5666**

---

**CALL 48 HRS BEFORE YOU DIG**

ANYONE OBTAINING A BUILDING PERMIT TO CONSTRUCT A DECK, FENCE, GARAGE, ADDITION, ETC..MUST FIRST CALL THE ABOVE NUMBER TO REQUEST LINE LOCATIONS OF LOCAL UTILITIES. THIS IS REQUIRED ANYTIME YOU PLAN TO DIG FOR ANY REASON. PLEASE CALL BEFORE YOU START DIGGING.

## PERMITS AND INSPECTIONS

**Permits Required** – No building or structure regulated by the City of Blair shall be erected, constructed, enlarged, altered, repaired, moved, converted or demolished unless a separate permit for each building or structure has first been obtained from the City.

**A REScheck/COMcheck Compliance Certificate must be submitted at the time of application for all new construction (residential or commercial) permits.**

**Permit Issuance** – Contractors/Homeowners will make applications for a building permit at City Hall but no money will be collected for the permit until the Building Inspector reviews all plans and determines the permit fee. Such plans may also be reviewed by other Departments of the City to verify compliance with any applicable laws under their jurisdiction. If the Building Inspector and other Departments (2 days-residential, 5+ days-commercial review) find that the work described in an application for a permit, the plans, specifications, and/or other data filed therewith conform to the requirement of the International Building Code and the City Zoning Ordinance, the Contractor/Homeowner will be contacted regarding the permit fee amount and allowed to pick up the building permit. No work should start until the permit is issued and paid for.

When the City issues a permit where plans are required, it shall be endorsed in writing or by a stamp on the plans and specifications “APPROVED”. Such approved plans and specifications shall not be changed, modified, or altered without authorization from the City and all work regulated by this code shall be done in accordance with the approved plans.

***NOTE: A survey of the lot may be required to verify that the structure is located in accordance with the approved plans.***

A deposit will also be collected during the application process to insure all inspections and permits are obtained. This deposit will be refunded after the completion of a final inspection and if none of the following have occurred: 1) *theft of water service by either the plumber, owner or general contractor*, 2) *all required inspections have not been obtained*, 3) *occupancy occurs prior to a final inspection*, 4) *all permits have not been obtained*, 5) *the project is completed without a final inspection being done*. This deposit is collected to insure the compliance of all building codes and building permit regulations and will be determined as follows: 1) \$200.00 – for all residential additions/remodels/accessory buildings valued under \$10,000 and 2) \$500.00 - for all commercial, new homes and residential additions/remodels/accessory buildings valued \$10,000 or greater

**Inspections** – All construction or work, for which a permit is required, shall be subject to inspection by the Building Inspector and all such construction work shall remain accessible and exposed for inspection purposes until approved by the Building Inspector.

It shall be the duty of the permit applicant to cause the work to remain accessible and exposed for inspection purposes. Neither the Building Inspector nor the jurisdiction shall be liable for expense cause by the removal or replacement of any material required to allow inspection.

**Inspection Request** – It shall be the duty of the persons doing the work authorized by the permit to notify the Building Inspector a minimum of twenty-four (24) hours in advance that such work is ready for inspection. It shall be the duty of the person requesting any inspections required by this code to provide access to and means for inspection of such work.

**NOTE:** *If a twenty-four (24) hour advance notice is not given for an inspection, same day inspection can not be guaranteed. Also, be sure to schedule inspections prior to ordering concrete.*

**Approval Required** – Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the Building Inspector.

**Required Inspections** – The Building Inspector, upon notification shall make the following inspections and shall either approve that portion of the construction as completed or shall notify the permit holder or his agent wherein the same fails to comply with this code:

1. **Temporary Service:** Requires a permit and inspection prior to hookup by OPPD.
2. **Foundation Inspection:** To be made after excavations for footings are complete and any required reinforcing steel is in place.
3. **Concrete Slab or Under-floor Inspection:** To be made after all in-slab or under-floor building service, piping accessories and/or other ancillary equipment are in place, but before any concrete is placed.
4. **Rough-in Inspections:** Rough-in mechanical features include electrical, plumbing, heating, ventilating, refrigeration, and air conditioning.
  - A) **Rough Plumbing:** To be made after all fixture outlets, water heater, vents, water lines, waste lines, and sewer lines have been installed.
  - B) **Rough Electrical:** To be made after all panels, branch circuits, receptacle outlets, wires, and conduits have been installed. All temporary power and permanent service is required to be installed by a licensed electrician by the State of Nebraska Electrical Board.
  - C) **Rough Mechanical:** To be made after all heating, refrigeration, compressors, venting pipes, and conditioned air ducts have been installed.

**Note:** *All mechanical inspections must be made prior to the installation of any insulation and/or wallboard.*

**Note:** *During new construction, if there is to be a finished basement, please contact the Utilities Department for installation of remote wires prior to any drywall being installed.*

- 5) **Frame Inspection:** To be made after the roof, all framing, fire blocking and bracing are in place and all pipes, chimneys and vents are complete and the rough electrical, plumbing, and heating wires, pipes, and ducts are approved.

*Note: Framing inspections are required upon completion of the rough-ins for electrical, plumbing, and mechanical. This includes the completion of fire stopping, draft stops, and bracing.*

*Note: Drywall inspections for fire-resistance rated construction shall be inspected prior to any plaster being installed or wallboard joints being taped and finished.*

- 6) **Permanent Service:** The City of Blair requires a building or structure to be fully enclosed prior to accepting a permanent service (siding need not be complete, as long as the structure is tight from the weather elements.) Once the service has been approved, the City will fax the approved inspection to OPPD.

The permanent service shall have a GFCI receptacle on each floor including the basement. This requirement shall be completed prior to approving an inspection for permanent service. Note: Generally this inspection should be requested on or prior to your drywall inspection.

*Note: All meter service equipment shall be installed in or directly attached on single family dwellings.*

- 7) **Final Inspection:** To be made after the building is completed and ready for occupancy. There shall be a final inspection and approval of all buildings and structures when completed and ready for occupancy and use.

*Note: Failure to comply with a final inspection and/or allow occupancy prior to a final inspection will result in **FORFEITURE** of the deposit.*

- 8) **Septic Systems:** Septic Tank and laterals shall be inspected for proper installation and to ensure their size of tank and laterals will work for that property.

- 9) **Stop Box Location Cards:** These cards must be completed and returned to City Hall before the building deposit can be refunded.

- 10) All Commercial/Industrial construction requires review and approval of the State Fire Marshal's Office. This review is your responsibility. Forms can be obtained at City Hall.

**NOTE: ALL SINGLE FAMILY DWELLINGS CONSTRUCTED WITHIN THE CORPORATE LIMITS OF THE CITY OF BLAIR OR WITHIN THE ZONING JURISDICTION LIMITS OF THE MUNICIPALITY SHALL HAVE ROOF EAVES OF NOT LESS THAN TWELVE INCHES (12").**

## CHECK LIST ROUGH-IN

### Temporary Electric Pedestal

- GFCI
- Stability
- Grounding

### Foundation

- Setbacks
- Footings
- Basement Walls
- Perimeter Drain

### Underground

- Electrical
- Sewer
- Water
- Septic

### Rough Plumbing

- Test Procedure
- Venting
- Strapping
- Nail Plates
- Proper Fall

### Rough Mechanical

- Combustibles/Chase
- Combustion Air Vent
- Bath fan venting
- Dryer Vent lgth/Els.
- Furnace
- GFCI

### Drywall (Prior to taping for Fire Walls Only)

- Water Meter

### Rough Electric

- Outlet Spacing Rooms
- Kitchen, Islands, Penn.
- Nail Plates
- Wire Location /Walls
- Bundling
- Whirlpool
- Garage Fire Wall

### Rough Framing

- Fire-Blocking
- Penetrations
- Hangers/Truss Clips
- Bearing to Foundation
- Notching
- Truss Plans
- Strapping
- Sill Plate Fastners
- Beam Shims
- Stair Headroom
- Joist Spacing
- Joist Bearing Surface
- Joist Overlap
- Double Joist Bearing Wall
- Rafter Size, Spacing Span
- Attic Access
- Attic Venting
- Crawl Space Venting
- Smoke Detectors
- Egress Windows
- Safety Glazing
- Bracing

## CHECK LIST FINAL

### Final Plumbing

- Leaks
- Reversed Hot and Cold
- Caulking
- Dishwasher Air Gap
- Check Traps
- Stop Box Location Card
- OPPD Water Line Fees  
(If Applicable)

### Final Mechanical

- Water Heater Vent
- Combustion Air
- Branch Circuit
- Disconnect
- Gas Pipe

### Final Electrical

- Fixtures
- Exit Lights
- GFCI's Function
- Outlet Polarity
- Bonding Jumper
- Panel Marking
- Dishwasher
- Disposal
- Stair Lighting
- Closet Lighting
- Exposed Romex

### Final Framing

- Stair Rise & Run
- Railing/Guardrails
- Fire Wall Penetration
- Garage Fire Door
- Smoke Detectors
- Shower Enclosures
- Landing and Stoops
- Curb/Driveway
- Splash Blocks/Downspouts
- Ceiling Insulation
- Decks
- Sidewalks
- Contiguous Parcel Agreement

# **INFORMATION FOR**

## **CONTRACTORS/SUBCONTRACTORS**

Any non-resident contractor/subcontractor doing business in Nebraska, must register with the **Nebraska Department of Revenue** at (402) 471-5729 or 1-800-742-7474.

Any contractor/subcontractor doing business in Nebraska who is Incorporated in or outside the State of Nebraska must be registered with the **Nebraska Secretary of State** at (402) 471-4079.

Any contractor/subcontractor doing business in **Douglas, Lancaster or Sarpy** county in Nebraska must register under the Nebraska Contractor Registration Act with the **Nebraska Department of Labor** at (402) 595-3189.

Contractors/Subcontractors who need information regarding Workers' Compensation Insurance Coverage may contact the **Nebraska Worker's Compensation Court** at 1-800-599-5155.

Contractors/Subcontractors who need information regarding Unemployment Insurance Coverage may contact the **Nebraska Unemployment Insurance Division** at (402) 595-3187 in Omaha and (402) 471-4512 in Lincoln.

# **NOTICE**

**TO**

## **CONTRACTORS & SUBCONTRACTORS**

Nebraska State Law, Sections 48-2101 through 48-2116, requires all contractors and subcontractors doing business in **Douglas, Lancaster, or Sarpy** county, to register with the State of Nebraska. For further information contact:

Nebraska Department of Labor  
Division of Safety & Labor Standards  
1313 Farnam Street, Third Floor  
Omaha, NE 68102-1898  
Phone: (402) 595-3189

Any contractor or subcontractor failing to register with the Nebraska Department of Labor is subject to a fine of **\$500.00 to \$5,000.00.**

**APPENDIX - PERMIT, LICENSE AND APPLICATION FEES  
AS SET BY MAYOR AND CITY COUNCIL  
Application Permit and License Fees – Effective 12/1/2010**

---

<b>Dog and Cat License</b>	<b>\$15.00</b>
Spayed female dog/cat or neutered male dog/cat	\$10.00
Tag replacement	\$ 5.00
<b>Dog Impoundment</b>	<b>\$15.00</b>
<b>Cat Impoundment</b>	<b>\$ 8.00</b>
<b>Dog Boarding Fee</b>	<b>\$ 8.00</b>
<b>Cat Boarding Fee</b>	<b>\$ 6.00</b>
<b>Dog Adoption</b>	<b>\$20.00</b>
<b>Cat Adoption</b>	<b>\$10.00</b>
<b>Drop Off Fee</b>	<b>\$20.00</b>
<b>Pawnbrokers, Junk &amp; Secondhand Dealers - Annual</b>	<b>\$50.00</b>
<b>Hawkers, Peddlers or sellers of goods (30 days)</b>	<b>\$10.00</b>
<b>(1 year)</b>	<b>\$75.00</b>

---

<b>License Fee - General Contractor</b>	<b>\$60.00</b>
<i>(Certificate of Insurance with minimum limits of 1,000,000 Aggregate/ \$300,000 Each Occurrence)</i>	
<b>Permit Issuance Fee (All Permits)</b>	<b>\$25.00</b>
<b>Building Permit Deposit Fee</b>	
Residential additions/remodels/accessory buildings valued under \$10,000	<b>\$200.00</b>
Commercial, new homes and residential additions/remodels/accessory buildings valued \$10,000 or greater	<b>\$500.00</b>
Misc. permits	<b>\$50.00</b>

**Building Permit Fees (PERMIT ISSUANCE FEE will be added)**

The Permit Fees for the following building permit types are determined using the following formulas and charts:

**RESIDENTIAL – NEW CONSTRUCTION:**

**Permit fee is:**

Finished sq/ft area (not including finished basement area) X **\$92** plus

Finished basement sq/ft area X **\$56** plus

Unfinished basement sq/ft area X **\$29** plus

Garage sq/ft area X **\$25**

**Multiplied by 0.006**

**RESIDENTIAL – ADDITIONS / REMODELS and COMMERCIAL – NEW CONSTRUCTION / ADDITIONS / REMODELS:**

Business/Industrial/Educational/Assembly/Factory/Storage/Utility  
*\*Porches with roofs/screened patios are considered additions*

**Construction valuation computation: Sq/ft area X \$63**

Except for the following:

Accessory Buildings & Interior Remodeling Projects sq/ft area X \$43

Pole barns with no hard surface floor sq/ft area X \$25

Sign Erecting/Awnings and Decks/Handicap Ramps sq/ft area X \$25 (Minimum \$2000)

**Construction valuation is .....Permit fee is:**

\$0	TO	\$50	.....	\$0		
\$51	TO	\$500	.....	\$25		
\$501	TO	\$2,000	.....	\$25	+	\$3 per additional \$100
\$2,001	TO	\$25,000	.....	\$70	+	\$13 per additional \$1,000
\$25,001	TO	\$50,000	.....	\$370	+	\$10 per additional \$1,000
\$50,001	TO	\$100,000	.....	\$620	+	\$7 per additional \$1,000
\$100,001	TO	\$500,000	.....	\$970	+	\$5 per additional \$1,000
\$500,001	TO	\$1,000,000	.....	\$2,970	+	\$4 per additional \$1,000
\$1,000,001	AND OVER		.....	\$4,970	+	\$3 per additional \$1,000

**Misc. Permit Fees (INCLUDES PERMIT ISSUANCE FEE)**

**\$65.00**

- Egress Window
- Fences
- Gazebos
- Patios / Driveways / Sidewalks (*new or replacement*)
- Roofing/Siding/Soffits and/or Eave Repair/Gutters
- Swimming Pools with Fence
- Window/Door Replacement (*size change only*)
- Miscellaneous Building Permits (*items not covered by one of the above*)

**Utility Excavation and Curb Grinding\***

**\$75.00**

*\*Bond Checks are required on Utility Excavation and Curb Grinding Permits-See Permit Application*

**PERMIT RENEWAL FEE:**

*This fee is based on the amount of the original permit valuation and is charged when work is not completed within two years and the permit expires. Renewals will only be allowed with the stipulation that all exterior site work and outside finish work is completed and interior life-safety issues have been properly address. Permit renewals are for one (1) year, with a maximum of two (2) renewals for a maximum permit span of four (4) years.*

Original permit valuation up to \$50,000	<b>\$150.00</b>
Original permit valuation of \$50,000 – \$100,000	<b>\$200.00</b>
Original permit valuation of \$100,000 – \$500,000	<b>\$300.00</b>
Original permit valuation of \$500,000 or more	<b>\$400.00</b>

**SUBCONTRACTOR PERMIT FEES** are based upon actual items that require an inspection or review. When applicable, all items of the same sub-permit type (mechanical, plumbing or electrical) should be combined on a single permit with one (1) permit issuance fee. (Example: A 20 unit apartment complex should be charged one (1) permit issuance fee and 20 sets of specific items on the mechanical, plumbing and/or electrical permits.)

**PLUMBING PERMIT FEES**

<b>License Fee: Master Plumber</b> <i>(plus \$5000 bond)</i>	<b>\$60.00</b>
<b>Journeyman Plumber</b> <i>(No Bond Required)</i>	<b>\$25.00</b>
<b>Water Service Line Installer</b> <i>(plus \$5000 bond)</i>	<b>\$60.00</b>
<b>Drain Layer</b> <i>(plus \$5000 bond)</i>	<b>\$60.00</b>

**Permit Issuance Fee** **\$25.00**

**Plumbing:**

Modular Home .....	\$50.00
Kitchen <i>(Per Unit)</i> .....	\$12.00
Bath – Single Stall <i>(Per Unit)</i> .....	\$12.00
Bath – Multi-Stall <i>(Per Unit)</i> .....	\$25.00
Rough-In Bath <i>(Per Unit)</i> .....	\$8.00
Slop Sink/Laundry Tray/Drain <i>(Per Unit)</i> .....	\$6.00
Additional Sinks <i>(Per Unit)</i> .....	\$6.00
Outside Water Faucet <i>(Per Unit)</i> .....	\$6.00
Water Heater (New and Replacement) <i>(Per Unit)</i> .....	\$10.00
Backflow/Grease Trap <i>(Per Unit)</i> .....	\$15.00
Drinking Fountain <i>(Per Unit)</i> .....	\$6.00
Water Service <i>(Per Connection)</i> .....	\$15.00
Sewer <i>(Per Connection)</i> .....	\$15.00
Groundwork .....	\$15.00
Septic Tank & Laterals .....	\$15.00
Lawn Sprinkler System <i>(Per backflow preventer)</i> .....	\$10.00
Sprinkler System <i>(Commercial)</i> .....	\$30.00
Gas/Water Piping System <i>(Commercial)</i> .....	\$50.00
Water Tap:	
3/4" .....	\$150.00
1" .....	\$200.00
1 1/2" .....	\$250.00
2" .....	\$300.00

**Anything larger requires approval from our Director of Public Works**

**MECHANICAL PERMIT FEES**

<b>License Fee: Master Heater</b> <i>(plus \$5,000 bond)</i>	<b>\$60.00</b>
<b>Journeyman Heater</b> <i>(No Bond Required)</i>	<b>\$25.00</b>
<b>Gas Line Installer</b> <i>(plus \$5,000 bond)</i>	<b>\$25.00</b>

**Permit Issuance Fee** **\$25.00**

**Heating Permit Fees**

Modular Home .....	\$50.00
Furnace/Heat Pump/Air Conditioner <i>(Per Unit)</i>	
Up to and including 100,000 BTU / 3 Ton.....	\$15.00
Over 100,000 BTU / 3 Ton.....	\$25.00
Refrigeration Units/Coolers/Lines/Compressor (Commercial – New or Replacement) .....	\$15.00
Appliance Vents/Fans.....	\$10.00
Duct System.....	\$15.00
Gas/Air Outlets <i>(Per Outlet)</i>	
First 5.....	\$6.00
Additional.....	\$1.00
Radiant Heat Systems/Gas/Water Piping Systems .....	\$50.00
Boiler (BTUs)	
Up to 100,000.....	\$15.00
100,000 – 500,000.....	\$30.00
500,000 – 1,000,000.....	\$40.00
1,000,000 – 1,750,000.....	\$60.00
Over 1,750,000.....	\$100.00

**ELECTRICAL PERMIT FEES**

<b>License Fee: Electrician</b> <i>(plus \$5,000 bond)</i>	<b>\$60.00</b>
<b>Journeyman Electrician</b> <i>(No Bond Required)</i>	<b>\$25.00</b>
<b>Fire/Security System Installer</b> <i>(No Bond Required)</i>	<b>\$25.00</b>

*\*Copy of current state electrical card required for all of the above*

**Permit Issuance Fee** **\$25.00**

**Electrical Permit Fees**

Existing Service <i>(Upgrade)</i> .....	\$25.00
Temporary Service .....	\$15.00
Fire Alarm System.....	\$15.00
Modular Home .....	\$50.00
Sign.....	\$25.00
Smoke Detectors.....	\$3.00
Miscellaneous Apparatus, Conduits and Conductors.....	\$15.00

*(Misc. items for which a permit is required but for which no fee is herein set forth.)*

COMMERCIAL/MULTI-FAMILY AND ALL UPGRADES:

**New Service Fee = (Amp Fee + \$5.00 per branch circuit)**

1-100 Amp Fee.....	\$25.00
101-200 Amp Fee.....	\$35.00
201-300 Amp Fee.....	\$55.00
301-400 Amp Fee.....	\$75.00
401-500 Amp Fee.....	\$95.00
501-600 Amp Fee.....	\$115.00
601-700 Amp Fee.....	\$135.00
701-800 Amp Fee.....	\$155.00
801-900 Amp Fee.....	\$175.00
901-1000 Amp Fee.....	\$195.00
OVER 1000 Amp	
1st 1000 Amps .....	\$195.00
Each additional 100 Amps.....	\$20.00

*(Example: 200 ampere service with 40 branch circuits = \$35.00 + (40 X 5.00) = \$235.00 permit fee)*

**NEW RESIDENTIAL:**

New Single Family/Two Family Dwelling Fee = **Finished sq/ft area X .063**

OTHER TYPES of residential occupancies and alterations, additions and modifications to existing residential and commercial buildings:

Receptacle, Switch and Lighting Outlets <i>(Per Unit - 110 volts only)</i> .....	\$1.00
Power Apparatus <i>(Per Unit - 220 volts)</i> .....	\$8.00

---

**TREE TRIMMERS**

**License Fee: Tree Trimmer** *(plus \$5,000 bond)* **\$ 60.00**  
*\* No permit fee is required*

---

**After Hour Fees** **\$80.00/hour**  
*Inspections that require the inspector to remain on the job site past 4:30 p.m. for an extended period due to contractor failure or for Saturday inspections.*

**Reinspection Fee** **\$50.00**  
*Fee for each inspection or re-inspection when such portion of the work for which inspection was requested is not complete or when corrections have not been made, and fee shall apply for additional inspections required by failure to call.*

**Work Without a Permit:** **Double the Permit Fee**  
*One written warning per general contractor or homeowner will be issued at no cost. Following the*

written warning, whenever any work for which a permit is required is started without first obtaining a permit, a fine equal to the actual cost of the permit shall be issued. (Examples: \$50 permit fee gets a \$50 fine, \$1,200 permit fee gets a \$1,200 fine)

---

## MISCELLANEOUS FEES & ZONING PERMIT FEES

Demolish/Move Building .....	\$50.00
Tree Planting ( <i>in the city right of way</i> ).....	\$15.00
Conditional Use Permit ( <i>new and renewal</i> ).....	\$230.00
Variance Application.....	\$230.00
Nonconforming Use Limited Extension .....	\$230.00
Rezoning .....	\$300.00
Zoning Ordinance Amendments ( <i>change to text</i> ) .....	\$550.00
Lot Split Application; Administrative Lot Line Adjustment.....	\$230.00
<b>Preliminary Plat</b>	
1 to 10 Lots ( <i>Plus \$10.00 per lot</i> ) .....	\$300.00
11 to 50 Lots ( <i>Plus \$10.00 per lot</i> ) .....	\$600.00
51 + Lots ( <i>Plus \$10.00 per lot</i> ) .....	\$900.00
<b>Final Plat</b>	
1 to 10 Lots ( <i>Plus \$10.00 per lot</i> ) .....	\$250.00
11 to 50 Lots ( <i>Plus \$10.00 per lot</i> ) .....	\$400.00
51 + Lots ( <i>Plus \$10.00 per lot</i> ) .....	\$600.00
<b>Replat</b>	
1 to 10 Lots ( <i>Plus \$10.00 per lot</i> ) .....	\$250.00
11 to 50 Lots ( <i>Plus \$10.00 per lot</i> ) .....	\$400.00
51 + Lots ( <i>Plus \$10.00 per lot</i> ) .....	\$600.00

**\*Amended by Resolution No. 2006-52 – November 14, 2006**

**\*Amended by Resolution No. 2007-53 – August 14, 2007**

**\*Amended by Resolution No. 2008-14 – April 8, 2008**

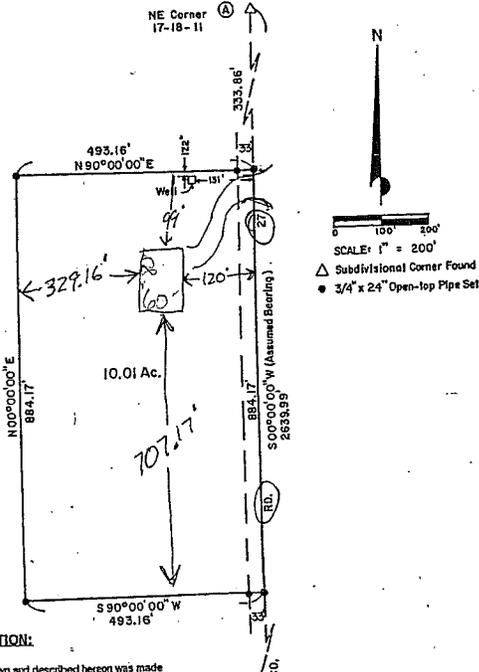
**\*Amended by Resolution No. 2008-29 – August 12, 2008**

**\*Amended by Resolution No. 2008-37 – October 14, 2008**

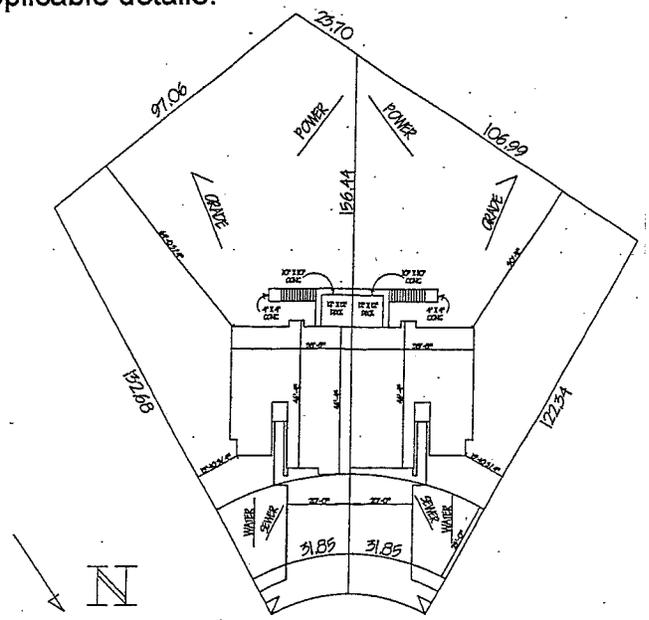
**\*Amended by Resolution No. 2010-50 – November 23, 2010**

# SAMPLE SITE PLANS

Site Plan must include property lines and dimensions, footprint of all buildings with dimensions, building setbacks from property line, distance between buildings, direction arrow, scale, location and dimensions of driveways and parking areas, location of proposed signs and fences, and any other applicable details.



**SURVEYOR'S CERTIFICATION:**  
I hereby certify that the survey shown and described hereon was made



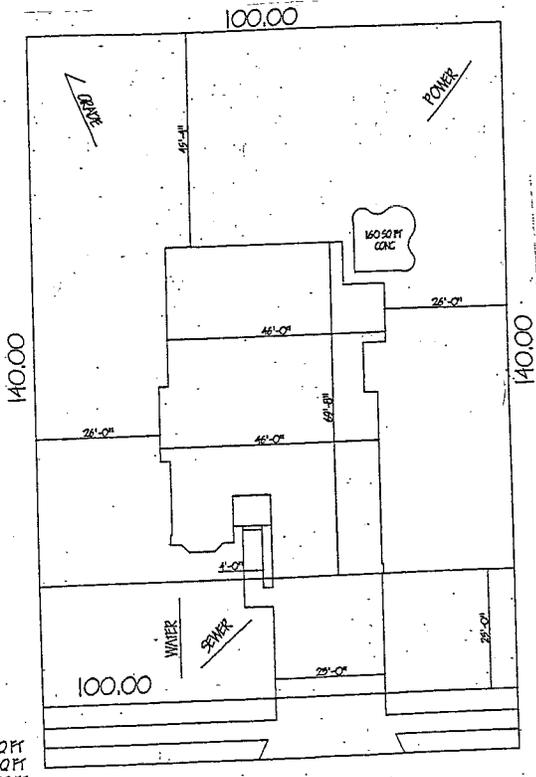
**LOT B**

LOT	10477 SQ FT
HOUSE	1140 SQ FT
GARAGE	441 SQ FT
CONCRETE	731 SQ FT

**LOT A**

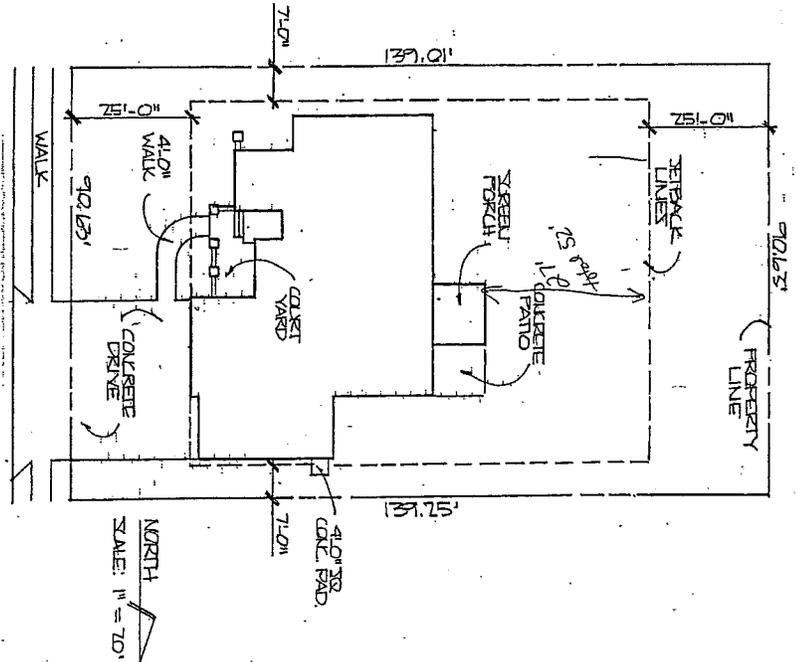
LOT	8832 SQ FT
HOUSE	1140 SQ FT
GARAGE	420 SQ FT
CONCRETE	712 SQ FT

**PLOT PLAN**  
SCALE 1" = 30' 0"



LOT	14000 SQ FT
HOUSE	2309 SQ FT
GARAGE	464 SQ FT
CONCRETE	860 SQ FT

**PLOT PLAN**  
SCALE 1" = 20' 0"



**NORTH**  
SCALE: 1" = 70'

ORDINANCE NO. 1766

AN ORDINANCE AMENDING THE ZONING REGULATIONS OF THE CITY OF BLAIR, NEBRASKA, ESTABLISHING AND REQUIRING CERTAIN REQUIREMENTS FOR SINGLE FAMILY DWELLINGS WITH REGARD TO MINIMUM EAVE SPECIFICATIONS AND METER SERVICE IN THE CITY OF BLAIR, NEBRASKA, AND ITS JURISDICTIONAL AREA, REPEALING ALL ORDINANCES OR PARTS OF ORDINANCES IN CONFLICT THEREWITH, AND PROVIDING WHEN THIS ORDINANCE SHALL BE IN FULL FORCE AND EFFECT.

BE IT ORDAINED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF BLAIR, NEBRASKA.

SECTION 1. That all single family dwellings constructed within the corporate limits of the City of Blair or within the zoning jurisdictional limits of the municipality shall have roof eaves of not less than twelve inches (12").

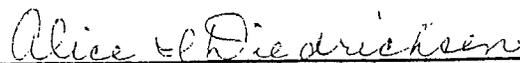
SECTION 2. That all meter service equipment shall be installed in or directly attached on single family dwellings.

SECTION 3. This ordinance shall be in full force and effect from and following the passage and publication hereof in pamphlet form as required by law.

PASSED AND APPROVED this 10th day of October, 1995.

  
MICHAEL A. MINES, MAYOR

ATTEST:

  
ALICE I. DIEDRICHSEN, CITY CLERK

(SEAL)





# CITY OF BLAIR

June 24, 2005

TO: ALL REGISTERED BLAIR GENERAL CONTRACTORS  
FROM: BLAIR CITY BUILDING DEPARTMENT  
RE: 2003 INTERNATIONAL ENERGY CONSERVATION CODE

On July 1, 2005, the 2003 International Energy Conservation Code will be the new Nebraska Energy Code. The Nebraska Energy Code replaces the 1983 Model Energy Code which has been the state standard for the past 20 years.

Therefore, as of July 1, 2005, when you apply for a Building Permit for a new home or a new commercial building **you must show that your building will comply with the Nebraska Energy Code by submitting a Compliance Certificate.** This certificate can be generated by using two free software programs developed by the U.S. Dept. of Energy. The residential program is named *REScheck* and can be downloaded at [www.energycodes.gov/rescheck](http://www.energycodes.gov/rescheck). The commercial program is named *COMcheck* and can be downloaded at [www.energycodes.gov/comcheck](http://www.energycodes.gov/comcheck). User guides for each program can be found at these sites also.

If you don't have Internet access, the City of Blair can provide you a CD-ROM containing both of these programs and the user guides.

Enclosed is a sample copy of a REScheck Compliance Certificate. The certificate will clearly show whether compliance fails or passes. **Without a passing certificate you will not be able to fill out a permit, so please make sure you bring it with you at the time you apply.**

If you have any questions regarding these requirements, please contact either of us at the numbers below our names. For questions about the REScheck or COMcheck software, please contact Dale Miller.

Phil Green  
Assistant City Administrator  
426-6691

Dale Miller  
Building Inspector  
426-6696



Permit Number

Checked By/Date

## REScheck Compliance Certificate 2003 IECC

REScheck Software Version 3.6 Release 2

Data filename: C:\Program Files\Check\REScheck\SAMPLE (Home).rck

PROJECT TITLE: SAMPLE

CITY: Blair

STATE: Nebraska

HDD: 6506

CONSTRUCTION TYPE: Single Family

WINDOW / WALL RATIO: 0.00

DATE: 06/13/05

DATE OF PLANS: April 20, 2005

### PROJECT DESCRIPTION:

Ranch walk out, 3 Bedrooms and 2 car garage.

### DESIGNER/CONTRACTOR:

Sample

### PROJECT NOTES:

2 egress windows in basement.

### COMPLIANCE: Fails

Maximum UA = 457

Your Home UA = 1110

142.9% Worse Than Code (UA)

	<u>Gross</u> <u>Area or</u>	<u>Cavity</u>	<u>Cont.</u>	<u>Glazing</u> <u>or Door</u>	
	<u>Perimeter</u>	<u>R-Value</u>	<u>R-Value</u>	<u>U-Factor</u>	<u>UA</u>
Ceiling 1: Flat Ceiling or Scissor Truss	1758	0.0	0.2		886
Skylight 1: Metal Frame:Triple Pane with Low-E	8			1.110	9
Wall 1: Wood Frame, 16" o.c.	1758	21.0	18.0		59
Door 1: Solid	18			1.340	24
Basement Wall 1: Solid Concrete or Masonry	1758	18.0	13.0		76
Wall height: 12.0'					
Depth below grade: 9.0'					
Insulation depth: 8.0'					
Floor 1: All-Wood Joist/Truss:Over Unconditioned Space	1758	13.0	15.0		56



# City of *Blair*

June 28, 2000

To: Licensed Plumbers & General Contractors

From: City of Blair

The City of Blair has requirements that must be met by all plumbers working within City jurisdiction. These requirements are as follows:

Plumbers must be licensed with the City of Blair and obtain a permit before beginning work on any job.

Only those holding a Master Plumbers License, Journeyman Plumbers License or Helpers License are entitled to do plumbing. The work done by the holders of a Journeyman Plumbers or Helpers License must be done under the direct supervision of a Master Plumber. Plumbers allowing work to be done under their license by unqualified or unsupervised personnel place their license at risk.

***Water lines may not be charged or water used until a meter is installed. Construction meters should be installed and an account set up as soon as water is ran into the building. Inside plumbing does not have to be done. Anyone caught straight piping the water line, for any purpose, will be prosecuted for theft of service.***

The City furnishes water meters when an account is established. The account may be in the name of the plumber or general contractor and any usage on the meter and related charges will be billed to the new homeowner, unless other arrangements have been made. Meters are available at Blair City offices.

Hydrant meters may also be obtained at the Blair City office and require that an account be established and a meter deposit be posted. (Based on availability)

A stop box location card must be completed and placed on file at City Hall. Cards are available at City Hall and must be prepared according to City specifications. ***Final inspections will not be performed until this card is on file.***

***Failure to comply with these requirements could result in licenses being revoked and/or contractor's security deposits being held.***

# CITY OF BLAIR

## Water Service Location Card

ROUTE NUMBER \_\_\_\_\_

Owner John F Blair

Address 2147 Front Street

Plumber No Name Plumbing & Heating Inc.

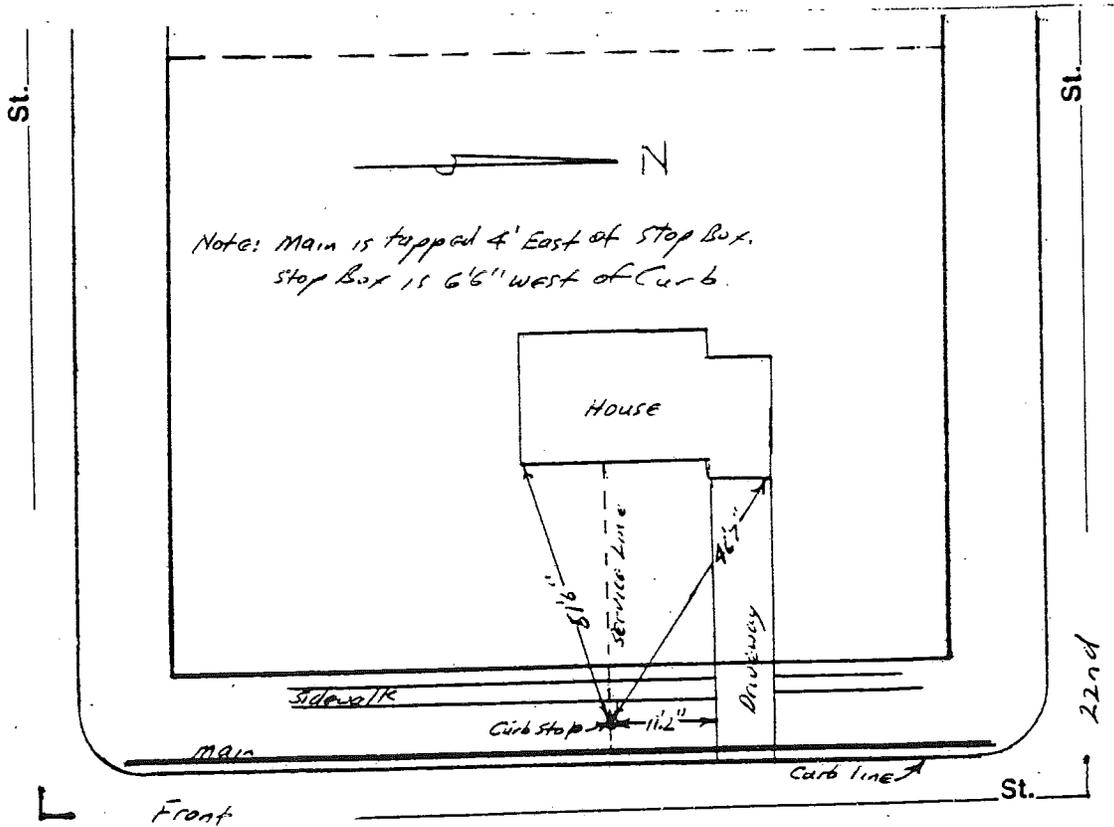
Type and Size of Service Line 3/4" K" Copper

Depth of Main at Tap 4'-8"

### METER DATA

Size \_\_\_\_\_ Serial Number \_\_\_\_\_

Location \_\_\_\_\_





# CITY OF BLAIR

---

## Memorandum

October 15, 2003

To: All Licensed Plumbers

From: Al Schoemaker

RE: Tapping of City Water Mains

Effective January 1, 2004 the City of Blair will be the only party that will be tapping city water mains. Water main tapping requests must be made three (3) working days in advance and the water main must be excavated and exposed for tap to be made. Plumber must provide corporation for the tap. This work will be for the water main tap only. Plumbers will be responsible for the connection of the water service lines to the corporation. The fees for water main taps are as follows:

- 3/4"           \$ 150
- 1"             \$ 200
- 1 1/2"       \$ 250
- 2"             \$ 300

For taps larger than 2" please call Allen Schoemaker for price.



# CITY OF BLAIR

---

January 1, 2006

ALL MASTER PLUMBERS,

Effective January 1, 2006 all water, sewer, vents and storm drainage (within a building) shall be tested according to the 2006 International Plumbing Code, Section 312.

**THE TEST SHALL BE COMPLETED AND WITNESSED BY THE BUILDING INSPECTOR DURING THE PLUMBING ROUGH-INS.**

## **DRAINAGE AND VENT AIR TEST**

An air test shall be made by forcing air into the system until there is a uniform gauge pressure the **FIVE POUNDS PER SQUARE INCH (psi)**. This pressure shall be held for a test period of at least 15 minutes. Any adjustment to the test pressure required because of ambient temperature or the seating of gaskets shall be made prior to the beginning of the test period.

## **WATER SUPPLY SYSTEM TEST**

Upon completion of the water supply system, the system shall be tested and proved tight under a water pressure or air test of not less than **90 POUNDS PER SQUARE INCH (psi)**. The water utilized for tests shall be obtained from a potable source of supply.

If you have any questions contact me at (402)-426-4191.

Sincerely,

Dale Miller  
Building Inspector

**CITY OF BLAIR  
RURAL WATER CUSTOMER CONNECT FEES**

**All fees must be paid prior to tap.**

- 1. Rural customers that directly connect to water mains constructed by the City of Blair at city expense shall pay a connect fee of \$3,000.00.**
- 2. Rural customers that connect to a water main that is constructed and paid for by a district or developer pays for the water main construction shall pay a connect fee of \$750.00.**
- 3. Rural customers that connect onto a water main that is owned and maintained by the developer on Highway 75 South (OPPD Water Main) shall pay a connect fee of \$1,200.00.**

**The City of Blair will only be responsible for the city water mains and not for any water mains within the development or feed the development. Oak Park I, II, IV the City of Blair will continue to read individual meters and bill the rural customers directly and bill the developer for any water loss within the development recorded by the master meter.**

**Homeowner:** Responsible for all materials and labor to construct line. (Corporation stop, curb stop, meter pit, line material, backflow preventer, etc.)

Meter furnished by City of Blair and installed at homeowners' expense. Service line from main to curb stop to be solid copper or copper with flared couplings.

**Curb stop:**

On rural systems which serve multiple housing units, an individual curb stop must be installed on the service line to each residence at the time of connection.

On existing rural systems, an individual curb stop must be installed in the existing service line to each residence prior to the activation of the system. Curb stops must be installed on public right-of-way prior to homeowners' property line.

## CITY OF BLAIR WATER RATES

Effective for Bills due 8/10/05

### CITY

<u>Residential</u>		<u>Commercial</u>	
Customer Chg, per month	per meter size	Customer Chg, per month	per meter size
First 15,000 CF/month, per HCF	0.981	First 65,000 CF/month, per HCF	1.015
Balance, per HCF	0.610	Balance, per HCF	0.610

### RURAL

<u>Residential</u>		<u>Commercial</u>	
Customer Chg, per month	per meter size	Customer Chg, per month	per meter size
First 15,000 CF/month, per HCF	1.472	First 65,000 CF/month, per HCF	1.472
Balance, per HCF	0.722	Balance, per HCF	0.722

<u>Industrial</u>		<u>City Departments</u>	
Customer Chg, per month	0.00	Customer Chg, per month	0.00
Commodity Charge, per HCF	0.554	Commodity Chg, per HCF	0.554

### CUSTOMER CHARGE/BY METER SIZE

Meter Size	City Water		Rural Water	
	Residential	Comm/Ind.	Residential	Comm/Ind.
5/8"	\$ 8.40	\$11.25	\$14.55	\$14.55
3/4"	12.00	15.45	16.75	16.75
1"	16.00	18.00	23.50	23.50
1 1/2"	32.50	37.00	40.00	40.00
2"	54.50	62.00	55.00	65.00
3"	115.00	132.00	115.00	130.00
4"	197.50	227.00	200.00	230.00
6"	445.00	512.00	450.00	515.00
8"	775.00	895.00	780.00	895.00

Exhibit "A"

## SEPTIC TANK MAINTENANCE

Once a septic tank and absorption field are installed, you can do several things to prolong their life. This will help protect your investment which may cost \$2,500 or more. Here are several tips you can follow.

In every properly functioning septic tank, sludge accumulates in the bottom. This sludge is composed of solid materials and must be removed periodically. If the sludge is not removed, the solids will build up in the tank and will begin to wash out into the absorption field and will eventually clog it to the point where a new field will be needed.

Most authorities agree for a typical 3 bedroom home, a 1,000-1,500 gallon septic tank will need to have the solids removed every 2-5 years. Smaller tanks must be pumped more often.

Septic tank additives that "clean" the tank are available, but are not recommended. Some additives may cause the solids to be washed from the tank into the absorption field, causing clogging problems even faster. Other compounds may produce septic effluent which will destroy soil structure and cause premature failure of the field.

Occasionally, a floating scum layer may develop in the tank. This scum layer must also be checked periodically and removed by pumping. Pumping is necessary to maintain the life of the absorption field.

An absorption field generally does not require any maintenance. However, to protect the life of the field:

1. Do not drive over the field with cars, trucks, or heavy equipment. This will help prevent breakage or blockage of the lines.
2. Do not plant trees or shrubbery in the field area. The root systems may clog the field.
3. Do not pour concrete or asphalt over the field. Evaporation is an important part of the fields ability to get rid of moisture.
4. Maintain good drainage of surface water away from the field area.

Remember your septic system is not a disposal. Disposable diapers, sanitary napkins, paper towels, and other slowly degradable products **should not** be flushed down your drains.

Garbage disposals and water softeners also effect your system. If you have these appliances, you should have your tank pumped more often.

Following these tips should reduce the chance of troubles with your system. Remember, it is very important to remove the solids from your septic tank regularly. Do not put the job off until the septic tank fills up. If this does happen, a new absorption field may need to be installed.

# **ATTENTION: PROPERTY OWNERS & CONTRACTORS**

Prior to the commencement of a demolition or renovation project by other than a homeowner, (in that person's residential property of 4 units or less), each residential or commercial property must undergo a thorough inspection for asbestos containing materials.

This inspection must be performed by a Nebraska certified Asbestos Inspector. A signed statement by the Inspector certifying that the structure is free of asbestos containing material must be submitted with the application for demolition or renovation. The statement shall include the following: Inspection date, project site address, Inspector name, State cert. no., and statement certifying that the structure, or portion involved in renovation, is free of asbestos containing material. Failure to do so will result in the permit being denied.

If a structure is composed of basic building material, (wood, brick, glass, concrete, or metal), a signed statement by the property owner attesting to the absence of asbestos material, may be submitted in lieu of the Inspector's statement. The statement shall include the following: Property owners name, property owners address, project site address, and statement certifying that the structure consists only of wood, brick, glass, concrete, or metal. Failure to do so will result in the permit being denied.

This is a requirement of the EPA National Emission Standards for Hazardous Air Pollutants [40 C.F.R. Part 61, (NESHAP)], and of the State of Nebraska Asbestos Control Regulations – Title 178 Chapter 22 NAC.

Lincoln/NESHAP  
Lincoln – Lancaster County Health Department  
3140 N Street  
Lincoln, Nebraska 68501-1514  
402/441-8034 Fax 402/441-8323

Nebraska Asbestos Control Program  
Nebraska Health & Human Services – Regulation & Licensure  
301 Centennial Mall South, P.O. 95007  
Lincoln, Nebraska 68509-5007  
402/471-0386 Fax 402/471-8833

TABLE R301.2(1)  
CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

GROUND SNOW LOAD	WIND DESIGN		SEISMIC DESIGN CATEGORY <sup>f</sup>	SUBJECT TO DAMAGE FROM			WINTER DESIGN TEMP <sup>a</sup>	ICE BARRIER UNDERLAYMENT REQUIRED <sup>h</sup>	FLOOD HAZARDS <sup>g</sup>	AIR FREEZING INDEX <sup>i</sup>	MEAN ANNUAL TEMP <sup>j</sup>	Climate Zone
	Speed <sup>d</sup> (mph)	Topographic effects <sup>k</sup>		Weathering <sup>a</sup>	Frost line depth <sup>b</sup>	Termite <sup>e</sup>						
25	90	NO	A	Severe	42	m-H	m-H	yes	1971	1500	50	5A

For SI: 1 pound per square foot = 0.0479 kPa, 1 mile per hour = 0.447 m/s.

- a. Weathering may require a higher strength concrete or grade of masonry than necessary to satisfy the structural requirements of this code. The weathering column shall be filled in with the weathering index (i.e., "negligible," "moderate" or "severe") for concrete as determined from the Weathering Probability Map [Figure R301.2(3)]. The grade of masonry units shall be determined from ASTM C 34, C 55, C 62, C 73, C 90, C 129, C 145, C 216 or C 652.
- b. The frost line depth may require deeper footings than indicated in Figure R403.1(1). The jurisdiction shall fill in the frost line depth column with the minimum depth of footing below finish grade.
- c. The jurisdiction shall fill in this part of the table to indicate the need for protection depending on whether there has been a history of local subterranean termite damage.
- d. The jurisdiction shall fill in this part of the table with the wind speed from the basic wind speed map [Figure R301.2(4)]. Wind exposure category shall be determined on a site-specific basis in accordance with Section R301.2.1.4.
- e. The outdoor design dry-bulb temperature shall be selected from the columns of 97<sup>1/2</sup>-percent values for winter from Appendix D of the *International Plumbing Code*. Deviations from the Appendix D temperatures shall be permitted to reflect local climates or local weather experience as determined by the building official.
- f. The jurisdiction shall fill in this part of the table with the seismic design category determined from Section R301.2.2.1.
- g. The jurisdiction shall fill in this part of the table with (a) the date of the jurisdiction's entry into the National Flood Insurance Program (date of adoption of the first code or ordinance for management of flood hazard areas), (b) the date(s) of the Flood Insurance Study and (c) the panel numbers and dates of all currently effective FIRMs and FBFMs or other flood hazard map adopted by the authority having jurisdiction, as amended.
- h. In accordance with Sections R905.2.7.1, R905.4.3.1, R905.5.3.1, R905.6.3.1, R905.7.3.1 and R905.8.3.1, where there has been a history of local damage from the effects of ice damming, the jurisdiction shall fill in this part of the table with "YES." Otherwise, the jurisdiction shall fill in this part of the table with "NO."
- i. The jurisdiction shall fill in this part of the table with the 100-year return period air freezing index (BF-days) from Figure R403.3(2) or from the 100-year (99%) value on the National Climatic Data Center data table "Air Freezing Index- USA Method (Base 32°)" at [www.ncdc.noaa.gov/fpsf.html](http://www.ncdc.noaa.gov/fpsf.html).
- j. The jurisdiction shall fill in this part of the table with the mean annual temperature from the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32°F)" at [www.ncdc.noaa.gov/fpsf.html](http://www.ncdc.noaa.gov/fpsf.html).
- k. In accordance with Section R301.2.1.5, where there is local historical data documenting structural damage to buildings due to topographic wind speed-up effects, the jurisdiction shall fill in this part of the table with "YES." Otherwise, the jurisdiction shall indicate "NO" in this part of the table.

# Part III—Building Planning and Construction

## CHAPTER 3

### BUILDING PLANNING

#### SECTION R301 DESIGN CRITERIA

**R301.1 Application.** Buildings and structures, and all parts thereof, shall be constructed to safely support all loads, including dead loads, live loads, roof loads, flood loads, snow loads, wind loads and seismic loads as prescribed by this code. The construction of buildings and structures in accordance with the provisions of this code shall result in a system that provides a complete load path that meets all requirements for the transfer of all loads from their point of origin through the load-resisting elements to the foundation. Buildings and structures constructed as prescribed by this code are deemed to comply with the requirements of this section.

**R301.1.1 Alternative provisions.** As an alternative to the requirements in Section R301.1 the following standards are permitted subject to the limitations of this code and the limitations therein. Where engineered design is used in conjunction with these standards, the design shall comply with the *International Building Code*.

1. American Forest and Paper Association (AF&PA) *Wood Frame Construction Manual (WFCM)*.
2. American Iron and Steel Institute (AISI) *Standard for Cold-Formed Steel Framing—Prescriptive Method for One- and Two-Family Dwellings (AISI S230)*.
3. ICC-400 *Standard on the Design and Construction of Log Structures*.

**R301.1.2 Construction systems.** The requirements of this code are based on platform and balloon-frame construction for light-frame buildings. The requirements for concrete and masonry buildings are based on a balloon framing system. Other framing systems must have equivalent detailing to ensure force transfer, continuity and compatible deformations.

**R301.1.3 Engineered design.** When a building of otherwise conventional construction contains structural elements exceeding the limits of Section R301 or otherwise not conforming to this code, these elements shall be designed in accordance with accepted engineering practice. The extent of such design need only demonstrate compliance of nonconventional elements with other applicable provisions and shall be compatible with the performance of the conventional framed system. Engineered design in accordance with the *International Building Code* is permitted for all buildings and structures, and parts thereof, included in the scope of this code.

**R301.2 Climatic and geographic design criteria.** Buildings shall be constructed in accordance with the provisions of this

code as limited by the provisions of this section. Additional criteria shall be established by the local *jurisdiction* and set forth in Table R301.2(1).

**R301.2.1 Wind limitations.** Buildings and portions thereof shall be limited by wind speed, as defined in Table R301.2(1) and construction methods in accordance with this code. Basic wind speeds shall be determined from Figure R301.2(4). Where different construction methods and structural materials are used for various portions of a building, the applicable requirements of this section for each portion shall apply. Where loads for wall coverings, curtain walls, roof coverings, exterior windows, skylights, garage doors and exterior doors are not otherwise specified, the loads listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3) shall be used to determine design load performance requirements for wall coverings, curtain walls, roof coverings, exterior windows, skylights, garage doors and exterior doors. Asphalt shingles shall be designed for wind speeds in accordance with Section R905.2.6.

**R301.2.1.1 Design criteria.** In regions where the basic wind speeds from Figure R301.2(4) equal or exceed 100 miles per hour (45 m/s) in *hurricane-prone regions*, or 110 miles per hour (49 m/s) elsewhere, the design of buildings shall be in accordance with one of the following methods. The elements of design not addressed by those documents in Items 1 through 4 shall be in accordance with this code.

1. American Forest and Paper Association (AF&PA) *Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM)*; or
2. International Code Council (ICC) *Standard for Residential Construction in High Wind Regions (ICC-600)*; or
3. *Minimum Design Loads for Buildings and Other Structures (ASCE-7)*; or
4. American Iron and Steel Institute (AISI), *Standard for Cold-Formed Steel Framing—Prescriptive Method For One- and Two-Family Dwellings (AISI S230)*.
5. Concrete construction shall be designed in accordance with the provisions of this code.
6. Structural insulated panel (SIP) walls shall be designed in accordance with the provisions of this code.

located within 10 feet (3048 mm) of an intake opening, such opening shall be located a minimum of 2 feet (610 mm) below the contaminant source.

For the purpose of this section, the exhaust from *dwelling* unit toilet rooms, bathrooms and kitchens shall not be considered as hazardous or noxious.

**R303.4.2 Exhaust openings.** Exhaust air shall not be directed onto walkways.

**R303.5 Outside opening protection.** Air exhaust and intake openings that terminate outdoors shall be protected with corrosion-resistant screens, louvers or grilles having a minimum opening size of 1/4 inch (6 mm) and a maximum opening size of 1/2 inch (13 mm), in any dimension. Openings shall be protected against local weather conditions. Outdoor air exhaust and intake openings shall meet the provisions for *exterior wall* opening protectives in accordance with this code.

**R303.6 Stairway illumination.** All interior and exterior stairways shall be provided with a means to illuminate the stairs, including the landings and treads. Interior stairways shall be provided with an artificial light source located in the immediate vicinity of each landing of the stairway. For interior stairs the artificial light sources shall be capable of illuminating treads and landings to levels not less than 1 foot-candle (11 lux) measured at the center of treads and landings. Exterior stairways shall be provided with an artificial light source located in the immediate vicinity of the top landing of the stairway. Exterior stairways providing access to a *basement* from the outside *grade* level shall be provided with an artificial light source located in the immediate vicinity of the bottom landing of the stairway.

**Exception:** An artificial light source is not required at the top and bottom landing, provided an artificial light source is located directly over each stairway section.

**R303.6.1 Light activation.** Where lighting outlets are installed in interior stairways, there shall be a wall switch at each floor level to control the lighting outlet where the stairway has six or more risers. The illumination of exterior stairways shall be controlled from inside the *dwelling* unit.

**Exception:** Lights that are continuously illuminated or automatically controlled.

**R303.7 Required glazed openings.** Required glazed openings shall open directly onto a street or public alley, or a *yard* or court located on the same *lot* as the building.

**Exceptions:**

1. Required glazed openings may face into a roofed porch where the porch abuts a street, *yard* or court and the longer side of the porch is at least 65 percent unobstructed and the ceiling height is not less than 7 feet (2134 mm).
2. Eave projections shall not be considered as obstructing the clear open space of a *yard* or court.
3. Required glazed openings may face into the area under a deck, balcony, bay or floor cantilever provided a clear vertical space at least 36 inches (914 mm) in height is provided.

**R303.7.1 Sunroom additions.** Required glazed openings shall be permitted to open into sunroom *additions* or patio covers that abut a street, *yard* or court if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening, and the ceiling height of the sunroom is not less than 7 feet (2134 mm).

**R303.8 Required heating.** When the winter design temperature in Table R301.2(1) is below 60°F (16°C), every *dwelling unit* shall be provided with heating facilities capable of maintaining a minimum room temperature of 68°F (20°C) at a point 3 feet (914 mm) above the floor and 2 feet (610 mm) from exterior walls in all habitable rooms at the design temperature. The installation of one or more portable space heaters shall not be used to achieve compliance with this section.

**SECTION R304  
MINIMUM ROOM AREAS**

**R304.1 Minimum area.** Every *dwelling* unit shall have at least one habitable room that shall have not less than 120 square feet (11 m<sup>2</sup>) of gross floor area.

**R304.2 Other rooms.** Other habitable rooms shall have a floor area of not less than 70 square feet (6.5 m<sup>2</sup>).

**Exception:** Kitchens.

**R304.3 Minimum dimensions.** Habitable rooms shall not be less than 7 feet (2134 mm) in any horizontal dimension.

**Exception:** Kitchens.

**R304.4 Height effect on room area.** Portions of a room with a sloping ceiling measuring less than 5 feet (1524 mm) or a furred ceiling measuring less than 7 feet (2134 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required habitable area for that room.

**SECTION R305  
CEILING HEIGHT**

**R305.1 Minimum height.** *Habitable space*, hallways, bathrooms, toilet rooms, laundry rooms and portions of *basements* containing these spaces shall have a ceiling height of not less than 7 feet (2134 mm).

**Exceptions:**

1. For rooms with sloped ceilings, at least 50 percent of the required floor area of the room must have a ceiling height of at least 7 feet (2134 mm) and no portion of the required floor area may have a ceiling height of less than 5 feet (1524 mm).
2. Bathrooms shall have a minimum ceiling height of 6 feet 8 inches (2032 mm) at the center of the front clearance area for fixtures as shown in Figure R307.1. The ceiling height above fixtures shall be such that the fixture is capable of being used for its intended purpose. A shower or tub equipped with a showerhead shall have a minimum ceiling height of 6 feet 8 inches (2032 mm) above a minimum area 30 inches (762 mm) by 30 inches (762 mm) at the showerhead.

fireblocking in walls constructed using parallel rows of studs or staggered studs.

**R302.11.1.2 Unfaced fiberglass.** Unfaced fiberglass batt insulation used as fireblocking shall fill the entire cross section of the wall cavity to a minimum height of 16 inches (406 mm) measured vertically. When piping, conduit or similar obstructions are encountered, the insulation shall be packed tightly around the obstruction.

**R302.11.1.3 Loose-fill insulation material.** Loose-fill insulation material shall not be used as a fireblock 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.

**R302.11.2 Fireblocking integrity.** The integrity of all fireblocks shall be maintained.

**R302.12 Draftstopping.** In combustible construction where 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 1,000 square feet (92.9 m<sup>2</sup>). Draftstopping shall divide the concealed space into approximately equal areas. Where the assembly is enclosed by a floor membrane above 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.

**R302.12.1 Materials.** Draftstopping materials shall not be less than 1/2-inch (12.7 mm) gypsum board, 3/8-inch (9.5 mm) wood structural panels or other *approved* materials adequately supported. Draftstopping shall be installed parallel to the floor framing members unless otherwise *approved* by the *building official*. The integrity of the draftstops shall be maintained.

**R302.13 Combustible insulation clearance.** Combustible insulation shall be separated a minimum of 3 inches (76 mm) from recessed luminaires, fan motors and other heat-producing devices.

**Exception:** Where heat-producing devices are listed for lesser clearances, combustible insulation complying with the listing requirements shall be separated in accordance with the conditions stipulated in the listing.

Recessed luminaires installed in the *building thermal envelope* shall meet the requirements of Section N1102.4.5.

## SECTION R303 LIGHT, VENTILATION AND HEATING

**R303.1 Habitable rooms.** All habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural *ventilation* shall be through windows, doors, louvers or other *approved* openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants.

The minimum openable area to the outdoors shall be 4 percent of the floor area being ventilated.

### Exceptions:

1. The glazed areas need not be openable where the opening is not required by Section R310 and an *approved mechanical ventilation* system capable of producing 0.35 air change per hour in the room is installed or a whole-house mechanical *ventilation* system is installed capable of supplying outdoor *ventilation* air of 15 cubic feet per minute (cfm) (78 L/s) per occupant computed on the basis of two occupants for the first bedroom and one occupant for each additional bedroom.
2. The glazed areas need not be installed in rooms where Exception 1 above is satisfied and artificial light is provided capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.
3. Use of sunroom *additions* and patio covers, as defined in Section R202, shall be permitted for natural *ventilation* if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening.

**R303.2 Adjoining rooms.** For the purpose of determining light and *ventilation* requirements, any room shall be considered as a portion of an adjoining room when at least one-half of the area of the common wall is open and unobstructed and provides an opening of not less than one-tenth of the floor area of the interior room but not less than 25 square feet (2.3 m<sup>2</sup>).

**Exception:** Openings required for light and/or *ventilation* shall be permitted to open into a thermally isolated sunroom *addition* or patio cover, provided that there is an openable area between the adjoining room and the sunroom *addition* or patio cover of not less than one-tenth of the floor area of the interior room but not less than 20 square feet (2 m<sup>2</sup>). The minimum openable area to the outdoors shall be based upon the total floor area being ventilated.

**R303.3 Bathrooms.** Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet (0.3 m<sup>2</sup>), one-half of which must be openable.

**Exception:** The glazed areas shall not be required where artificial light and a mechanical *ventilation* system are provided. The minimum *ventilation* rates shall be 50 cubic feet per minute (24 L/s) for intermittent *ventilation* or 20 cubic feet per minute (10 L/s) for continuous *ventilation*. *Ventilation* air from the space shall be exhausted directly to the outside.

**R303.4 Opening location.** Outdoor intake and exhaust openings shall be located in accordance with Sections R303.4.1 and R303.4.2.

**R303.4.1 Intake openings.** Mechanical and gravity outdoor air intake openings shall be located a minimum of 10 feet (3048 mm) from any hazardous or noxious contaminant, such as vents, chimneys, plumbing vents, streets, alleys, parking lots and loading docks, except as otherwise specified in this code. Where a source of contaminant is

**R305.1.1 Basements.** Portions of *basements* that do not contain *habitable space*, hallways, bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 6 feet 8 inches (2032 mm).

**Exception:** Beams, girders, ducts or other obstructions may project to within 6 feet 4 inches (1931 mm) of the finished floor.

**SECTION R306  
SANITATION**

**R306.1 Toilet facilities.** Every *dwelling* unit shall be provided with a water closet, lavatory, and a bathtub or shower.

**R306.2 Kitchen.** Each *dwelling* unit shall be provided with a kitchen area and every kitchen area shall be provided with a sink.

**R306.3 Sewage disposal.** All plumbing fixtures shall be connected to a sanitary sewer or to an *approved* private sewage disposal system.

**R306.4 Water supply to fixtures.** All plumbing fixtures shall be connected to an *approved* water supply. Kitchen sinks, lavatories, bathtubs, showers, bidets, laundry tubs and washing machine outlets shall be provided with hot and cold water.

**SECTION R307  
TOILET, BATH AND SHOWER SPACES**

**R307.1 Space required.** Fixtures shall be spaced in accordance with Figure R307.1, and in accordance with the requirements of Section P2705.1.

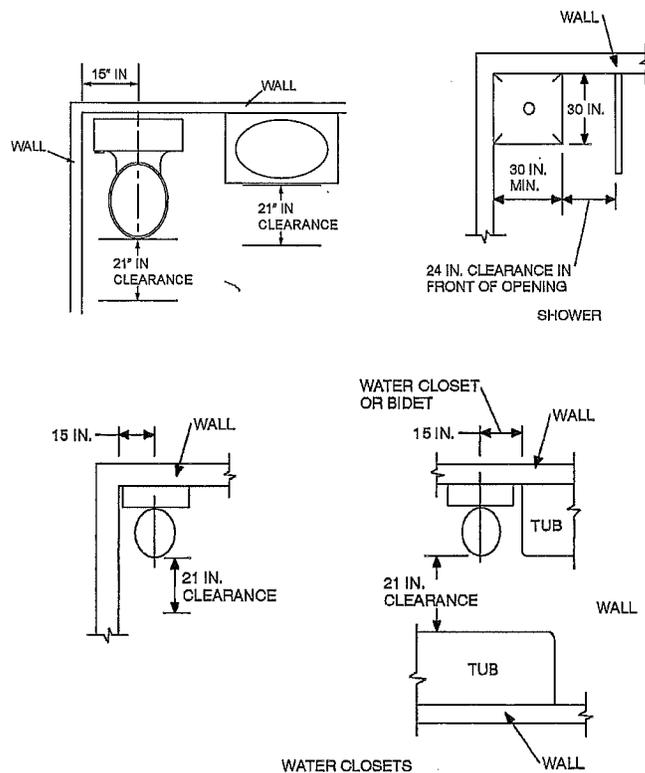
**R307.2 Bathtub and shower spaces.** Bathtub and shower floors and walls above bathtubs with installed shower heads and in shower compartments shall be finished with a nonabsorbent surface. Such wall surfaces shall extend to a height of not less than 6 feet (1829 mm) above the floor.

**SECTION R308  
GLAZING**

**R308.1 Identification.** Except as indicated in Section R308.1.1 each pane of glazing installed in hazardous locations as defined in Section R308.4 shall be provided with a manufacturer's designation specifying who applied the designation, designating the type of glass and the safety glazing standard with which it complies, which is visible in the final installation. The designation shall be acid etched, sandblasted, ceramic-fired, laser etched, embossed, or be of a type which once applied cannot be removed without being destroyed. A *label* shall be permitted in lieu of the manufacturer's designation.

**Exceptions:**

1. For other than tempered glass, manufacturer's designations are not required provided the *building official*



**FIGURE R307.1  
MINIMUM FIXTURE CLEARANCES**

For SI: 1 inch = 25.4 mm.

approves the use of a certificate, affidavit or other evidence confirming compliance with this code.

2. Tempered spandrel glass is permitted to be identified by the manufacturer with a removable paper designation.

**R308.1.1 Identification of multiple assemblies.** Multipane assemblies having individual panes not exceeding 1 square foot (0.09 m<sup>2</sup>) in exposed area shall have at least one pane in the assembly identified in accordance with Section R308.1. All other panes in the assembly shall be labeled "CPSC 16 CFR 1201" or "ANSI Z97.1" as appropriate.

**R308.2 Louvered windows or jalousies.** Regular, float, wired or patterned glass in jalousies and louvered windows shall be no thinner than nominal 3/16 inch (5 mm) and no longer than 48 inches (1219 mm). Exposed glass edges shall be smooth.

**R308.2.1 Wired glass prohibited.** Wired glass with wire exposed on longitudinal edges shall not be used in jalousies or louvered windows.

**R308.3 Human impact loads.** Individual glazed areas, including glass mirrors in hazardous locations such as those indicated as defined in Section R308.4, shall pass the test requirements of Section R308.3.1.

**Exceptions:**

1. Louvered windows and jalousies shall comply with Section R308.2.
2. Mirrors and other glass panels mounted or hung on a surface that provides a continuous backing support.
3. Glass unit masonry complying with Section R610.

**R308.3.1 Impact test.** Where required by other sections of the code, glazing shall be tested in accordance with CPSC

16 CFR 1201. Glazing shall comply with the test criteria for Category I or II as indicated in Table R308.3.1(1).

**Exception:** Glazing not in doors or enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers shall be permitted to be tested in accordance with ANSI Z97.1. Glazing shall comply with the test criteria for Class A or B as indicated in Table R308.3.1 (2).

**R308.4 Hazardous locations.** The following shall be considered specific hazardous locations for the purposes of glazing:

1. Glazing in all fixed and operable panels of swinging, sliding and bifold doors.

**Exceptions:**

1. Glazed openings of a size through which a 3-inch diameter (76 mm) sphere is unable to pass.
2. Decorative glazing.
2. Glazing in an individual fixed or operable panel adjacent to a door where the nearest vertical edge is within a 24-inch (610 mm) arc of the door in a closed position and whose bottom edge is less than 60 inches (1524 mm) above the floor or walking surface.

**Exceptions:**

1. Decorative glazing.
2. When there is an intervening wall or other permanent barrier between the door and the glazing.
3. Glazing in walls on the latch side of and perpendicular to the plane of the door in a closed position.

TABLE R308.3.1(1)  
MINIMUM CATEGORY CLASSIFICATION OF GLAZING USING CPSC 16 CFR 1201

EXPOSED SURFACE AREA OF ONE SIDE OF ONE LITE	GLAZING IN STORM OR COMBINATION DOORS (Category Class)	GLAZING IN DOORS (Category Class)	GLAZED PANELS REGULATED BY ITEM 7 OF SECTION R308.4 (Category Class)	GLAZED PANELS REGULATED BY ITEM 6 OF SECTION R308.4 (Category Class)	GLAZING IN DOORS AND ENCLOSURES REGULATED BY ITEM 5 OF SECTION R308.4 (Category Class)	SLIDING GLASS DOORS PATIO TYPE (Category Class)
9 square feet or less	I	I	NR	I	II	II
More than 9 square feet	II	II	II	II	II	II

For SI: 1 square foot = 0.0929 m<sup>2</sup>,  
NR means "No Requirement."

TABLE R308.3.1(2)  
MINIMUM CATEGORY CLASSIFICATION OF GLAZING USING ANSI Z97.1

EXPOSED SURFACE AREA OF ONE SIDE OF ONE LITE	GLAZED PANELS REGULATED BY ITEM 7 OF SECTION R308.4 (Category Class)	GLAZED PANELS REGULATED BY ITEM 6 OF SECTION R308.4 (Category Class)	DOORS AND ENCLOSURES REGULATED BY ITEM 5 OF SECTION R308.4 (Category Class)
9 square feet or less	No requirement	B	A
More than 9 square feet	A	A	A

For SI: 1 square foot = 0.0929 m<sup>2</sup>.  
a. Use is permitted only by the exception to Section R308.3.1.

**R308.6.2 Permitted materials.** The following types of glazing may be used:

1. Laminated glass with a minimum 0.015-inch (0.38 mm) polyvinyl butyral interlayer for glass panes 16 square feet (1.5 m<sup>2</sup>) or less in area located such that the highest point of the glass is not more than 12 feet (3658 mm) above a walking surface or other accessible area; for higher or larger sizes, the minimum interlayer thickness shall be 0.030 inch (0.76 mm).
2. Fully tempered glass.
3. Heat-strengthened glass.
4. Wired glass.
5. *Approved* rigid plastics.

**R308.6.3 Screens, general.** For fully tempered or heat-strengthened glass, a retaining screen meeting the requirements of Section R308.6.7 shall be installed below the glass, except for fully tempered glass that meets either condition listed in Section R308.6.5.

**R308.6.4 Screens with multiple glazing.** When the inboard pane is fully tempered, heat-strengthened or wired glass, a retaining screen meeting the requirements of Section R308.6.7 shall be installed below the glass, except for either condition listed in Section R308.6.5. All other panes in the multiple glazing may be of any type listed in Section R308.6.2.

**R308.6.5 Screens not required.** Screens shall not be required when fully tempered glass is used as single glazing or the inboard pane in multiple glazing and either of the following conditions are met:

1. Glass area 16 square feet (1.49 m<sup>2</sup>) or less. Highest point of glass not more than 12 feet (3658 mm) above a walking surface or other accessible area, nominal glass thickness not more than  $\frac{3}{16}$  inch (4.8 mm), and (for multiple glazing only) the other pane or panes fully tempered, laminated or wired glass.
2. Glass area greater than 16 square feet (1.49 m<sup>2</sup>). Glass sloped 30 degrees (0.52 rad) or less from vertical, and highest point of glass not more than 10 feet (3048 mm) above a walking surface or other accessible area.

**R308.6.6 Glass in greenhouses.** Any glazing material is permitted to be installed without screening in the sloped areas of greenhouses, provided the greenhouse height at the ridge does not exceed 20 feet (6096 mm) above *grade*.

**R308.6.7 Screen characteristics.** The screen and its fastenings shall be capable of supporting twice the weight of the glazing, be firmly and substantially fastened to the framing members, and have a mesh opening of no more than 1 inch by 1 inch (25 mm by 25 mm).

**R308.6.8 Curbs for skylights.** All unit skylights installed in a roof with a pitch flatter than three units vertical in 12 units horizontal (25-percent slope) shall be mounted on a curb extending at least 4 inches (102 mm) above the plane of the roof unless otherwise specified in the manufacturer's installation instructions.

**R308.6.9 Testing and labeling.** Unit skylights shall be tested by an *approved* independent laboratory, and bear a *label* identifying manufacturer, performance *grade* rating and *approved* inspection agency to indicate compliance with the requirements of AAMA/WDMA/CSA 101/I.S.2/A440.

## SECTION R309 GARAGES AND CARPORTS

**R309.1 Floor surface.** Garage floor surfaces shall be of *approved* noncombustible material.

The area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.

**R309.2 Carports.** Carports shall be open on at least two sides. Carport floor surfaces shall be of *approved* noncombustible material. Carports not open on at least two sides shall be considered a garage and shall comply with the provisions of this section for garages.

**Exception:** Asphalt surfaces shall be permitted at ground level in carports.

The area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.

**R309.3 Flood hazard areas.** For buildings located in flood hazard areas as established by Table R301.2(1), garage floors shall be:

1. Elevated to or above the design flood elevation as determined in Section R322; or
2. Located below the design flood elevation provided they are at or above *grade* on at least one side, are used solely for parking, building access or storage, meet the requirements of Section R322 and are otherwise constructed in accordance with this code.

**R309.4 Automatic garage door openers.** Automatic garage door openers, if provided, shall be listed in accordance with UL 325.

## SECTION R310 EMERGENCY ESCAPE AND RESCUE OPENINGS

**R310.1 Emergency escape and rescue required.** *Basements*, habitable attics and every sleeping room shall have at least one operable emergency escape and rescue opening. Where *basements* contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room. Where emergency escape and rescue openings are provided they shall have a sill height of not more than 44 inches (1118 mm) 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 emergency escape and rescue opening from the inside. Emergency escape and rescue openings with a finished sill height below the adjacent ground elevation shall be provided with a window

4. Glazing adjacent to a door where access through the door is to a closet or storage area 3 feet (914 mm) or less in depth.
5. Glazing that is adjacent to the fixed panel of patio doors.
3. Glazing in an individual fixed or operable panel that meets all of the following conditions:
  - 3.1. The exposed area of an individual pane is larger than 9 square feet (0.836 m<sup>2</sup>); and
  - 3.2. The bottom edge of the glazing is less than 18 inches (457 mm) above the floor; and
  - 3.3. The top edge of the glazing is more than 36 inches (914 mm) above the floor; and
  - 3.4. One or more walking surfaces are within 36 inches (914 mm), measured horizontally and in a straight line, of the glazing.

**Exceptions:**

1. Decorative glazing.
2. When a horizontal rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and be a minimum of 1½ inches (38 mm) in cross sectional height.
3. Outboard panes in insulating glass units and other multiple glazed panels when the bottom edge of the glass is 25 feet (7620 mm) or more above *grade*, a roof, walking surfaces or other horizontal [within 45 degrees (0.79 rad) of horizontal] surface adjacent to the glass exterior.
4. All glazing in railings regardless of area or height above a walking surface. Included are structural baluster panels and nonstructural infill panels.
5. Glazing in enclosures for or walls facing hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) measured vertically above any standing or walking surface.
 

**Exception:** Glazing that is more than 60 inches (1524 mm), measured horizontally and in a straight line, from the water's edge of a hot tub, whirlpool or bathtub.
6. Glazing in walls and fences adjacent to indoor and outdoor swimming pools, hot tubs and spas where the bottom edge of the glazing is less than 60 inches (1524 mm) above a walking surface and within 60 inches (1524 mm), measured horizontally and in a straight line, of the water's edge. This shall apply to single glazing and all panes in multiple glazing.
7. Glazing adjacent to stairways, landings and ramps within 36 inches (914 mm) horizontally of a walking sur-

face when the exposed surface of the glazing is less than 60 inches (1524 mm) above the plane of the adjacent walking surface.

**Exceptions:**

1. When a rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and be a minimum of 1½ inches (38 mm) in cross sectional height.
2. The side of the stairway has a guardrail or handrail, including balusters or in-fill panels, complying with Sections R311.7.6 and R312 and the plane of the glazing is more than 18 inches (457 mm) from the railing; or
3. When a solid wall or panel extends from the plane of the adjacent walking surface to 34 inches (863 mm) to 36 inches (914 mm) above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a *guard*.
8. Glazing adjacent to stairways within 60 inches (1524 mm) horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glazing is less than 60 inches (1524 mm) above the nose of the tread.

**Exceptions:**

1. The side of the stairway has a guardrail or handrail, including balusters or in-fill panels, complying with Sections R311.7.6 and R312 and the plane of the glass is more than 18 inches (457 mm) from the railing; or
2. When a solid wall or panel extends from the plane of the adjacent walking surface to 34 inches (864 mm) to 36 inches (914 mm) above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a *guard*.

**R308.5 Site built windows.** Site built windows shall comply with Section 2404 of the *International Building Code*.

**R308.6 Skylights and sloped glazing.** Skylights and sloped glazing shall comply with the following sections.

**R308.6.1 Definitions.**

**SKYLIGHTS AND SLOPED GLAZING.** Glass or other transparent or translucent glazing material installed at a slope of 15 degrees (0.26 rad) or more from vertical. Glazing materials in skylights, including unit skylights, solariums, sunrooms, roofs and sloped walls are included in this definition.

**UNIT SKYLIGHT.** A factory assembled, glazed fenestration unit, containing one panel of glazing material, that allows for natural daylighting through an opening in the roof assembly while preserving the weather-resistant barrier of the roof.

accordance with Section R311.8 or a stairway in accordance with Section R311.7.

### R311.5 Construction.

**R311.5.1 Attachment.** Exterior landings, decks, balconies, stairs and similar facilities shall be positively anchored to the primary structure to resist both vertical and lateral forces or shall be designed to be self-supporting. Attachment shall not be accomplished by use of toenails or nails subject to withdrawal.

**R311.6 Hallways.** The minimum width of a hallway shall be not less than 3 feet (914 mm).

### 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. Handrails shall not project more than 4.5 inches (114 mm) on either side of the stairway and the minimum clear width of the stairway at and below the handrail height, including treads and landings, shall not be less than 31½ inches (787 mm) where a handrail is installed on one side and 27 inches (698 mm) where handrails are provided on both sides.

**Exception:** The width of spiral stairways shall be in accordance with Section R311.7.9.1.

**R311.7.2 Headroom.** The minimum headroom in all parts of the stairway shall not be less than 6 feet 8 inches (2032 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.

**Exception:** Where the nosings of treads at the side of a flight extend under the edge of a floor opening through which the stair passes, the floor opening shall be allowed to project horizontally into the required headroom a maximum of 4¾ inches (121 mm).

**R311.7.3 Walkline.** The walkline across winder treads shall be concentric to the curved direction of travel through the turn and located 12 inches (305 mm) from the side where the winders are narrower. The 12-inch (305 mm) dimension shall be measured from the widest point of the clear stair width at the walking surface of the winder. If winders are adjacent within the flight, the point of the widest clear stair width of the adjacent winders shall be used.

**R311.7.4 Stair treads and risers.** Stair treads and risers shall meet the requirements of this section. For the purposes of this section all dimensions and dimensioned surfaces shall be exclusive of carpets, rugs or runners.

**R311.7.4.1 Riser height.** The maximum riser height shall be 7¾ inches (196 mm). The riser shall be measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than ¾ inch (9.5 mm).

**R311.7.4.2 Tread depth.** The minimum tread depth shall be 10 inches (254 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. The greatest tread depth

within any flight of stairs shall not exceed the smallest by more than ¾ inch (9.5 mm). Consistently shaped winders at the walkline shall be allowed within the same flight of stairs as rectangular treads and do not have to be within ¾ inch (9.5 mm) of the rectangular tread depth.

Winder treads shall have a minimum tread depth of 10 inches (254 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline. Winder treads shall have a minimum tread depth of 6 inches (152 mm) at any point within the clear width of the stair. Within any flight of stairs, the largest winder tread depth at the walkline shall not exceed the smallest winder tread by more than ¾ inch (9.5 mm).

**R311.7.4.3 Profile.** The radius of curvature at the nosing shall be no greater than 9/16 inch (14 mm). A nosing not less than ¾ inch (19 mm) but not more than 1¼ inches (32 mm) shall be provided on stairways with solid risers. The greatest nosing projection shall not exceed the smallest nosing projection by more than ¾ inch (9.5 mm) between two stories, including the nosing at the level of floors and landings. Beveling of nosings shall not exceed ½ inch (12.7 mm). Risers shall be vertical or sloped under the tread above from the underside of the nosing above at an angle not more than 30 degrees (0.51 rad) from the vertical. Open risers are permitted, provided that the opening between treads does not permit the passage of a 4-inch diameter (102 mm) sphere.

#### Exceptions:

1. A nosing is not required where the tread depth is a minimum of 11 inches (279 mm).
2. The opening between adjacent treads is not limited on stairs with a total rise of 30 inches (762 mm) or less.

**R311.7.4.4 Exterior wood/plastic composite stair treads.** Wood/plastic composite stair treads shall comply with the provisions of Section R317.4.

**R311.7.5 Landings for stairways.** There shall be a floor or landing at the top and bottom of each stairway.

**Exception:** A floor or landing is not required at the top of an interior flight of stairs, including stairs in an enclosed garage, provided a door does not swing over the stairs. A flight of stairs shall not have a vertical rise larger than 12 feet (3658 mm) between floor levels or landings. The width of each landing shall not be less than the width of the stairway served. Every landing shall have a minimum dimension of 36 inches (914 mm) measured in the direction of travel.

**R311.7.6 Stairway walking surface.** The walking surface of treads and landings of stairways shall be sloped no steeper than one unit vertical in 48 inches horizontal (2-percent slope).

**R311.7.7 Handrails.** Handrails shall be provided on at least one side of each continuous run of treads or flight with four or more risers.

**R311.7.7.1 Height.** Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or

well in accordance with Section R310.2. Emergency escape and rescue openings shall open directly into a public way, or to a yard or court that opens to a public way.

**Exception:** *Basements* used only to house mechanical equipment and not exceeding total floor area of 200 square feet (18.58 m<sup>2</sup>).

**R310.1.1 Minimum opening area.** All emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet (0.530 m<sup>2</sup>).

**Exception:** *Grade* floor openings shall have a minimum net clear opening of 5 square feet (0.465 m<sup>2</sup>).

**R310.1.2 Minimum opening height.** The minimum net clear opening height shall be 24 inches (610 mm).

**R310.1.3 Minimum opening width.** The minimum net clear opening width shall be 20 inches (508 mm).

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

\* **R310.2 Window wells.** The minimum horizontal area of the window well shall be 9 square feet (0.9 m<sup>2</sup>), with a minimum horizontal projection and width of 36 inches (914 mm). The area of the window well shall allow the emergency escape and rescue opening to be fully opened.

**Exception:** The ladder or steps required by Section R310.2.1 shall be permitted to encroach a maximum of 6 inches (152 mm) into the required dimensions of the window well.

\* **R310.2.1 Ladder and steps.** Window wells with a vertical depth greater than 44 inches (1118 mm) 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 Sections R311.7 and R311.8. Ladders or rungs shall have an inside width of at least 12 inches (305 mm), shall project at least 3 inches (76 mm) from the wall and shall be spaced not more than 18 inches (457 mm) 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 R311.7.8.2.

**R310.4 Bars, grilles, covers and screens.** Bars, grilles, 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 R310.1.3, and such devices shall be releasable or removable from the inside without the use of a key, tool, special knowledge or force greater than that which is required for normal operation of the escape and rescue opening.

\* **R310.5 Emergency escape windows under decks and porches.** Emergency escape windows are allowed to be installed under decks and porches provided the location of the deck allows the emergency escape window to be fully opened and provides a path not less than 36 inches (914 mm) in height to a yard or court.

## SECTION R311 MEANS OF EGRESS

**R311.1 Means of egress.** All *dwelling*s shall be provided with a means of egress as provided in this section. The means of egress shall provide a continuous and unobstructed path of vertical and horizontal egress travel from all portions of the *dwelling* to the exterior of the *dwelling* at the required egress door without requiring travel through a garage.

**R311.2 Egress door.** At least one egress door shall be provided for each *dwelling* unit. The egress door shall be side-hinged, and shall provide a minimum clear width of 32 inches (813 mm) when measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). The minimum clear height of the door opening shall not be less than 78 inches (1981 mm) in height measured from the top of the threshold to the bottom of the stop. Other doors shall not be required to comply with these minimum dimensions. Egress doors shall be readily openable from inside the *dwelling* without the use of a key or special knowledge or effort.

**R311.3 Floors and landings at exterior doors.** There shall be a landing or floor on each side of each exterior door. The width of each landing shall not be less than the door served. Every landing shall have a minimum dimension of 36 inches (914 mm) measured in the direction of travel. Exterior landings shall be permitted to have a slope not to exceed 1/4 unit vertical in 12 units horizontal (2-percent).

**Exception:** Exterior balconies less than 60 square feet (5.6 m<sup>2</sup>) and only accessible from a door are permitted to have a landing less than 36 inches (914 mm) measured in the direction of travel.

**R311.3.1 Floor elevations at the required egress doors.** Landings or floors at the required egress door shall not be more than 1 1/2 inches (38 mm) lower than the top of the threshold.

**Exception:** The exterior landing or floor shall not be more than 7 3/4 inches (196 mm) below the top of the threshold provided the door does not swing over the landing or floor.

When exterior landings or floors serving the required egress door are not at *grade*, they shall be provided with access to *grade* by means of a ramp in accordance with Section R311.8 or a stairway in accordance with Section R311.7.

**R311.3.2 Floor elevations for other exterior doors.** Doors other than the required egress door shall be provided with landings or floors not more than 7 3/4 inches (196 mm) below the top of the threshold.

**Exception:** A landing is not required where a stairway of two or fewer risers is located on the exterior side of the door, provided the door does not swing over the stairway.

**R311.3.3 Storm and screen doors.** Storm and screen doors shall be permitted to swing over all exterior stairs and landings.

**R311.4 Vertical egress.** Egress from habitable levels including habitable attics and *basements* not provided with an egress door in accordance with Section R311.2 shall be by a ramp in

 SECTION R312  
GUARDS

**R312.1 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*.

**R312.2 Height.** Required *guards* at open-sided walking surfaces, including stairs, porches, balconies or landings, shall be not less than 36 inches (914 mm) high measured vertically above the adjacent walking surface, adjacent fixed seating or the line connecting the leading edges of the treads.

**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 treads.
2. Where the top of the *guard* also serves as a handrail on the open sides of stairs, the top of the *guard* shall not be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

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

**Exceptions:**

1. The triangular openings at the open side of a 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.
2. *Guards* on the open sides of stairs shall not have openings which allow passage of a sphere  $4\frac{3}{8}$  inches (111 mm) in diameter.

**R312.4 Exterior woodplastic composite guards.** Woodplastic composite *guards* shall comply with the provisions of Section R317.4.

Delete R313 - use R317,06  
SECTION R313 IRC

**AUTOMATIC FIRE SPRINKLER SYSTEMS**

**R313.1 Townhouse automatic fire sprinkler systems.** An automatic residential fire sprinkler system shall be installed in *townhouses*.

**Exception:** An automatic residential fire sprinkler system shall not be required when *additions* or *alterations* are made to existing *townhouses* that do not have an automatic residential fire sprinkler system installed.

**R313.1.1 Design and installation.** Automatic residential fire sprinkler systems for *townhouses* shall be designed and installed in accordance with Section P2904.

**R313.2 One- and two-family dwellings automatic fire systems.** Effective January 1, 2011, an automatic residential fire sprinkler system shall be installed in one- and two- family *dwellings*.

**Exception:** An automatic residential fire sprinkler system shall not be required for *additions* or *alterations* to existing buildings that are not already provided with an automatic residential sprinkler system.

**R313.2.1 Design and installation.** Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D.

**SECTION R314  
SMOKE ALARMS**

**R314.1 Smoke detection and notification.** All smoke alarms shall be listed in accordance with UL 217 and installed in accordance with the provisions of this code and the household fire warning *equipment* provisions of NFPA 72.

**R314.2 Smoke detection systems.** Household fire alarm systems installed in accordance with NFPA 72 that include smoke alarms, or a combination of smoke detector and audible notification device installed as required by this section for smoke alarms, shall be permitted. The household fire alarm system shall provide the same level of smoke detection and alarm as required by this section for smoke alarms. Where a household fire warning system is installed using a combination of smoke detector and audible notification device(s), it shall become a permanent fixture of the occupancy and owned by the homeowner. The system shall be monitored by an *approved* supervising station and be maintained in accordance with NFPA 72.

**Exception:** Where smoke alarms are provided meeting the requirements of Section R314.4.

**R314.3 Location.** Smoke alarms shall be installed in the following locations:

1. In each sleeping room.
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms.
3. On each additional *story* of the *dwelling*, including *basements* and habitable attics but not including crawl spaces and uninhabitable *attics*. In *dwellings* or *dwelling units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full *story* below the upper level.

When more than one smoke alarm is required to be installed within an individual *dwelling* unit the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit.

**R314.3.1 Alterations, repairs and additions.** When *alterations*, repairs or *additions* requiring a *permit* occur, or when one or more sleeping rooms are added or created in existing *dwellings*, the individual *dwelling unit* shall be equipped with smoke alarms located as required for new *dwellings*.

**Exceptions:**

1. Work involving the exterior surfaces of *dwellings*, such as the replacement of roofing or siding, or the *addition* or replacement of windows or doors, or

finish surface of ramp slope, shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm).

**Exceptions:**

1. The use of a volute, turnout or starting easing shall be allowed over the lowest tread.
2. When handrail fittings or bendings are used to provide continuous transition between flights, the transition from handrail to guardrail, or used at the start of a flight, the handrail height at the fittings or bendings shall be permitted to exceed the maximum height.

**R311.7.7.2 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 the 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 inch (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.

**R311.7.7.3 Grip-size.** All required handrails shall be of one of the following types or provide equivalent graspability.

1. Type I. Handrails with a circular cross section shall have an outside diameter of at least 1¼ inches (32 mm) and not greater than 2 inches (51 mm). If the handrail is not circular, it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6¼ inches (160 mm) with a maximum cross section of dimension of 2¼ inches (57 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).
2. Type II. Handrails with a perimeter greater than 6¼ inches (160 mm) shall have a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of ¾ inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of at least 5/16 inch (8 mm) within 7/8 inch (22 mm) below the widest portion of the profile. This required depth shall continue for at least 3/8 inch (10 mm) to a level that is not less than 1¾ inches (45 mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1¼ inches (32 mm) to a maximum of 2¾ inches (70 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).

**R311.7.7.4 Exterior wood/plastic composite handrails.** Wood/plastic composite handrails shall comply with the provisions of Section R317.4.

**R311.7.8 Illumination.** All stairs shall be provided with illumination in accordance with Section R303.6.

**R311.7.9 Special stairways.** Spiral stairways and bulkhead enclosure stairways shall comply with all requirements of Section R311.7 except as specified below.

**R311.7.9.1 Spiral stairways.** Spiral stairways are permitted, provided the minimum clear width at and below the handrail shall be 26 inches (660 mm) with each tread having a 7½-inch (190 mm) minimum tread depth at 12 inches (914 mm) from the narrower edge. All treads shall be identical, and the rise shall be no more than 9½ inches (241 mm). A minimum headroom of 6 feet 6 inches (1982 mm) shall be provided.

**R311.7.9.2 Bulkhead enclosure stairways.** Stairways serving bulkhead enclosures, not part of the required building egress, providing access from the outside grade level to the *basement* shall be exempt from the requirements of Sections R311.3 and R311.7 where the maximum height from the *basement* finished floor level to grade adjacent to the stairway does not exceed 8 feet (2438 mm) and the grade level opening to the stairway is covered by a bulkhead enclosure with hinged doors or other *approved* means.

**R311.8 Ramps.**

**R311.8.1 Maximum slope.** Ramps shall have a maximum slope of 1 unit vertical in 12 units horizontal (8.3 percent slope).

**Exception:** Where it is technically infeasible to comply because of site constraints, ramps may have a maximum slope of one unit vertical in eight horizontal (12.5 percent slope).

**R311.8.2 Landings required.** A minimum 3-foot-by-3-foot (914 mm by 914 mm) landing shall be provided:

1. At the top and bottom of ramps.
2. Where doors open onto ramps.
3. Where ramps change direction.

**R311.8.3 Handrails required.** Handrails shall be provided on at least one side of all ramps exceeding a slope of one unit vertical in 12 units horizontal (8.33-percent slope).

**R311.8.3.1 Height.** Handrail height, measured above the finished surface of the ramp slope, shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm).

**R311.8.3.2 Grip size.** Handrails on ramps shall comply with Section R311.7.7.3.

**R311.8.3.3 Continuity.** Handrails where required on ramps shall be continuous for the full length of the ramp. 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.

**TABLE R403.1  
MINIMUM WIDTH OF CONCRETE,  
PRECAST OR MASONRY FOOTINGS  
(inches)<sup>a</sup>**

	LOAD-BEARING VALUE OF SOIL (psf)			
	1,500	2,000	3,000	≥ 4,000
<b>Conventional light-frame construction</b>				
1-story	12	12	12	12
2-story	15	12	12	12
3-story	23	17	12	12
<b>4-inch brick veneer over light frame or 8-inch hollow concrete masonry</b>				
1-story	12	12	12	12
2-story	21	16	12	12
3-story	32	24	16	12
<b>8-inch solid or fully grouted masonry</b>				
1-story	16	12	12	12
2-story	29	21	14	12
3-story	42	32	21	16

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

a. Where minimum footing width is 12 inches, use of a single wythe of solid or fully grouted 12-inch nominal concrete masonry units is permitted.

**R403.1.2 Continuous footing in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>.** The *braced wall panels* at exterior walls of buildings located in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub> shall be supported by continuous footings. All required interior *braced wall panels* in buildings with plan dimensions greater than 50 feet (15 240 mm) shall also be supported by continuous footings.

**R403.1.3 Seismic reinforcing.** Concrete footings located in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>, as established in Table R301.2(1), shall have minimum reinforcement. Bottom reinforcement shall be located a minimum of 3 inches (76 mm) clear from the bottom of the footing.

In Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub> where a construction joint is created between a concrete footing and a stem wall, a minimum of one No. 4 bar shall be installed at not more than 4 feet (1219 mm) on center. The vertical bar shall extend to 3 inches (76 mm) clear of the bottom of the footing, have a standard hook and extend a minimum of 14 inches (357 mm) into the stem wall.

In Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub> where a grouted masonry stem wall is supported on a concrete footing and stem wall, a minimum of one No. 4 bar shall be installed at not more than 4 feet (1219 mm) on center. The vertical bar shall extend to 3 inches (76 mm) clear of the bottom of the footing and have a standard hook.

In Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub> masonry stem walls without solid grout and vertical reinforcing are not permitted.

**Exception:** In detached one- and two-family *dwelling*s which are three stories or less in height and constructed with stud bearing walls, plain concrete footings without longitudinal reinforcement supporting walls and isolated plain concrete footings supporting columns or pedestals are permitted.

**R403.1.3.1 Foundations with stemwalls.** Foundations with stem walls shall have installed a minimum of one No. 4 bar within 12 inches (305 mm) of the top of the wall and one No. 4 bar located 3 inches (76 mm) to 4 inches (102 mm) from the bottom of the footing.

**R403.1.3.2 Slabs-on-ground with turned-down footings.** Slabs on ground with turned down footings shall have a minimum of one No. 4 bar at the top and the bottom of the footing.

**Exception:** For slabs-on-ground cast monolithically with the footing, locating one No. 5 bar or two No. 4 bars in the middle third of the footing depth shall be permitted as an alternative to placement at the footing top and bottom.

Where the slab is not cast monolithically with the footing, No. 3 or larger vertical dowels with standard hooks on each end shall be provided in accordance with Figure R403.1.3.2. Standard hooks shall comply with Section R611.5.4.5.

**R403.1.4 Minimum depth.** All exterior footings shall be placed at least 12 inches (305 mm) below the undisturbed ground surface. Where applicable, the depth of footings shall also conform to Sections R403.1.4.1 through R403.1.4.2.

**R403.1.4.1 Frost protection.** Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

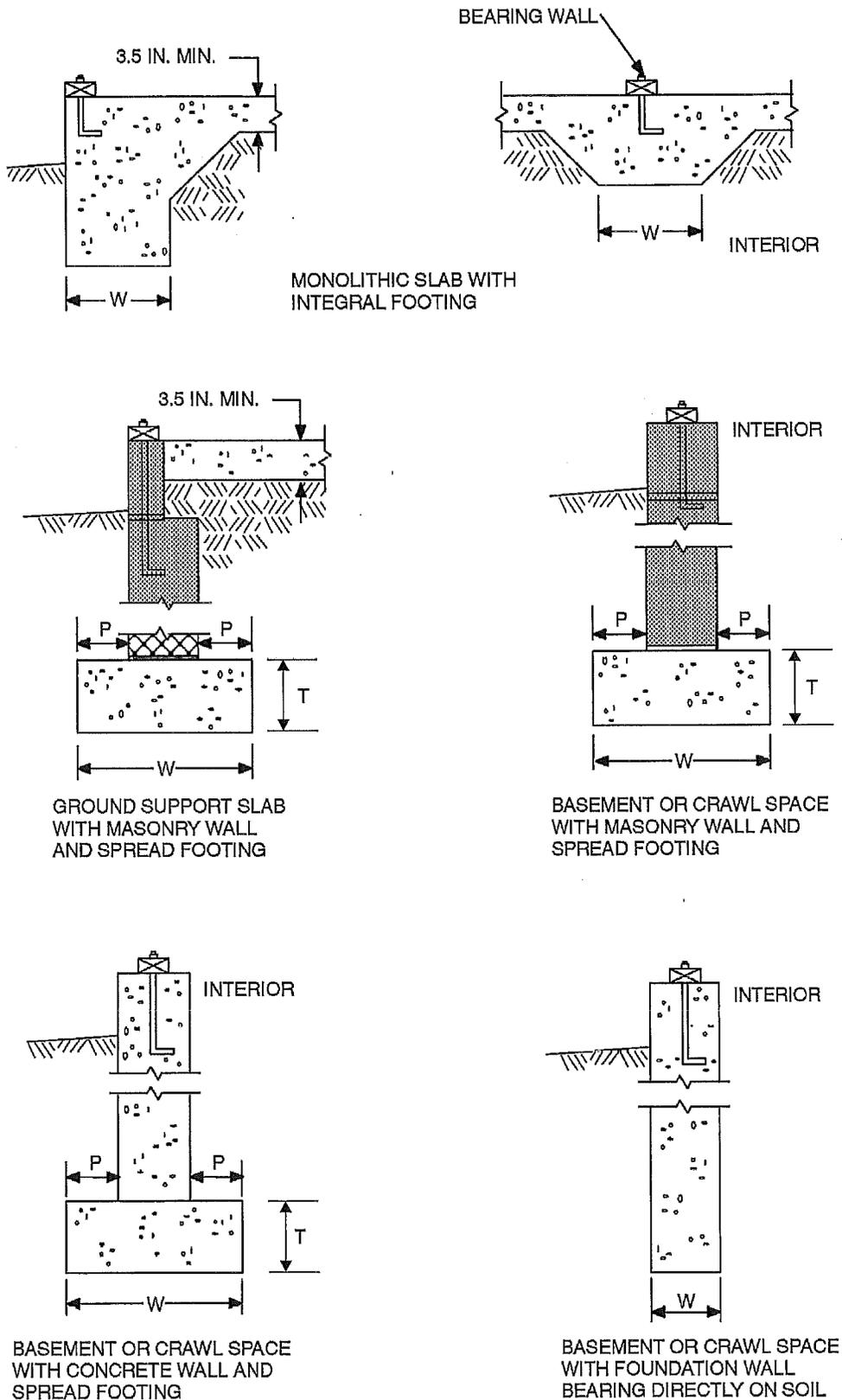
1. Extended below the frost line specified in Table R301.2.(1);
2. Constructing in accordance with Section R403.3;
3. Constructing in accordance with ASCE 32; or
4. Erected on solid rock. *See IGCC*  
*See www.nedc.noaa.gov/FPSF/html*

**Exceptions:**

1. Protection of freestanding *accessory structures* with an area of 600 square feet (56 m<sup>2</sup>) or less, of light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.
2. Protection of freestanding *accessory structures* with an area of 400 square feet (37 m<sup>2</sup>) or less, of other than light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.
3. Decks not supported by a dwelling need not be provided with footings that extend below the frost line.

Footings shall not bear on frozen soil unless the frozen condition is permanent.

**R403.1.4.2 Seismic conditions.** In Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>, interior footings supporting bearing or bracing walls and cast monolithically with a slab on *grade* shall extend to a depth of not less than 12 inches (305 mm) below the top of the slab.



For SI: 1 inch = 25.4 mm.

FIGURE R403.1(1)  
CONCRETE AND MASONRY FOUNDATION DETAILS

**R403.1.5 Slope.** The top surface of footings shall be level. The bottom surface of footings shall not have a slope exceeding one unit vertical in 10 units horizontal (10-percent slope). Footings shall be stepped where it is necessary to change the elevation of the top surface of the footings or where the slope of the bottom surface of the footings will exceed one unit vertical in ten units horizontal (10-percent slope).

**R403.1.6 Foundation anchorage.** Sill plates and walls supported directly on continuous foundations shall be anchored to the foundation in accordance with this section.

Wood sole plates at all exterior walls on monolithic slabs, wood sole plates of *braced wall panels* at building interiors on monolithic slabs and all wood sill plates shall be anchored to the foundation with anchor bolts spaced a maximum of 6 feet (1829 mm) on center. Bolts shall be at least  $\frac{1}{2}$  inch (12.7 mm) in diameter and shall extend a minimum of 7 inches (178 mm) into concrete or grouted cells of concrete masonry units. A nut and washer shall be tightened on each anchor bolt. There shall be a minimum of two bolts per plate section with one bolt located not more than 12 inches (305 mm) or less than seven bolt diameters from each end of the plate section. Interior bearing wall sole plates on monolithic slab foundation that are not part of a *braced wall panel* shall be positively anchored with *approved* fasteners. Sill plates and sole plates shall be protected against decay and termites where required by Sections R317 and R318. Cold-formed steel framing systems shall be fastened to wood sill plates or anchored directly to the foundation as required in Section R505.3.1 or R603.3.1.

**Exceptions:**

1. Foundation anchorage, spaced as required to provide equivalent anchorage to  $\frac{1}{2}$ -inch-diameter (12.7 mm) anchor bolts.
2. Walls 24 inches (610 mm) total length or shorter connecting offset *braced wall panels* shall be anchored to the foundation with a minimum of one anchor bolt located in the center third of the plate section and shall be attached to adjacent *braced wall panels* at corners as shown in Figure R602.10.4.4(1).
3. Connection of walls 12 inches (305 mm) total length or shorter connecting offset *braced wall panels* to the foundation without anchor bolts shall be permitted. The wall shall be attached to adjacent *braced wall panels* at corners as shown in Figure R602.10.4.4(1).

**R403.1.6.1 Foundation anchorage in Seismic Design Categories C, D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>.** In addition to the requirements of Section R403.1.6, the following requirements shall apply to wood light-frame structures in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub> and wood light-frame townhouses in Seismic Design Category C.

1. Plate washers conforming to Section R602.11.1 shall be provided for all anchor bolts over the full length of required *braced wall lines* except where *approved* anchor straps are used. Properly sized

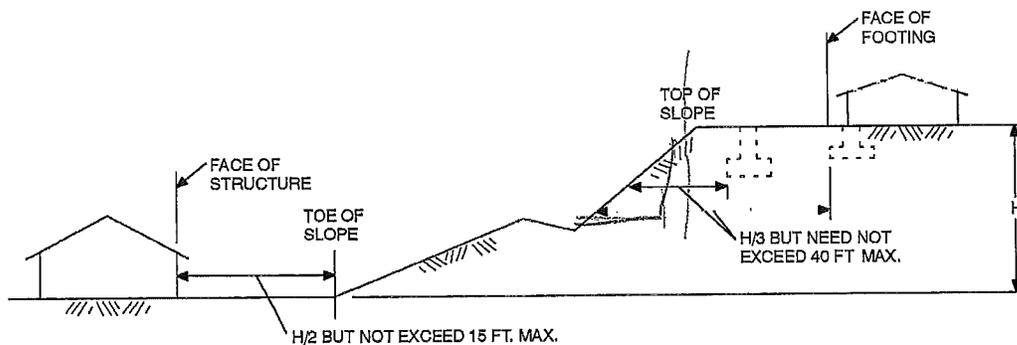
cut washers shall be permitted for anchor bolts in wall lines not containing *braced wall panels*.

2. Interior braced wall plates shall have anchor bolts spaced at not more than 6 feet (1829 mm) on center and located within 12 inches (305 mm) of the ends of each plate section when supported on a continuous foundation.
3. Interior bearing wall sole plates shall have anchor bolts spaced at not more than 6 feet (1829 mm) on center and located within 12 inches (305 mm) of the ends of each plate section when supported on a continuous foundation.
4. The maximum anchor bolt spacing shall be 4 feet (1219 mm) for buildings over two stories in height.
5. Stepped cripple walls shall conform to Section R602.11.2.
6. Where continuous wood foundations in accordance with Section R404.2 are used, the force transfer shall have a capacity equal to or greater than the connections required by Section R602.11.1 or the *braced wall panel* shall be connected to the wood foundations in accordance with the *braced wall panel*-to-floor fastening requirements of Table R602.3(1).

**R403.1.7 Footings on or adjacent to slopes.** The placement of buildings and structures on or adjacent to slopes steeper than one unit vertical in three units horizontal (33.3-percent slope) shall conform to Sections R403.1.7.1 through R403.1.7.4.

**R403.1.7.1 Building clearances from ascending slopes.** In general, buildings below slopes shall be set a sufficient distance from the slope to provide protection from slope drainage, erosion and shallow failures. Except as provided in Section R403.1.7.4 and Figure R403.1.7.1, the following criteria will be assumed to provide this protection. Where the existing slope is steeper than one unit vertical in one unit horizontal (100-percent slope), the toe of the slope shall be assumed to be at the intersection of a horizontal plane drawn from the top of the foundation and a plane drawn tangent to the slope at an angle of 45 degrees (0.79 rad) to the horizontal. Where a retaining wall is constructed at the toe of the slope, the height of the slope shall be measured from the top of the wall to the top of the slope.

**R403.1.7.2 Footing setback from descending slope surfaces.** Footings on or adjacent to slope surfaces shall be founded in material with an embedment and setback from the slope surface sufficient to provide vertical and lateral support for the footing without detrimental settlement. Except as provided for in Section R403.1.7.4 and Figure R403.1.7.1, the following setback is deemed adequate to meet the criteria. Where the slope is steeper than one unit vertical in one unit horizontal (100-percent slope), the required setback shall be measured from an imaginary plane 45 degrees (0.79 rad) to the horizontal, projected upward from the toe of the slope.



For SI: 1 foot = 304.8 mm.

**FIGURE R403.1.7.1**  
**FOUNDATION CLEARANCE FROM SLOPES**

**R403.1.7.3 Foundation elevation.** On graded sites, the top of any exterior foundation shall extend above the elevation of the street gutter at point of discharge or the inlet of an *approved* drainage device a minimum of 12 inches (305 mm) plus 2 percent. Alternate elevations are permitted subject to the approval of the *building official*, provided it can be demonstrated that required drainage to the point of discharge and away from the structure is provided at all locations on the site.

**R403.1.7.4 Alternate setback and clearances.** Alternate setbacks and clearances are permitted, subject to the approval of the *building official*. The *building official* is permitted to require an investigation and recommendation of a qualified engineer to demonstrate that the intent of this section has been satisfied. Such an investigation shall include consideration of material, height of slope, slope gradient, load intensity and erosion characteristics of slope material.

**R403.1.8 Foundations on expansive soils.** Foundation and floor slabs for buildings located on expansive soils shall be designed in accordance with Section 1805.8 of the *International Building Code*.

**Exception:** Slab-on-ground and other foundation systems which have performed adequately in soil conditions similar to those encountered at the building site are permitted subject to the approval of the *building official*.

**R403.1.8.1 Expansive soils classifications.** Soils meeting all four of the following provisions shall be considered expansive, except that tests to show compliance with Items 1, 2 and 3 shall not be required if the test prescribed in Item 4 is conducted:

1. Plasticity Index (PI) of 15 or greater, determined in accordance with ASTM D 4318.
2. More than 10 percent of the soil particles pass a No. 200 sieve (75 μm), determined in accordance with ASTM D 422.
3. More than 10 percent of the soil particles are less than 5 micrometers in size, determined in accordance with ASTM D 422.
4. Expansion Index greater than 20, determined in accordance with ASTM D 4829.

**R403.2 Footings for wood foundations.** Footings for wood foundations shall be in accordance with Figures R403.1(2) and

R403.1(3). Gravel shall be washed and well graded. The maximum size stone shall not exceed 3/4 inch (19.1 mm). Gravel shall be free from organic, clayey or silty soils. Sand shall be free from organic, clayey or silty soils. Crushed stone shall have a maximum size of 1/2 inch (12.7 mm).

**R403.3 Frost protected shallow foundations.** For buildings where the monthly mean temperature of the building is maintained at a minimum of 64°F (18°C), footings are not required to extend below the frost line when protected from frost by insulation in accordance with Figure R403.3(1) and Table R403.3(1). Foundations protected from frost in accordance with Figure R403.3(1) and Table R403.3(1) shall not be used for unheated spaces such as porches, utility rooms, garages and carports, and shall not be attached to basements or crawl spaces that are not maintained at a minimum monthly mean temperature of 64°F (18°C).

Materials used below *grade* for the purpose of insulating footings against frost shall be *labeled* as complying with ASTM C 578.

**R403.3.1 Foundations adjoining frost protected shallow foundations.** Foundations that adjoin frost protected shallow foundations shall be protected from frost in accordance with Section R403.1.4.

**R403.3.1.1 Attachment to unheated slab-on-ground structure.** Vertical wall insulation and horizontal insulation of frost protected shallow foundations that adjoin a slab-on-ground foundation that does not have a monthly mean temperature maintained at a minimum of 64°F (18°C) shall be in accordance with Figure R403.3(3) and Table R403.3(1). Vertical wall insulation shall extend between the frost protected shallow foundation and the adjoining slab foundation. Required horizontal insulation shall be continuous under the adjoining slab foundation and through any foundation walls adjoining the frost protected shallow foundation. Where insulation passes through a foundation wall, it shall either be of a type complying with this section and having bearing capacity equal to or greater than the structural loads imposed by the building, or the building shall be designed and constructed using beams, lintels, cantilevers or other means of transferring building loads such that the structural loads of the building do not bear on the insulation.

**R905.14.1 Slope.** Sprayed polyurethane foam roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage.

**R905.14.2 Material standards.** Spray-applied polyurethane foam insulation shall comply with ASTM C 1029, Type III or IV.

**R905.14.3 Application.** Foamed-in-place roof insulation shall be installed in accordance with this chapter and the manufacturer's installation instructions. A liquid-applied protective coating that complies with Section R905.15 shall be applied no less than 2 hours nor more than 72 hours following the application of the foam.

**R905.14.4 Foam plastics.** Foam plastic materials and installation shall comply with Section R314.

**R905.15 Liquid-applied coatings.** The installation of liquid-applied coatings shall comply with the provisions of this section.

**R905.15.1 Slope.** Liquid-applied roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope).

**R905.15.2 Material standards.** Liquid-applied roof coatings shall comply with ASTM C 836, C 957, D 1227, D 3468, D 6083, D 6694 or D 6947.

**R905.15.3 Application.** Liquid-applied roof coatings shall be installed according to this chapter and the manufacturer's installation instructions.

 **SECTION R906  
ROOF INSULATION**

**R906.1 General.** The use of above-deck thermal insulation shall be permitted provided such insulation is covered with an *approved* roof covering and passes FM 4450 or UL 1256.

**R906.2 Material standards.** Above-deck thermal insulation board shall comply with the standards in Table R906.2.

**TABLE R906.2  
MATERIAL STANDARDS FOR ROOF INSULATION**

Cellular glass board	ASTM C 552
Composite boards	ASTM C 1289, Type III, IV, V or VI
Expanded polystyrene	ASTM C 578
Extruded polystyrene board	ASTM C 578
Perlite board	ASTM C 728
Polyisocyanurate board	ASTM C 1289, Type I or Type II
Wood fiberboard	ASTM C 208

 **SECTION R907  
REROOFING**

**R907.1 General.** Materials and methods of application used for re-covering or replacing an existing roof covering shall comply with the requirements of Chapter 9.

**Exception:** Reroofing shall not be required to meet the minimum design slope requirement of one-quarter unit vertical

in 12 units horizontal (2-percent slope) in Section R905 for roofs that provide positive roof drainage.

**R907.2 Structural and construction loads.** The structural roof components shall be capable of supporting the roof covering system and the material and equipment loads that will be encountered during installation of the roof covering system.

**R907.3 Recovering versus replacement.** New roof coverings shall not be installed without first removing all existing layers of roof coverings where any of the following conditions exist:

1. Where the existing roof or roof covering is water-soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.
4. For asphalt shingles, when the building is located in an area subject to moderate or severe hail exposure according to Figure R903.5.

**Exceptions:**

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Installation of metal panel, metal shingle and concrete and clay tile roof coverings over existing wood shake roofs shall be permitted when the application is in accordance with Section R907.4.
3. The application of new protective coating over existing spray polyurethane foam roofing systems shall be permitted without tear-off of existing roof coverings.

**R907.4 Roof recovering.** Where the application of a new roof covering over wood shingle or shake roofs creates a combustible concealed space, the entire existing surface shall be covered with gypsum board, mineral fiber, glass fiber or other *approved* materials securely fastened in place.

**R907.5 Reinstallation of materials.** Existing slate, clay or cement tile shall be permitted for reinstallation, except that damaged, cracked or broken slate or tile shall not be reinstalled. Existing vent flashing, metal edgings, drain outlets, collars and metal counterflashings shall not be reinstalled where rusted, damaged or deteriorated. Aggregate surfacing materials shall not be reinstalled.

**R907.6 Flashings.** Flashings shall be reconstructed in accordance with *approved* manufacturer's installation instructions. Metal flashing to which bituminous materials are to be adhered shall be primed prior to installation.

Still must Submit Energy Calculations (Energy Certificate)

**SECTION N1102  
BUILDING THERMAL ENVELOPE**

**N1102.1 Insulation and fenestration criteria.** The building thermal envelope shall meet the requirements of Table N1102.1 based on the climate zone specified in Table N1101.2.

**N1102.1.1 R-value computation.** Insulation material used in layers, such as framing cavity insulation and insulating sheathing, shall be summed to compute the component R-value. The manufacturer's settled R-value shall be used for blown insulation. Computed R-values shall not include an R-value for other building materials or air films.

**N1102.1.2 U-factor alternative.** An assembly with a U-factor equal to or less than that specified in Table

N1102.1.2 shall be permitted as an alternative to the R-value in Table N1102.1.

**N1102.1.3 Total UA alternative.** If the total building thermal envelope UA (sum of U-factor times assembly area) is less than or equal to the total UA resulting from using the U-factors in Table N1102.1.2, (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table N1102.1. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to UA compliance.

**TABLE N1102.1  
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT<sup>a</sup>**

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT <sup>b</sup> U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE <sup>k</sup>	FLOOR R-VALUE	BASEMENT <sup>c</sup> WALL R-VALUE	SLAB <sup>d</sup> R-VALUE AND DEPTH	CRAWL SPACE <sup>e</sup> WALL R-VALUE
1	1.2	0.75	0.35 <sup>j</sup>	30	13	3/4	13	0	0	0
2	0.65 <sup>i</sup>	0.75	0.35 <sup>j</sup>	30	13	4/6	13	0	0	0
3	0.50 <sup>i</sup>	0.65	0.35 <sup>e,j</sup>	30	13	5/8	19	5/13 <sup>f</sup>	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13 + 5 <sup>h</sup>	13/17	30 <sup>f</sup>	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13 + 5 <sup>h</sup>	15/19	30 <sup>g</sup>	10/13	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	30 <sup>g</sup>	10/13	10, 4 ft	10/13

- a. R-values are minimums. U-factors and solar heat gain coefficient (SHGC) are maximums. R-19 batts compressed in to nominal 2 x 6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.
- b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
- c. The first R-value applies to continuous insulation, the second to framing cavity insulation; either insulation meets the requirement.
- d. R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less, in zones 1 through 3 for heated slabs.
- e. There are no SHGC requirements in the Marine Zone.
- f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.2 and Table N1101.2.
- g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
- h. "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25% or less of the exterior, R-5 sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25% of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
- i. For impact-rated fenestration complying with Section R301.2.1.2, the maximum U-factor shall be 0.75 in zone 2 and 0.65 in zone 3.
- j. For impact-resistant fenestration complying with Section R301.2.1.2 of the International Residential Code, the maximum SHGC shall be 0.40.
- k. The second R-value applies when more than half the insulation is on the interior.

**TABLE N1101.2—continued**  
**CLIMATE ZONES, MOISTURE REGIMES AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY**

**Key:**

**A—Moist, B—Dry, C—Marine, Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (\*) indicates a warm-humid location.**

6A Pepin	6A Trempealeau	6B Campbell	7 Sublette	Northern Mariana Islands 1A (all)*
6A Pierce	6A Vernon	6B Carbon	6B Sweetwater	
6A Polk	7 Vilas	6B Converse	7 Teton	Puerto Rico 1A (all)*
6A Portage	6A Walworth	6B Crook	6B Uinta	
7 Price	7 Washburn	6B Fremont	6B Washakie	Virgin Islands 1A (all)*
6A Racine	6A Washington	5B Goshen	6B Weston	
6A Richland	6A Waukesha	6B Hot Springs		
6A Rock	6A Waupaca	6B Johnson		
6A Rusk	6A Waushara	6B Laramie	<b>US TERRITORIES</b>	
6A Sauk	6A Winnebago	7 Lincoln	<b>American Samoa</b>	
7 Sawyer	6A Wood	6B Natrona	1A (all)*	
6A Shawano		6B Niobrara		
6A Sheboygan	<b>Wyoming</b>	6B Park		
6A St. Croix	6B Albany	5B Platte	<b>Guam</b>	
7 Taylor	6B Big Horn	6B Sheridan	1A (all)*	

**TABLE N1101.5(1)**  
**DEFAULT GLAZED FENESTRATION U-FACTORS**

FRAME TYPE	SINGLE PANE	DOUBLE PANE	SKYLIGHT	
			Single	Double
Metal	1.2	0.8	2	1.3
Metal with thermal break	1.1	0.65	1.9	1.1
Nonmetal or metal clad	0.95	0.55	1.75	1.05
Glazed block	0.6			

**TABLE N1101.5(2)**  
**DEFAULT DOOR U-FACTORS**

DOOR TYPE	U-FACTOR
Uninsulated metal	1.2
Insulated metal	0.6
Wood	0.5
Insulated, nonmetal edge, max 45% glazing, any glazing double pane	0.35

**TABLE N1101.5(3)**  
**DEFAULT GLAZED FENESTRATION SHGC**

SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
Clear	Tinted	Clear	Tinted	
0.8	0.7	0.7	0.6	0.6

TABLE N1102.2.5  
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION (R-VALUE)

WOOD FRAME R-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT R-VALUE <sup>a</sup>
<b>Steel Truss Ceilings<sup>a</sup></b>	
R-30	R-38 or R-30 + 3 or R-26 + 5
R-38	R-49 or R-38 + 3
R-49	R-38 + 5
<b>Steel Joist Ceilings<sup>b</sup></b>	
R-30	R-38 in 2 × 4 or 2 × 6 or 2 × 8 R-49 in any framing
R-38	R-49 in 2 × 4 or 2 × 6 or 2 × 8 or 2 × 10
<b>Steel Framed Wall</b>	
R-13	R-13 + 5 or R15 + 4 or R-21 + 3 or R-0 + 10
R-19	R-13 + 9 or R-19 + 8 or R-25 + 7
R-21	R-13 + 10 or R-19 + 9 or R-25 + 8
<b>Steel Joist Floor</b>	
R-13	R-19 in 2 × 6 R-19 + R-6 in 2 × 8 or 2 × 10
R-19	R-19 + R-6 in 2 × 6 R-19 + R-12 in 2 × 8 or 2 × 10

For SI: 1 inch = 25.4 mm.

a. Cavity insulation R-value is listed first, followed by continuous insulation R-value.

b. Insulation exceeding the height of the framing shall cover the framing.

**N1102.2.9 Crawl space walls.** As an alternative to insulating floors over crawl spaces, insulation of crawl space walls shall be permitted when the crawl space is not vented to the outside. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished *grade* level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder. All joints of the vapor retarder shall overlap by 6 inches (152 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (152 mm) up the stem wall and shall be attached to the stem wall.

**N1102.2.10 Masonry veneer.** Insulation shall not be required on the horizontal portion of the foundation that supports a masonry veneer.

**N1102.2.11 Thermally isolated sunroom insulation.** The minimum ceiling insulation R-values shall be R-19 in zones 1 through 4 and R-24 in zones 5 through 8. The minimum wall R-value shall be R-13 in all zones. New wall(s) separating the sunroom from *conditioned space* shall meet the *building thermal envelope* requirements.

### N1102.3 Fenestration.

**N1102.3.1 U-factor.** An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements.

**N1102.3.2 Glazed fenestration SHGC.** An area-weighted average of fenestration products more than 50 percent glazed shall be permitted to satisfy the solar heat gain coefficient (SHGC) requirements.

**N1102.3.3 Glazed fenestration exemption.** Up to 15 square feet (1.4 m<sup>2</sup>) of glazed fenestration per *dwelling unit* shall be permitted to be exempt from U-factor and SHGC requirements in Section N1102.1. This exemption shall not apply to the U-factor alternative approach in Section N1102.1.2 and the Total UA alternative in Section N1102.1.3.

**N1102.3.4 Opaque door exemption.** One side-hinged opaque door assembly up to 24 square feet (2.22 m<sup>2</sup>) in area is exempted from the U-factor requirement in Section N1102.1.1. This exemption shall not apply to the U-factor alternative approach in Section N1102.1.2 and the Total UA alternative in Section N1102.1.3.

**N1102.3.5 Thermally isolated sunroom U-factor.** For zones 4 through 8 the maximum fenestration U-factor shall be 0.50 and the maximum skylight U-factor shall be 0.75. New windows and doors separating the sunroom from *conditioned space* shall meet the *building thermal envelope* requirements.

**N1102.3.6 Replacement fenestration.** Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for U-factor and solar heat gain coefficient (SHGC) in Table N1102.1.

## N1102.2 Specific insulation requirements.

**N1102.2.1 Ceilings with attic spaces.** When Section N1102.1 would require R-38 in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly R-38 shall be deemed to satisfy the requirement for R-49 wherever the full height of uncompressed R-38 insulation extends over the wall top plate at the eaves. This reduction shall not apply to the *U*-factor alternative approach in Section N1102.1.2 and the Total UA alternative in Section N1102.1.3.

**N1102.2.2 Ceilings without attic spaces.** Where Section N1102.1 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section 402.1.1 shall be limited to 500 square feet (46 m<sup>2</sup>) of ceiling area. This reduction shall not apply to the *U*-factor alternative approach in Section N1102.1.2 and the Total UA alternative in Section N1102.1.3.

**N1102.2.3 Access hatches and doors.** Access doors from *conditioned spaces* to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all *equipment* which prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer is required to be provided when loose fill insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living space when the *attic* access is opened and to provide a permanent means of maintaining the installed *R*-value of the loose fill insulation.

**N1102.2.4 Mass walls.** Mass walls, for the purposes of this chapter, shall be considered above-grade walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs.

**N1102.2.5 Steel-frame ceilings, walls and floors.** Steel-frame ceilings, walls and floors shall meet the insulation requirements of Table N1102.2.5 or shall meet the *U*-factor requirements in Table N1102.1.2. The calculation of the *U*-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method.

**Exception:** In climate zones 1 and 2, the continuous insulation requirements in Table N1102.2.5 shall be permitted to be reduced to R-3 for steel frame wall assemblies with studs spaced at 24 inches (610 mm) on center.

**N1102.2.6 Floors.** Floor insulation shall be installed to maintain permanent contact with the underside of the subfloor decking.

**N1102.2.7 Basement walls.** *Exterior walls* associated with conditioned basements shall be insulated from the top of the *basement wall* down to 10 feet (3048 mm) below *grade* or to the *basement* floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Sections N1102.1 and N1102.2.6.

**N1102.2.8 Slab-on-grade floors.** Slab-on-grade floors with a floor surface less than 12 inches below *grade* shall be insulated in accordance with Table N1102.1. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below *grade* shall be extended the distance provided in Table N1102.1 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil. The top edge of the insulation installed between the *exterior wall* and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the *exterior wall*. Slab-edge insulation is not required in jurisdictions designated by the code official as having a very heavy termite infestation.

TABLE N1102.1.2  
EQUIVALENT *U*-FACTORS<sup>a</sup>

CLIMATE ZONE	FENESTRATION <i>U</i> -FACTOR	SKYLIGHT <i>U</i> -FACTOR	CEILING <i>U</i> -FACTOR	FRAME WALL <i>U</i> -FACTOR	MASS WALL <i>U</i> -FACTOR <sup>b</sup>	FLOOR <i>U</i> -FACTOR	BASEMENT WALL <i>U</i> -FACTOR	CRAWL SPACE WALL <i>U</i> -FACTOR
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091 <sup>c</sup>	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.060	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.060	0.060	0.033	0.059	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	0.059	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.

b. When more than half the insulation is on the interior, the mass wall *U*-factors shall be a maximum of 0.17 in zone 1, 0.14 in zone 2, 0.12 in zone 3, 0.10 in zone 4 except Marine and the same as the frame wall *U*-factor in Marine zone 4 and in zones 5 through 8.

c. Basement wall *U*-factor of 0.360 in warm-humid climates as defined by Figure N1101.2 and Table N1101.2.

### N1102.4 Air leakage.

**N1102.4.1 Building thermal envelope.** The *building thermal envelope* shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material.

1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.
6. Knee walls.
7. Walls and ceilings separating the garage from *conditioned spaces*.
8. Behind tubs and showers on *exterior walls*.
9. Common walls between *dwelling units*.
10. Attic access openings.
11. Rim joists junction.
12. Other sources of infiltration.

**N1102.4.2 Air sealing and insulation.** Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section N1102.4.2.1 or N1102.4.2.2.

**N1102.4.2.1 Testing option.** Tested air leakage is less than 7 ACH when tested with a blower door at a pressure of 50 pascals (0.007 psi). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;
2. Dampers shall be closed, but not sealed; including exhaust, intake, makeup air, back draft, and flue dampers;
3. Interior doors shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s) shall be turned off;
6. HVAC ducts shall not be sealed; and
7. Supply and return registers shall not be sealed.

**N1102.4.2.2 Visual inspection option.** The items listed in Table N1102.4.2, applicable to the method of construction, are field verified. Where required by the code official, an *approved* party independent from the installer

of the insulation, shall inspect the air barrier and insulation.

**N1102.4.3 Fireplaces.** New wood-burning fireplaces shall have gasketed doors and outdoor combustion air.

**N1102.4.4 Fenestration air leakage.** Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cubic foot per minute per square foot [1.5(L/s)/m<sup>2</sup>], and swinging doors no more than 0.5 cubic foot per minute per square foot [2.5(L/s)/m<sup>2</sup>], when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory, and listed and *labeled* by the manufacturer.

**Exception:** Site-built windows, skylights and doors.

**N1102.4.5 Recessed lighting.** Recessed luminaires installed in the *building thermal envelope* shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and *labeled* as meeting ASTM E 283 when tested at 1.57 psi (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the *conditioned space* to the ceiling cavity. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

## SECTION N1103 SYSTEMS

**N1103.1 Controls.** At least one thermostat shall be installed for each separate heating and cooling system.

**N1103.1.1 Programmable thermostat.** Where the primary heating system is a forced air furnace, at least one thermostat per *dwelling unit* shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures down to 55°F (13°C) or up to 85°F (29°C). The thermostat shall initially be programmed with a heating temperature set point no higher than 70°F (21°C) and a cooling temperature set point no lower than 78°F (26°C).

**N1103.1.2 Heat pump supplementary heat.** Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load.

### N1103.2 Ducts.

**N1103.2.1 Insulation.** Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

**Exception:** Ducts or portions thereof located completely inside the *building thermal envelope*.

**N1103.2.2 Sealing.** Ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.4. Duct tightness shall be verified by either of the following:

1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (3.78 L/s) per 100 ft<sup>2</sup> (9.29

m<sup>2</sup>) of conditioned floor area or a total leakage less than or equal to 12 cfm (5.66 L/s) per 100 ft<sup>2</sup> (9.29 m<sup>2</sup>) of conditioned floor area when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler end closure. All register boots shall be taped or otherwise sealed during the test.

2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (2.83 L/s) per 100 ft<sup>2</sup> (9.29 m<sup>2</sup>) of conditioned floor area when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (1.89 L/s) per 100 ft<sup>2</sup> (9.29 m<sup>2</sup>) of conditioned floor area.

**Exception:** Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*.

**N1103.2.3 Building cavities.** Building framing cavities shall not be used as supply ducts.

**N1103.3 Mechanical system piping insulation.** Mechanical system piping capable of carrying fluids above 105°F (40°C) or below 55°F (13°C) shall be insulated to a minimum of R-3.

**N1103.4 Circulating hot water systems.** All circulating service hot water piping shall be insulated to at least R-2. Circulating hot water systems shall include an automatic or *readily accessible* manual switch that can turn off the hot water circulating pump when the system is not in use.

**N1103.5 Mechanical ventilation.** Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

TABLE N1102.4.2  
AIR BARRIER AND INSULATION INSPECTION

COMPONENT	CRITERIA
Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material.
Ceiling/attic	Air barrier in any dropped ceiling/soffit is substantially aligned with insulation and any gaps are sealed Attic access (except unvented attic), knee wall door, or drop down stair is sealed.
Walls	Corners and headers are insulated. Junction of foundation and sill plate is sealed.
Windows and doors	Space between window/door jambs and framing is sealed.
Rim joists	Rim joists are insulated and include an air barrier.
Floors (including above garage and cantilevered floors)	Insulation is installed to maintain permanent contact with underside of subfloor decking. Air barrier is installed at any exposed edge of floor.
Crawlspace walls	Insulation is permanently attached to walls. Exposed earth in unvented crawlspaces is covered with Class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditioned space are sealed.
Narrow cavities	Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation.
Garage separation	Air sealing is provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures are airtight, IC rated and sealed to drywall. Exception—fixtures in conditioned space.
Plumbing and wiring	Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring.
Shower/tub on exterior wall	Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.
Electrical/phone box on exterior wall	Air barrier extends behind boxes or air sealed type boxes are installed.
Common wall	Air barrier is installed in common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.
Fireplace	Fireplace walls include an air barrier.

**N1103.6 Equipment sizing.** Heating and cooling *equipment* shall be sized as specified in Section M1401.3.

**N1103.7 Snow melt system controls.** Snow- and ice-melting systems supplied through energy service to the building shall include automatic controls capable of shutting off the system when the pavement temperature is above 50°F (10°C) and no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F (5°C).

**N1103.8 Pools.** Pools shall be provided with energy conserving measures in accordance with Sections N1103.8.1 through N1103.8.3.

**N1103.8.1 Pool heaters.** All pool heaters shall be equipped with a *readily accessible* on-off switch to allow shutting off the heater without adjusting the thermostat setting. Pool heaters fired by natural gas or LPG shall not have continuously burning pilot lights.

**N1103.8.2 Time switches.** Time switches that can automatically turn off and on heaters and pumps according to a pre-set schedule shall be installed on swimming pool heaters and pumps.

**Exceptions:**

1. Where public health standards require 24-hour pump operation.
2. Where pumps are required to operate solar- and waste-heat-recovery pool heating systems.

**N1103.8.3 Pool covers.** Heated pools shall be equipped with a vapor retardant pool cover on or at the water surface. Pools heated to more than 90°F (32°C) shall have a pool cover with a minimum insulation value of R-12.

**SECTION N1104  
LIGHTING SYSTEMS**

**N1104.1 Lighting equipment.** A minimum of 50 percent of the lamps in permanently installed lighting fixtures shall be *high-efficacy lamps*.

## APPENDIX G

# SWIMMING POOLS, SPAS AND HOT TUBS

*(The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.)*

### SECTION AG101 GENERAL

**AG101.1 General.** The provisions of this appendix shall control the design and construction of swimming pools, spas and hot tubs installed in or on the *lot* of a one- or two-family dwelling.

**AG101.2 Pools in flood hazard areas.** Pools that are located in flood hazard areas established by Table R301.2(1), including above-ground pools, on-ground pools and in-ground pools that involve placement of fill, shall comply with Sections AG101.2.1 or AG101.2.2.

**Exception:** Pools located in riverine flood hazard areas which are outside of designated floodways.

**AG101.2.1 Pools located in designated floodways.** Where pools are located in designated floodways, documentation shall be submitted to the *building official*, which demonstrates that the construction of the pool will not increase the design flood elevation at any point within the *jurisdiction*.

**AG101.2.2 Pools located where floodways have not been designated.** Where pools are located where design flood elevations are specified but floodways have not been designated, the applicant shall provide a floodway analysis that demonstrates that the proposed pool will not increase the design flood elevation more than 1 foot (305 mm) at any point within the *jurisdiction*.

### SECTION AG102 DEFINITIONS

**AG102.1 General.** For the purposes of these requirements, the terms used shall be defined as follows and as set forth in Chapter 2.

**ABOVE-GROUND/ON-GROUND POOL.** See "Swimming pool."

**BARRIER.** A fence, wall, building wall or combination thereof which completely surrounds the swimming pool and obstructs access to the swimming pool.

**HOT TUB.** See "Swimming pool."

**IN-GROUND POOL.** See "Swimming pool."

**RESIDENTIAL.** That which is situated on the premises of a detached one- or two-family dwelling or a one-family *townhouse* not more than three stories in height.

**SPA, NONPORTABLE.** See "Swimming pool."

**SPA, PORTABLE.** A nonpermanent structure intended for recreational bathing, in which all controls, water-heating and water-circulating *equipment* are an integral part of the product.

**SWIMMING POOL.** Any structure intended for swimming or recreational bathing that contains water over 24 inches (610

mm) deep. This includes in-ground, above-ground and on-ground swimming pools, hot tubs and spas.

**SWIMMING POOL, INDOOR.** A swimming pool which is totally contained within a structure and surrounded on all four sides by the walls of the enclosing structure.

**SWIMMING POOL, OUTDOOR.** Any swimming pool which is not an indoor pool.

### SECTION AG103 SWIMMING POOLS

**AG103.1 In-ground pools.** In-ground pools shall be designed and constructed in conformance with ANSI/NSPI-5 as listed in Section AG108.

**AG103.2 Above-ground and on-ground pools.** Above-ground and on-ground pools shall be designed and constructed in conformance with ANSI/NSPI-4 as listed in Section AG108.

**AG103.3 Pools in flood hazard areas.** In flood hazard areas established by Table R301.2(1), pools in coastal high hazard areas shall be designed and constructed in conformance with ASCE 24.

### SECTION AG104 SPAS AND HOT TUBS

**AG104.1 Permanently installed spas and hot tubs.** Permanently installed spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-3 as listed in Section AG108.

**AG104.2 Portable spas and hot tubs.** Portable spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-6 as listed in Section AG108.

### SECTION AG105 BARRIER REQUIREMENTS

**AG105.1 Application.** The provisions of this chapter shall control the design of barriers for residential swimming pools, spas and hot tubs. These design controls are intended to provide protection against potential drownings and near-drownings by restricting access to swimming pools, spas and hot tubs.

**AG105.2 Outdoor swimming pool.** An outdoor swimming pool, including an in-ground, above-ground or on-ground pool, hot tub or spa shall be surrounded by a barrier which shall comply with the following:

1. The top of the barrier shall be at least 48 inches (1219 mm) above *grade* measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of

the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. Where the top of the pool structure is above grade, such as an above-ground pool, the barrier may be at ground level, such as the pool structure, or mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm).

2. Openings in the barrier shall not allow passage of a 4-inch-diameter (102 mm) sphere.
3. Solid barriers which do not have openings, such as a masonry or stone wall, shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.
4. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical members shall not exceed  $1\frac{3}{4}$  inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed  $1\frac{3}{4}$  inches (44 mm) in width.
5. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed  $1\frac{3}{4}$  inches (44 mm) in width.
6. Maximum mesh size for chain link fences shall be a  $2\frac{1}{4}$ -inch (57 mm) square unless the fence has slats fastened at the top or the bottom which reduce the openings to not more than  $1\frac{3}{4}$  inches (44 mm).
7. Where the barrier is composed of diagonal members, such as a lattice fence, the maximum opening formed by the diagonal members shall not be more than  $1\frac{3}{4}$  inches (44 mm).
8. Access gates shall comply with the requirements of Section AG105.2, Items 1 through 7, and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outward away from the pool and shall be self-closing and have a self-latching device. Gates other than pedestrian access gates shall have a self-latching device. Where the release mechanism of the self-latching device is located less than 54 inches (1372 mm) from the bottom of the gate, the release mechanism and openings shall comply with the following:
  - 8.1. The release mechanism shall be located on the pool side of the gate at least 3 inches (76 mm) below the top of the gate; and
  - 8.2. The gate and barrier shall have no opening larger than  $\frac{1}{2}$  inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.
9. Where a wall of a *dwelling* serves as part of the barrier, one of the following conditions shall be met:
  - 9.1. The pool shall be equipped with a powered safety cover in compliance with ASTM F 1346; or
  - 9.2. Doors with direct access to the pool through that wall shall be equipped with an alarm which produces an audible warning when the door and/or its screen, if present, are opened. The alarm shall be listed and *labeled* in accordance with UL 2017. The deactivation switch(es) shall be located at least 54 inches (1372 mm) above the threshold of the door; or
  - 9.3. Other means of protection, such as self-closing doors with self-latching devices, which are *approved* by the governing body, shall be acceptable as long as the degree of protection afforded is not less than the protection afforded by Item 9.1 or 9.2 described above.
10. Where an above-ground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps:
  - 10.1. The ladder or steps shall be capable of being secured, locked or removed to prevent access; or
  - 10.2. The ladder or steps shall be surrounded by a barrier which meets the requirements of Section AG105.2, Items 1 through 9. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch-diameter (102 mm) sphere.

**AG105.3 Indoor swimming pool.** Walls surrounding an indoor swimming pool shall comply with Section AG105.2, Item 9.

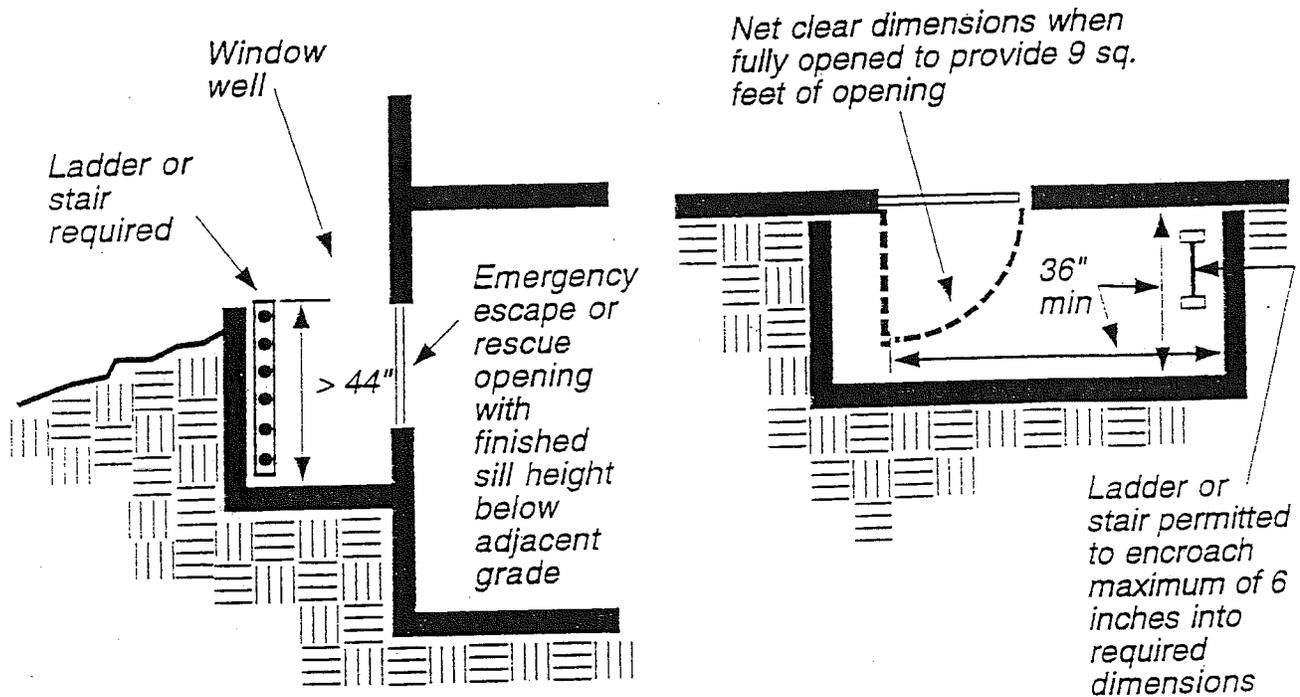
**AG105.4 Prohibited locations.** Barriers shall be located to prohibit permanent structures, *equipment* or similar objects from being used to climb them.

**AG105.5 Barrier exceptions.** Spas or hot tubs with a safety cover which complies with ASTM F 1346, as listed in Section AG107, shall be exempt from the provisions of this appendix.

## SECTION AG106 ENTRAPMENT PROTECTION FOR SWIMMING POOL AND SPA SUCTION OUTLETS

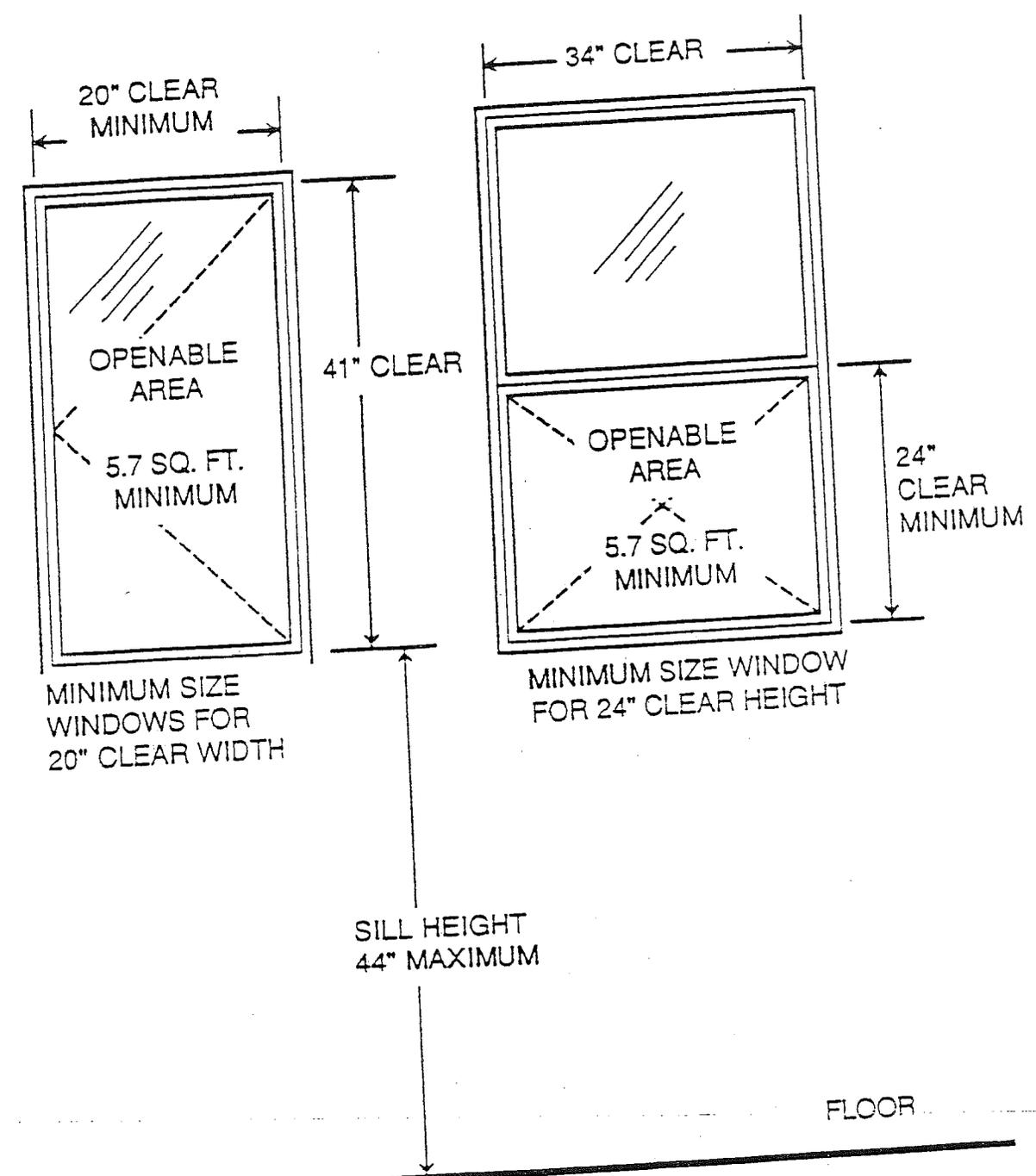
**AG106.1 General.** Suction outlets shall be designed and installed in accordance with ANSI/APSP-7.

**ESCAPE AND RESCUE WINDOWS WITH A FINISHED SILL HEIGHT BELOW THE ADJACENT GROUND ELEVATION SHALL HAVE A WINDOW WELL**



**WINDOW WELL** is a soil-retaining structure at a window having a sill height lower than the adjacent ground elevation. Section 224

**EMERGENCY ESCAPES  
Section 310.**



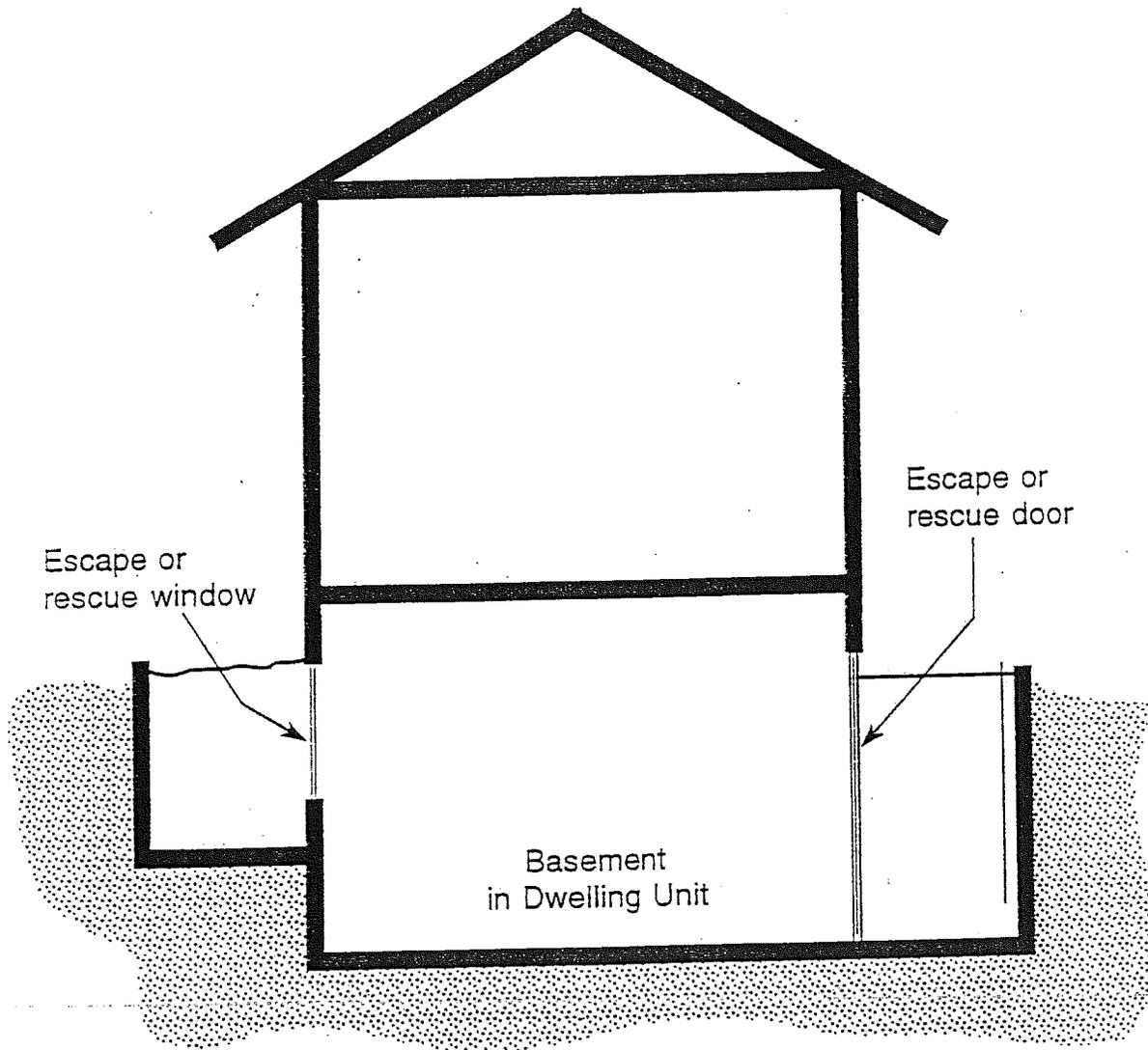
- Basement in dwelling unit, or
- sleeping room below the fourth story

## ESCAPE OR RESCUE WINDOWS

### Section 310

Basements in dwelling units shall have at least one operable window or door approved for emergency escape or rescue.

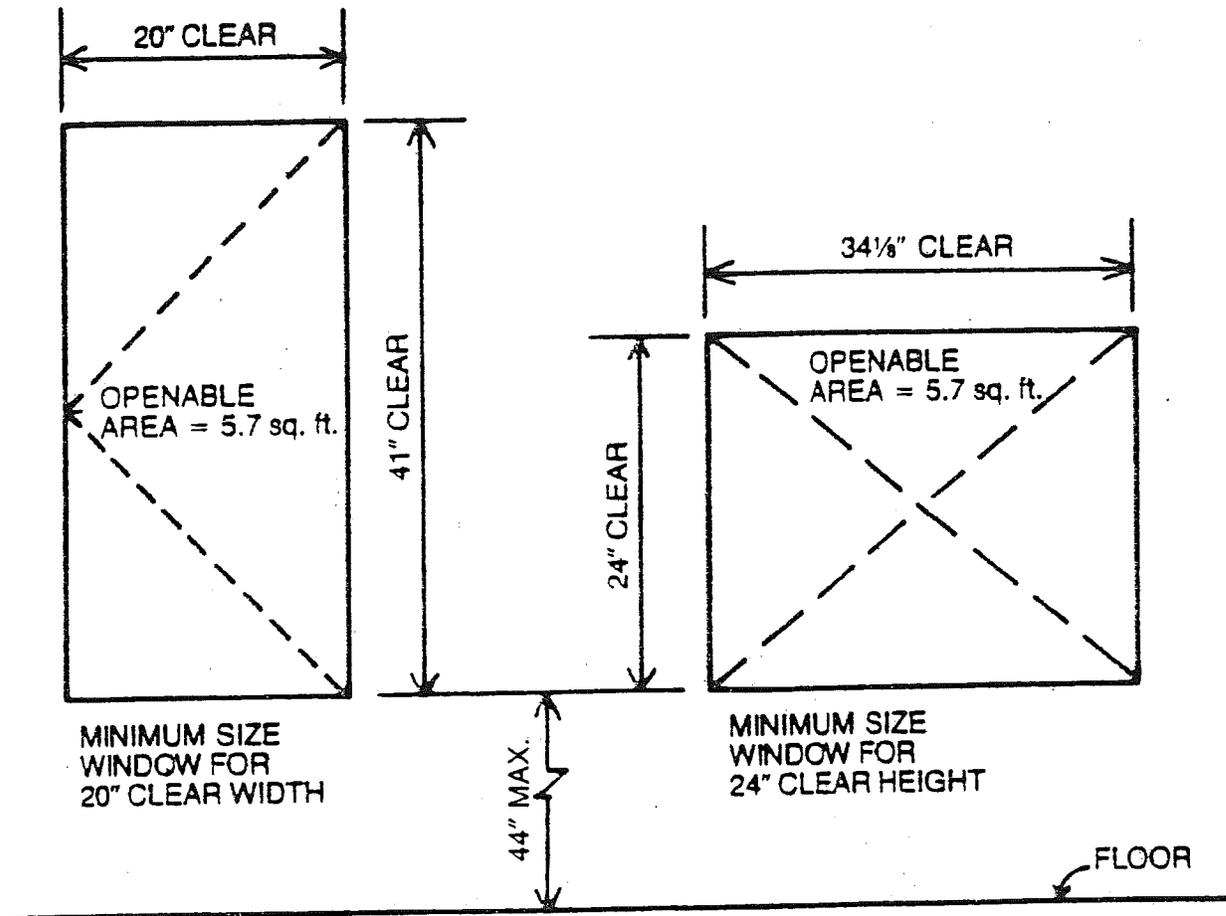
These openings are required to open directly to a public street, public alley, yard or exit court.



This requirement does not affect the requirement for sleeping rooms which are located in the basement. Sleeping rooms still require an exterior door or window for emergency escape or rescue that opens directly from the room.

## **EXITS AND EMERGENCY ESCAPES**

### **Section 310**



## EMERGENCY ESCAPE AND RESCUE WINDOW

Figure No. 12-1

## **SECTION 1103 ACCESSORY BUILDINGS AND USES**

1103.01 USE FOR DWELLING: Accessory buildings shall not be used for dwelling purposes unless specifically permitted.

### **1103.02 SIZE LIMITATIONS**

Accessory buildings are intended to remain secondary in nature to the primary building or structure on the land or tract of land in which they are located. Accessory buildings in all Residential Districts (does not include AGG) shall meet the following additional requirements:

1. The maximum number of accessory buildings shall be limited to two (2) structures.
2. No accessory building shall be located between the front building line of the principle building and the front property line, except:
  - A) In RRE Districts upon the approval of a conditional use permit. The conditional use permit may include but not limited to requirements for additional set back, landscaping, screening, etc. All accessory buildings must meet front yard setback requirements.
  - B) In RL Districts on lots of forty-five thousand (45,000) square feet or greater upon the approval of a conditional use permit. The conditional use permit may include but not limited to requirements for additional set back, landscaping, screening, etc. All accessory buildings must meet front yard setback requirements.
3. For lots that are 10,000 square feet or smaller, the maximum combined total square footage of all accessory buildings shall not exceed the greater of:
  - A) Fifty (50) percent of the total square footage of the primary building's ground coverage area (area calculated at the exterior of the building at ground level).
  - B) Eight hundred and sixty four (864) square feet.
4. For lots larger than 10,000 square feet, the maximum combined total square footage of all accessory buildings shall not exceed the greater of:
  - A) Fifty (50) percent of the total square footage of the primary building's ground coverage area (area calculated at the exterior of the building at ground level)
  - B) Eight hundred and sixty four (864) square feet plus one (1) percent of the lot size above 10,000 square feet, not to exceed twelve hundred (1,200) square feet.
5. The combined total square footage area of the primary and accessory buildings shall not exceed the maximum allowable Lot Coverage Area as allowed by the zoning classification in which the buildings are located.

6. The maximum allowable building height of an accessory building, at its highest point, shall not exceed the height of the peak of the roof of the primary building or the height of twenty (20) feet, whichever is less. For purposes of this provision, height shall mean vertical distance measured from the average elevation of the finished grade of the building to the highest point of the building.
7. No accessory structure shall be constructed without a primary building or structure. No accessory building shall remain if the primary structure is removed or demolished.

1103.03 VEHICLE ACCESS: Unless otherwise specifically permitted, any accessory building requiring vehicle access from an alley way shall be located a minimum of fifteen (15) feet from the rear property line.

1103.04 ATTACHED ACCESSORY USE: Any accessory attached to the principle building shall be considered as a part of the principle building and shall meet the same requirements as specified for the principle building in said district.

1103.05 FIRE HAZARDOUS ACCESSORY USES: No accessory use shall be located within ten (10) feet of a residential dwelling that creates a fire hazard or would subject the residential structure to a potential fire, such as a detached fireplace, barbecue ovens, flammable liquid storage, etc.

1103.06 CAR PORTS: Car ports are not considered structures. Car ports can not be use for storing anything but cars and pickups.

## **SECTION 1102 FENCES, , HEDGES AND RETAINING WALLS**

Fences, and Hedges: Notwithstanding other provisions of this ordinance, fences and hedges may be permitted in any required yard, provided that no fence or hedge along the sides or front edge of any front yard shall be over three and one half (3 1/2) feet in height. Additionally, no fence or hedge shall exceed 2 1/2 feet in height when located within the site triangle of a corner lot.

A) The following regulations shall apply to the construction of fences.

- 1) No solid fence shall be constructed closer to the street than the front property line. If sidewalk is located within the front yard, no fence shall enclose the sidewalk nor shall a fence be constructed nearer than six inches (6") to the sidewalk.
- 2) No fence erected in a required front yard shall materially obstruct public view. No component of a front yard fence shall exceed 3 1/2' feet in height, nor shall any structural member exceed thirty six inches (36") in area, as measured using the horizontal cross section.
- 3) No fence shall be constructed which will constitute a traffic hazard as identified in the site triangle of a corner lot (See Section 1101).
- 4) No fence constructed in the second front yard (the side yard abutting the street) of a corner lot shall exceed forty eight inches (48") in height. For the purposes of this section, the "second front yard" shall be deemed to be in the area extending from the front corner of the house to the rear lot line on the side of the lot immediately adjacent to the City Street.
- 5) No fence shall be constructed in such a manner or be of such design as to be hazardous or dangerous to persons or animals by intent of its construction or by inadequate maintenance (examples of hazardous or dangerous fences shall be wire strand fences such as electrical conduit wire fences, barbed wire fences, chicken wire fences, etc.). Permitted types of fences shall include chain link fencing, wood fencing (including split rail and split rail with plastic coated wire backing), wrought iron, plastic, vinyl and other ornamental fencing or masonry (see Item #6).
- 6) Applicants for masonry fences must first locate the property pins or have a licensed surveyor locate or set the property pins to confirm the location of the property lines. The side of concrete fences facing any adjoining property or right of way must be brick or stone textured.
- 7) No fence within Residential Districts, except fences erected upon public or parochial school grounds or in public parks and in public playgrounds, shall be constructed of a height greater than six (6) feet.
- 8) All fences shall conform to the construction standards of the building code and other ordinances.

- 9) In commercial and industrial districts, maximum height of fences shall be six (6) feet. Except, when industry standards for certain types of businesses require fences of greater heights, the Zoning Administrator at his/her discretion may allow greater heights.
- 10) All fences or parts thereof which are solid shall be constructed so that all posts, braces, stringers, and all other structural members faced to the interior or the lot or parcel being fenced.
- 11) Effective from and after July 1, 1998, the Rules and Regulations of the International Building Code pertaining to confinement and fencing of outdoor pools shall be in effect and shall be enforced.
- 12) All fence posts shall be made of wood, wrought iron, plastic, vinyl, ornamental fencing and masonry or of similar material as the remainder of the fence.

B) The following regulations shall apply to the construction of retaining walls.

1) PURPOSE AND INTENT.

- a) To allow for the review of retaining walls of a size that may impact surrounding buildings, land, and uses;
- b) To require the construction of retaining walls in a manner consistent with engineering and construction best practices; and
- c) To lessen the impact of large retaining walls on abutting properties and the public by encouraging the use of landscaping and aesthetically pleasing design elements.

2) APPLICABILITY AND EXEMPTIONS: The regulations and requirements contained herein shall apply to all retaining walls erected in the City of Blair, except the following:

- a) Retaining walls that are six (6) feet in height or less shall not require a building permit but must meet the requirements of this section.
- b) A terraced combination of walls, in which each separate wall is six (6) feet in height or less and in which each terrace is at least two times (2x) the height of the next lowest wall, shall not require a building permit but must meet the requirements of this section.

3) GENERAL REQUIREMENTS: Following are the general requirements for retaining walls, including walls six (6) feet in height or less that do not require a building permit. No retaining wall shall be constructed in excess of these General

Requirements regarding maximum height or maximum slope without first obtaining a Conditional Use Permit (see Subsection B(4) below).

- a) Permit and Design - A building permit shall be required for all retaining walls that are over six (6) feet in height. All retaining walls requiring a permit must be designed by an engineer licensed in Nebraska.
- b) Terracing - Terracing of retaining walls is allowed and encouraged. In a terraced retaining wall system, if a successive wall is setback from the next lowest wall at least two times (2x) the height of the next lowest wall, the walls shall be considered as separate walls. If a successive wall is setback from the next lowest wall less than two times (2x) the height of the next lowest wall, the multiple walls shall be treated as a single wall and the height shall be measured as described in subsection 3(c) below.
- c) Determining Retaining Wall Height - The height of a retaining wall shall be the distance from the grade at the front of the wall to the grade at the back of the wall at the same section. For walls that are not a constant height the largest of these measurements shall be used to determine the height of the wall. Multiple walls treated as a single wall shall be measured from the grade at the front of the lowest wall to the grade at the back of the highest successive wall.
- d) Setback and Maximum Height Requirements –
  - i. Applicants for retaining walls located within three (3) feet of a property line must first locate the property pins or have a licensed surveyor locate or set the property pins to confirm the location of the property lines.
  - ii. Retaining walls which discharge storm water at their base from downspout drains located on any structure shall be located at least three (3) feet from the property line. Such discharge locations shall be constructed and maintained to eliminate any erosion from the base of the wall or adjoining property.
  - iii. Front yard(s) – No retaining wall erected in a required front yard shall materially obstruct public view or constitute a traffic hazard as identified in the site triangle of a corner lot (See Section 1101). No retaining wall shall be constructed closer than six (6) inches from the front property line without an easement from the City. No retaining wall in a required front yard shall exceed three and a half (3½) feet in height. No retaining wall bordering and facing the driveway or approved parking areas shall exceed ten (10) feet in height.
  - iv. Side and rear yard(s) - No retaining wall shall be constructed closer than six (6) inches from the side or rear property line. If the face of the retaining wall is towards the inside of the property, a permanent easement must exist for all areas outside the property requiring geogrid support and backfill, and such

easements must be recorded against all effected properties. No retaining wall shall exceed ten (10) feet in height.

- e) Wall Surcharge – Retaining walls shall have a maximum 1:4 (25%) slope in the soil surcharge uphill from the retaining wall for a minimum distance of two times (2x) the height of the wall.
  - f) Nonconforming Retaining Walls - Retaining walls constructed and/or permitted prior to the adoption of these regulations shall be allowed to remain in their existing state; however, significant changes or alterations to such walls shall be made in conformity with these regulations. The repair and routine maintenance of nonconforming retaining walls shall be allowed without requiring conformity with these regulations.
- 4) CONDITIONAL USE PERMIT REQUESTS TO EXCEED GENERAL HEIGHT AND/OR SLOPE LIMITATIONS:
- a) A Conditional Use Permit application may be submitted for the following exceptions only:
    - i. Retaining walls to exceed the maximum heights indicated in Subsection B(3)(d).
    - ii. Retaining walls to exceed the maximum 1:4 (25%) slope in the soil surcharge indicated in Subsection B(3)(e).
  - b) A Conditional Use Permit application must address, and will be evaluated on, the following criteria:
    - i. That the proposed retaining wall is otherwise in compliance with the provisions of this Section;
    - ii. That the proposed retaining wall will not adversely impact adjacent property, the public or public infrastructure;
    - iii. That the proposed retaining wall is the minimum structure necessary to allow a subject property to be reasonably utilized.

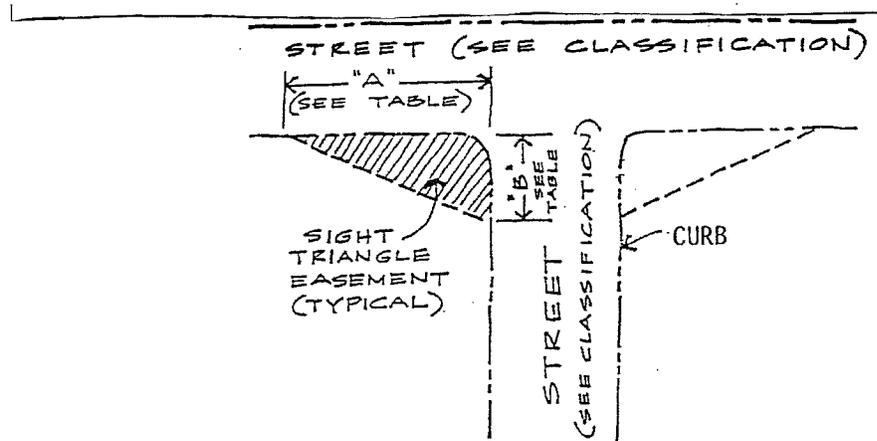
Notwithstanding the above, any real estate located outside the corporate limits of the City of Blair and which is included in the General Agricultural Zoning District or the Rural Residential Estate Zoning District shall be exempt regarding fences and hedges from the requirements set forth hereinabove in this Section.

# ARTICLE 11 SUPPLEMENTARY DISTRICT REGULATIONS

## SECTION 1101 VISIBILITY AT INTERSECTIONS

### Sight Triangle Easement:

On a corner lot in all districts, except the CCB Central Business District, continuous unobstructed sight distance shall be provided for safe traffic operations. The sight triangle consists of the area measured along the curb or outside lane of a street, beginning at the point where the two curb lines would intersect perpendicularly. No obstruction, including fences, hedges, walls, shrubbery or other manmade or natural obstructions shall exist between a height of two and one-half (2 1/2) feet and ten (10) feet with a sight triangle of the following dimensions set forth on Diagram shown below and incorporated by this reference herein:



REQUIREMENT BY STREET CLASSIFICATION (MEASURED ALONG CURB OR OUTSIDE LANE)

"A" (DISTANCE IN FEET)	"B" (DISTANCE IN FEET)		
	LOCAL STREET	COLLECTOR STREET	ARTERIAL STREET
45 LOCAL STREET	45	45	60
45 COLLECTOR STREET	45	45	60
60 ARTERIAL STREET	45	45	60

### SIGHT TRIANGLE

**\*All Local to Collector, Local to Arterial, Collector to Arterial and Arterial to Arterial should be controlled by stop signs and traffic signals.**

Source: The Illustrated Book of Development Definitions, (Moskowitz, Harvey and Carl Lindbloom, 1995).

# Curb Grinding

In an effort to minimize damage to city streets and curbs, the City of Blair, Nebraska deems it in the best interest of the public to adopt a policy providing for grinding concrete curbs rather than cutting curbs.

For grinding of a curb, please contact one of the following companies:

Charlie's Excavating	402-339-6660
D & D Concrete Sawing	402-359-5124
Heimes Excavating	800-894-6001

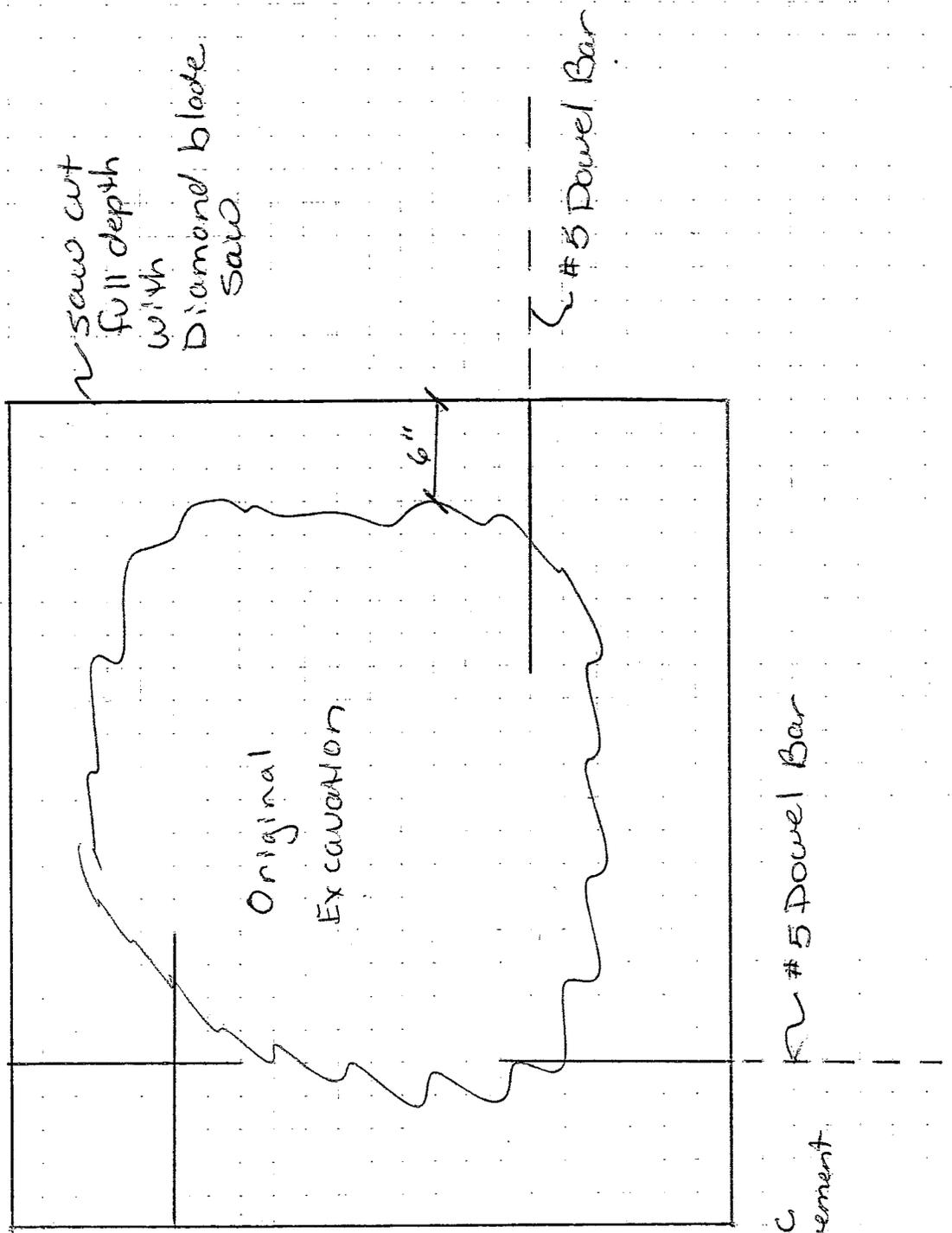
If you have any questions, please contact:

Allen Schoemaker  
Director of Public Works  
(402) 426-4191

## **Street Patch Repair Procedures For The City of Blair, NE**

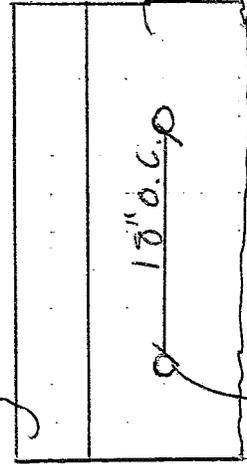
1. The contractor who cuts a city street within the City of Blair will need to reconstruct the street per the attached detail.
2. All backfill material shall be compacted to a minimum density of 95%. The top 6 inches shall be 1 inch clean crushed rock.
3. The pavement shall be full depth saw cut a minimum of 6 inches beyond the excavation limits with a diamond blade saw.
4. Concrete shall be PR1 per Nebraska Department of Roads standard specifications 1997 edition English Units. Concrete will need to be covered during cure time to allow for required strength within the specified time.
5. All composite pavement (Asphalt over Concrete) will need to be reconstructed the same way. The concrete will be poured to the bottom of the asphalt overlay and the asphalt will then be placed over the concrete once the concrete has cured.
6. All patches will need to be reconstructed one inch thicker than the existing pavement but in no case thinner than 7 inches thick.
7. All patches in PCC pavement shall have number 5 reinforcement bars put in 18 inches long with 9 inches drilled and epoxied into the existing pavement. Bars will need to be spaced 18 inches on center but not less than 2 bars per side of the patch shall be provided. The drilled holes shall be thoroughly cleaned out with compressed air to remove all dust, dirt, and loose materials.
8. All old pavement including reinforcement shall become the property of the contractor and shall be removed from the job site.

#5 Dowel Bar 18 inches Long  
Spaced 18 inches on center (TYP).  
Epoxy 9 inches of bar into existing pavement.



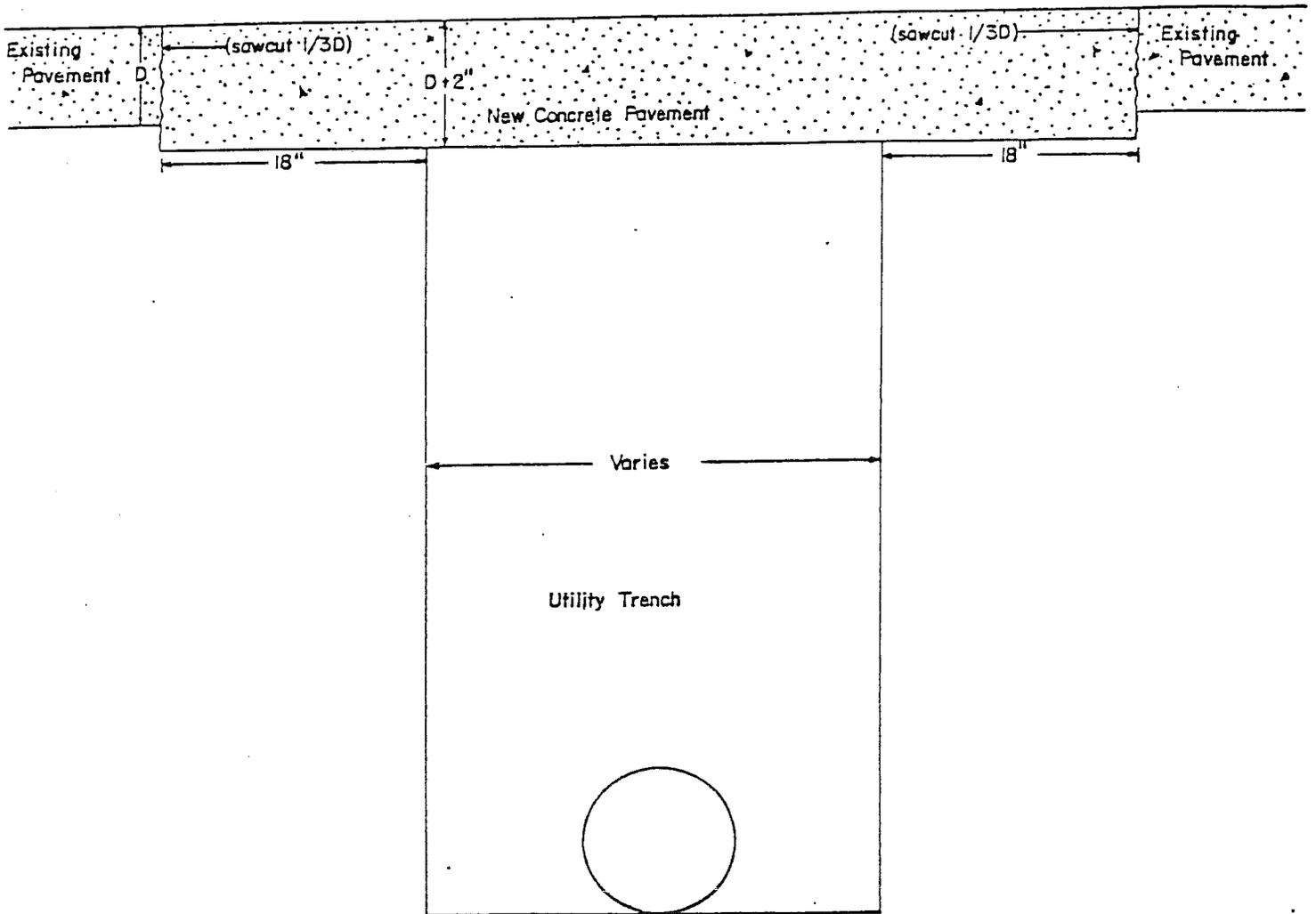
#5 Dowel Bar

Asphalt Overlay



#5 Dowel Bar

City of Blair, Nebraska  
Standard Drawing for removal and replacement  
of Concrete Pavement for Utility Trenches

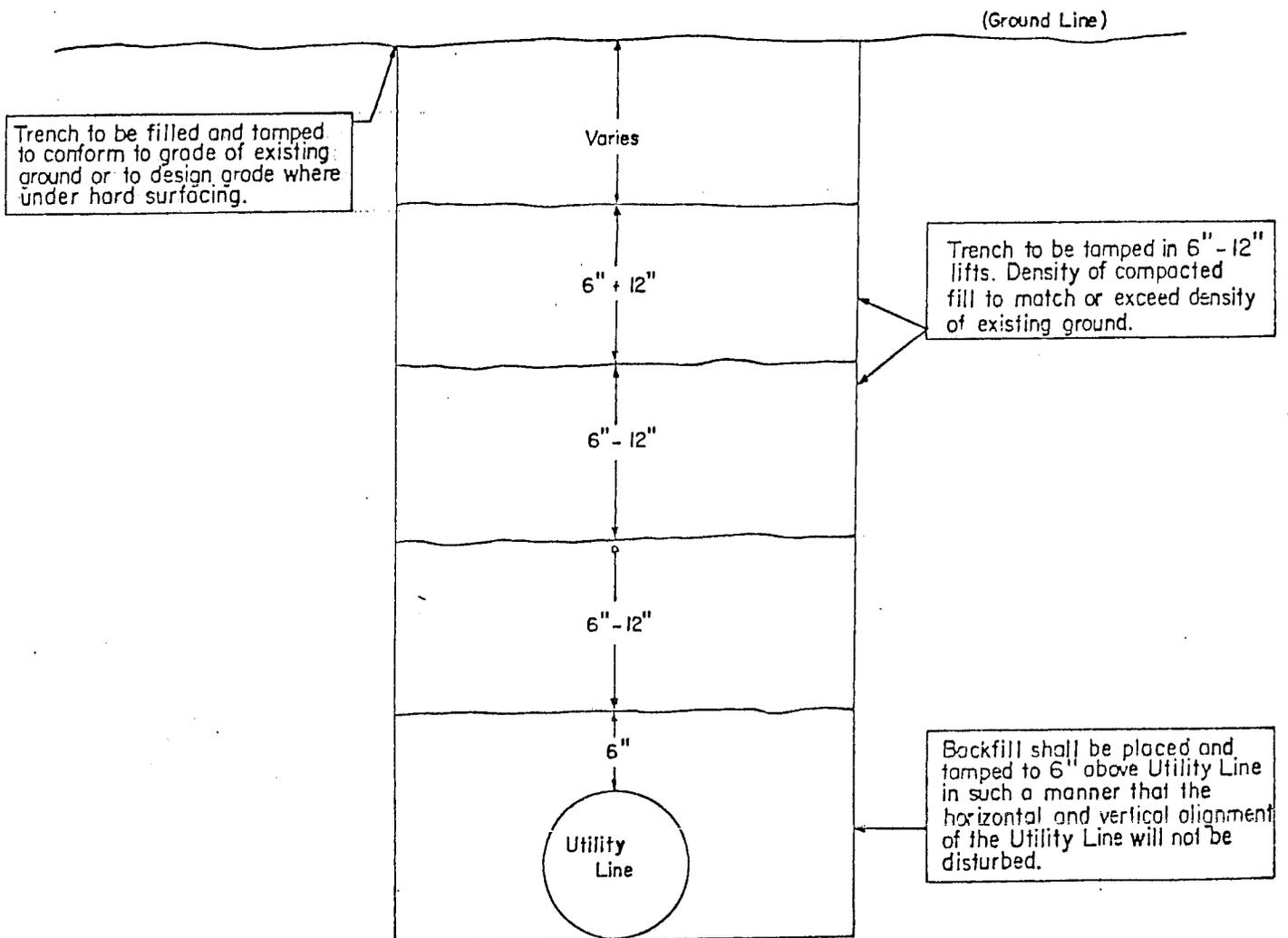


Note: Concrete used as replacement will be type currently used for street construction in the City of Blair, Nebraska.

Where removal and replacement is done in streets with brick over concrete, replacement shall conform to the original construction as close as possible.

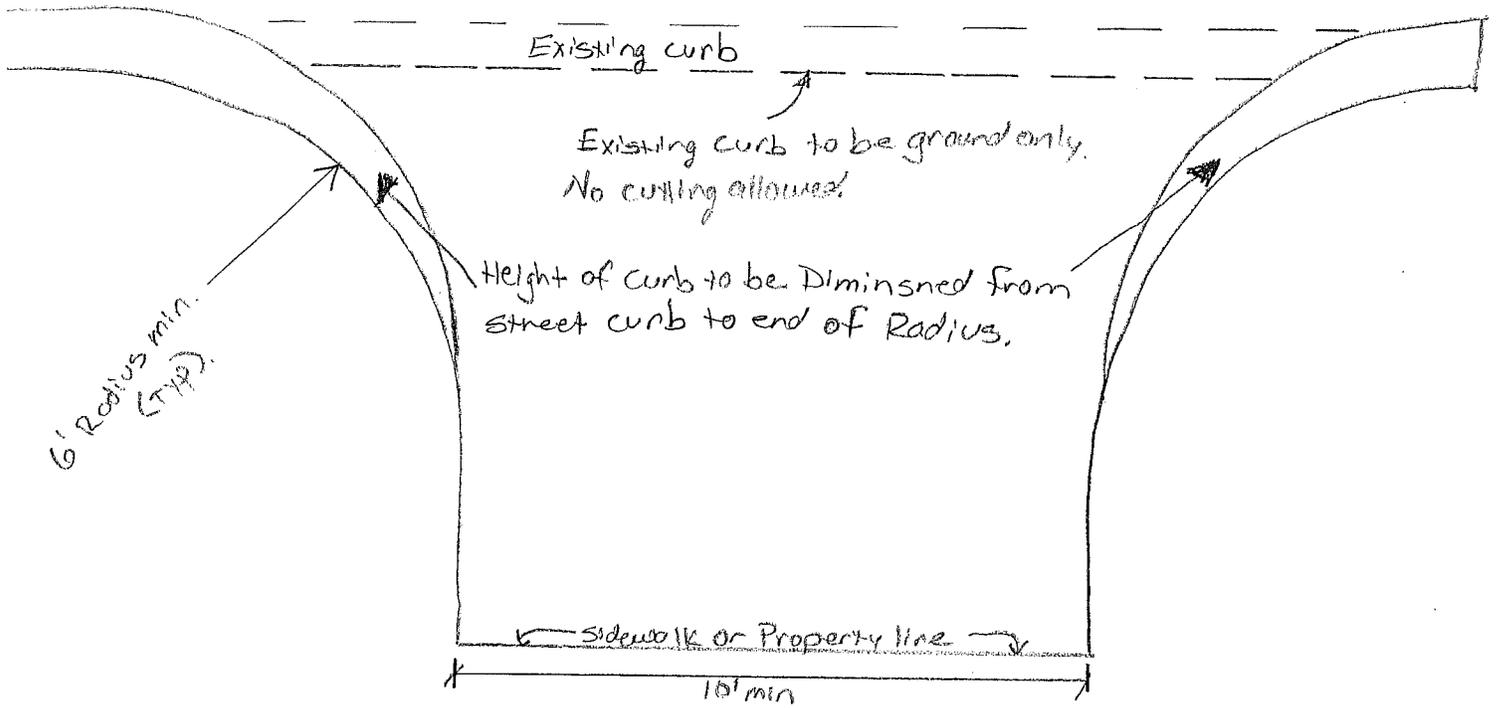
City of Blair, Nebraska

Standard Drawing for Utility Trench Compaction

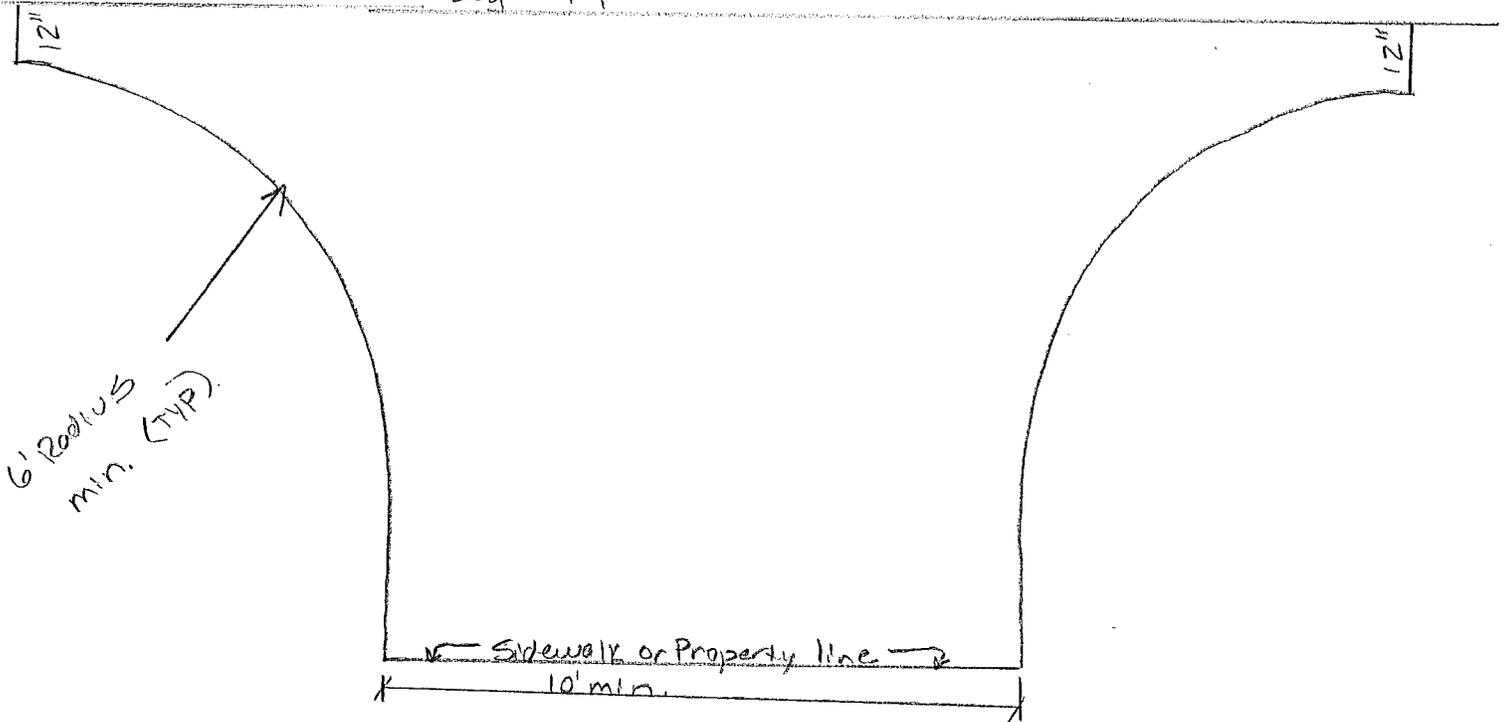


Note: Compaction may be accomplished by use of Pneumatic Hammer, Vibrating Tamper or Gravity Tamper. Water Compaction will not be allowed.

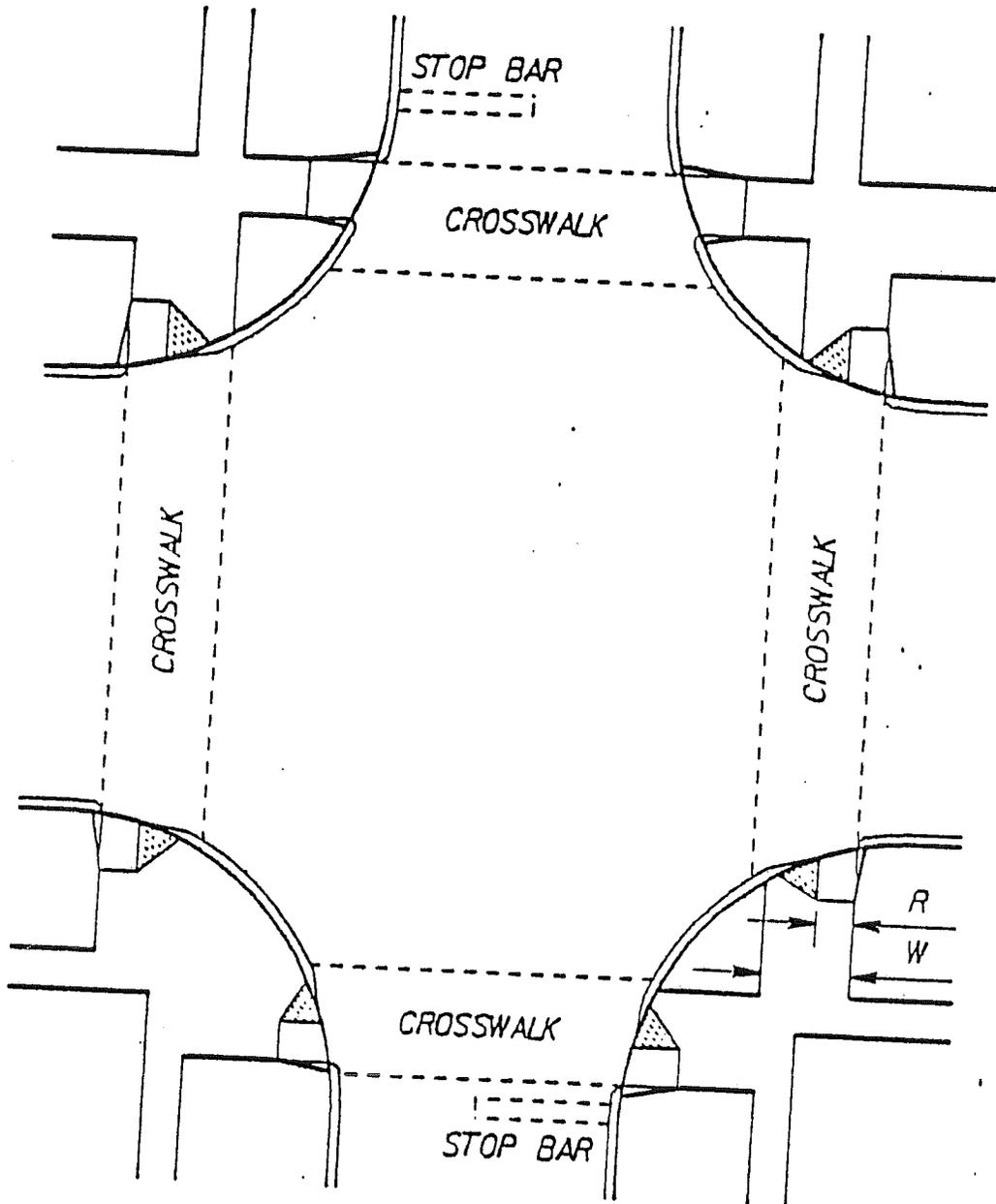
# Standard Driveway Construction



## Edge of paved street with no curb.

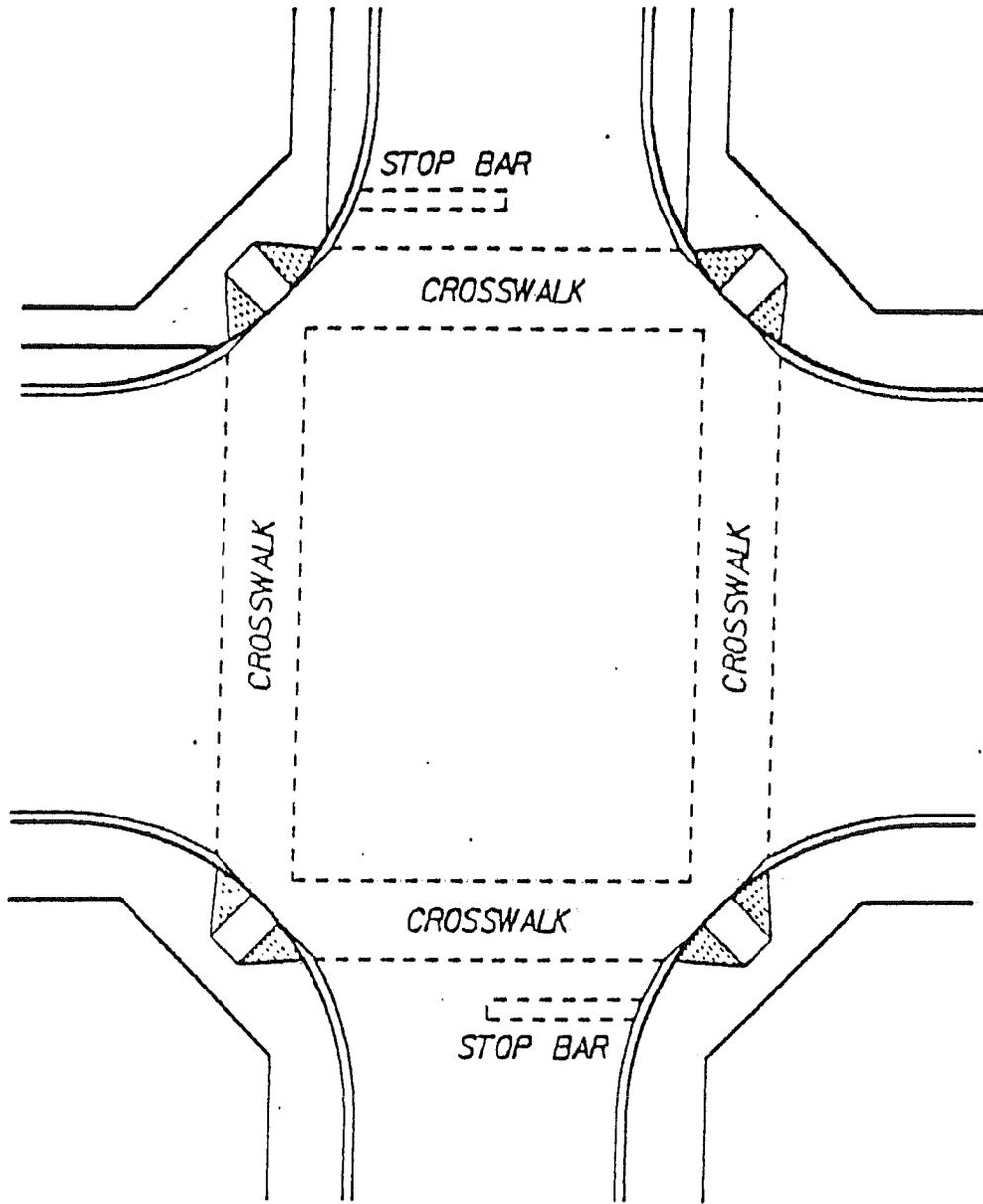


- Pavement thickness shall be minimum of 6" concrete.
- If over drainage ditch culvert must be sized by city before construction of approach.

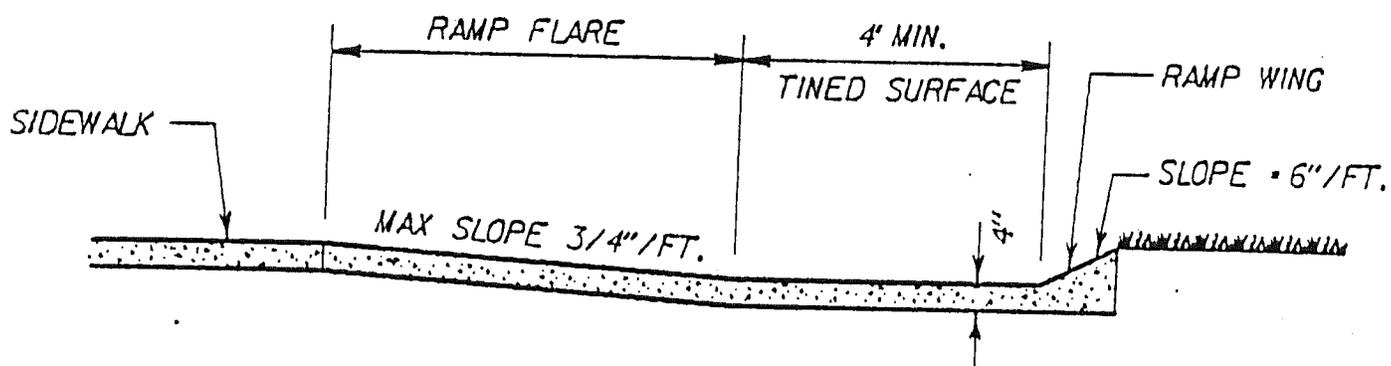


WHERE W IS 9'-0" OR LESS, R=W  
WHERE W IS GREATER THAN 9'-0", R=4'-0"

TYPE II



TYPE III



SECTION A-A  
TYPICAL RAMP CROSS SECTION

## NOTES

THE NORMAL GUTTER LINE PROFILE SHALL BE MAINTAINED THROUGH THE AREA OF THE CURB RAMP.

THE SURFACE OF THE CURB RAMP SHALL BE TINED TRANSVERSELY TO THE SLOPE OF THE CURB RAMP. THE TINES SHALL PRODUCE GROOVES APPROXIMATELY 1/8 INCH WIDE AND 3/16 INCH DEEP ON 1/2 INCH CENTERS. THE FLARES AND WINGS SHALL BE BROOMED.

CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE CURB RAMP, FREE OF SAGS AND SHORT GRADE CHANGES.

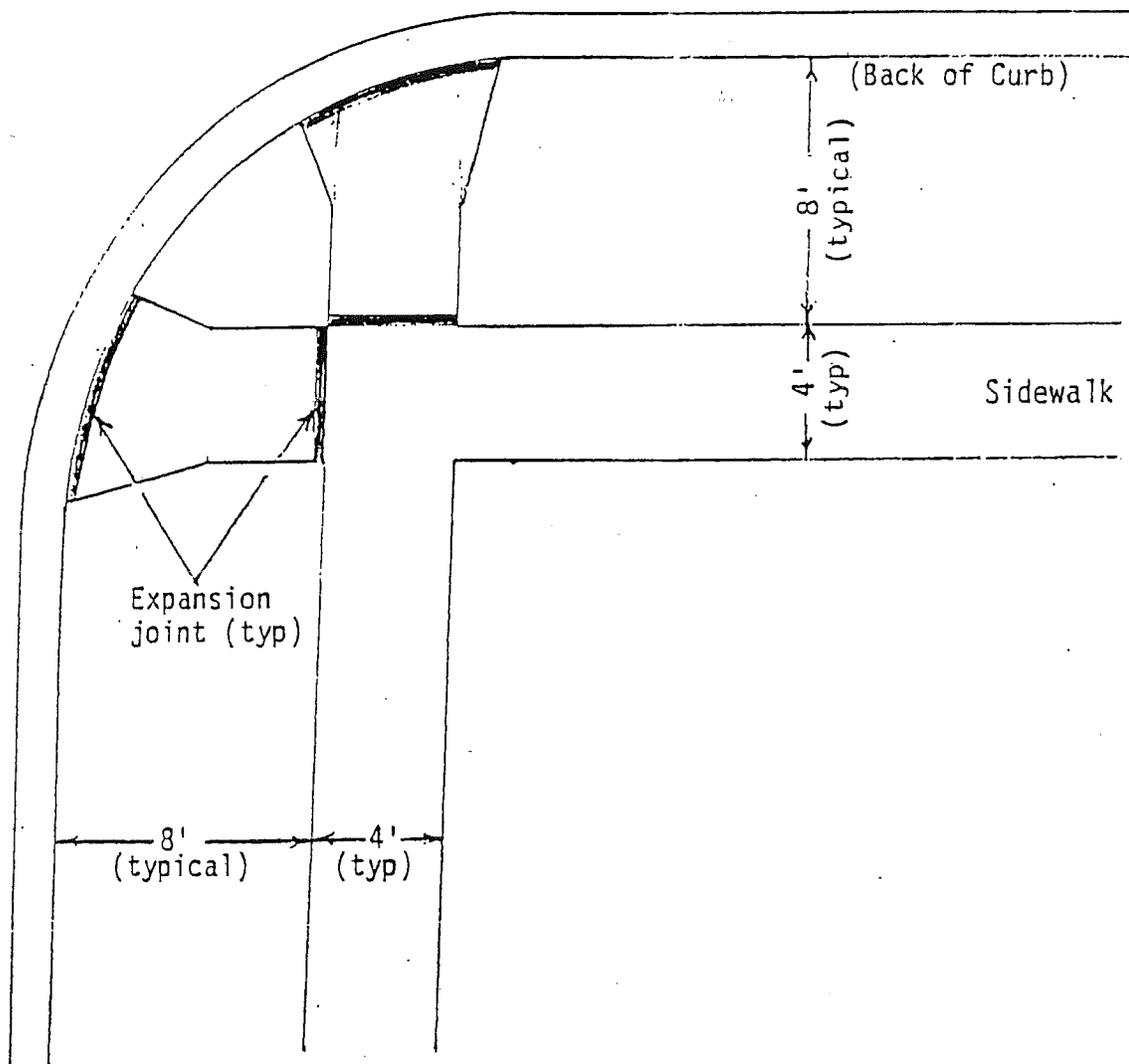
THE RAMP FLARES SHALL BE CONSTRUCTED WITH A  $\frac{3}{4}$  INCH/FT SLOPE AT RIGHT ANGLES TO THE SLOPE OF THE CURB RAMP. (TYPE II, III, & IV)

THE SLOPE OF THE SIDEWALKS APPROACHING CURB RAMPS (OR THEIR FLARES) SHALL BE FLAT ENOUGH TO PROVIDE RECOVERY AREAS FOR WHEELCHAIRS ENTERING OR EXITING THE RAMPS.

A MINIMUM CLEARANCE OF 5 1/2 FEET SHALL BE PROVIDED BETWEEN AN OBSTRUCTION AND THE TOP END OF THE TYPE I OR II CURB RAMP.

MINIMUM THICKNESS OF CONCRETE SHALL BE 6".

- Note 1: Handicap ramps required at intersection with street curb on all new construction or when replacing existing sidewalk.
- Note 2: Sidewalks to be constructed at typical location as shown or in line with existing sidewalks.
- Note 3: Sidewalks to be constructed to typical width shown. Deviation from typical must be approved by City.
- Note 4: Sidewalks shall be constructed of portland cement concrete to a minimum thickness of 6". Deviations must be approved by City.
- Note 5: Expansion joints to be 1/2" minimum non-extruding mastic.
- Note 6: Where street Right-of-way widths are less than 50', location of sidewalk will be determined by the City.



# 2009 INTERNATIONAL RESIDENTIAL CODE

## CITY OF BLAIR REROOFING REQUIREMENTS

- R907.1 Materials and methods of application used for recovering or replacing an existing roof covering shall comply with the requirements of the building code.
- R905.2.7.1 **ICE PROTECTION REQUIRED:** An ice barrier that consists of at least two layers of underlayment or of a self-adhering polymer modified bitumen sheet. Either option shall be used in lieu of normal underlayment and shall extend from the eave's edge to a point at least 24 inches inside the exterior wall line of the building.
- R907.2 **STRUCTURALLY SOUND:** The structural roof components shall be capable of supporting the roof covering system and the material and equipment loads that will be encountered during installation of the roof covering system.
- R907.3 **REMOVAL OF EXISTING COVERING:** New roof coverings shall not be installed without first removing existing roof coverings where any of the following conditions occur.
1. Where the existing roof covering is water soaked or has deteriorated to the point that the existing roof covering is not adequate as a base for additional roofing.
  2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos cement tile.
  3. Where existing roof has two or more applications of any type of roof covering.
  4. For asphalt shingles, when the building is located in an area subject to moderate or severe hail exposure. **Note: This applies to the City of Blair.**
- Exceptions allowed under R907.3:**
1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the buildings structural system and do not rely on the existing roofs and roof covering for support, shall not require the removal of existing roof coverings.
  2. Installation of metal panel, metal shingle and concrete and clay tile roof coverings over existing wood shake roofs in accordance with Section R907.4.
  3. The application of new protective coating over existing spray polyurethane foam roofing systems shall be permitted without tear-off of existing roof coverings.
- R907.5 **Existing vent flashing, metal edges, drain outlets, collars metal counter-flashing shall not be reinstalled where rusted.**
- R907.6 Flashing shall be reconstructed in accordance with approved manufacturer's installation instructions. **Metal flashing to which bituminous materials are to be adhered shall be primed prior to installation.**