 <b>Building Division</b>	<b>ROOFING</b> New and Re-roofs City of Palo Alto (CPA) Building Inspection Division 285 Hamilton Ave. Inspection Request: 650 329-2496	Revision Date: 02/07/11
	<b>IVR#'s: Tear-off 802, In-Progress 805, Final 808</b>	General Requirements/Checklist for: <b>Residential</b> Codes Enforced: 2010 CRC, CBC, CPC, CMC, CEC Palo Alto Municipal Code (PAMC)
The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.		

### **WARNING**

- Failure to complete items below prior to inspection may result in a re-inspection fee.

### **GREEN BUILDING TIPS**

- Link to all of the energy efficiency tax credits: [www.energystar.gov/taxcredits](http://www.energystar.gov/taxcredits)
- Installing radiant barrier sheathing reduces summer heat gain and winter heat loss, reflects 97% of heat back towards its source and can cut your annual energy cost by approximately 20% to 30%.
- Solar reflective asphalt shingles.
- Solar powered roof fan.
- Energy star skylights or light tubes.
- Attic/roof insulation rebate. [www.cityofpaloalto.org/smartenergy](http://www.cityofpaloalto.org/smartenergy)
- Dispose of old roof at a local recycling center. See list of Recycling Centers

### **APPLICATION**

- **Accessory structures:** Structures 120 s.f. or less in area do not require reroofing permits. Structures greater than 120 s.f. will require submittal of documentation verifying status as a legal permitted structure including a dimensioned site plan prior to inspection.
- A permit is required for repairs that exceed 100 sq. ft./1 square.
- Approved roof assemblies covered under CBC chapter15: Asphalt shingles, Clay and concrete tile, Metal roof panels, Metal roof shingles, Mineral-surfaced roll roofing, Wood shingles, Wood shakes, Built-up roofs, Modified bitumen roofing. All other roof assemblies are considered an alternative methods and shall be pre-approved prior to installation.
- All approved roofing systems shall be installed per manufacturer's instructions.
- Proposed skylights and/or structural changes require appropriate permits; including all building, electrical, plumbing and mechanical, as required. Structural plans shall be included as required.
- Overlay installations must have prior approval. A pre -roof inspection is required.

**DOCUMENTATION**

- Permit card shall be at all scheduled inspections.
- Provide inspector with manufacturer's installation instructions OR provide ICC/ES report (ICC/ES evaluation service at [www.icc-es.org](http://www.icc-es.org))

**DUST CONTROL** *PAMC 9.56.030 (A) (21)*

- Dry cutting of tile/stone/concrete is not allowed, must use wet saw.

**ALTERNATIVE METHODS**

- Roofing systems not covered in the CBC chapter 15, such as fluid applied or applied non-asphaltic sheets, shall be pre-approved and installed with materials and procedures approved by the building official including ICC/ES report submittals. *CBC 1506.3*

**NOT ALLOWED**

- Copper rain gutters/downspouts are not allowed per *PAMC sec. 16.09.160 (b) 2*
- Buildings with eave overhangs cannot collect or direct water over adjacent properties (must install gutters).

**ACCESS TO ROOF (LADDER)**

- Provide extended ladder secured to building, extended minimum of 30" above roof level. provide ladder(s) at all roof levels. Ladders to be minimum rated at 350 lbs load capacity. **Ladders shall be placed so as not to damage roof and gutters.** *CBC 108.4.4*

**FIREPLACE CHIMNEY**

- **Damage:** When inspection reveals that an existing fireplace chimney is not safe for the intended application, it shall be repaired, rebuilt, or replaced with a approved factory built chimney. *CBC 115.1, CMC 802.5.4.4* See "fireplace transition frame" checklist.

**Spark Arrester**

- Replacement alteration or repair to roof requires a spark arrester to be installed. All chimneys attached to any appliance or fireplace that burns solid fuel/wood burning shall be equipped with an approved spark arrester. Spark arrester shall be properly sized, screened, accessible and removable for cleaning per *CBC 2113a.9.1* **architectural shroud(s) are not allowed** unless listed as part of the fireplace. *CRC R1003.9.1, CBC 2113a.9.1, 2802.1, CBC 2113a.9.1, PAMC 16.04.200*
- Penetration in roof 30" or more requires a cricket. (Skylight and chimney)

**SKYLIGHTS**

- Skylights require separate permit and inspections.
- Skylight curbs** required at 3:12 slope, min. 4" for less than 3:12 roof.

**FIRE CLASSIFICATION**

- Roof assemblies shall be divided into classes defined below. The minimum roof coverings installed on buildings shall comply with **table 1505.1** based on the type of construction of the building.

**Table 1505.1 \***  
**MINIMUM ROOF COVERING CLASSIFICATION**  
**FOR TYPES OF CONSTRUCTION**

<b>IA</b>	<b>IB</b>	<b>IIA</b>	<b>IIB</b>	<b>IIIA</b>	<b>IIIB</b>	<b>IV</b>	<b>VA</b>	<b>VB</b>
<b>B</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>B</b>	<b>B</b>	<b>C</b>

\* Unless otherwise required in accordance with chapter 7A. (Exterior Wildland Exposure)

### **REQUIRED INSPECTIONS**

- **Tear-off: REPLACE DAMAGED WOOD PRIOR TO INSPECTION.** Verify structure is adequate for roofing system load. Verify fireplace chimney is structurally safe.
- **Sheathing:** If applicable, sheathing must be completed prior to inspection. Tear-off and roof nailing may be combined **except** in repaired areas must leave accessible for inspection.
- **In-progress:** Complete a representative sample of roof underlayment, starter coarse, nailing, flashing, attachments, clearances, and drainage provisions.
- **Final:** All work complete, spark arrester installed, roof and job site clean of debris. If gutters and rain leaders existed prior to the installation of the roofing, they must be installed at the time of the inspection.

### **CPA INSPECTION** General Requirements

#### **Structural loads**

- Verify roofing materials have not changed creating added load.
- 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 system. If necessary, an engineer's assessment will be required. *CBC 1510.2*

#### **Roof covering**

- Roof coverings shall be installed per approved manufacturer's installation instructions and applicable provisions of *CBC 1506.1*
- Identification: Roof-covering material packages shall bear manufacture's identification marks and approved testing agency labels. *CBC 1506.4*
- Roof-coverings shall be compatible with each other and with the building to which the materials are applied. *CBC 1506.2*

#### **Fire classification**

- Min. Class C. *CBC 1505.4*
- WildLand Urban Interface fire area shall have min. Class A. *CBC 1505.1.4, 1505.2*

#### **Sheathing**

- Sheathing cut into widths less than 24" require solid blocking at all panel edges. *CBC 2305.2.4*
- Plywood and OSB roof sheathing shall be exterior grade (Exposure 1) including the under side of eaves. *CBC 2304.7.2*
- Minimum sheathing thickness shall not be less than 7/16" for plywood and 11/32" for OSB. *CBC TABLE 2304.7*

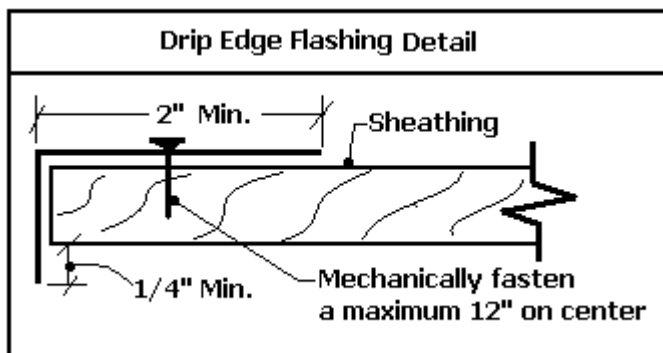
- Sheathing shall be gapped 1/8" at edges.
- Fasteners: Min. 6 edge and 12 field nailing with min. 8d commons nails.

**Flashing (Coastal Zone Requirements)**

- Material: Metal flashing shall be min. corrosion resistant 26 gage galvanized sheet AND shall be **primed and painted**. *CBC 1503.2.1*
- Location: Flashing shall be installed at wall and roof intersections, at gutters, change in roof slope or direction, around openings, and drip edge flashing at eaves and gable edges. *CBC 1503.2.1, 1507.2.9.3*
- Counter flashing** is required at all vertical surfaces (walls and chimneys).
- Sidewall flashing** shall be by the step-flashing method. The flashing shall be a minimum of 4" high and 4" wide. *CRC R905.2.8.3*
- Frequently missed/inspection failure:** Missing, rusted or damaged flashing and counter flashing vent caps and metal edging shall be replaced with new materials. All metal allowed to be reinstalled shall be primed prior to re-roofing and painted prior to final installation *CBC 1510.6*
- Valley flashing shall extend a min. 8" from centerline each way, total 16", and shall have a min. 4" end lap. *CBC 1507.5.6*
- Valley flashing for **wood shakes and shingles** shall extend a minimum 11" from centerline each way, total of 22", and shall have a min. 4" end lap. *CBC 1507.9.7, 1507.9.8*
- All flashing shall be sloped 1/4" per foot.

**Frequently missed/inspection failure**

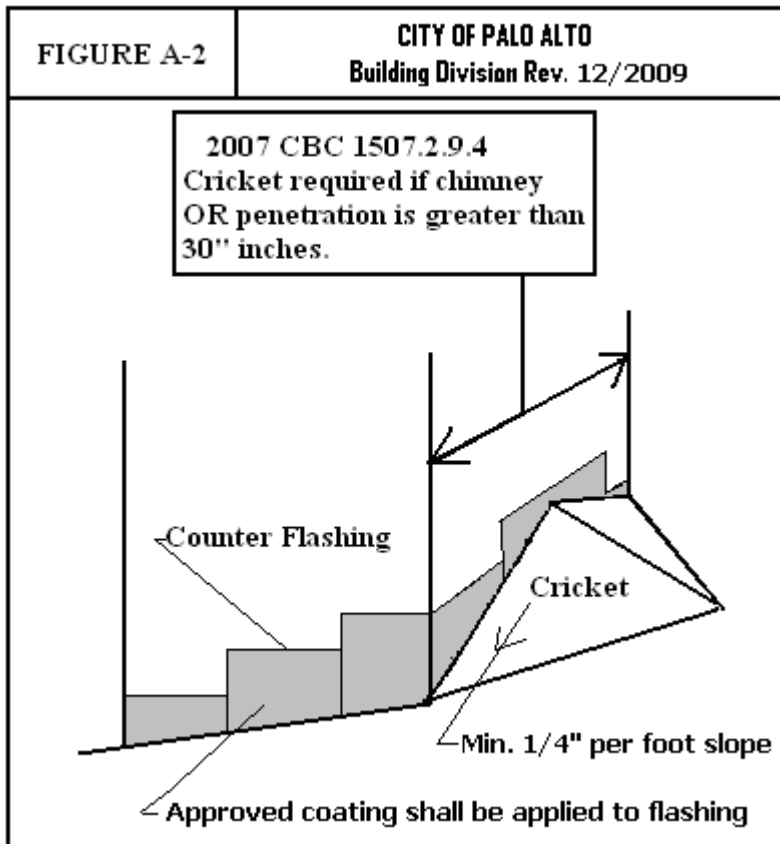
- Provide drip edge at eaves and gables of asphalt and wood shingles** Drip edge shall extend a min. 1/4" below sheathing and extend back on roof a **min. 2"** and mechanically fastened a maximum of 12" on center. *CBC 1507.2.9.3* **Note:** Rain gutters shall not be used in place of drip edge unless the flange is a min. 2". See detail below



- Vent flashing and vent caps**
- Roof top vent flashing minimum requirements: See **Table A-1** below
- Vent caps shall be primed and painted prior to final inspection.

<b>Table A-1</b>		<b>Rooftop Vent Flashing Minimum Size Requirements</b>			
<b>Regular</b>		<b>Wood Shingle</b>		<b>Wood Shake</b>	
<b>Vent pipe size</b>	<b>Base size</b>	<b>Vent pipe size</b>	<b>Base size</b>	<b>Vent pipe size</b>	<b>Base size</b>
1"-2.5"	10"x15"	1"-2.5"	17"x17"	1"-2.5"	17"x23"
3"-4"	15"x18"	3"-4"	20"x26"	3"-4"	20"x26"

- Cricket or saddle** **\*New CBC Code requirement as of January 1, 2008**
- \*Cricket or saddle shall be installed at the ridge side of chimney or penetration greater than 30" wide *CBC 1507.2.9.4*. SEE **FIGURE A-2**



**Ventilation**

- Roof/Attic ventilation: Min. net free ventilation 1/150 sq. ft. of area with 50% at upper portion a min. of 3' above eave or cornices vents and the balance ventilation provided by eave or cornice vents. Openings to attics shall be covered with corrosion-resistant wire mesh. Mesh openings: Min. of 1/8" not to exceed 1/4". *CBC 1203.2, 1203.2.1*

**Fasteners**

- All roofing systems shall use corrosion resistant, 12 gage fasteners/nails, clay or tile min. 11 gage. Fasteners shall have a sufficient length to penetrate into deck a min. of 3/4". *CBC 1507.2.6, 1507.3.6*

**Rain Gutters/Downspouts**

- Frequently Missed/Inspection Failure:** Contractor shall provide SPLASH BLOCKS (min. 2' long) under downspouts diverting water from foundation. *CBC 1803.3*
- Roof gutters shall be of non-combustible materials or min. schedule 40 plastic pipe.

**Vent and chimney termination**

- Paint all ABS/Plastic vent pipes. *IAPMO Installation standards section 313.3*
- Heat producing double wall type B vents shall maintain a min. 1" clearance to combustibles and terminate with a listed vent cap. *CPC 510.6, 510.7*
- Chimney(s) terminations must be 2' above any roof/structure within 10' and not less than 3' above the highest point where the chimney passes through the roof. See figure *CMC 802.5.2.1*
- Dryer back-draft damper shall be approved/listed for horizontal/rooftop termination (no screens). *CMC504.3.1*
- Gas appliance vents 12" or smaller shall terminate a min. of 12" above any portion of a building within 10' horizontally when 6:12 or flatter, see CMC Figure 8-2 for vents larger than 12". Vents within 8' of a wall shall terminate a min. of 2' above the wall's roof edge. Exception: Direct-Vent *CMC 802.6.2, 802.8.1*
- Waste vents shall terminate vertically not less than 6" above roof, nor less than 1' from any vertical surface and 10' from or 3' above any opening such as windows, doors, air intake, nor less than 3' from any lot line. Side wall vent may not terminate under vented soffit. *CPC 906.1, 2*

 **Roof top equipment**

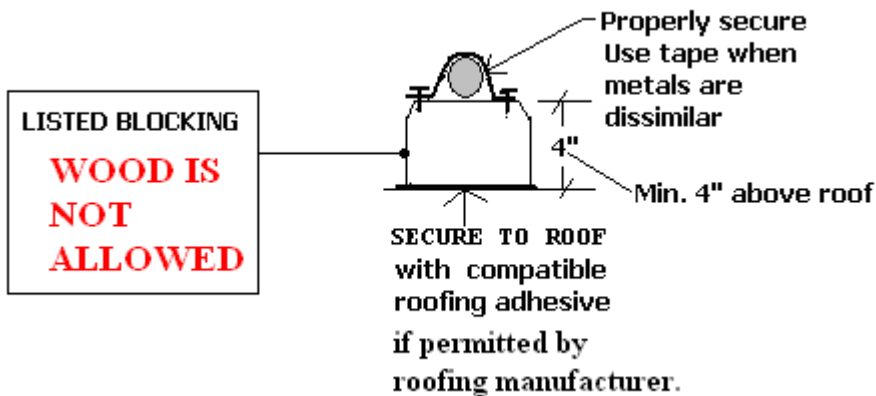
- See "Roof Top Equipment" guidelines on checklist
- Remove abandoned equipment above rooftops.
- Existing mechanical equipment at roof shall be seismically secured per *CMC 304.4* See HVAC checklist for all requirements .
- All existing piping systems disturbed by re-roofing shall be reinstalled to comply with applicable codes. SEE **[FIGURE A-1]**

**Frequently Missed/Inspection Failure**

- Equipment deck and cap flashing drainage:** All equipment sheet metal deck/caps/lids and cap flashing shall have a min. 1/4" per foot slope. **FIX:** Apply a two part epoxy system roof coating or snow roof system. *CMC 904.10.2.2, 904.10.2.4*
- Electrical**
- Electrical wiring systems under roofing materials shall have physical protection from nails such as **angle iron or rigid metal conduit**. MC, AC, romex cable or flex are not suitable unless protected.
- Gas piping** *CPC 1211.3*
- Gas test:** Provide gas test as applicable when gas pipe is altered/changed. See "Whole House Gas Test" checklist for test requirements.
- When gas piping is required to be concealed/encapsulated in roof assembly (not recommended) provide base vent flashing at all gas connections i.e. elbows, tees etc.
- Roof drains**
- Existing** flat roof decks shall have positive slope to move surface water to roof drains (preventing water ponding). *CBC 1510.1 exception*

- Min. ¼" per foot slope to drain. *CBC 1506.1*
- Roof drains** that run through the interior of the building shall be in plumbing pipe.
- Primary drain(s)** shall be sized per *CPC Table 11-1* at the **2 inch per hour** rate.
- Secondary drain(s)** shall be the same size as the primary drain with the inlet flow line 2" above the low point of the roof and shall be an independent system OR overflow scupper(s) shall be installed with the inlet flow line located 2" above the low point of the roof and the scupper opening a min. of 4" high and have a width equal to the circumference of the primary drain. Overflow drains shall not be connected to the primary drain. *CPC 1101.11.2.1,2*
- Strainer(s) for flat deck** primary drain(s) shall be level with the deck with the inlet area not less than 2 times the area of the drain pipe. *CPC 1105.3*
- Strainer(s) for all flat roof** secondary drain(s) shall be a min. of 4" above with the inlet area not less than 1-1/2 times the size of the inlet pipe. *CPC 1105.3*

FIGURE A-1



### WILDLAND URBAN INTERFACE WEST OF 280

- Roof covering for all new buildings** shall be fire-retardant minimum class A.
- Re-Roofing of existing** structure where more than 50% of the total roof area is replaced, the entire roof covering shall be a fire-retardant roof covering that is at least Class A *PMCA 16.04.170*
- Valley flashing:** Minimum 26 gage galvanized sheet metal installed over a min. 36" wide No. 72 cap sheet running full length of valley. *CBC 704.A.1.3*
- Fire-stopped/birdstop** with approved materials, where roof profile allows a space between roof covering and deck to prevent the intrusion of flames and embers. **OR** have one layer of No. 72 ASTM cap sheet installed over the combustible decking. *CBC 704A.1.2*
- Attic ventilation:** Roof surface vents shall resist the intrusion of flame and embers into attic, or shall be protected with corrosion resistant, non combustible wire mesh with ¼ " openings. *CBC 704A.2.1*
- Gutters and Downspouts** shall be constructed with non-combustible materials and shall be installed with means to prevent debris from accumulating such as screens. *CBC 704A.1*



**Information on specific roofing types are available in the CPA Roofing Guidelines Manual at Development Center counter and Building Division web page.**

- Roof overlay
- Metal roof
- Single ply membranes roof (TPO)
- Spray applied roof
- Tar and gravel roof
- Clay and concrete tile roof