

# UPGRADE TO A HEALTHIER HOME: NEW CONSTRUCTION

A healthier, high-performance home is possible. With minimal investment, you can add features that improve air quality, reduce energy bills, increase durability, and add to resale value, while improving comfort and decreasing health risks.

Upgrades to your home can deliver an indoor environment that is peacefully quiet, less prone to dust, odor, allergens, and pollutants, and, most importantly, healthier for your family. A healthier home can help improve sleep, productivity, and cognition. In addition, improving home performance will reduce short-term costs and add long-term value.

From the tables below, choose the upgrades that are right for your build and enjoy an improved lifestyle with healthier home construction.

## KEY OCCUPANT BENEFITS & ACTIONS<sup>1</sup>

- Health Savings (\$-\$\$\$)
- Fewer Odors
- Better Sleep
- Peacefully Quiet
- Energy Savings (\$-\$\$\$)
- Improved Cognition
- Less Dust/Dirt
- Fewer Sick Days
- Fewer Pests

Benefit	Affordable \$	Workforce \$\$	Market Rate \$\$\$	High End \$\$\$\$
<b>Peacefully Quiet</b>	<ul style="list-style-type: none"> <li>Air tightness of building envelope &lt;2 ACH@50 Pascal</li> </ul>		<ul style="list-style-type: none"> <li>Air tightness of building envelope &lt;1 ACH@50 Pascal</li> </ul>	<ul style="list-style-type: none"> <li>Air tightness of building envelope &lt;0.6ACH@50 Pascal</li> </ul>
<b>Minimized Dust, Fewer Odors</b>	<ul style="list-style-type: none"> <li>Mechanical Ventilation meets ASHRAE 62.2-10</li> <li>Continuous low sone integrated bath fan(s) and independent supply ventilation</li> </ul>	<ul style="list-style-type: none"> <li>ERV / HRV Ventilation Rate of 0.4 ACH to 0.6 ACH <i>Note: 0.4 ACH (air changes per hour) means the air in the house is exchanged every 135 to 90 min. The higher the number the more air is exchanged.</i></li> <li>Independent ERV / HRV ventilation system not integrated with heating or cooling system.</li> </ul>		
	<ul style="list-style-type: none"> <li>Cooking ventilation with low sone (quiet) and conditioned makeup air</li> <li>Cooking ventilation has rated capture efficiency or is field-tested</li> <li>4" MERV 13 Air Handler (heating / cooling) Air Filters or equivalent.</li> <li>HEPA Vacuum</li> </ul>			
<b>Healthy Indoor Air</b>	<ul style="list-style-type: none"> <li>Sealed combustion or electric appliances</li> <li>Hayward dust removal protocol<sup>2</sup> should be implemented after construction (pre-drywall) and prior to occupancy.</li> <li>Clothes dryer has makeup air damper or is ventless</li> <li>If attached garage present, 100% air sealed with exhaust ventilation</li> </ul>			
<b>Less Chemical Exposure</b>	<ul style="list-style-type: none"> <li>NO particle board, OSB, volatile paints, foam insulation, or wall-to-wall carpet</li> <li>Seal I-Joists and any engineered wood products with low-VOC wood sealer</li> </ul>			

<sup>1</sup>Benefits may differ by climate, home, and/or occupant(s)

<sup>3</sup>[Hayward Construction Dust Protocol \(2018\)](#)

Action Category	Affordable \$	Workforce \$\$	Market Rate \$\$\$	High End \$\$\$\$
Clean Tap Water	• Test water to determine contaminants			
	• Filtered water pitchers	• Under-sink filtration system		• Whole house and under-sink filtration
Exterior Wall Assembly and Moisture Management	<ul style="list-style-type: none"> <li>• Rain screens (drainage plane) behind cladding (climate-specific)</li> <li>• Whole-house dehumidifier (in moderate and high humid climates)</li> <li>• Crawlspace: sealed with mechanical ventilation</li> <li>• Basement: insulation and exterior moisture barrier</li> <li>• Insulated slab and basement floor (minimum 4' perimeter)</li> </ul>			
3rd Party Commissioning	• Code compliant	• Certified EPA: EnergyStar, Indoor airPLUS and WaterSense		
	• Energy Rating Index (ERI) of 57 to 62 <sup>3</sup>	• ERV / HRV commissioned (balanced and flows measured)		
	<ul style="list-style-type: none"> <li>• Manual "J" and "S" calculation on the heating and cooling equipment</li> <li>• Heating and cooling system is commissioned and balanced</li> <li>• Heating and cooling ducts must be in conditioned space</li> <li>• Return ducts in all bedrooms and rooms that can be separated by a door</li> <li>• Blower door testing and zonal pressure diagnostics</li> </ul>			
Other Healthy Upgrades	<ul style="list-style-type: none"> <li>• Smooth surface low VOC flooring</li> <li>• Passive Radon Mitigation System</li> <li>• Perform long term radon test (91+ days)</li> <li>• CO (carbon monoxide) detector that alarms at 6 ppm</li> <li>• Consumer IAQ Monitor with PM 2.5, TVOC, CO2, RH, temperature, NO2 and ozone</li> <li>• Off-gas appliances before installation</li> <li>• No panels or multiple electrical runs within 5 feet of beds, favorite chair, or desk (EMF)</li> <li>• Zonable WiFi &amp; router that can be turned off at night</li> <li>• Smart Meter EMF shield/cover for EMF mitigation</li> <li>• No WiFi transmitter within 10 feet of beds, favorite chair, or desk</li> <li>• Security door(s) with screens for natural ventilation</li> <li>• Homeowner education and user manual and maintenance reminders</li> </ul>			

## INCREMENTAL COSTS & HAYWARD SCORE ESTIMATE FOR NEW BUILD

(Calculated using California construction costs on 2,000 sq ft home)

	Affordable \$	Workforce \$\$	Market Rate \$\$\$	High End \$\$\$\$
Net Cost	\$13K	\$22K <sup>4</sup>	\$30K <sup>4</sup>	\$40K <sup>4</sup>
<b>HAYWARD SCORE</b>	<b>75</b>	<b>85</b>	<b>90</b>	<b>95</b>

<sup>3</sup>Climate specific, refer to IECC or IRC TABLE R406.4

<sup>4</sup>California's Title 24 Energy Calculation provides significant credit for the use of an ERV / HRV. Construction cost saving is not included in the calculations above.

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