Sun Ridge

Owner Manual

ICHIJO
Technological Homes

Owner Manual Table of Contents

Pages

Ichijo Specification Sheet

UTILITIES

WATER	1" Underground Water Service, Individually 3/4" Metered
ELECTRICAL	Line Voltage Consumption: 200 amp Underground Electrical Service to Net Meter
	Line Voltage Production: Sunnyboy String Inverter connected to Production Meter
	Communications: Highlands Fiber Network - Underground Service Terminated Inside LV Panel
	Communications: Comcast - Underground Service Terminated Outside of Building
SEWER	Underground connection direct tied to Sanitary Sewer System
STORM	Perforated Footing Drains tightligned directly to Storm System
	Roofs Drains connected to and tightlined directly to Storm System

STRUCTURAL (ENVELOPE)

FOUNDATION	Steel Reinforced Concrete Footings and Walls per approved Structural Plans
WALL	Exterior: 2x6 Framing Optimized Panelized System @ 16" o'c', 1/2" OSB, Hardie Wrap, Exterior Siding
	Interior: 2x4 Framing @ 16" o'c'
FLOOR/CEILING	12" Engineered TJI Joist System, 3/4" Structural Floor Sheathing
ROOF	Sloped: Dimensional 2x12 Framing or Engineered Truss System
	Flat: Engineered Scissor Truss
INSULATION	Wall: R-21 Fiberglass Batt Insulation w/ 1.5" Rigid Foam at Headers
	Flat Ceiling: 2" Closed Cell Spray Foam and Combination R-30 Fiberglass Batt Insulation
	Vaulted Ceiling: 2" Closed Cell Spray Foam and Combination R-30 Fiberglass Batt Insulation
	Crawl Space: R-30 Fiberglass Batt Insulation
	No Garage Insulation

EXTERIOR

SIDING	Allura Prefinished Lap Siding (50 year warranty)
	Hardie Panel Siding (50 year warranty)/ low VOC paint finish
ROOF	Sloped: 30 year warranty IKO composite shingles w/ ice and watershield underlayment
	Flat: 60 mil PVC Membrane
WINDOW	Wu Kong Windows LTD, PVC Window Sash, U-Factor 0.32 or below, Double Pane Low-E glass with Argon, Screen(casement windows do not come with screens)
	*tempered glass in accordance with building codes
EXTERIOR DOOR	Fiberglass Exterior Door, Low-E glass, U-Factor 0.20
	Wu Kong Windows LTD, PVC Window Sash, U-Factor 0.32 or below, Double Pane Low-E glass with Argon, Screen
GARAGE DOOR	Wayne Dalton 8200, Sonoma Panels
	1/2 HP, Linear Model LDCO800
WATERPROOF DECK	WEATHERDEK 65 mil PVC Membrane
RAILING	Half Wall: Fully Sided 42" High Half Wall with Prefinished Parapet Metal Cap
	Open Railing: Stainless Steel Cable Rail with IPE wood cap
GUTTER and DOWNSPOUT	Gutter: 5" K-Line Gutter
	Downspout: 3" Round
FLASHING	Pre Painted Metal Flashing
EXTERIOR CONCRETE	4" Exterior Flatwork, Exposed Aggregate Finish, Sawcut Expansion Joints
LANDSCAPING	Drought Tolerant Landscaping, organic soil composition

Ichijo Specification Sheet

MECHANICAL

WATER HEATING	Rinnai RL75i Tankless Water Heater
HVAC	BRYANT Single Stage Natural Gas Forced Air Furnace, 95% AFUE
	Nest - Generation II Thermostat
VENTILATION	Bathroom, Laundry: Panasonic Fans
	Whole House Ventilation Timer
	Range: Hood 300 cfm: Whirlpool GXW7330DXS

INTERIOR FINISHES

WALL and CEILING	1/2" Drywall , Orange Peel Texture Finish, contains recycle contents with low VOC painting Garage: 5/8" Type X, Fire Tape Finish, contains recycle contents with No Finish
FLOOR	Main Floor: Armstrong - Century Hickory Farm - Prefinished 9/16" Hardwood
	Master, Main Bath: Tierra Sol Ceramic Tile
	Laundry, Utility: Wanke Cascade - Devine Contact - 2x2' Vinyl Tile
INTERIOR DOOR	HRD Interior Door
	HRD Magnetic Door Catch
MILLWORK	Base: 1/2x5" MDF, Paint Finish
	Casing: 1x4" MDF, Paint Finish
	Wall Caps: 1x4-13/16" MDF with 1x4" Apron, Paint Finish
	Window Sills: 1x10 MDF with 1x4" Apron, Paint Finish
STAIRWAY	Carpet: Mohawk - New Opportunity 10lb Carpet Pad
GRABRAIL	1"x2" Prefinished Wood Grabrail
CABINETS	HRD Piano Finish
	Built In Recycle Center
	Blum Hardware, Full extension, soft close (not all cabinet doors/drawers can accommodate soft close) Pull out drawer organizational systems Spice Rack and Cooking Utensil organizational system Knife safe storage organizational system Upper cabinet earthquake safety latches
CLOSET SYSTEMS	Secondary Bedrooms: HRD Melamine Organizer Closet System Pantry, Understair Closet, Master: Satin Chrome Wire Shelving
COUNTERTOP	Kitchen: 2cm Eased Laminated Edge, Pental Quartz Bathrooms: 2cm Eased Edge, Pental Quartz
BACKSPLASH	Kitchen: Tierra Sol Tile
	Bathrooms: 2cm eased Edge, Quartz - Arctic White
TUB/SHOWER SURROUND	Master: 7' Full Height Tile Surround with Seat Bench and built in Niche
	Main: Fiberglass tub/shower combo

PLUMBING FIXTURES

KITCHEN	Sink: Undermount 16 gauge Rectangle Single Bowl Sink, model LB-1300
	Faucet: Danze, D455158 Spring Loaded, single lever.
MAIN BATHROOM	Sink: Kohler K-2660-1-0 Rectangle Vessel Sink
	Faucet: GROHE 32.642-001 EUROSMART 1HDL
	Toilet: Kohler K 3989 Highline Dual Flush
	Shower Head: GROHE 35.012-001 EUROSMART T/S TRIM
MASTER BATHROOM	Sink: Kohler K-2660-1-0 Rectangle Vessel Sink
	Faucet: GROHE 32.642-001 EUROSMART 1HDL
	Toilet: Kohler K 3989 Highline Dual Flush

	Shower Head: GROHE 35.012-001 EUROSMART T/S TRIM
POWDER BATHROOM	Pedestal Sink: GERBER MAXWELL 22-504 PED LAV 20X17
	Faucet: GROHE 32.642-001 EUROSMART 1HDL
	Toilet: Kohler K 3989 Highline Dual Flush
EXTERIOR	(2) Frost Free Hose Bib

APPLIANCE

RANGE	Stainless Steel, Freestanding GE model JGB640SEFSS 30" GAS Range
DISHWASHER	Stainless Steel, GE model GDT580SSFSS quite model 48 dBa.
MICRO WAVE	Stainless Steel, GE 2.2 cu. Ft. model PEB 7226SFSS Stainless Steel trim kit model JX7227SFSS
HOOD	Stainless Steel, Whirlpool GXW7330DXS, 300 cfm
DISPOSAL	General Electric, GC1000PE, 1/3 HP Motor

ELECTRICAL

LINE VOLTAGE	200 AMP, Main House Breaker. Breakers, Circuits, and All Convenience Receptacles installed on a per code basis.
USB RECEPTACLES	Located in Den, Kitchen, and Master Bedroom
GFI RECEPTACLES	Installed on a per code basis in all wet locations
LOW VOLTAGE	Smoke Detectors: Installed Per Code Carbon Monoxide Detector: Installed Per Code Comcast: Pre-wired, terminated on exterior of building, Conduit provided. HFN: Prewired, terminated in Low Volt Panel, HFN Activation Ready

LIGHTING

EXTERIOR LIGHTS	Wall Sconce: Progress Outdoor Wall Light in Antique Bronze Finish, product #P1033992 Soffits Over Entry: 6" Can Light with Flush Mount LED Trim, approved for Wet Locations
CAN LIGHTS	6" Flat Ceiling: 6" Sloped Ceiling:
KITCHEN	Pendants: Double Shade Art Glass Low Voltage Mini Pendant, model 339715 Under cabinet Lighting: Built In Cabinet LED Strip Lighting
DINING	Surface Mount Modern Drum Pendant Light with White Shade, model P840562
STORAGE CLOSET	Surface Mount 8inch Flush mount Ceiling Light, model 19864
LAUNDRY	Surface Mount Contemporary Satin Nickel Ceiling Light, model 418067
DEN, SECONDARY BEDROOMS	Surface Mount Contemporary Satin Nickel Ceiling Light, model 418067
STAIR SCONCE	Modern LED Wall Sconce with White Glass model 450665
MASTER BATHROOM	Modern LED Bathroom Light with White Glass, model P1210018 6" Can Light with Flush Mount LED Trim, approved for Wet Locations
MAIN BATHROOM	Modern Bathroom Light with White Glass, model P438565
POWDER BATHROOM	Modern LED Bathroom Light with White Glass, model 450669

HARDWARE

CABINET PULLS	HRD iSmart Door Knob 120mm
DOOR KNOBS	Exterior: Schlage Latitude Entry Handle set
	Exterior: Schlage Deadbolt
	Interior: HRD Series Hardware
BATH HARDWARE	Toilet Paper Holder: Lugano Series, Polished Chrome
	Towel Bar: 30" Lugano Series, Polished Chrome
	Towel Hook: Lugano Series, Polished Chrome
MIRROR	Main Bath: 5MM Clear Glass Mirror, Frameless,
	Master Bath: 5mm Clear Glass Mirror, Frameless,
	Powder Bath: 5mm Clear Glass Mirror, Frameless

INFORMATION ABOUT CLEANERS

Remember to read and follow the manufacturer's instructions and recommended usage when using a household cleaner. They will perform as promised if they are used as directed.

- All-purpose cleaners – Soft Scrub, Scrub Free, Mr. Clean, Top Job, Fantastik, Ajax Liquid, Liquid Comet and Lestoil
- "Soapless" detergents – Spic & Span
- Scouring Powders – Comet, Bon Ami, Ajax
- Scouring Pads (nylon) – Scotch Brite
    - Steel Wool NOT recommended
- For bathrooms – specialty cleaners such as Crew Bathroom Cleaner and Dow Bathroom Cleaner are effective for routine maintenance.
- Commercial cleaners – Aqua Mix or Hilliard's "Assurance" are suitable for heavy cleaning in commercial applications and are available at tile distributers.

INFORMATION ABOUT GROUT

Grout may present a special cleaning problem because it is susceptible to many staining agents. It should be cleaned immediately if subjected to these substances. See **Stain Removal Guide** on previous page for some typical causes of stains as well as the recommended method of removal.

After the counter has been clean and dried, grout joint should be treated with silicone sealer to keep them clean. This should be done at least twice a year for maximum protection. In addition to keeping the gout clean, the grout joint should be in good repair. Scrape out loose, cracked or powdery joints and refill with new grout.

One common grouting trouble spot is the joint between the tub and the tile wall in the bathroom. As the house or tub settles, the grout may crack and crumble. This can be repaired fairly simply by removing the old grout with a sharp, pointed tool. Take care not to scratch the tile or tub. Dry the joint thoroughly and fill with a flexible caulking compound such as silicone rubber caulking (available at tile distributers or home improvement stores).

REMOVING LOOSE OR DAMAGED TILE

Damaged or broken tiles should be removed or replaced by a skilled tile mechanic or installer only. Is the tile is simply loose; it should be fairly simple to repair. Clean the back and sides of the tile and remove all of the grout and bonding material. Apply fresh mastic and set the tile into place. Allow 24 hours for drying, then grout. If more than one tile is loose, consult a tile professional for the best results.

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FLOOR DESIGN
A Design Center

HARDWOOD FLOOR CARE AND MAINTENANCE

General Care

- Never wet mop or flood your floor with water or other products. This can severely damage the flooring and will void all warranties. The use of a Swiffer® by Proctor & Gamble or a similar product is highly recommended. Do NOT use oils soaps, liquid or paste wax products or other household cleaners that contain lemon or tung oils.

- BI-WEEKLY: Vacuum or sweep the floor

- MONTHLY: Spot-clean with an appropriate cleaner. Apply the cleaner to a clean dampened sponge and wipe the surface of the hardwood. Follow up with a clean, dry terry cloth towel to dry the surface. Never pour cleaner directly on the floor.

- Immediately blot up spills or spots.

- Sand and water are wood's worst enemies. Place rugs inside every outside entrance of the house, in front of the kitchen sink, in front of kitchen work stations, and dishwasher to protect the floor from water or oily detergent. Use area rugs in highly traveled areas and pivot points (stair landings, room entries, etc.), especially if you have a large family or indoor pets.

- Hardwood floors are prone to dents and scratches and will never be "scratch-free". Protect floors by keeping high-heeled shoes in good condition. Damaged or worn high-heels may expose a metal tip that will certainly damage the surface finish. Keeps pets' nails trimmed and paws clean and free of dirt, gravel, grease, oil and stains.

- Exposure to the sun and it's UV rays accelerates the oxidation and aging of wood and fabrics. This cause the stain and/or wood to fade and/or change color. We recommend that you rearrange rugs and furniture periodically so the floor ages evenly. Use draperies or shades to help block out most of the sun's harmful rays. Samples or models in the showroom may also fade, making an exact match to new flooring impossible. Custom finishing and staining of the interior millwork and/or cabinets should be done from the actual floor to be installed (not a showroom sample) if a color and/or gloss match is desired.

- Maintain relative humidity level in your home between 40% and 60% throughout the year. Hardwood is a living material that reacts to change of relative humidity.

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STONE COUNTERTOP CARE AND MAINTENANCE

General Care

- Keep stone surfaces clean with mild dish soap or Windex. Never use petroleum-based cleaners, waxes and abrasive cleansing agents like Comet or Ajax.

- Seal stone surfaces periodically. Granite and marble surfaces are porous, even though the highly polished surface has the appearance of being water resistant. Natural stone must be sealed, or "impregnated" in order to protect against staining. It recommended that the surfaces are sealed at least twice annually; more often depending on traffic and use. Some stones, especially light-colored ones require more applications of sealant. NOTE: the stone needs to be resealed when spilled water begins to leave dark spots or condensation rings.

- Remove cooking oils and acids promptly. Sealing the stone protects it against water and any liquids, but only provides a short term barrier to oil, grease and acids. These substances should be removed promptly at the conclusion of entertaining, eating and food preparation.

- Avoid hot grease and oil splatters. Special care should be taken to protect against hot grease splatters and spills around the range area. The combination of oil plus heat breaks down all sealers and leaves stone with a darkened spot. Should such an accident occur, most oil spots can be removed by applying a poultice, direct heat, or darkening the entire surface to blend the spot.

- DO NOT use the stone as a cutting board. Granite is extremely dense and hard and it is very difficult to scratch. However, a sharp knife may spar the surface, leaving it fractured and susceptible to future chipping or cracking.

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CERAMIC TILE CARE AND MAINTENANCE

STEP #1 – IDENTIFY TYPE OF USEAGE OF TILE

There are two basic types of ceramic tile – glazed and unglazed. The other surface which requires care is the grout, the material which is used when installing the tile. Each requires certain routine cleaning and may need heavy-duty cleaning depending on its use and the degree of traffic in the area.

- Glazed tile- most often used on traditional walls, countertops and floors. It has a though, glass-like surface produced by kiln firing at extremely high temperatures. Glazed tile can have a glossy, matte or textured finish.
- Unglazed tile – composed of natural clays which are sometimes mixed with pigments. It can be used on floors, walls, countertops, window sills, fireplaces, swimming pools, etc. It may require more careful attention than glazed tile.

STEP #2 – TILE CARE

Glazed tile walls in a home will maintain their appearance with simple, routine care. Wipe regularly with a damp cloth or sponge, using a non-abrasive household cleaner. Window cleaners such as Windex or Glass Plus are ideal for cleaning glossy tile surfaces.

- Glazed tile floors – vacuum regularly to remove dirt and gritty particles. Follow with a mop or sponge dampened with an approved household cleaner.
- Unglazed tile walls and floors – vacuum regularly to remove dirt and gritty particles. Follow up with a mop or sponge dampened with a solution of water and a "soapless" detergent.
- Bathroom tile (tub, shower, vanity tops, etc.) – clean more thoroughly because of build-up of soap scum, body oils or hard-water stains. Use the usual "clean, damp cloth or sponge" with an all-purpose cleaner, but allow it to stand for about five minutes before rinsing and drying. OTHER RECOMMENDATIONS: solution of equal parts water and white vinegar or a commercial cleaner from a tile distributer.

TIP: How to keep shower walls mildew-free – clean regularly with a tile cleaner of fungicide such a Lysol or ammonia. Dry with a towel after each use and leave curtain door open between showers.

Fish Friendly Moss Control

Homeowners often ask about the best method of moss control to use in their landscapes, sidewalks, patios, and driveways. Many times the most effective solutions for moss removal involve extremely harsh chemical treatments that cause serious aquatic degradation to local ground water supplies and to the health of our rivers and streams. Many of the "less toxic" options include copper and zinc, while less toxic than many of the chemical treatments are still extremely harmful to aquatic life.

The following is a list of some of the "less toxic" options along with their side effects, and alternatives. It is an excerpt from a website put together by the Botany Department at Oregon State University.

Zinc Strips: General Information: Zinc strips are usually considered the long-term solution to controlling mosses (see photo at right: skylights are surrounded by galvanized flashing that has suppressed the growth of mosses below the skylights. The remaining parts of this cedar shake roof are covered mainly with the moss Dicranoweisia. Zinc strips and galvanized flashing are apparently relatively safe and inexpensive. They effectively kill or retard the growth of mosses and fungi and appear to have effect up to 15 feet below the zinc flashing along the length of the flashing. To use: apply the rolled zinc or galvanized flashing to each side of ridge caps along the roof peaks. Place a nail down each foot of the zinc strip. With each rain zinc is released from the strip and kills the mosses below the strip. For best results remove the existing mosses prior to treatment. The active ingredient is metallic zinc.

Effectiveness: Zinc strips are considered to be effective for up to one year for most brands. The effect of galvanized flashing (example above) can persist for decades. Success rates vary with the degree of moss development and weather. Zinc strips or flashing are most effective before mosses are well developed. Physical removal of existing moss followed by installation of zinc strips or flashing is an effective long-term strategy for suppressing moss growth.

Negative Side Effects: Direct runoff from the zinc strips or flashing to surrounding vegetation, fish ponds, or water supplies should be avoided, because some contamination by zinc is likely to occur. Zinc strips should not be used with strong acids or bases.

Possible Alternatives: Consider periodic physical control.

Potassium salts of fatty acids: General Information: This product is non-staining on most surfaces and is for use on decks, fences, roofs and lawns. This product will not harm bordering plants. This kind of moss killer is formed from naturally occurring, biodegradable fatty acids. It is water based non-corrosive to metals and contains no zinc or iron. This product is available in liquid form in several brands. One brand is Safer Brand for moss and algae. To apply this product, attach bottle to hose and spray liberally over infected area.

Effectiveness: Many people have reported varying degrees of success with the use of potassium salt products. Experimental trials on Racomitrium on old asphalt resulted in very little kill, even at concentrations well above the recommended dose (Ash 1999).

Negative Side Effects: Because this product occurs naturally in the environment and is biodegradable the environmental side effects are small. This product is toxic to aquatic invertebrates. Potassium should not be applied directly to water and should not come into contact with water sources.

Possible Alternatives: Before treating mosses one should consider whether it is necessary to treat the mosses or not. Please see our site on whether or not to control mosses as well as the page related to applying bleach to mosses.

Zinc Sulfate: General Information: The active ingredient for some moss killers is zinc sulfate monohydrate usually at concentrations of 99%. One brand name is Moss B Ware. Zinc sulfate will not stain roofs or corrode aluminum and galvanized gutters. To use zinc sulfate one can apply powder directly to moss areas. Manufacturers recommend that powder should be applied thoroughly - for example, up to three pounds for every 600 square feet. For spraying combine three pounds to five gallons of water and apply to 600 square feet. This product needs to be applied on a calm day.

Effectiveness: Powder application has been known to control mosses for two years and spraying application may need to be applied annually. Some roofing companies will guarantee no mosses for up to five years after using this product while treating roofs.

Negative Side Effects: This product is toxic both to fishes and aquatic invertebrates. Zinc sulfate should not be applied to water. If zinc sulfate comes into contact with neighboring plants, damage may occur. Plants and shrubbery should be draped when this chemical is being used.

Possible Alternatives: Though this product is effective in controlling mosses, it is not entirely environmentally safe or smart. Conside the need to control -- is there a different perspective or solution to your moss problem without polluting the environment?

Zinc Chloride: General Information: Zinc chloride comes in two different concentrations, 13% and 62%. The 13% concentration can be applied directly to moss without mixing with water. Spray directly from nozzle six to ten inches away from target. Make sure to wet the area thoroughly. The 62% concentration needs to be mixed with water before applying to an affected area. Mix one pint of concentration to three gallons of water. Using a backpack sprayer, one manufacture recommends using one gallon for every 100 sq ft. Zinc chloride should be applied just prior to fall rains or in the early spring.

Effectiveness: Zinc chloride is effective in controlling mosses from one year up to five years. Increased application concentrations may be needed in areas of higher moss concentration.

Negative Side Effects: Avoid drift and runoff when using this product. Zinc chloride will affect other plants and lawns. Application should only take place when air is still and when no rain is expected within 24 hours. Zinc chloride is corrosive and should not be used when copper fixtures are present. This product is toxic to fishes and aquatic invertebrates. Avoid contaminating water sources with zinc chloride. If zinc chloride comes into contact with a painted area damage is possible.

Possible Alternatives: Considering the toxicity of this chemical, it may be possible to use a less corrosive and less dangerous product. Please see other chemicals on this web site as well as considering reasons to control or not.

Zinc - Copper sulfate mix: General Information: Zinc and copper sulfate comes dry, but can be applied as a powder or mixed with water. This product reacts electrolyticallly with water to stimulate a slow release reaction. Zinc and copper sulfate will not stain patios, decks, walls, walkways, buildings or roofs. However, zinc and copper sulfate

may react with red bricks. This product is not harmful to lawns, ornamental shrubs, trees, turf or other vegetation such as flowers and vegetation. To apply simply sprinkle areas thoroughly with powder when it is wet, either after a rain or when early morning dew is present. Do not use this product in high wind. For spray application a wet applicator may need to be purchased. It is not clear if this product is still available commercially. According to information from one manufacturer, apply one pound of moss killer to 1000 sq ft. This product may be applied anytime during the year, but should not be applied while it is raining. Since this product specializes in the slow release reaction; allow plenty of time for the chemical to act. This product is corrosive and should not be used if copper fixtures are present.

Effectiveness: Applications of zinc and copper sulfate are said to last for up to one year depending on the concentrations of moss. Annual application is generally needed.

Negative Side Effects: Though this product is supposedly safe for surrounding plants, it is toxic to fishes and aquatic invertebrates. Do not apply this product to water or let the product come into contact with water sources. When applying this product or any product to rooftops it is essential to avoid runoff. Collecting the runoff in a fashioned trap would greatly reduce the negative effects on the environment.

Possible Alternatives: Based on the manufacturer's information, this chemical would seem to be a slightly better chemical to use when considering the environment. Considering the components, however, leads us to doubt this. See the section on zinc sulfate above. The toxicity of copper sulfate is well known. Deciding whether or not to control is still a good question to consider.

Bleach: General Information: Chlorine bleach (sodium hypochlorite) can be used on a number of surfaces contaminated with mosses including decks, patios, walks and roofs. When used to proper concentrations bleach is non corrosive to metals and will not stain treated areas. One should, however, avoid contact with clothing. Brand names of bleach especially for mosses can be found in the moss control area in garden centers - one brand is 30seconds brand. To apply bleach mix one part water with one part concentrate. Use a backpack sprayer and spray liquid to dry area infected with mosses. Keep surface wet for at lease 30 seconds. After finishing application rinse thoroughly with water. If applying to wood keep wet for at least 15 minutes. An alternative to this concentration is to use four times the water. When applying one will need to keep the surface wet for four times as long. This concentration will cover 600 sq ft on porous surfaces or 1800 sq ft on non-porous surfaces.

Effectiveness: Bleach applications remain effective for up to one year, but annual applications are usually necessary.

Negative Side Effects: Bleach at these concentrations will be toxic to plants if left on for more than ten minutes. After ten minutes, injury or "burning" of foliage will occur. Since this product is toxic to fishes and aquatic invertebrates contact with water sources should be avoided.

Possible Alternatives: Bleach is a good alternative to many other chemical controls, being less toxic to plants and aquatic ecosystems. Additionally, one could consider not controlling the mosses at all.

Oregon State University. Botany 465/565. Spring, 2000. Living with Mosses. http://bryophytes.science.oregonstate.edu/mosses.htm. September 2011

The most environmentally friendly method of moss control is physical removal by sweeping, scraping, and pressure washing. Ideally this is done at the driest time of the year (August-September) when the moss is not growing and spreading. Prevention of a comfortable growing

environment for mosses and lichens is key to reducing the amount of labor needed to manage your mosses around the home. This would include removal of organic material such as leaves and plant matter, maintaining a relatively dry environment in order to inhibit growth, and regularly cleaning and sweeping areas prone to moss and fungi growth.

And lastly, in areas that do not pose a risk to structure of safety, there is always the option to let the moss grow in its natural state.

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Sun Ridge

Operation and Maintenance Manual

Owner:
Sun Ridge

Issaquah, WA 98029

Contractor
NW Wind & Solar
828 Poplar Place S.
Seattle, WA 98144
206.58-SOLAR (76527)

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5/27/2015

CONGRATULATIONS!

Thank you for your business and commitment to renewable energy . You have made an environmentally conscious decision that will not only save you money for years to come, but one that also expresses your stewardship for protecting our planet and its resources for future generations. NW Wind & Solar looks forward to providing you with excellent service during your warranty period and we hope to be your resource for all your energy needs.

YOUR SOLAR SYSTEM DETAILS

SYSTEM SIZE:	**3.12kW**
SOLAR MODULES:	**CSUN 260**
SOLAR INVERTER:	**SMA 3000TL-US**
RACKING SYSTEM:	**Iron Ridge**

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WARRANTY

PROJECT WARRANTY FOR: Sun Ridge

LOCATED:
Issaquah, WA 98029

We NW Wind & Solar the undersigned, do hereby warranty, for a period of five-years from the date of substantial completion:
all work performed under the terms of the contract documents.
We will remedy, at our expense, any defects appearing during that period due to poor materials and/or workmanship only. We can warrant owner-furnished items only to the extent to which we installed or handled those items.

This warranty shall not be interpreted as holding NW Wind & Solar responsible for any deterioration of work due to normal usage and wear, nor abusive care and handling. We cannot warranty equipment, materials, etc., repaired or tampered with by parties other than those directed by NW Wind & Solar or the warranted subcontractor. Items repaired during this warranty period do not receive an additional and/or extended warranty.

Sub-subcontractor and manufacturer warranties, which exceed the ten-year warranty period, shall run concurrent and will be the responsibility of the sub-subcontractor or manufacturer after the ten-year warranty period.

Sincerely,

Kevin Charap

NW Wind & Solar

5/27/2015

3 SYSTEM MAINTENANCE

Your Solar PV System has no moving parts, as such, there is very little maintenance required to keep your system operating. The primary maintenance task will be ensuring that the PV panels stay clean for maximum efficiency. This involves lightly washing dirt, leaves, seasonal debris and any site specific material that may come to rest on the face of your solar panels. In *Western Washington* our climate will do this for you for most of the year.

Given a sufficient tilt (at least 15 degrees), it is generally not necessary to clean the modules (rainfall will have a self-cleaning effect). In case of heavy soiling, we recommend cleaning the modules using plenty of water (from a hose) without any cleaning agents and using a gentle cleaning implement (a sponge). Dirt must never be scraped or rubbed away when dry, as this may cause micro-scratches.

Your Inverter will have a monitoring screen that provides production data. It is recommended to periodically view this monitor to confirm expected production values are being met. Annually, you will take a recording of the kilowatt hours produced from your Production Meter for the Production Incentive Application and it is recommended to compare the Inverter Data with that of the Production Meter.

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Incentives

Your system qualifies for:

1 30% Federal Income Tax Credit.

When filing end of year taxes reference your Solar System Proposal and final contract price on your return.

2 Washington State Production Incentive.

Please find enclosed Renewable Energy System Cost Recovery Certification - 82.16RCW
Enter Applicant Information, Permit No. and Closing date for final inspection date.
Print name, sign, date.
Attach PV1 Plan (One-Line Diagram) and submit following instructions on the bottom of the form.

Your Utility will respond 30-60 days with a welcome letter to Net Metering and the Incentive Program, once your application is approved. The utility will read your Production meter each summer and process incentive payments each fall until June 2020.

Department of Revenue
Washington State

Reset This Form

Renewable Energy System Cost Recovery Certification
82.16 RCW

UBI/Tax Registration Number: _____ ☐ I do not have a UBI/Tax Registration Number

☐ New renewable energy system

☐ Modification to existing renewable energy system ☐ New owner of existing renewable energy system

Applicant Information:

Legal Name: _____ Phone: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Location of Renewable Energy System (if different from above):

Street: _____

City: _____ State: _____ Zip: _____

Technical Information: Attach a one-line diagram for the system (required)

Electrical Permit No. _____ Final Inspection Date: _____

System components (check all that apply):

☐ Solar modules manufactured in Washington Module Manufacturer: _____ Model: _____

☐ Solar inverter manufactured in Washington Inverter Manufacturer: _____ Model: _____

☑ Solar equipment manufactured outside of Washington

☐ Wind generation equipment with inverter manufactured in WA Manufacturer: _____ Model: _____

☐ Wind generation equipment manufactured outside of Washington

☐ Anaerobic digester

System Qualifications:

Are the real property and the renewable energy system both owned by the applicant? Yes ☑ No ☐

Property parcel number: _____

Does the energy produced meet the definition of "customer generated electricity?" Yes ☑ No ☐

Can the electricity be transformed or transmitted for entry into or operation in parallel with electricity transmission and distribution systems? Yes ☑ No ☐

I certify the information provided is true, complete, and correct to the best of my knowledge and belief under penalty of perjury.

☑ ***I authorize the Department of Revenue to email my utility once my certification has received final approval.***

Name of Utility: Puget Sound Energy

Name (please print): _____ Title: Owner

Signature: _____ Date: _____

For Official Use Only- Approval Signatures

Climate and Rural Energy Development Center - WSU

_____ Date: _____

Department of Revenue

_____ Date: _____

Print This Form

Mail or fax to:
Department of Revenue
Attn: Taxpayer Account Administration SPECS Team
PO Box 47476 ♦Olympia WA 98504-7476 ♦(360) 902-7003 ♦Fax: **(360) 586-0527**

Definitions and Instructions

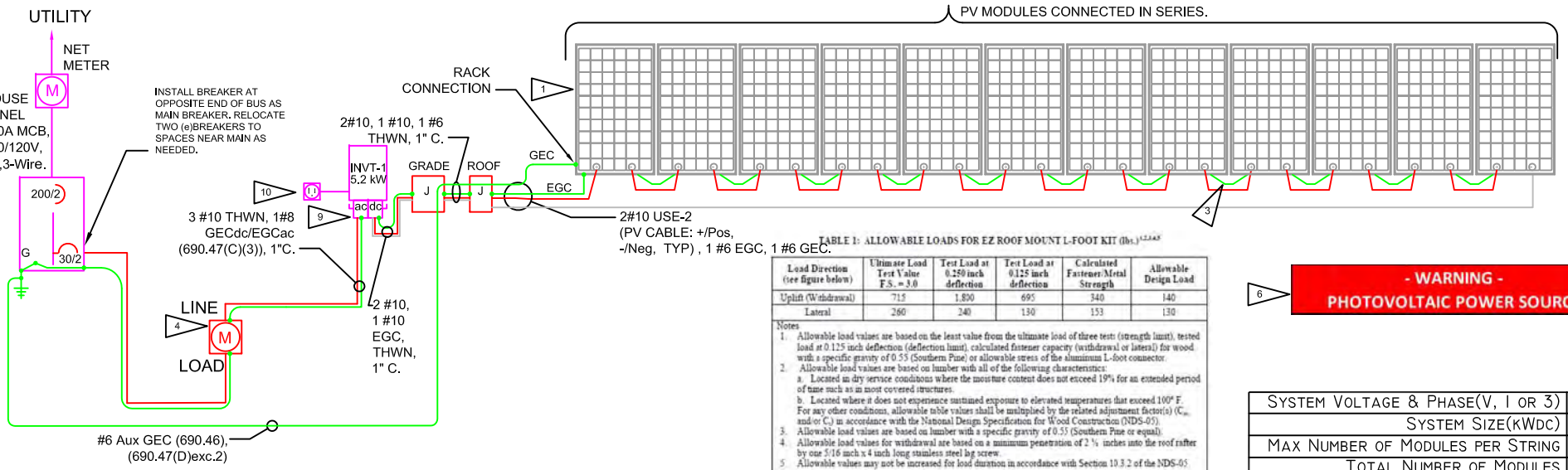
This program is discussed in Washington Administrative Code (WAC) 458-20-273. Additional definitions and information about the program are available on our website at dor.wa.gov.

Instructions
Before completing this form, first contact the utility serving your property to confirm it is participating in this program and to receive its application procedures for this incentive payment.

1. Complete page one of the certification form and attach a copy of the one line diagram for the system. Incomplete applications will be returned to the system owner.
    a. Applicant Information: The renewable energy system and the property on which the system is located must be owned by the same individual, business, or local government entity. Leasing the property or the renewable energy system does not constitute ownership.
    b. Technical Information: A list of equipment approved as “made in Washington” can be found on our website at dor.wa.gov. Attach a one-line diagram that shows the make and model of the equipment and the production meter.
    c. System Qualifications: If any of the check boxes are marked “No”, then you do not qualify to participate in the cost recovery incentive payment program. Your property’s parcel number can be found on your county assessor’s website online. Please attach additional documentation if county assessor records do not show you as the legal owner of the property.
    d. Signature: Print your name, sign and date the form. Provide the name of your utility and signature if you would like the Department to contact your utility after the certification has been approved.
2. Contact the Department at (360) 902-7003 if you have any questions or need assistance completing this form.
3. Mail or fax the certification and one line diagram to the Department.
4. The Department, in partnership with the Climate and Rural Energy Development Center at Washington State University, will verify the information provided and contact you if there are any questions.
5. The Department will notify you within 30 days of receipt of this form whether the renewable energy system qualifies for an incentive payment.
6. After you have received approval from the Department, make sure to enclose a copy of your approved certification and approval letter when you apply to your utility for an incentive payment.

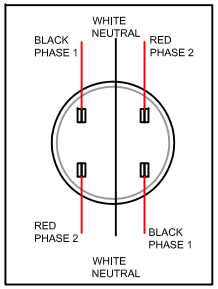
Definitions
Except for community solar projects, the term **“applicant”** means an individual, business, or local government that owns the renewable energy system that qualifies under the definition of “customer-generated electricity”.

“Customer-generated electricity” means a community solar project or the alternating current electricity that is generated from a renewable energy system located in Washington state, that is installed on an individual's, business', or local government's property and the property involved is served by a light and power business. Except for utility-owned community solar systems, a system located on a leasehold interest does not qualify under this definition. Except for a utility-owned solar energy system that is voluntarily funded by the utility's ratepayers, "customer-generated electricity" does not include electricity generated by a light and power business with greater than one thousand megawatt hours of annual sales or a gas distribution business.



SHEET NOTES

1. PV MODULE - SEE PV MODULE SCHEDULE ON THIS SHEET.
2. NOT USED.
3. #6 BARE CU GROUND WIRE OR WEEB(WASHER ELECTRICAL EQUIPMENT BOND).
4. PRODUCTION METER, SEE METER SOCKET WIRING DIAGRAM ON THIS SHEET. COLOCATED WITH NET METER.
5. CONNECT #6 BARE CU GROUNDING ELECTRODE CONDUCTOR (GEC) TO EXISTING SERVICE GROUNDING SYSTEM OR BUILDING STEEL.
6. PROVIDE RED WARNING LABEL WITH WHITE TEXT.
7. MAINTAIN MIN. 3' CLEARANCE FROM ALL ROOF EDGES.
8. PV MODULES ATTACHED TO ROOF PER SUNMODO DETAIL.
9. AC DISCONNECT REQUIRED ONLY IF INVERTER IS NOT COLOCATED WITH INTERCONNECTION BREAKER. (690.15).
10. SECURE POWER POWER SUPPLY OPTION. PLUG OPERATES OFF INVERTER POWER IN THE EVENT OF GRID FAILURE. MANUAL SWITCH OVER. 1500W AVAILABLE AT 120 VOLTS.

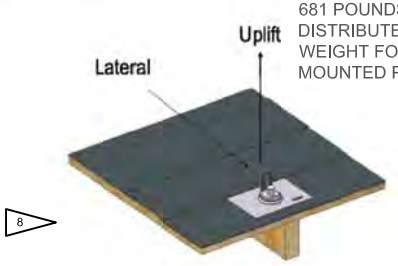


METER SOCKET WIRING DIAGRAM:

TABLE 1: ALLOWABLE LOADS FOR EZ ROOF MOUNT L-FOOT KIT (lbs.)[1,2,3,4,5]

Load Direction (see figure below)	Ultimate Load Test Value F.S. = 3.0	Test Load at 0.250 inch deflection	Test Load at 0.125 inch deflection	Calculated Fastener/Metal Strength	Allowable Design Load
Uplift (Withdrawal)	715	1,800	695	340	140
Lateral	260	240	130	153	130

Notes
1. Allowable load values are based on the least value from the ultimate load of three tests (strength limit), tested load at 0.125 inch deflection (deflection limit), calculated fastener capacity (withdrawal or lateral) for wood with a specific gravity of 0.55 (Southern Pine) or allowable stress of the aluminum L-foot connector.
2. Allowable load values are based on lumber with all of the following characteristics:
   a. Located in dry service conditions where the moisture content does not exceed 19% for an extended period of time such as in most covered structures.
   b. Located where it does not experience sustained exposure to elevated temperatures that exceed 100° F. For any other conditions, allowable table values shall be multiplied by the related adjustment factor(s) (C_m and/or C_t) in accordance with the National Design Specification for Wood Construction (NDS-05).
3. Allowable load values are based on lumber with a specific gravity of 0.55 (Southern Pine or equal).
4. Allowable load values for withdrawal are based on a minimum penetration of 2 ½ inches into the roof rafter by one 5/16 inch x 4 inch long stainless steel lag screw.
5. Allowable values may not be increased for load duration in accordance with Section 10.3.2 of the NDS-05.



681 POUNDS TOTAL DISTRIBUTED DEAD WEIGHT FOR ROOF MOUNTED PV SYSTEM.

- WARNING - PHOTOVOLTAIC POWER SOURCE

SYSTEM VOLTAGE & PHASE(V, 1 OR 3)	240-1
SYSTEM SIZE(KWDC)	3.12
MAX NUMBER OF MODULES PER STRING	12
TOTAL NUMBER OF MODULES	12
TOTAL NUMBER OF INVERTERS	1
LOWEST EXPECTED AMBIENT TEMP(°C)	-10
HIGHEST EXPECTED AMBIENT TEMP(°C)	36
STANDARD TEST CONDITIONS(°C)	25

PV MODULE MAKE	CSUN
MODEL	260M
MAX POWER - PMAX(W)	260
MAX POWER POINT VOLTAGE - VMPP(V)	30.8
MAX POWER POINT CURRENT - IMPP(A)	8.44
OPEN CIRCUIT VOLTAGE - VOC(V)	38.1
SHORT CIRCUIT CURRENT - ISC(A)	8.9
TEMP COEFFICIENT PMPP(%/°C)	-0.423
TEMP COEFFICIENT VOC(%/°C)	0.307
TEMP COEFFICIENT ISC(MA/°C)	3.47
MAX SYSTEM VOLTAGE(V)	600

UL-1741 INVERTER NUMBER	1
INVERTER MAKE	SMA
MODEL	3000TL-US
_____DC INPUT_____	
MAX INPUT VOLTAGE(V)	600
MAX POWER PER INPUT(W)	3,200
INPUT VOLTAGE RANGE(V)	125 - 500
MAX INPUT CURRENT(A)	15
_____AC OUTPUT_____	
OUTPUT VOLTAGE RANGE(V)	211 - 264
NOMINAL OUTPUT VOLTAGE(V)	240
MAX CONTINUOUS OUTPUT CURRENT(A)	12.5
MAX CONTINUOUS POWER OUTPUT(W)	3,000

STRING NUMBER(S)	1
NUMBER OF MODULES IN SERIES	12
NUMBER OF STRINGS IN PARALLEL	1
STRING POWER(KWDC)	3.12
MAX POWER POINT CURRENT - IMPP(A)	8.44
MAX POWER POINT VOLTAGE(V)	369.60
MAX STRING VOLTAGE(V)	506.33
MIN PV OUTPUT CIRCUIT AMPACITY(A)	13.88

System Grounding Type (NEG, POS, UG):	NEG ☐	POS ☐	UG ☒
Conductor Insulation Colors Negative:	White or Gray	Black	Black
Inverter(s) on Roof: Y ☐ N ☐ Positive:	Red	White or Gray	Red
480-Volt System with GFP:	YES ☐	NO ☒	

NW WIND & SOLAR
YOUR ENERGY ARCHITECTS
828 POPLAR PLACE SOUTH
SEATTLE, WA 98144
PHONE: (206) 587-6527
FAX: (206) 726-8160
WWW.NWWINDANDSOLAR.COM

NW WIND & SOLAR IS A DIVISION OF SME INC. OF SEATTLE

PROJ. MGR.:	Kevin Charap
DESIGN BY:	Dallas Anderson, PE
PROJ. NO.:	14-W05
DATE:	11/6/14
SCALE:	NA
REV. NO.:	1

PROJECT TITLE: SUN RIDGE 3.12KW SINGLE FAMILY HOME
PHOTOVOLTAIC SYSTEM

PROJECT SITE: ADDRESS TBD
ISSAQUAH, WA 98027

SHEET TITLE: PV RISER AND SCHEDULES

SHEET NUMBER: PV1

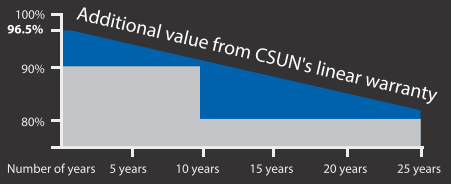
Mono

Powerguard insurance global coverage

Within the first year, the output power shall not be less than 96.5% of the minimum output power in CSUN's product datasheet, thereafter the loss of output power shall not exceed 0.68% per year, ending with 80.18% in the 25th year.

CSUN Standard warranty

CSUN's NEW linear performance warranty



CSUN270-60M

Highest efficiency offer: QSAR™

CSUN255-60M CSUN260-60M
CSUN265-60M CSUN270-60M

19%
Cell efficiency

270 W
Highest power output

10 Jahre
Material & workmanship warranty

25 Jahre
Linear power output warranty

- Higher efficiency – perfect for rooftop projects
- Positive tolerance offer
- Excellent current distribution performance reduces power loss
- Passed salt mist & ammonia corrosion, blowing sand and hail testing
- Certificated to withstand wind (2400 Pa) and snow load (5400 Pa)
- Excellent performance under weak light conditions
- Good temperature coefficient performance enables better output in tropical zones

- CSUN, established in 2004, is a hi-tech corporation with its core business in R&D, manufacturing, and sale of high efficiency silicon based solar cells and modules.
- As one of the leading PV enterprises in the world, CSUN has delivered more than 1GW solar products, to residential, commercial, utility and off-grid projects all around the world.
- Through strict selection of raw materials, stringent quality control and rigorous test in state of the art facilities in Istanbul, Nanjing and Shanghai, CSUN has always committed to higher efficiency, more stable and better cost performance products.

QSAR™ is the trade mark owned by CSUN, also the brand name of high efficiency solar module produced by CSUN. From March 2012, CSUN will change "QUASAR" originally used into "QSAR".

All information and data are subject to change without notice.

www.csun-solar.com

Version 3/2014–ENG

Electrical characteristics at Standard Test Conditions (STC)

Module	QSAR 270-60M	QSAR 265-60M	QSAR 260-60M	QSAR 255-60M
Maximum Power - Pmpp (W)	270	265	260	255
Positive power tolerance	0~3%	0~3%	0~3%	0~3%
Open Circuit Voltage - Voc (V)	38.3	38.2	38.1	38.0
Short Circuit Current - Isc (A)	9.07	8.98	8.90	8.82
Maximum Power Voltage - Vmpp (V)	31.2	31,0	30,8	30.7
Maximum Power Current - Impp (A)	8.65	8.55	8.44	8.30
Module efficiency	16.63%	16.32%	16.01%	15.70%

Electrical data relates to standard test conditions (STC) : irradiance 1000W/m² ; AM 1.5 ; cell temperature 25°C measuring uncertainty of power is within ±3%. Certified in accordance with IEC61215, IEC61730-1/2 and UL 1703.

Electrical Characteristics at Normal Operating Cell Temperature (NOCT)

Module	QSAR 270-60M	QSAR 265-60M	QSAR 260-60M	QSAR 255-60M
Maximum Power - Pmpp (W)	198	195	192	188
Maximum Power Voltage - Vmpp (V)	28.8	28.6	28.4	28.1
Maximum Power Current - Impp (A)	6.88	6.82	6.76	6.68
Open Circuit Voltage - Voc (V)	35.3	35.2	35.1	35
Short Circuit Current - Isc (A)	7.36	7.28	7.19	7.12

Electrical data relates to normal operating cell temperature (NOCT): irradiance 800 W/m² ; wind speed 1 m/s ; cell temperature 45°C ambient temperature 20°C measuring uncertainty of power is within ±3%

Temperature Characteristics

Voltage Temperature Coefficient	-0.307%/K
Current Temperature Coefficient	+0.039%/K
Power Temperature Coefficient	-0.423%/K

Maximum Ratings

Maximum system voltage (V)	1000
Series fuse rating (A)	20
Reverse current overload (A)	27

Mechanical Characteristics

Dimensions	1640 × 990 × 35 mm
Weight	18.3 kg
Frame	Anodized aluminum profile
Front glass	White toughened safety glass, 3.2 mm
Cell Encapsulation	EVA (Ethylene-Vinyl-Acetate)
Back Sheet	Composite film
Cells	6 × 10 pieces monocrystalline solar cells series strings (156 mm × 156 mm)
Junction Box	Rated current ≥ 12A, IP ≥ 65, TUV & UL
Cable	Length 900 mm, 1 × 4 mm²
Connector	MC 4/ compatible with MC 4

Packaging

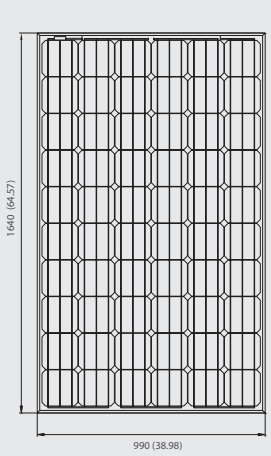
Container 20'	360 pcs.
Container 40'	840 pcs.
Container 40'HC	896 pcs.

System Design

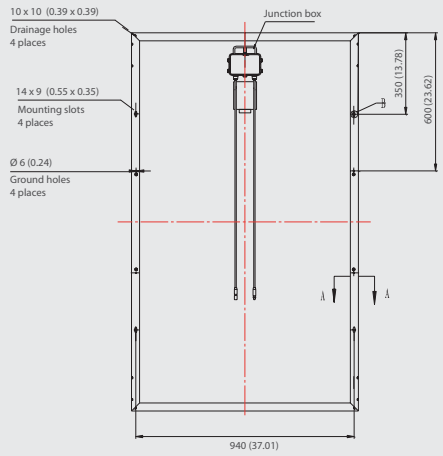
Temp. range	-40°C to + 85°C
Hail	max. diameter of 25mm with impact speed of 23m/s
Max. capacity	Snow 5400 Pa, wind 2400 Pa
Application class	A
Safety class	II

Dimensions

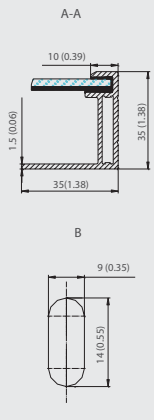
Note: Module layout below only valid for modules with 35mm thickness. All dimensions in mm (inch).



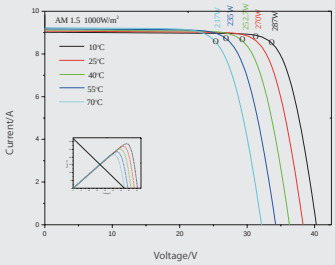
FRONT VIEW

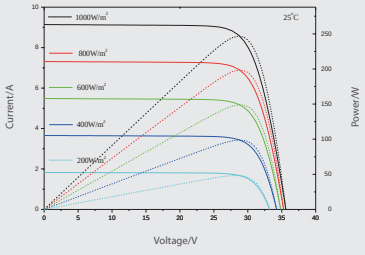


BACKVIEW



IV-Curves





SB 3000TL-US-22 / 3800TL-US-22 / 4000TL-US-22 / 5000TL-US-22 /
6000TL-US-22 / 7000TL-US-22 / 7700TL-US-22

Certified

- UL 1741 and 1699B compliant
- Integrated AFCI meets the requirements of NEC 2011 690.11

Innovative

- Secure Power Supply provides daytime power during grid outages

Powerful

- 97.6% maximum efficiency
- Wide input voltage range
- Shade management with OptiTrac Global Peak MPP tracking

Flexible

- Two MPP trackers provide numerous design options
- Extended operating temperature range

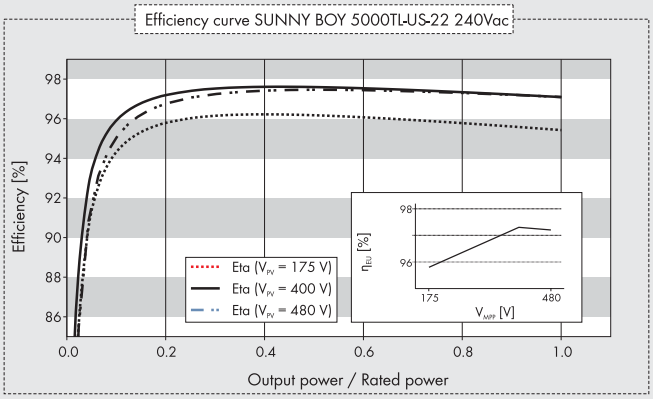
SUNNY BOY 3000TL-US / 3800TL-US /4000TL-US / 5000TL-US / 6000TL-US / 7000TL-US / 7700TL-US

Setting new heights in residential inverter performance

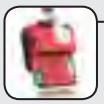
The Sunny Boy 3000TL-US/3800TL-US/4000TL-US/5000TL-US/6000TL-US/7000TL-US/7700TL-US represents the next step in performance for UL certified inverters. Its transformerless design means high efficiency and reduced weight. Maximum power production is derived from wide input voltage and operating temperature ranges. Multiple MPP trackers and OptiTrac™ Global Peak mitigate the effect of shade and allow for installation at challenging sites. The unique Secure Power Supply feature provides daytime power in the event of a grid outage. High performance, flexible design and innovative features make the Sunny Boy TL-US series the first choice among solar professionals.

MADE IN THE USA OF U.S. AND IMPORTED PARTS

Technical data	Sunny Boy 3000TL-US		Sunny Boy 3800TL-US		Sunny Boy 4000TL-US	
	208 V AC	240 V AC	208 V AC	240 V AC	208 V AC	240 V AC
Input (DC)						
Max. usable DC power (@ cos φ = 1)	3200 W		4200 W		4200 W	
Max. DC voltage	600 V		600 V		600 V	
Rated MPPT voltage range	175 – 480 V		175 – 480 V		175 – 480 V	
MPPT operating voltage range	125 – 500 V		125 – 500 V		125 – 500 V	
Min. DC voltage / start voltage	125 V / 150 V		125 V / 150 V		125 V / 150 V	
Max. operating input current / per MPP tracker	18 A / 15 A		24 A / 15 A		24 A / 15 A	
Number of MPP trackers / strings per MPP tracker	2 / 2					
Output (AC)						
AC nominal power	3000 W		3330 W	3840 W	4000 W	
Max. AC apparent power	3000 VA		3330 VA	3840 VA	4000 VA	
Nominal AC voltage / adjustable	208 V / ●	240 V / ●	208 V / ●	240 V / ●	208 V / ●	240 V / ●
AC voltage range	183 – 229 V	211 – 264 V	183 – 229 V	211 – 264 V	183 – 229 V	211 – 264 V
AC grid frequency; range	60 Hz / 59.3 – 60.5 Hz		60 Hz / 59.3 – 60.5 Hz		60 Hz / 59.3 – 60.5 Hz	
Max. output current	15 A		16 A		20 A	
Power factor (cos φ)	1		1		1	
Output phases / line connections	1 / 2		1 / 2		1 / 2	
Harmonics	< 4%		< 4%		< 4%	
Efficiency						
Max. efficiency	97.2%	97.6%	97.2%	97.5%	97.2%	97.5%
CEC efficiency	96.5%	96.5%	96.5%	97.0%	96.5%	97.0%
Protection devices						
DC disconnection device	●					
DC reverse-polarity protection	●					
Ground fault monitoring / Grid monitoring	● / ●					
AC short circuit protection	●					
All-pole sensitive residual current monitoring unit	●					
Arc fault circuit interrupter (AFCI) compliant to UL 1699B	●					
Protection class / overvoltage category	I / IV					
General data						
Dimensions (W / H / D) in mm (in)	490 / 519 / 185 (19.3 / 20.5 / 7.3)					
DC Disconnect dimensions (W / H / D) in mm (in)	187 / 297 / 190 (7.4 / 11.7 / 7.5)					
Packing dimensions (W / H / D) in mm (in)	617 / 597 / 266 (24.3 / 23.5 / 10.5)					
DC Disconnect packing dimensions (W / H / D) in mm (in)	370 / 240 / 280 (14.6 / 9.4 / 11.0)					
Weight / DC Disconnect weight	24 kg (53 lb) / 3.5 kg (8 lb)					
Packing weight / DC Disconnect packing weight	27 kg (60 lb) / 3.5 kg (8 lb)					
Operating temperature range	–40 °C ... +60 °C (–40 °F ... +140 °F)					
Noise emission (typical)	≤ 25 dB(A)		< 25 dB(A)		< 25 dB(A)	
Internal consumption at night	< 1 W		< 1 W		< 1 W	
Topology	Transformerless		Transformerless		Transformerless	
Cooling	Convection		Convection		Convection	
Electronics protection rating	NEMA 3R		NEMA 3R		NEMA 3R	
Features						
Secure Power Supply	●		●		●	
Display: graphic	●		●		●	
Interfaces: RS485 / Speedwire/Webconnect	o/o		o/o		o/o	
Warranty: 10 / 15 / 20 years	●/o/o		●/o/o		●/o/o	
Certificates and permits (more available on request)	UL 1741, UL 1998, UL 1699B, IEEE1547, FCC Part 15 (Class A & B), CAN/CSA C22.2 107.1-1					
NOTE: US inverters ship with gray lids						
Type designation	SB 3000TL-US-22		SB 3800TL-US-22		SB 4000TL-US-22	



Accessories



Speedwire/Webconnect interface
SWDM-US-10

RS485 interface
DM-485CB-US-10

Fan kit for SB 3000/3800/4000/5000TL-US-22
FANKIT02-10

● Standard feature ○ Optional feature – Not available
Data at nominal conditions

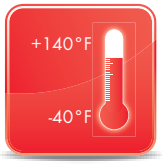
Sunny Boy 5000TL-US		Sunny Boy 6000TL-US		Sunny Boy 7000TL-US		Sunny Boy 7700TL-US	
208 V AC	**240 V AC**	**208 V AC**	**240 V AC**	**208 V AC**	**240 V AC**	**208 V AC**	**240 V AC**
5300 W		6300 W		7300 W		8000 W	
600 V		600 V		600 V		600 V	
175 – 480 V		210 – 480 V		245 – 480 V		270 – 480 V	
125 – 500 V		125 – 500 V		125 – 500 V		125 – 500 V	
125 V / 150 V		125 V / 150 V		125 V / 150 V		125 V / 150 V	
30 A / 15 A		30 A / 15 A		30 A / 18 A		30 A / 18 A	
2 / 2							
4550 W	5000 W	5200 W	6000 W	6000 W	7000 W	6650 W	7680 W
4550 VA	5000 VA	5200 VA	6000 VA	6000 VA	7000 VA	6650 VA	7680 VA
208 V / ●	240 V / ●	208 V / ●	240 V / ●	208 V / ●	240 V / ●	208 V / ●	240 V / ●
183 – 229 V	211 – 264 V	183 – 229 V	211 – 264 V	183 – 229 V	211 – 264 V	183 – 229 V	211 – 264 V
60 Hz / 59.3 – 60.5 Hz		60 Hz / 59.3 – 60.5 Hz		60 Hz / 59.3 – 60.5 Hz		60 Hz / 59.3 – 60.5 Hz	
22 A		25 A		29.2 A		32 A	
1		1		1		1	
1 / 2		1 / 2		1 / 2		1 / 2	
< 4%		< 4%		< 4%		< 4%	
97.2%	97.6%	97.0%	97.4%	96.8%	96.8%	96.8%	97.3%
96.5%	97.0%	96.5%	97.0%	96.5%	96.5%	96.5%	96.5%
●							
●							
● / ●							
●							
●							
●							
I / IV							
490 / 519 / 185 (19.3 / 20.5 / 7.3)							
187 / 297 / 190 (7.4 / 11.7 / 7.5)							
617 / 597 / 266 (24.3 / 23.5 / 10.5)							
370 / 240 / 280 (14.6 / 9.4 / 11.0)							
24 kg (53 lb) / 3.5 kg (8 lb)							
27 kg (60 lb) / 3.5 kg (8 lb)							
–40 °C ... +60 °C (–40 °F ... +140 °F)							
< 29 dB(A)		< 29 dB(A)		< 29 dB(A)		< 29 dB(A)	
< 1 W		< 1 W		< 1 W		< 1 W	
Transformerless		Transformerless		Transformerless		Transformerless	
Convection		Fan		Fan		Fan	
NEMA 3R		NEMA 3R		NEMA 3R		NEMA 3R	
●		●		●		●	
●		●		●		●	
○/○		○/○		○/○		○/○	
●/○/○		●/○/○		●/○/○		●/○/○	
UL 1741, UL 1998, UL 1699B, IEEE1547, FCC Part 15 (Class A & B), CAN/CSA C22.2 107.1-1							
SB 5000TL-US-22		SB 6000TL-US-22		SB 7000TL-US-22		SB 7700TL-US-22	

More efficient

Shade management

Easier

Secure Power Supply



Broad temperature range

Flexible communications

A NEW GENERATION OF INNOVATION

THE SUNNY BOY TL-US RESIDENTIAL SERIES HAS YET AGAIN REDEFINED THE CATEGORY.

Transformerless design

The Sunny Boy 3000TL-US / 3800TL-US / 4000TL-US / 5000TL-US / 6000TL-US / 7000TL-US / 7700TL-US are transformerless inverters, which means owners and installers benefit from high efficiency and lower weight. A wide input voltage range also means the inverters will produce high amounts of power under a number of conditions.

Additionally, transformerless inverters have been shown to be among the safest string inverters on the market. An industry first, the TL-US series has been tested to UL 1741 and UL 1699B and is in compliance with the arc fault requirements of NEC 2011.

Increased energy production

OptiTrac™ Global Peak, SMA's shade-tolerant MPP tracking algorithm, quickly adjusts to changes in solar irradiation, which mitigates the effects of shade and results in higher total power output. And, with two MPP trackers, the TL-US series can ably handle complex roofs with multiple orientations or string lengths.

An extended operating temperature range of -40 °F to +140 °F ensures power is produced in all types of climates and for longer periods of time than with most traditional string inverters.

Secure Power Supply

One of many unique features of the TL-US residential series is its innovative Secure Power Supply. With most grid-tied inverters, when the grid goes down, so does the solar-powered home. SMA's solution provides daytime energy to a dedicated power outlet during prolonged grid outages, providing homeowners with access to power as long as the sun shines.

Simple installation

As a transformerless inverter, the TL-US residential series is lighter in weight than its transformer-based counterparts, making it easier to lift and transport. A new wall mounting plate features anti-theft security and makes hanging the inverter quick and easy. A simplified DC wiring concept allows the DC disconnect to be used as a wire raceway, saving labor and materials.

The 3800TL-US and 7700TL-US models allow installers to maximize system size and energy production for customers with 100 A and 200 A service panels.

Leading monitoring and control solutions

The new TL-US residential line features more than high performance and a large graphic display. The monitoring and control options provide users with an outstanding degree of flexibility. Multiple communication options allow for a highly controllable inverter and one that can be monitored on Sunny Portal from anywhere on the planet via an Internet connection. Whether communicating through RS485, or SMA's new plug-and-play WebConnect, installers can find an optimal solution to their monitoring needs.

Wide Power Class Range

Whether you're looking for a model to maximize a 100 A service panel or trying to meet the needs of a larger residential PV system, the Sunny Boy TL-US with Secure Power Supply has you covered. Its wide range of power classes—from 3 to 7.7 kW—offers customers the right size for virtually any residential application. The TL-US series is not only the smartest inverter on the planet, it's also the most flexible.

Toll Free +1 888 4 SMA USA
www.SMA-America.com

SMA America, LLC

Appendix A

1 Year Materials & Workmanship Warranty

This warranty covers material defects and general workmanship for interior and exterior finishes. Warranty standard and coverage are as follows;

1. Finishes (Drywall, Paint, Carpet, etc.)
   The Warranty provides protection against defects in finishes in the home, including drywall, lath and plaster walls and ceilings, hard-surface flooring, bathtubs, showers and countertops, resilient and finished-wood flooring, trims, interior and exterior painting and carpeting.

2. Nail pops and drywall cracks
   The Warranty provides repair for nail pops and drywall cracks caused by acclimation to the temperature and humidity of the seasons.

3. Roof
   The Warranty covers roof leaks that are caused by rain, normal wear or natural deterioration on a well-maintained roof. The leak caused by buildup of snow, ice, leaves, bird droppings or other build up that prevents rainwater drainage shall not be considered a defect and such water penetration shall not be covered.

4. Doors & Windows
   For proper fit and smooth operation, interior, exterior and garage doors, doorknobs, deadbolts and locksets, wood, plastic and metal windows, glass and glazing; and storm doors, windows and screens are covered.

5. Concrete
   For protection against defects in concrete surfaces, warranty coverage includes concrete basement and attached garage floors, slab-on-grade floors with finish flooring, stoops and steps, and interior concrete work. Small cracks not affecting structural stability are not unusual on the surface of the concrete. Cracks greater than 1/4 inch will be repaired by concrete caulk.

6. Cabinets & Vanities
   To keep kitchens and bathrooms functional, warranty coverage includes defects in kitchen and vanity cabinet doors and drawers, as well as high-pressure laminated kitchen and vanity countertops.

7. Electrical Components
   The Warranty provides coverage against defects in receptacles, fixtures, fuses, ground-fault circuit interrupters (GFCI) and circuit breakers. This excludes light bulbs and batteries.

8. Masonry
   The Warranty coverage includes workmanship on masonry, brick and stone veneer, concrete block basement walls, stucco and cement plaster walls. Due to lime content and porous property, discoloration, efflorescence, chemical reaction or water absorption shall not be covered.

9. Thermal & Moisture Protection
   The Warranty coverage provides protection against defects in waterproofing, moisture control and ventilation in basements, attics and roofs; insulation around living areas; exterior wall caulking, and siding, gutters and downspouts.

10. Mechanical
    The Warranty coverage is provided for plumbing and water supply fixtures such as faucets, valves and water pipes, as well as operation of the heating and cooling system.

11. Site Work
    The warranty includes protection against defects in the grading established by the builder in backfilled areas of the foundation so surface water drains away from the home. There should be no standing water in the yard 48 hours after no rainfall.

2 year System Warranty

This warranty protects a home from defects in the electrical, plumbing and mechanical distribution systems for a full two years.

1. Mechanical (Waste Piping)
   For smooth-flowing pipes, the systems warranty covers repairs to sanitary sewers, fixtures, and waste and drain lines to prevent clogs or poor drainage.

2. Electrical System
   The systems warranty covers wiring and electrical conductors, ensuring that the home's wiring carries its designed load

3. Mechanical (Duct Work)
   To provide a temperature-controlled environment all year long, systems warranty

coverage includes repairs to the home's heating and cooling ductwork if it separates or detaches.

4. Mechanical (Plumbing)
   To keep water flowing in and out of the home, systems warranty coverage includes waste, vent and water pipe leaks and bursts; heating and air conditioning refrigerant line leaks; and water supply and septic tank system operation.

10 year Structural Warranty

Structural defects are defined as physical damage to a home's designated load-bearing elements described below caused by failure that affects their load-bearing function to the extent that the home becomes unsafe, unsanitary or otherwise unlivable.

1. Roof Framing Systems
2. Floor Framing
3. Load-Bearing Walls & Partitions
4. Beams, Girders
5. Columns
6. Footing & Foundation Systems.
7. Window structural and glazing units

Ichijo Limited Warranty

1 Coverage period

ICHIJO to provide Limited Warranty for 1 year, 2 year and 10 year respectively depending on the building components and elements. (attached hereto as Appendix A)
This Limited Warranty commences on the date of closing, or the date of Home Owner's occupancy whichever occurs first. This Limited Warranty is in effect only if ICHIJO is in receipt of entire contracted/purchase price.

2 Request for warranty services

Warranty inquiries have to be in writing to be considered by ICHIJO. No Limited Warranty work will be performed nor guaranteed until request has been received in writing, unless designated an emergency.

3 Remedy

ICHIJO will, within a reasonable time, examine an alleged defect to determine if it is covered by this Limited Warranty. A defect covered by this Warranty will be repaired, replaced, or replaced with item of like kind, at ICHIJO's expense. Any repair or replacement shall not extend the Warranty term. The total liability of Warranty is limited and shall not exceed the sales price of the home.

4 Right of access

Home Owner to provide ICHIJO access to property to perform its work under this Warranty. Failure to provide such access may relieve ICHIJO of its obligations.

5 Exclusions

1) Damages or losses resulting from accidents; civil commotion; acts of God or Nature – including, but not limited to wind storms, wind driven water, floods, sink holes, hail, lightning, fallen trees, earthquakes, explosions, fire, smoke, water escape, or changes in underground water table.
2) Defects or damages caused by animal droppings, rubbing, eating or infestation.
3) Any condition which does not result in actual physical damage to the Home including, but not limited to un-inhabitability or health risk due to presence or consequence of unacceptable levels of radon gas, formaldehyde, mold, carcinogenic substances, or other pollutants and contaminants, or the presence of hazardous or toxic materials.
4) Any soil erosion/sedimentation or storm water control management systems that are approved by a governing jurisdiction.
5) Expenses a HOME Owner may incur as a consequence of defect or warranty repair

including but not limited to the cost of having to move out while repairs are being made, household appliances, or personal properties.

6) Consequential bodily injury or punitive damages.
7) Any defects, damage, or loss which is caused or aggravated by negligence of Home Owner or anyone other than ICHIJO or its employees, agents, or subcontractors.

6 Any appliance or equipment provided by ICHIJO, including but not limited to water heaters, pumps, stoves, ranges, ovens, garbage disposals, dishwashers, furnaces, air conditioning units, heat pumps, photovoltaic systems and other similar items shall be for the manufacturer's warranties to the Home Owner, and to be registered by Home Owner to uphold manufacturer's specific warranty.

7 Discoloring
Repair or replacement of interior or exterior surface, including driveways and sidewalks, shall be limited to the defective area.

8 Transfer of Ichijo Warranty
One (1) year Materials & Workmanship Warranty will automatically terminate if the property is leased, vacated or sold by original Home Owner.
Only two (2) year System Warranty and ten (10) year Structural Warranty will stay with the home and automatically transfer to the new owner upon change of ownership.

IB Roof Systems™

Roof System Maintenance Packet

IB Roof Systems™ | Roof System Maintenance Packet

GENERAL INFORMATION

Building Name: _____

Location: _____

Contact: _____

Owner: _____

Tenant: _____ Tenant Phone: (_____)_____

Architect: _____ Architect Phone: (_____)_____

Roofing Contractor: _____ Contractor Phone: (_____)_____

Membrane Manufacturer: _____

Warranty Terms: _____ Dates Installed: _____

Warranty Coverage Period: _____ From: _____ To: _____

Membrane Type: _____ Thickness: _____

Insulation: _____ Building Height: _____

Design Wind Speed: _____ Roof Area (Sq. Ft.): _____

Specification: _____ Construction Type: _____

Roof Deck Type: _____ Roof Slope: _____ Drainage: ❍ Yes ❍ No

Installation Method: ❍ Fully Adhered ❍ Mechanically Attached

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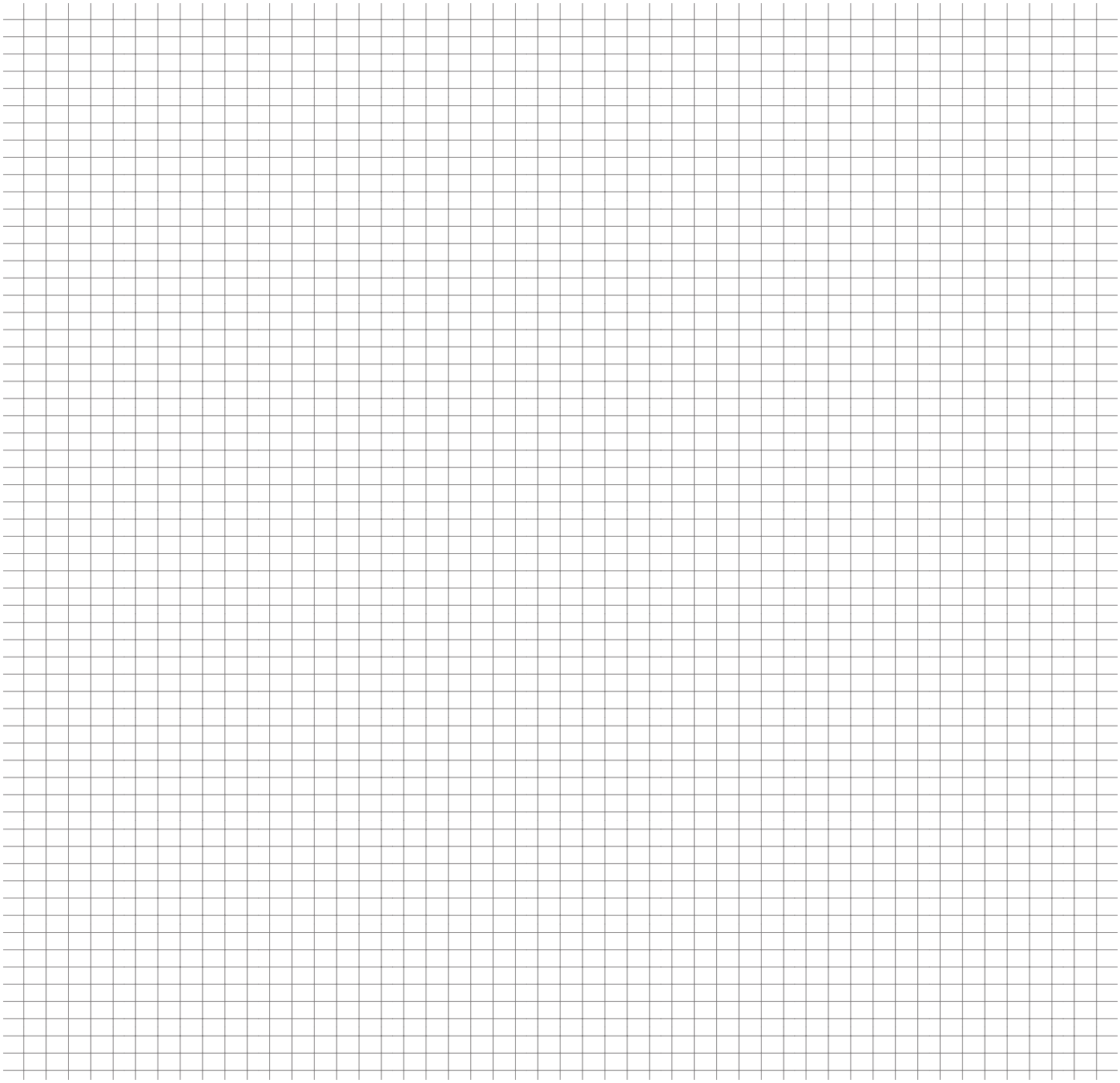
ROOF TOP DRAWING

Draw the shape of the building including outer dimensions. Use the code numbers from the Inspection Form and add to the drawing.

Building Name: _____ Date: _____

Inspector's Name: _____ Phone: _____



Building: _____ Inspection Date: _____

Location: _____

Inspector: _____

Contact: _____ Contact Phone: (_____)_____

Membrane: _____ Surfacing: _____

Installation Method: ❍ Fully Adhered ❍ Mechanically Attached

Has the occupancy or use of the building changed since the last inspection?

❍ No ❍ Yes If yes, how? _____

Have any changes, additions or new penetrations been made to the roof since the last inspection?

❍ No ❍ Yes If yes, how? _____

Has there been leakage?

❍ No ❍ Yes If yes, under what condition? ❍ Light Rain ❍ Heavy Rain ❍ Wind Driven Rain ❍ Leaks Continuously

Were emergency repairs performed? ❍ No ❍ Yes If yes, describe: _____

_____

INSPECTION CHECKLIST

Perform an initial general building inspection: condition may indicate roof problem.

Note location for investigation on roof: _____

INTERIOR: ROOF DECK

Code	Item	Condition Present	Action Needed	Action Taken
A1	Rusting		Roofer/Owner	
A2	Spalling		Roofer/Owner	
A3	Crackling		Roofer/Owner	
A4	Buckling		Roofer/Owner	
A5	Sagging		Roofer/Owner	
A6	Open Joints		Roofer/Owner	

WALLS

Code	Item	Condition Present	Action Needed	Action Taken
B1	Movement		Owner	
B2	Settling		Owner	
B3	Cracks		Owner	
B4	Spalling		Owner	
B5	Paint Peeling		Owner	
B6	Water Stains		Roofer	

EXTERIOR WALLS

Code	Item	Condition Present	Action Needed	Action Taken
C1	Mortar Joints		Owner	
C2	Cracks		Owner	
C3	Stains		Owner	
C4	Efflorescence		Owner	
C5	Sealant Joints		Owner	
C6	Windows		Owner	
C7	Fascia Displaced		Owner	
C8	Gutters Anchored		Owner	
C9	Downspouts		Owner	

ROOF GENERAL

Code	Item	Condition Present	Action Needed	Action Taken
D1	Ponded Water		Roofer/Owner	
D2	Debris		Owner	
D3	Physical Damage		Roofer/Owner	

PERIMETER: CAP FLASHINGS / COUNTER FLASHINGS

Code	Item	Condition Present	Action Needed	Action Taken
E1	Loose/Missing Fasteners		Roofer/Owner	
E2	Loose/Displaced Metal		Roofer/Owner	
E3	Deformed Metal		Roofer/Owner	
E4	Corrosion		Roofer/Owner	
E5	Loose/Missing Joint Covers		Roofer/Owner	
E6	Cracked Sealant		Roofer/Owner	
E7	Punctures		Roofer/Owner	
E8	Other		Roofer/Owner	

PERIMETER: COPING

Code	Item	Condition Present	Action Needed	Action Taken
F1	Loose/Missing Fasteners		Roofer/Owner	
F2	Loose/Displaced Metal		Roofer/Owner	
F3	Deformed Metal		Roofer/Owner	
F4	Corrosion		Roofer/Owner	
F5	Loose/Missing Joint Covers		Roofer/Owner	
F6	Cracked Sealant		Roofer/Owner	
F7	Punctures		Roofer/Owner	
F8	Other		Roofer/Owner	

PERIMETER: EXPANSION JOINTS

Code	Item	Condition Present	Action Needed	Action Taken
G1	Loose/Missing Fasteners		Roofer/Manufacturer	
G2	Loose/Displaced Metal		Roofer/Manufacturer	
G3	Deformed Metal		Roofer/Manufacturer	
G4	Corrosion		Roofer/Manufacturer	
G5	Spliced Joints		Roofer/Manufacturer	
G6	Strip Flashing		Roofer/Manufacturer	
G7	Punctures		Roofer/Manufacturer	
G8	Splitting		Roofer/Manufacturer	
G9	Mechanical Damage		Roofer/Manufacturer	
G10	Hinder Damage		Roofer/Manufacturer	
G11	Other		Roofer/Manufacturer	

PERIMETER: EDGE METAL

Code	Item	Condition Present	Action Needed	Action Taken
H1	Loose/Missing Fasteners		Roofer/Manufacturer	
H2	Loose/Missing Stripped-In Flashing		Roofer/Manufacturer	
H3	Splits in Butt Joint Patches		Roofer/Manufacturer	
H4	Corrosion		Roofer/Manufacturer	
H5	Loose/Missing Metal Sections		Roofer/Manufacturer	
H6	Loose/Missing Joint Covers		Roofer/Manufacturer	
H7	Open End Joints		Roofer/Manufacturer	
H8	Cracked Sealant		Roofer/Manufacturer	
H9	Other		Roofer/Manufacturer	

WALLS: BASE FLASHING

Code	Item	Condition Present	Action Needed	Action Taken
J1	Exposed Top Seal		Roofer/Manufacturer	
J2	Adhesion		Roofer/Manufacturer	
J3	Seams Attachment to the Field		Roofer/Manufacturer	
J4	Vertical End Laps		Roofer/Manufacturer	
J5	Cracked Sealant		Roofer/Manufacturer	
J6	Deterioration		Roofer/Manufacturer	
J7	Punctures		Roofer/Manufacturer	
J8	Sagging/Wrinkles		Roofer/Manufacturer	
J9	Excessive		Roofer/Manufacturer	
J10	Other		Roofer/Manufacturer	

PENETRATIONS: PITCH-PANS

Code	Item	Condition Present	Action Needed	Action Taken
K1	Pitch Pocket Sealant			
K2	Loose Flashing		Roofer/Manufacturer	
K3	Draw Bands		Roofer/Manufacturer	
K4	Other			

PENETRATIONS: DRAINS

Code	Item	Condition Present	Action Needed	Action Taken
L1	Strainers/Clamping Ring		Roofer/Manufacturer	
L2	Clear of Debris			
L3	Flashing		Roofer/Manufacturer	
L4	Ponding		Roofer/Manufacturer	

PENETRATIONS: ROOFTOP EQUIPMENT

Code	Item	Condition Present	Action Needed	Action Taken
M1	Attachment to Curbs		Roofer/Manufacturer	
M2	Access Panels		Roofer/Manufacturer	
M3	Housing		Roofer/Manufacturer	
M4	Liquid Discharge			
M5	Condensation			
M6	Roof Protected		Roofer/Manufacturer	

CONDUIT OR PIPE

Code	Item	Condition Present	Action Needed	Action Taken
N1	Sagging		Roofer/Manufacturer	
N2	Supports Moving		Roofer/Manufacturer	
N3	Joints		Roofer/Manufacturer	
N4	Corrosion		Roofer/Manufacturer	

FIELD: MEMBRANE (GENERAL)

Code	Item	Condition Present	Action Needed	Action Taken
O1	Dis-colorization		Roofer/Manufacturer	
O2	Coating/Surfacing		Roofer/Manufacturer	
O3	Cracking		Roofer/Manufacturer	
O4	Wrinkles		Roofer/Manufacturer	
O5	Punctures		Roofer/Manufacturer	
O6	Walkways, Displaced		Roofer/Manufacturer	
O7	Walkways, Deteriorated		Roofer/Manufacturer	
O8	Walkways Needed		Roofer/Manufacturer	

FIELD: SEAMS

Code	Item	Condition Present	Action Needed	Action Taken
P1	Open T-Joints		Roofer/Manufacturer	
P2	Fish Mouths		Roofer/Manufacturer	
P3	Ridges		Roofer/Manufacturer	
P4	Blisters		Roofer/Manufacturer	

FIELD: ADHERED MEMBRANE

Code	Item	Condition Present	Action Needed	Action Taken
Q1	Unadhered Areas		Roofer/Manufacturer	
Q2	Blisters		Roofer/Manufacturer	
Q3	Loose Insulation		Roofer/Manufacturer	
Q4	Fasteners Backing Out		Roofer/Manufacturer	

FIELD: MECHANICALLY FASTENED

Code	Item	Condition Present	Action Needed	Action Taken
R1	Loose Membrane		Roofer/Manufacturer	
R2	Loose Fasteners		Roofer/Manufacturer	
R3	Fasteners Backing Out		Roofer/Manufacturer	

MISCELLANEOUS

Code	Item	Condition Present	Action Needed	Action Taken
S1	Antennas			
S2	Guy Wires			
S3	Exhaust Vents			
S4	Ice or Icicles		Roofer/Manufacturer	
S5	Oils Deposits		Roofer/Manufacturer	
S6	Surface Contamination		Roofer/Manufacturer	
S7	Soft Areas		Roofer/Manufacturer	
S8	Vandalism			
S9	Vegetation Growth			

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IKO

Setting the Standard

Limited Warranty Information for Asphalt Shingles

Owner's Name: _____

Address: _____

_____

Contractor's Name: _____

Address: _____

_____

Phone #: _____

Contractor's Signature: _____

Date of Application: _____
(mm) (dd) (yy)

Product Applied: _____

Color: _____

Contract Price: _____

Number of Bundles: _____

Complete and retain for your records - do not send to IKO.

Note: This Limited Warranty form does not constitute proof of product purchase.

IKO Asphalt Shingle Limited Warranty

Congratulations on your purchase of IKO asphalt roof Shingles. Your choice gives you a roof backed by over 50 years of experience in making high quality products for homes across North America.

This brochure explains the details of the limited warranty IKO provides on your Shingles after they have been installed on your roof. Read it carefully to ensure you are well-informed about the warranty coverage for your purchase. Also, remember that your contractor or roofer is not an employee or representative of IKO. This limited warranty can only be changed if such change is in writing and signed by an authorized corporate officer of IKO. IKO is not bound by any guarantees, warranties or representations or any change to this limited warranty made by your contractor, roofer or by any other person not an authorized corporate officer of IKO. IKO's Limited Warranty and your coverage is detailed in this booklet (the "Limited Warranty"). If you have questions about that coverage, contact IKO directly for assistance.

There are many terms in this Limited Warranty that have specific meanings. For your convenience some of the terms are defined below:

"AR" means Shingles which are covered by the Limited Algae Resistance Warranty set out herein that provides for the cleaning of discoloration on the exposed face of certain Shingles caused by certain algae growth. Only Shingles shown as "AR" in the Information Tables, and Armourshake, Crowne Slate, Grandeur, and Royal Estate Shingles are covered by a Limited Algae Resistance Warranty. See the section titled "Limited Algae Resistance Warranty" for more details on this coverage.

"High Wind Application" means the installation of Shingles using the specific instructions that appear on the Shingle wrapper. Some local building codes may require additional fasteners. For "High Wind Application" of IKO Shingles, additional fasteners are required during installation. Please check your local building code and the application instructions specific to your Shingles for proper nailing and application requirements.

"IKO" in the United States means IKO Industries Inc. / in Canada it means IKO Industries Ltd.

"Iron Clad Protection" means the limited non prorated coverage provided by the IKO Limited Warranty during the Iron Clad Protection Period. Please read the section titled "IKO Iron Clad Protection Period" for more details on this coverage. The length of the Iron Clad Protection period for each Shingle is listed in the Information Tables below.

"Iron Clad Protection Period" means the initial period of the Warranty Period during which IKO provides Iron Clad Protection coverage. Please read the section titled "IKO Iron Clad Protection Period" for more details. The length of the Iron Clad Protection period for each Shingle is listed in the Information Tables below.

"Limited Warranty" means the limited warranties and your coverage provided by IKO for your Shingles as expressly set out in this document, and are the only warranties being provided by IKO.

"Maximum Liability" means the maximum obligation of IKO under the Limited Warranty, as described in the sections titled "Iron Clad Protection Period", "Beyond Iron Clad Protection Period", "Limited Wind Resistance Warranty" and "Limited Algae Resistance Warranty" whichever is applicable. Please read each of these sections carefully for more details.

"Owner" means the individual owner(s) of the single family residential home at the time that the Shingles were installed on that building. If you purchase a new residence from the builder of the home and are the first person to live in it, IKO will consider you to be the Owner, even though the Shingles had already been installed.

"Purchase" or "Purchased" means the retail purchase of the Shingles covered by this Limited Warranty.

"Shingle" or "Shingles" means the IKO asphalt shingle product identified in this Limited Warranty that was installed on the roof of the building owned by the Owner.

"Square" means 100 square feet of roof area.

"The Information Tables" means collectively the Limited Warranty Information Table and the Limited Lifetime Warranty Information Table below.

In addition to any other specific conditions set forth in this Limited Warranty, the "Warranty Conditions" are standard conditions that must be met for your IKO warranty to be valid. The Warranty Conditions include:

- The Shingles were properly installed, in strict accordance with both IKO's written installation instructions and local building code requirements; and
- The person making the Warranty claim is the Owner of the Shingles, or the person to whom the Limited Warranty was validly transferred as set out herein. For details on Warranty Transfers, please read "Transferability of Warranty" below; and
- The Shingles have a manufacturing defect that has resulted in a leak; and
- The repair or replacement must be with IKO Shingles and must be completed on the same building/structure to which the Shingles covered under this Limited Warranty were originally applied.

Depending on the type of Shingles used on the Owner's roof, other conditions described herein may also apply in order for the IKO warranty to be valid or applicable.

Limited Warranty Information Table

Name of Shingle	War-ranty Period (months)	IKO "Iron Clad Protection Period" (months)	Reduction Figure (first 180 months) n*	Reduction Figure (after 180 months) m*	Maximum Liability/ Dollar Limit per Square	Standard Application/ High Wind Application Warranty (Mph) [km/h]	Algae Resistance Warranty (months)
Armourshake**	Limited Lifetime†	180	Refer to Chart A	Refer to Chart A	95	110/130 [177/210]	120
Cambridge AR**	Limited Lifetime†	180	Refer to Chart A	Refer to Chart A	40	110/130 [177/210]	120
Cambridge	Limited Lifetime†	180	Refer to Chart A	Refer to Chart A	40	110/130 [177/210]	N/A
Crowne Slate **	Limited Lifetime†	180	Refer to Chart A	Refer to Chart A	95	110/130 [177/210]	120
Grandeur **	Limited Lifetime†	180	Refer to Chart A	Refer to Chart A	75	110/130 [177/210]	120
Royal Estate**	Limited Lifetime†	180	Refer to Chart A	Refer to Chart A	45	110/130 [177/210]	120
Marathon Ultra AR**	360	60	n/225	m/900	30	60 [97]	60
Marathon 25	300	60	n/225	m/600	30	60 [97]	N/A
Marathon 25 AR**	300	60	n/225	m/600	30	60 [97]	60
Marathon 20	240	36	n/225	m/300	30	60 [97]	N/A

Chart A – Limited Lifetime Warranty Information Table for Armourshake, Cambridge AR, Cambridge, Crowne Slate, Grandeur & Royal Estate Shingles

Name of Shingle	Warranty Period	IKO "Iron Clad Protection Period"	Reduction Figure for months 181-206	Reduction Figure for months 207-480	Reduction Figure for months 481+
Armourshake	Limited Lifetime†	180	n/260	384/480	432/480
Cambridge AR	Limited Lifetime†	180	n/260	384/480	432/480
Cambridge	Limited Lifetime†	180	n/260	384/480	432/480
Crowne Slate	Limited Lifetime†	180	n/260	384/480	432/480
Grandeur	Limited Lifetime†	180	n/260	384/480	432/480
Royal Estate	Limited Lifetime†	180	n/260	384/480	432/480

† For any non-individual owner, such as a corporation, religious entity, condominium, government entity or homeowner association, or for any non-single family residential home, the Warranty Period for these Shingles is limited to 40 years.

** Hip & Ridge Shingles used for installation of these Shingles must be Marathon Ultra AR, IKO Ultra HP, IKO Hip & Ridge 12 or an IKO approved equivalent product.

n* - refers to the number of months that have passed since the Shingles were installed on the building.

m* - refers to the number of months greater than 180 that have passed since the Shingles were installed on the building.

EXAMPLE - A manufacturing defect resulting in leaks is found in October 2030 in Shingles Purchased with a 25 year limited warranty. The Shingles were purchased in October 2012; 18 years, or a total of 216 months have elapsed since Purchase. IKO's warranty obligation will be reduced by (180/225 = .80) + (36/600 = .06) = .86. So IKO's maximum obligation would be 14% (100 - 86) of the cost of the replacement Shingles.

Asphalt Shingle Limited Warranty

LIMITED WARRANTY

IKO provides a Limited Warranty to the original Owner of its Shingle products. The coverage provided by this Limited Warranty is subject to the terms and conditions listed herein. This Limited Warranty is intended to provide coverage only to the Owner and only for a manufacturing defect that results in leaks. The Limited Warranty starts on the day that the original installation of the Shingles on the roof is completed, and coverage is limited to the length of time listed in the Information Tables for the specific Shingles product installed on the Owner's roof (the "Warranty Period"). The Limited Warranty provides the Owner specific legal rights, but the Owner may also have other legal rights. Those rights will vary from state to state or province to province. In situations where the coverage given includes a dollar value, it is meant to be given in the currency of the country in which the building is located.

IRON CLAD PROTECTION PERIOD

IKO offers Iron Clad Protection as set out below for every Shingle listed in the Information Tables. The length of the Iron Clad Period varies by Shingle product. Refer to the Information Tables to find the Iron Clad Protection Period for your Shingles. The Iron Clad Period starts on the day of installation of the Shingles on the Owner's roof. This coverage is limited to the amount of time shown in the Tables for your Shingles. During the Iron Clad Protection Period, IKO will, at its option, either repair or replace affected Shingles if all Warranty Conditions are met (the "Iron Clad Protection").

If there is a valid claim during the Iron Clad Period, IKO's Maximum Liability is limited to the reasonable cost of placing new Shingles on the Owner's roof. This means that IKO will supply replacement Shingles similar to those already on the roof, plus a reasonable allowance for the cost of applying the new Shingles. Other costs, such as flashings, metal work, vents or repair of any other damages or expenses incurred or claimed, removal of the existing shingles from the roof (tear-off), and disposal of the existing Shingles, are not covered by the Iron Clad Protection or by other terms of the Limited Warranty, including during the Iron Clad Protection Period.

BEYOND IRON CLAD PROTECTION PERIOD

Once the Iron Clad Period expires, the Limited Warranty provides certain outlined coverage to the Owner for the remainder of the Warranty Period outlined in the Information Tables for the Shingle product on your roof (the 'Beyond Iron Clad Protection Period"). This coverage during the Beyond Iron Clad Protection Period will apply only if the Warranty Conditions have been met.

During the Beyond Iron Clad Protection Period, IKO's Maximum Liability is the prorated portion of the replacement Shingles required at the time the claim was reported to IKO. Alternatively, if IKO decides it cannot reasonably provide replacement Shingles, IKO may offer coverage based upon the prorated value of the maximum liability per square shown in the Information Tables. Other costs, including labor, tear-off and disposal of the existing Shingles, other shingles, roof, flashings, metal work, vents or repair of any other damages or expenses incurred or claimed are not covered by the Limited Warranty. The formula used to calculate the coverage available is shown in the Information Tables.

LIMITED WIND RESISTANCE WARRANTY

For Armourshake, Cambridge AR, Cambridge, Crowne Slate, Grandeur and Royal Estate Shingles only, during the first 15 years after they are installed on the Owner's roof, the IKO Shingles carry a Limited Warranty for wind "blow-off" for Shingles lost from the roof due to wind gusts not exceeding certain maximum speeds (a "Limited Wind Resistance Warranty"). Each type of these Shingles carries a maximum wind resistance limit for this coverage. Please refer to the Information Table for the wind speed limits for the Shingles on your roof.

For all other shingles, during the first 5 years after they are installed on the Owner's roof, the IKO Shingles carry a Limited Wind Resistance Warranty for wind "blow-off" for Shingles lost from the roof due to wind gusts not exceeding certain maximum speeds. Each type of these Shingles carries a maximum wind resistance limit for this coverage. Please refer to the Information Tables for the wind speed limits for the Shingles on your roof.

For Shingles specified below in this section, the use of a High Wind Application will increase the limit of the maximum wind resistance under the Limited Wind Resistance Warranty (a "High Wind Resistance Limited Warranty"). The wind speed limits for the High Wind Resistance Limited Warranty for those Shingles are listed in the Information Tables. If additional nails as listed are used for the following shingles, the maximum wind speed increases to one hundred thirty (130) mph (two hundred ten (210) km/h);

(i) three (3) additional (8 in total) nails for Crowne Slate,

(ii) two (2) additional (6 in total) nails for Cambridge AR, Cambridge, Grandeur and Royal Estate,

(iii) one (1) additional (6 in total) nail for Armourshake.

In addition, for the High Wind Resistance Limited Warranty to apply, IKO starter strip shingles must be installed at all eaves and rakes, and IKO Hip and Ridge shingles must be used on all hips and ridges. Also:

(i) the Limited Wind Resistance Warranty will only apply if: (a) the Shingles were installed using roofing nails (not staples) in strict accordance with the instructions on the wrapper and (b) for installations in Canada during the fall, winter or in cool weather, the Shingles have been manually sealed at the time of installation, and for installations at all other times in Canada, and at all times in the U.S., the Shingles have been manually sealed at the time of installation, or have had the opportunity to seal down;

(ii) the High Wind Resistance Limited Warranty will only apply if: (a) the Shingles were installed using roofing nails (not staples) in strict accordance with the instructions on the wrapper and (b) for installations in Canada, the Shingles have been manually sealed at the time of installation, and for installations in the U.S., the Shingles have been manually sealed at the time of installation, or have had the opportunity to seal down.

Shingles that are installed in cool seasons or weather may not seal until weather conditions are adequate to allow the self seal down strip to activate. Please see the NO WARRANTY COVERAGE FOR WIND DAMAGE BEFORE SELF SEALING STRIPS SEAL paragraph in this Limited Warranty for more information regarding the self sealing strip. Please consult your roofer, shingle dealer, the product packaging or our website at www.iko.com for more information on the application instructions for your Shingles

For valid claims under the Limited Wind Resistance Warranty (where the warranty conditions are satisfied), IKO's Maximum Liability is to provide replacement Shingles for those Shingles lost from the roof due to 'blow-off', or alternatively, IKO will pay for the reasonable cost of manually sealing unsealed Shingles. Other costs, such as labor, tear-off, removal or disposal costs of Shingles, other shingles, roof, flashings, metal work, vents or repair of any other damages or expenses incurred or claimed, are not covered by the Limited Wind Resistance Warranty or otherwise.

NO LIMITED WIND RESISTANCE WARRANTY COVERAGE FOR WIND DAMAGE BEFORE SELF-SEALING STRIPS SEAL

All Shingles that contain a factory applied self sealing strip must be subjected to direct sunlight and warm temperatures for several days before full sealing will occur. Shingles installed in the fall or winter may not seal until the following spring. Shingles which do not receive direct sunlight, or which are not exposed to adequate surface temperatures may never seal. Damage to the factory self sealing strip by dust, sand or foreign matter will prevent the sealing strip from activating. This is the nature of shingles and failure to seal down under such circumstances is not a manufacturing defect. IKO will not be responsible for any blow-offs or wind damage that may occur prior to thermal sealing having occurred. After the Shingles have sealed, the Limited Warranty that commenced at installation will cover wind damage or blow-offs, in accordance with the terms listed in the "Limited Wind Resistance Warranty" section of this booklet.

LIMITED ALGAE RESISTANCE WARRANTY

Some IKO Shingles carry a Limited Warranty against discoloration caused by the development of blue-green algae on the exposed face of the Shingles. Please refer to the Information Tables to see whether your Shingles carry this coverage and for the period of coverage provided. If there is a valid claim under the Limited Algae Resistance Warranty, (where all the Warranty Conditions are satisfied), IKO's Maximum Liability is to provide the Owner with a labor payment certificate. The certificate will pay the reasonable costs of cleaning the affected Shingles up to a maximum value of $15 per square. This maximum value will be prorated based upon the number of months that the Shingles have been installed on the Owner's home at the time the claim is filed, divided by the maximum period of coverage listed in the Information Tables.

NON-TRANSFERABILITY OF LIMITED WARRANTY

This Limited Warranty provides rights to, and can only be enforced by the original Owner, or to a person to whom the Limited Warranty is allowed to be and is validly transferred as detailed below in the section titled "Limited Transferability of Limited Warranty". No other person or business can claim coverage or has rights under the Limited Warranty. In addition, IKO does not provide any warranty for Shingles purchased in Canada and installed in the United States or elsewhere not in Canada. Also, IKO does not provide any warranty for Shingles purchased in the United States and installed in Canada or elsewhere not in the United States.

LIMITED TRANSFERABILITY OF LIMITED WARRANTY

The Limited Warranty for your Shingles is intended to primarily provide coverage only to the original Owner of the Shingles. Certain limited provisions of the Limited Warranty and only for a limited period, as outlined below, may be transferred by the original Owner to the next property owner only once during the Limited Warranty period, and only during the first 10 years of the Warranty Period. If the original Owner dies, the Limited Warranty cannot be transferred to the Owner's estate or to anyone else. In the absence of a permissible and valid transfer of the Limited Warranty as set out herein, the Limited Warranty ends on the sale or other transfer of the property.

To transfer certain provisions of the Limited Warranty from the original Owner during the first 10 years of the Warranty Period, the Owner must complete the following steps:

- Notification of a request for transfer must be received in writing by IKO at the Quality Services Office. Both the Canadian and US Office addresses are listed below in the section entitled "Notification of Claims". Notification must be received within 30 days of the completion of the real estate transfer.
- The transfer request must attach the original Proof of Purchase for the Shingles, and a copy of the property transfer documents.
- The transfer request must also include payment in full of a $100 transfer fee to complete the transfer.

Except for Armourshake, Cambridge AR, Cambridge, Crowne Slate, Grandeur, Royal Estate Shingles, upon the sale or transfer of the property, the Iron Clad Protection Period shall automatically terminate and for an allowable and valid transfer of the Limited Warranty, the IKO shingles will then be covered for a limited Beyond Iron Clad Protection Period on a prorated basis for the Shingles only for a period of two (2) years following the transfer of the property. Please see the Limited Warranty Information Table for the method used to calculate the Limited Warranty coverage for the two (2) year period. The Reduction Figure for these Shingles will be n/225.

For Armourshake, Cambridge AR, Cambridge, Crowne Slate, Grandeur and Royal Estate Shingles, if the transfer of the Limited Warranty occurs within the first 7 years (84 months) after installation, the remaining Iron Clad Protection Period will remain intact. See the section titled "Iron Clad Protection Period" for more information. If the transfer takes place more than 7 years after installation, the Iron Clad Protection Period shall automatically terminate and coverage will be calculated on a prorated basis for the Shingles, using the formula shown in the Information Tables. (The Reduction Figure in Chart A for months 85-120 shall be n/260.) Regardless of when the transfer occurs, the Warranty Period for a transferred Limited Warranty for Armourshake, Cambridge AR, Cambridge, Crowne Slate, Grandeur and Royal Estate Shingles is limited to 15 years from the date of original installation.

EXCLUSIONS AND LIMITATIONS

Except as and limited to what is explicitly set out in this Limited Warranty with respect to the Limited Wind Resistance Warranty and the Limited Algae Resistance Warranty, the coverage under this Limited Warranty is only for manufacturing defects that result in a leak of the Shingles on the Owner's roof, and for no other cause whatsoever. Conditions that do not result in a leak, or are not due solely to a manufacturing defect in the Shingles are not covered by the Limited Warranty or otherwise.

As a result, and without limiting the generality of the foregoing, IKO will not have any liability or obligation under the Limited Warranty or otherwise for the following:

1. Any damage that occurs during or after any improper application process, including one that fails to follow IKO's printed application instructions;
2. Any variation in the color or shading between installed Shingles on the building, including the fading or weathering of colored granules used in any of IKO's Shingle blends, backsurfacing transfer between Shingles, or asphalt staining of Shingles. IKO reserves the right to discontinue or modify any of its products, including the color blend of any Shingles, without notice to the original Owner. IKO will not be liable for any costs as a result of such modification or discontinuance of any product;
3. Any damage to the interior or exterior of any building, or any property or contents within or outside any building;
4. Any damage caused by Acts of God or other causes beyond IKO's control, including, without limitation, lightning, gale or wind (except for the coverage in the Limited Wind Resistance Warranty), hail, hurricane, tornado, earthquake, explosion, flood, fungus contamination, solid objects falling on the roof, or any other causes. This exclusion does not apply to ordinary wear and tear of Shingles caused by the elements;
5. Any damage caused by settlement, distortion or cracking of the roof deck, walls or foundation of a building. This includes failure in the materials used as a roof base, or by the presence of people, animals, machinery, equipment or any traffic of any kind on the roof;
6. Any damage caused by buckling of Shingles. The installation of Shingles on dimensional lumber (including shiplap or board decks) is not recommended as it may cause buckling of Shingles;
7. Any damage that arises after the roof is altered following the original installation of the Shingles. This includes any alteration including structural additions, changes, or replacement; or equipment installations (including but not limited to, signs, water towers, fan housings, air conditioning equipment, solar heaters, water heaters, television and /or radio antennas, satellite dishes, skylights, and equipment or machinery of any kind);
8. Any costs incurred for any, work, repairs (whether temporary or permanent) or replacements not authorized in advance in writing by IKO;
9. Costs incurred for materials, repairs or replacements where materials produced by someone other than IKO (unless authorized in advance in writing by IKO to do so);
10. Any damage that arises from any cause other than a manufacturing defect that results in a leak;
11. Any discoloration or damage due to the presence of mold, mildew, fungus, algae, biological growth or pollutant or other matter on the Shingles or roof (except for the coverage in the Limited Algae Resistance Warranty);
12. Any damage or distortion caused by inadequate ventilation either at the eaves or on the rooftop of the building. This includes failure of ventilation caused by blocked, non operative or defective vents or any other condition that renders the ventilation system ineffective. Roof system ventilation should meet local building code standards for total vent area. Ventilation must also be distributed evenly between the rooftop and the eaves of the building;
13. Any costs related to the replacement of the Shingles that is not expressly covered in this Limited Warranty. This means that unless otherwise explicitly set out in this Limited Warranty, the Limited Warranty does not cover the cost of installation, application, tear-off, removal and disposal of Shingles, other shingles, roof flashings, metal work, vents or repair of any other damages caused by or associated with any leakage, or any other costs or expenses the Owner may incur or claim;
14. Any costs related to the removal of any asbestos present in the roof on which the Shingles have been installed;
15. Any damage due to the effects of debris, resins or drippings from trees in contact with or near the Shingles. Such damage may include blisters on the Shingle surface or premature aging caused by debris or matter on the roof;
16. Any damage due to the effects of chemicals on the Shingles, whether applied to the Shingles or roof, airborne or which otherwise come in contact with the Shingles or roof. This means that this Limited Warranty does not cover the effects on Shingles or roof of any chemical including but not limited to aliphatic or aromatic solvents, chlorinated hydrocarbons, turpentine, oils, organic or inorganic polar materials or any other related materials;
17. Any damage due to the excessive use of roofing cement;
18. Any damages or failure in performance of Shingles installed over insulated roof deck panels, except as outlined below under the section "REDUCED WARRANTY COVERAGE FOR INSTALLATION OF SHINGLES ON INSULATED ROOF DECKS";
19. Any Shingle product sold with or bearing "ECONOMY NO WARRANTY" tape or marking. Such Shingle product is sold on an "As Is", no warranty basis;
20. Any damage to Shingles applied in a closed valley application, where Shingles are used to construct the valley or run-off areas on the roof. Open metal valleys are recommended for best roof performance;
21. Any claim under this Limited Warranty where the Owner deliberately or negligently misrepresents any material fact;

NO LIABILITY OR COVERAGE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES

The Limited Warranty provides coverage only for certain limited damage to Shingles that is directly caused by a manufacturing defect. IN NO EVENT SHALL IKO OR ITS AFFILIATES BE LIABLE FOR ANY INDIRECT, ASSOCIATED, INCIDENTAL OR CONSEQUENTIAL DAMAGES. This means, without limiting the forgoing, that this Limited Warranty does not cover claims for: damages to homes or other structures, interiors, exteriors, furniture, contents, appliances, loss of income, loss of enjoyment, storage fees, economic loss, or any other loss or damage. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so this condition may not apply to you in those jurisdictions.

REDUCED WARRANTY COVERAGE FOR LOW SLOPE ROOFS

The Limited Warranty terms set out in this document only apply to Shingles installed on roof slopes of 4 in 12 (1:3) and steeper. The limited Warranty Period for Shingles installed on low slope roofs (i.e. those with a slope of less than 4 in 12 (1:3) and down to 2 in 12 (1:6)) is 12 years, and will be prorated for material only (with no Iron Clad Protection coverage) at an annual reduction rate of 8.33%. If certain application procedures are followed as detailed in the application instructions printed on the Shingle wrapper, the regular Limited Warranty may be available for slopes between 3 in 12 and 4 in 12 (1:4 and 1:3). Please see the product packaging or visit www.iko.com for application procedures and instructions for your Shingles, as certain Shingles may not be suitable for use on slopes below 4:12.

If you do not know the slope of your roof, please contact your contractor or roofer for assistance.

REDUCED WARRANTY COVERAGE FOR INSTALLATION OF SHINGLES ON INSULATED ROOF DECKS

The coverage under this Limited Warranty is reduced for any Shingles, which are applied to any of the following:

a) roof deck assemblies (of slopes greater than 2 in 12) where foam insulation is prefabricated into the roof deck system (commonly known as "nail board insulation"), or
b) where insulation is installed immediately beneath an acceptable roof deck system.

In the event that such Shingles are installed on insulated or unventilated decks the Warranty Period available to the Owner is reduced to 10 (ten) years with no Iron Clad Protection coverage. The annual reduction figure in this case shall be 10% per year.

LIMITED COVERAGE FOR REPLACEMENT SHINGLES

If IKO provides coverage under this Limited Warranty for a submitted claim, the replacement Shingles are covered by the Limited Warranty only for the remainder of the Warranty Period starting from the date of the original installation of the replaced Shingles.

SEVERABILITY

Each provision of this Limited Warranty is intended to be severable. If any provision hereof is illegal, invalid or unenforceable in whole or in part, such illegality, invalidity or unenforceability shall not affect the legality, validity or enforceability of the remainder hereof. Any provision hereof that is held to be illegal, invalid or unenforceable in any jurisdiction shall be illegal, invalid or unenforceable in that jurisdiction without affecting any other provision hereof in that jurisdiction or the legality, validity or enforceability of that provision in any other jurisdiction, and to this end the provisions hereof are declared to be severable.

NOTIFICATION OF CLAIMS

To receive coverage under the Limited Warranty, the following steps must be followed. This allows IKO the opportunity to review the claim and determine if the reported condition is covered by the Limited Warranty terms. To file a claim, the Owner must:

1. Contact IKO Quality Services within thirty (30) days of becoming aware of the alleged concern. The Owner may reach IKO toll free at the numbers listed below:

   Eastern Canada 1-800-361-5836 Western Canada 1-800-521-8484 United States 1-800-433-2811

2. Provide all information requested by the IKO Quality Services representative in order to open a claim. The Quality Services representative will then forward a Homeowner Inquiry Survey to your attention.
3. Complete and sign the Homeowner Inquiry Survey. Return the completed Survey along with the following additional items:
   a. A valid Proof of Purchase for your Shingles, which must identify that the Shingles are IKO Shingles, the model of IKO Shingle, the quantity of Shingles Purchased and the date of original Purchase.
   b. The required clear color photos as detailed in the Survey information.
   c. Two complete sample Shingles from the roof which demonstrate the alleged concern. (If claim is for color concerns, please send two full sample shingles of the lighter color and two full samples of the darker color.)
   d. Any other information requested by the Quality Service representative during the original reporting call.
4. All requested materials should be provided to IKO within 30 days of the discovery of the alleged concern at the address listed below. The cost of shipping the materials required for the claim is the responsibility of the Owner. Claims materials should be sent to:

   Canada
   IKO Industries Ltd.
   80 Stafford Drive
   Brampton ON
   L6W 1L4

   United States
   IKO Industries Inc.
   235 West South Tec Drive
   Kankakee IL
   60901-8426

5. Provide IKO and its representative(s) with access to all of the IKO Shingles in question, and the roof and outside and inside of the building upon which it was installed for the purpose of investigating the claim, if IKO requests access. This request may include physical inspection of the roof surface, taking sample Shingles, and photographing the roof surface and the attic space, should IKO determine that such information is needed.

If the Owner fails to send in all requested information or does not otherwise comply with these steps, it may result in a delay in response to the claim and IKO is entitled to conclude that the claim is not valid and decline coverage under the Limited Warranty.

IKO will evaluate and respond according to any obligations under the Limited Warranty within approximately 60 days of receiving all necessary information needed to assess reported claim.

IMPORTANT NOTICES

This Limited Warranty replaces all other oral or written warranties, liabilities or obligations of IKO. There are no other warranties which extend beyond the limited warranty described in this document. IKO will not be liable for any oral statement or other written statement about any IKO Shingle, whether such statements are made by an agent or employee of IKO or by any other person. IKO does not authorize its representatives, distributors, contractors or dealers to make any changes or modifications to this limited warranty. EXCEPT WHERE PROHIBITED BY LAW, THE OBLIGATION CONTAINED IN THIS LIMITED WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER OBLIGATIONS, WARRANTIES, CAUSES OF ACTION, CONDITIONS, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND EXCEPT FOR THE OBLIGATION EXPRESSLY CONTAINED IN THIS LIMITED WARRANTY, LIABILITY IS EXCLUDED RELATING TO, IN CONNECTION WITH, OR ARISING FROM, ANY RIGHT, CLAIM, REMEDY AND CAUSE OF ACTION AGAINST IKO OR ANY OF ITS AFFILIATED OR RELATED COMPANIES, OR THEIR AGENTS, OFFICERS, DIRECTORS AND EMPLOYEES, INCLUDING, WITHOUT LIMITATION, STRICT LIABILITY, STATUTE, TORT, NEGLIGENCE, WAIVER OF TORT AND INDIRECT, ASSOCIATED, INCIDENTAL OR CONSEQUENTIAL DAMAGES.

MANDATORY BINDING ARBITRATION: EVERY CLAIM, CONTROVERSY OR DISPUTE OF ANY KIND WHATSOEVER INCLUDING WHETHER ANY PARTICULAR MATTER IS SUBJECT TO ARBITRATION (EACH AN "ACTION") BETWEEN YOU AND IKO (INCLUDING ANY OF IKO'S EMPLOYEES AND AGENTS) RELATING TO OR ARISING OUT OF THE SHINGLES OR THIS LIMITED WARRANTY SHALL BE RESOLVED BY FINAL AND BINDING ARBITRATION, REGARDLESS OF WHETHER THE ACTION SOUNDS IN WARRANTY, CONTRACT, STATUTE OR ANY OTHER LEGAL OR EQUITABLE THEORY. TO ARBITRATE AN ACTION AGAINST IKO, YOU MUST INITIATE THE ARBITRATION, FOR U.S. CLAIMS, IN ACCORDANCE WITH THE RULES OF THE FEDERAL ARBITRATION ACT, TO BE CONDUCTED IN ACCORDANCE WITH THE RULES OF THE AMERICAN ARBITRATION ASSOCIATION, AND FOR CANADIAN CLAIMS, IN ACCORDANCE WITH THE ARBITRATION ACT, R.S.A. 2000, c. A-43, ALBERTA, AS MAY BE AMENDED) AND YOU MUST COMMENCE THE ARBITRATION AND PROVIDE WRITTEN NOTICE TO IKO BY CERTIFIED MAIL AT THE APPLICABLE ADDRESS NOTED ABOVE, WITHIN THE APPLICABLE TIME PERIOD PRESCRIBED IMMEDIATELY BELOW. Some jurisdictions do not allow mandatory arbitration, so the above mandatory arbitration provisions may not apply to you in those jurisdictions.

NO ACTION OR BREACH OF THIS LIMITED WARRANTY OR ANY OTHER ACTION AGAINST IKO RELATING TO OR ARISING OUT OF THE SHINGLES, THEIR PURCHASE OR THIS TRANSACTION SHALL BE BROUGHT LATER THAN ONE (1) YEAR AFTER ANY CAUSE OF ACTION HAS ARISEN OR ACCRUED. IN JURISDICTIONS WHERE STATUTORY CLAIMS OR IMPLIED WARRANTIES AND CONDITIONS CANNOT BE EXCLUDED, ALL SUCH STATUTORY CLAIMS, IMPLIED WARRANTIES AND CONDITIONS AND ALL RIGHTS TO BRING ACTIONS FOR BREACH THEREOF EXPIRE AFTER ONE (1) YEAR, OR SUCH LONGER PERIOD OF TIME IF MANDATED BY APPLICABLE LAWS, AFTER THE PURCHASE OF THE SHINGLE PRODUCT. SOME JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY OR CONDITION LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU IN THOSE JURISDICTIONS.

YOU FURTHER AGREE THAT YOUR CLAIM(S) WILL NOT BE CONSOLIDATED OR AGGREGATED WITH THE CLAIM(S) OF ANY OTHER PERSONS BY CLASS ACTION OR OTHERWISE WITHOUT THE WRITTEN CONSENT OF IKO.

This Limited Warranty applies to IKO Shingles sold on or after February 1, 2012 and supersedes all previously published warranties.

IB Roof Systems™

Lifetime Residential Limited Material Warranty

Certificate Number:
R02-020320

Our Promise
IB Roof Systems, ("IBRS"), proudly warrants that, subject to the other terms, conditions and limitations below, IBRS will replace the IBRS membrane that fail due to a manufacturing defect. This Warranty is void unless the IBRS membrane has been or is intended to be installed as part of an IB Roof System. IBRS does not provide labor or cover the cost to remove, dispose, re-install, construct, repair or maintain any product, improvement or structure except for the replacement of the IBRS membrane to the limited extent stated above.

Warranty Period
This Warranty commences upon the **'Date of Completion'** and will last for as long as you own the home, conditioned upon the submittal by mail of the completed Warranty Registration Form attached below and receipt of full payment of all labor and materials with the IB Roof System. **"Lifetime"** means for as long as the original owner owns the property and is alive, but if the owner is not a natural person, "Lifetime" means 15, 20, or 25 years based on material thickness installed. To transfer the remaining balance of this Warranty to a new owner, refer to Section d under the Owner's Responsibilities Section of this Warranty for the conditions of a transfer.

Owner's Responsibilities: Owner's failure to comply with the terms and conditions herein may void this Warranty.

a. **If a leak is discovered.** Immediately call the original roofing installer to report the leak location and severity. If suspected to be a material defect, then call IBRS' Technical Services Department at 800-426-1626 within five (5) calendar days (120 hours) of discovery and send written notice within fourteen (14) days of discovery to Attn: Warranty Department, IB Roof Systems, 2877 Chad Drive, Eugene, OR 97408. **Notice to the roofing installer is not notice to IBRS**. Reporting a leak to IBRS is owner's authorization for IBRS to investigate, including inspection of the roof as IBRS deems necessary. Any non-IBRS supplied material or equipment that impedes investigation or repair of the IB Roof System must be removed at Owner's expense. IBRS may acknowledge and investigate Owner's notice of a potential warranty claim by issuing a warranty claim kit that requires further information from Owner. Owner must promptly provide IBRS any information reasonably requested in the warranty claim kit. If no leak covered by this Warranty is found, Owner agrees to pay an investigation fee of $500 within sixty (60) days of invoice.
b. **Emergency Repairs.** After calling IBRS' Warranty Department, owner may, if necessary to minimize damage to the building or its contents, perform emergency repairs at the owner's sole expense. These repairs will not void this warranty so long as the emergency repairs were reasonable under the circumstances and do not result in permanent damage to or concealment of the IB Roof System.
c. **Maintenance.** The owner must perform periodic inspections (not less than every six months) of the entire roof and visible structure for signs of deterioration, wear, damage or water infiltration and perform routine roof maintenance, including but not limited to cleaning out and inspecting the condition of the gutters, roof drains and scuppers; keeping the roof free of debris; gently removing accumulated dirt, dust and general pollutants; properly re-caulking or resealing (with compatible products) any areas necessary to maintain waterproofing (including in and around reglets, pitch pans, clamps/draw band connections, and any other terminations or penetrations in and around the IB Roof System). The owner should keep records of inspections and maintenance. For more maintenance information, go to the IBRS website at www.ibroof.com.
d. **Transfer.** If transferred, the balance of any **"Lifetime"** warranty period shall be the remaining balance of the warranty based upon the original thickness of the membrane chosen for the installation **(ie. 50 mil-15 Yr, 60 mil-20 Yr, and 80 mil-25 yr)** from the date of the original membrane installation. Owner can transfer this Warranty to a subsequent owner for the remaining term only if **(a)**. Owner provides thirty (30) days written notice of the change in ownership by filling out the Warranty Transfer Form located on the IBRS website, (www.ibroof.com), in the Warranty Transfer Section. **(b)**. Owner makes any repairs to the IB Roof System or other roofing and building components that are identified by IBRS as necessary to preserve the integrity of the IB Roof System; and **(c)**. Owner pays a transfer fee of $250. This Warranty is not otherwise transferable by contract or operation of law.

Exclusions from Coverage. This Warranty does not cover leaks or other conditions caused by:

a. **Natural Disaster,** such as gale force wind or hail, windfall or wind-blown debris, flood, tornado/micro burst, hurricane, lightning/electrical storm, fire, earthquake, or any act of God.
b. **Failure of substrate under the IB Roof System,** including collapse, movement, deflection, loss of insulation or R-value, excessive moisture infiltration or condensation, or failure of any portion of any underlying structure.
c. **Change in use, abuse or misuse,** including excessive foot traffic, staging or storage of any nature on the IB Roof System; failure to properly maintain the roof system; or substantial change in the usage of the building without IBRS approval. Misuse includes using any portion of the IB Roof System for any purpose other than a roof waterproofing system.
d. **Alterations during or after installation,** including any additions, penetrations, or substantial work performed on or through the IB Roof System that is not in compliance with IBRS specifications and installation instructions.

e. **Any building material or component other than the IB Roof System membrane,** including without limitation; caulking or sealants; seams or any other connection, product or adhesive that ties or connects the IB Roof System to any other non-IB Roof System product; and any other material, component or product other than the membrane itself.
f. **Building design,** including but not limited to inadequate ventilation or insulation R-values, and improper placement of insulation.
g. **Contact with incompatible products,** materials, cleaners, chemicals or compounds, environmental fallout and any other chemicals not designated as "Satisfactory" in the Chemical Compatibility Sheet that is in effect on the Date of Completion.
h. **Animals, plants, insects, or other organisms** on or beneath the IB Roof System, including algae, moss, fungi, lichens, mold, or mildew. This Warranty also does not cover discoloration, dulling, loss of reflectivity, loss of acrylic surfacing, loss of printed patterns, or accumulation or retention of dirt, dust, or general pollutants.
i. **Any condition that is not in accordance with IBRS installation instructions,** (such as base flashing height or fasteners per square foot), unless specifically accepted by IBRS in writing.
j. **Improper Installation.** IBRS' "authorized" designation of applicators in no way warrants workmanship in any particular case.

Limitation of Damages, Choice of Law & Jurisdiction
THIS WARRANTY SUPERSEDES AND REPLACES ALL OTHER EXPRESSED (WRITTEN OR ORAL) AND IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, ALL OF WHICH ARE HEREBY EXPRESSLY DISCLAIMED. THIS WARRANTY IS OWNER'S SOLE AND EXCLUSIVE REMEDY. IBRS SHALL NOT BE LIABLE UNDER ANY THEORY OF LAW OR EQUITY (INCLUDING BUT NOT LIMITED TO NEGLIGENCE, BREACH OF WARRANTY OR STRICT LIABILITY) FOR ANY GENERAL, SPECIAL CONSEQUENTIAL, INCIDENTAL OR OTHER DAMAGES OF ANY KIND, INCLUDING BUT NOT LIMITED TO LOST PROFITS, INJURY OR DAMAGE TO ANY BUILDING OR STRUCTURE, ITS CONTENTS, OR ANY PERSON DUE TO ANY CAUSE, INCLUDING WITHOUT LIMITATION PRODUCT FAILURE, LEAKS, MOISTURE, CONDENSATION, MOLD, ORGANISMS, CHANGE IN APPEARANCE, LOSS OF REFLECTIVITY, VAPOR OR ODORS. Inspection(s) (if any) of the installation or condition of a roof are solely for IBRS' information and convenience, and any such inspection(s) shall not create any additional duty, liability or warranty by IBRS, express or implied, nor any additional remedy for the Owner or any other person . Owner is solely responsible for the investigation and remedy of any non-covered leaks or conditions. This Warranty is governed by the laws of the State of Oregon. Purchase of the IB Roof System constitutes irrevocable consent to the exclusive jurisdiction and venue in state or federal courts in Multnomah or Lane County, Oregon in all disputes against IBRS arising out of or relating to the purchase, use or warranty of this product. SOME STATE DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR LIMITATION OR EXCLUSION OF IMPLIED WARRANTIES, SO THESE EXCLUSIONS AND LIMITATIONS MAY NOT APPLY TO YOU.

NO REPRESENTATIVE, EMPLOYEE OR AGENT OF IBRS IS AUTHORIZED TO MODIFY THIS WARRANTY except in writing as authorized by IBRS' Technical Services Director.

THIS IS YOUR COPY OF THE WARRANTY WITH A UNIQUE REGISTRATION NUMBER. Please retain this section for your records and refer to the terms and conditions of your warranty should a roof top concern occur. You will not be contacted by IBRS with regards to product activation.
For the fastest response to a concern, contact your original installing contractor first and explain in detail your issue. The contractor information is located directly below this statement.

Roofing Contractor: _____ Phone: _____

Date of Completion: _____ Type of Membrane: _____

Owner's Name: _____ Color of Membrane: _____

Installation Address: _____

City, State, Zip: _____

Linear®
Building On Innovation.

PROFESSIONAL INSTALLATION BY:

MODEL LDC0800
BELT-DRIVE OR CHAIN-DRIVE
DC MOTOR GARAGE DOOR OPENER

HOMEOWNER'S INSTRUCTIONS

For Sectional Type Doors

IMPORTANT SAFETY NOTES

Please read the instructions carefully! This garage door opener is designed to provide safe and reliable service if installed and tested as described in these instructions. A garage door is the largest mechanical appliance in a residence. Care must be taken to prevent injury or death during installation and operation of the garage door and garage door opener.

THE FOLLOWING FORMATS ARE USED FOR SAFETY NOTES IN THESE INSTRUCTIONS.

⚠ WARNING ⚠

This type of warning note is used to indicate possible mechanical hazards that may cause serious injuries or death.

⚠ CAUTION ⚠

This type of warning note is used to indicate the possibility of damage to the garage door or garage door opener.

IMPORTANT USER SAFETY INSTRUCTIONS

⚠ WARNING ⚠

A MOVING GARAGE DOOR CAN CAUSE INJURY OR DEATH!
TO REDUCE THE RISK OF DEATH OR SEVERE INJURY:

1. **READ AND FOLLOW ALL INSTRUCTIONS.**
2. **Use this operator only with sectional overhead doors no more than 10 ft. tall.**
3. **NEVER LET CHILDREN OPERATE, OR PLAY WITH DOOR CONTROLS! KEEP REMOTE CONTROL AWAY FROM CHILDREN!**
4. **Always keep moving door in sight and away from people and objects until it is completely closed. NO ONE SHOULD CROSS THE PATH OF THE MOVING DOOR.**
5. **NEVER GO UNDER A STOPPED, PARTIALLY OPEN DOOR.**
6. **Test door opener monthly. The garage door MUST reverse on contact with a 1-1/2 inch object (or a 2x4 board laid flat at the center of the door) on the floor. If adjusting either the force or the limit of travel, re-test the door opener. Failure to adjust the opener properly may cause severe injury or death.**
7. **If possible, use the red emergency release handle only when the door is closed. Use caution when using this release with the door open. Weak or broken springs may cause the door to fall rapidly, causing injury or death.**
8. **KEEP GARAGE DOORS PROPERLY BALANCED. (See Garage Door Opener Maintenance) An improperly balanced door could cause severe injury or death. Have a qualified service person make repairs to cables, spring assembly and other hardware.**
9. **SAVE THESE INSTRUCTIONS.**

1 Using the Garage Door Opener

Opening the Door

1. With the door in view, press the wall station's UP/DOWN ARROW button, the button assigned to the opener on the remote control, or enter a valid access code and press START/STOP on a remote keypad.
2. When the opener is activated, the opener's light will turn on and the door will begin to open.
3. The door will open until the open limit is reached. If an obstacle is encountered (opener's light flashes four times) while the door is opening, the door will stop.
4. The opener's light will stay on for about five minutes after the door stops.

Closing the Door

1. With the door in view, press the wall station's UP/DOWN ARROW button or the button assigned to the opener on the remote control, or enter a valid access code and press START/STOP on a remote keypad.
2. When the opener is activated, the opener's light will turn on and the door will begin to close.
3. The door will close until the close limit is reached. If an obstacle is encountered (opener's light flashes four times), or the safety beam is interrupted (opener's light flashes three times) during closing, the door will stop, then re-open.
4. The opener's light will stay on for about five minutes after the door stops.

Stopping the Door Mid-travel

1. **The door can be stopped immediately at any time by pressing the wall station's UP/DOWN ARROW button, the remote control's pushbutton, or press the START/STOP button on a remote keypad (if the remote keypad was used to start the door).**
2. The next time the opener is activated, the door will move in the opposite direction.

Vacation Lock for Additional Security

1. Slide the wall station's LOCK switch to the locked position to prevent remote controls from opening the door after the door is completely closed. The remotes can close the door, but not open it. The door can still be opened or closed by using the wall station's UP/DOWN ARROW pushbutton.

➤ ***NOTE:*** *To signal that the vacation switch is locked, the opener's light and red light will flash five times if a remote is activated in an attempt to open the door.*

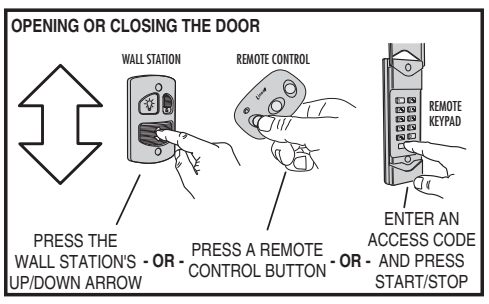
2. Slide the wall station's LOCK switch to the unlocked position to return the opener to normal operation.

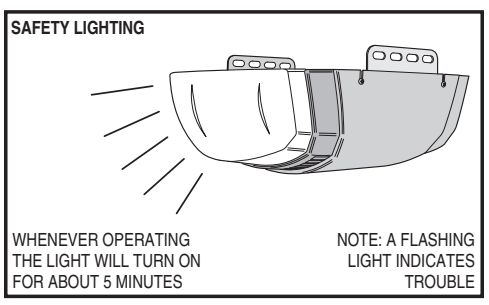
Controlling the Opener's Light

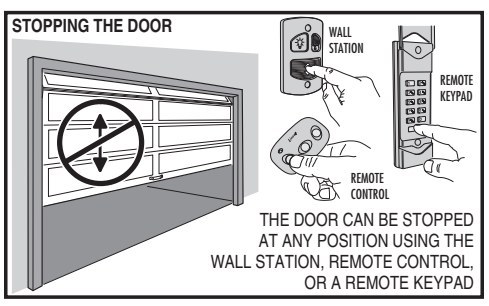
1. The opener's light can be lit by pushing the wall station's LIGHT button. The light will remain on until the LIGHT button is pressed again or the opener is cycled.
2. If the opener's light is on, pushing the wall station's LIGHT button will turn the opener's light off.

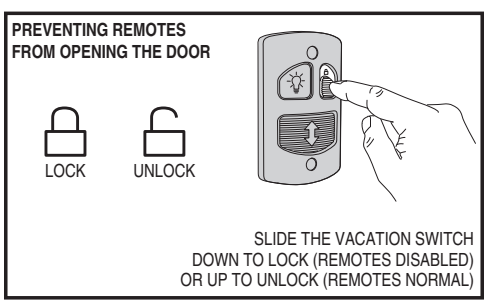
Disconnecting the Door from the Opener

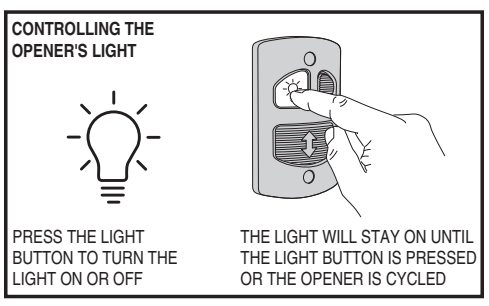
1. With the door in any position (preferably closed), carefully pull the red release handle. **USE CAUTION IF THE DOOR IS OPEN, THE DOOR MAY DROP.**
2. The disconnected door can be opened or closed manually.
3. To reconnect the opener, flip the release lever up. Raise or lower the door manually until the opener reconnects.

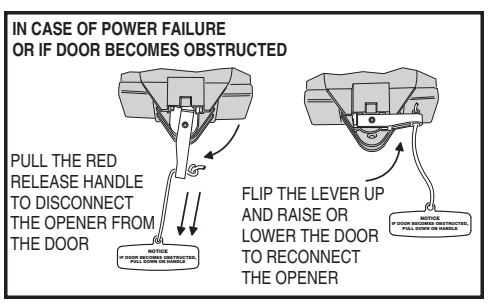












2 Remote Controls

This opener is supplied with a three-button remote control (the second and third buttons can be used to control an additional opener or gate if it contains a Linear MegaCode™ receiver). Additional single and multi-button remote controls can be purchased. The short wire on the back of the opener serves as an antenna for the remote controls. Do not cut off the wire or the remote controls will not operate well.

⚠ WARNING ⚠

Children operating or playing with a garage door opener can injure themselves or others. The garage door could cause serious injury or death. Do not allow children to operate the remote control(s) or the wall station. A moving garage door could injure or kill someone under it. Activate the opener only when the door is clearly visible, free of obstructions and adjusted properly.

To Add or Remove a Remote Control

1. Press the opener's LEARN button. The opener's light and red light will flash once and turn on for about 15 seconds. **A remote must be added or removed while the red light is still on.**
2. Send a signal from a remote. The opener's light and the red light will flash once if a remote was added, or the opener's light and the red light will flash four times if a remote was removed.
3. Repeat Steps 1 & 2 for any additional remote controls.

To Remove all Remote Controls

1. Press and hold the opener's LEARN button for ten seconds or more.
2. Release the LEARN button. **The red light and opener's light will blink three times signaling that all of the remotes in the opener's memory were erased.** The red light will turn off, then turn on for 15 seconds. A remote control can be entered during this time using Step 2 above.

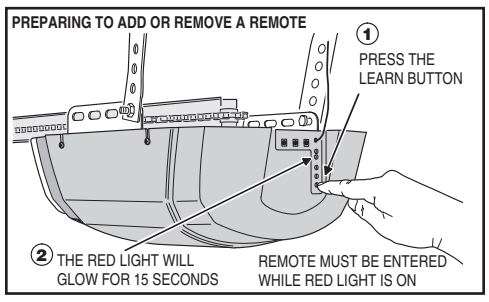
Testing

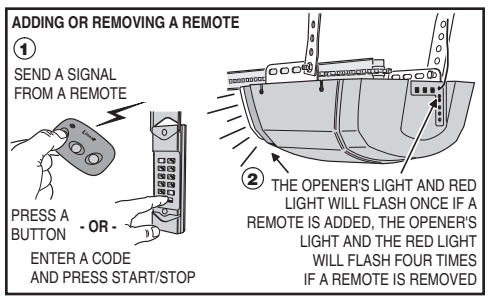
1. Before testing the remote control, straighten out the opener's antenna wire so it points up.
2. **Stand clear of the door,** press the remote control's button and verify that the opener starts.

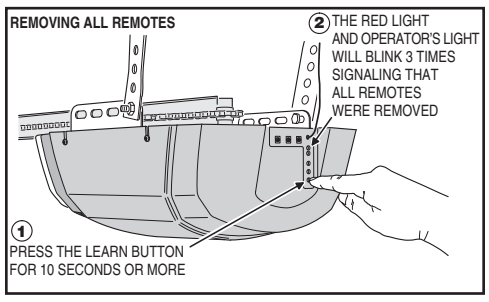
Replacing a Remote Control's Batteries

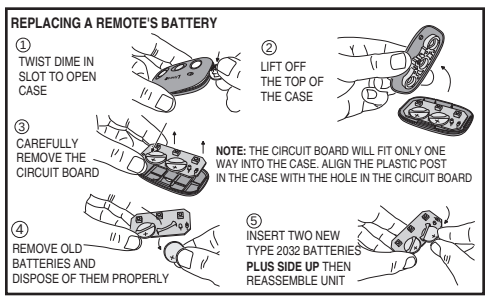
When the red light on the remote glows dimly, or fails to light at all when the remote is activated, the batteries need replacing.

1. Open the remote's case and remove the circuit board.
2. Replace old batteries with two Type 2032 batteries.
3. Re-assemble the remote.









3 Garage Door Opener Maintenance

Weather conditions may affect the door operation which could require some re-setting of the opener's adjustments. Doors may swell and become heavier during wet periods, door hinges and rollers might bind during cold periods. To insure safe operation of the door, perform the following tests, including any additional test steps described.

Every Month

1. With the door closed, pull the red release handle to disconnect the opener from the door.
2. From outside the garage, slowly open the door manually all the way, and then close it all the way. Notice if there is any binding, sticking or rubbing. The door should move smoothly in both directions.
3. Raise the garage door about halfway up. Carefully release the door and see if the door balances. It should stay in place. Close the door.

➤ ***NOTE:*** *If the garage door is unbalanced or the door travel isn't smooth, have a qualified garage door professional adjust or repair the door.*

4. To reconnect the opener, flip the release lever up and run the opener.
5. Perform the Safety Beam Test (Section 4).
6. Perform the Safety Reversal System Test as described in Section 8.

After Servicing the Opener

1. Perform the Safety Beam Test (Section 4).
2. Perform the Open and Close Limit Adjustments (Section 5).
3. Perform the Safety Reversal System Test (Section 8).

Every 6 Months

Check the belt or chain tension.

- For belt-drive rails, examine the length of the tension spring in the traveler. It should be about 1" long.
- For chain-drive rails, examine the spacing between the turnbuckle and the rail. The turnbuckle should be slightly above the rail.

➤ ***NOTE:*** *Too much or too little chain tension will cause excessive sprocket noise.*

Chain Adjustment

If necessary, use the following steps to adjust the chain.

1. Hold the turnbuckle with a flat blade screwdriver and loosen the two locknuts with a 7/16" end wrench.
2. Twist the turnbuckle to adjust the chain tension. Adjust the chain until the turnbuckle is sightly above the rail.
3. Hold the turnbuckle with a flat blade screwdriver and tighten the two locknuts with a 7/16" end wrench.

Belt Adjustment

The tension spring in the traveler keeps the belt taut. The factory setting for the tension spring length is .9" long. If the tension spring is longer than 1", adjust the belt.

1. Hold the traveler so the adjustment wheel is visible through the large slot.
2. Use a flat blade screwdriver to turn the adjustment wheel to compress the tension spring until its length is between .9" and 1" long.

Every Year

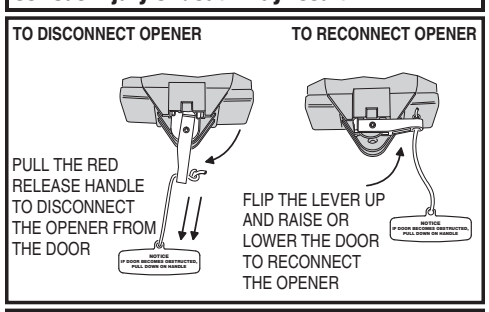
Check the door hardware for lubrication needs. Lubricate door hinges, rollers and bearings according to door manufacturer's recommended procedures.

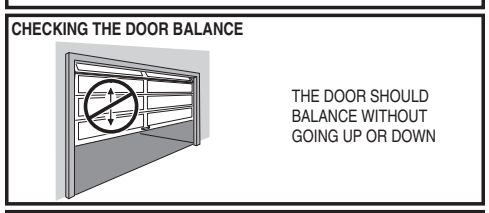
⚠ WARNING ⚠

Garage door hardware (springs, cables, brackets, pulleys, etc.) are under extreme pressure and tension. DO NOT ATTEMPT TO LOOSEN, TIGHTEN OR ADJUST ANY DOOR HARDWARE. CALL A QUALIFIED GARAGE DOOR INSTALLATION PROFESSIONAL!

⚠ WARNING ⚠

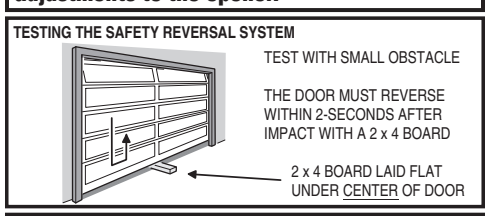
The garage door opener must not be installed and used on an unbalanced door. The opener's internal door force sensor will not function properly on an unbalanced door. Risk of serious injury or death may result.

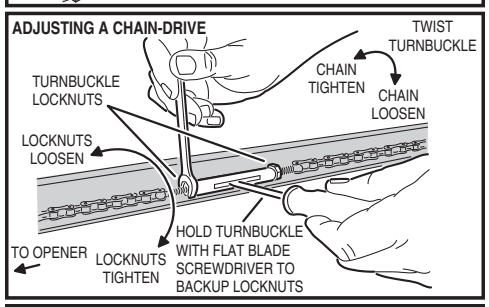


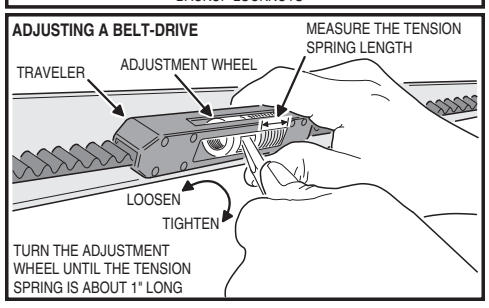


⚠ WARNING ⚠

Always perform the entire Safety Reversal System Test (see Section 8) after making any adjustments to the opener.







4 Testing the Infrared Safety Beam

The safety beam has two components, a sender and a receiver. The sender produces a narrow infrared beam that travels across the bottom of the door opening to the infrared receiver. If an object blocks the infrared beam while the door is closing, the door will stop, then reverse and fully open (the opener's light will flash three times).

As a safety feature, the opener will ignore signals from all remote controls if the door is open and the infrared safety beam is blocked or out of alignment. In this case, the door can be forced closed by pressing and holding the wall station's up/down arrow pushbutton (be sure the door area is in clear view).

⚠ WARNING ⚠

With the door closed, disengage the trolley from the chain during these alignment tests by pulling the red release handle.

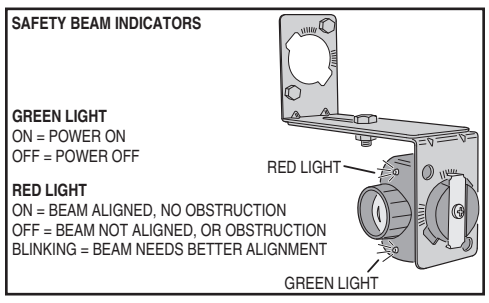
⚠ WARNING ⚠

Serious injury or death from a closing garage door may result because of failure to test and adjust safety reverse system. Repeat this test monthly and adjust as needed.

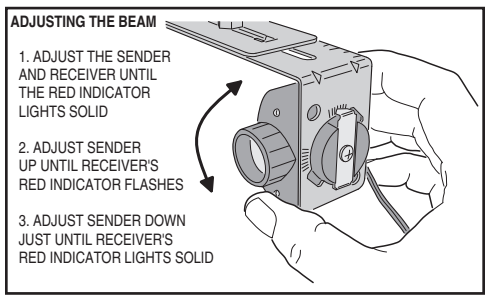
Safety Beam Test

1 Check that the opener has power. The green lights on the sender and receiver should be lit.

2 If the receiver's green light is on, but the red light is off, the receiver has power but is not detecting the infrared beam from the sender. The red light might flash when the beam is partially detected. This can be caused by mis-alignment or something blocking the beam. Adjust the safety beam sender and receiver while watching the receiver's red light (stay out of the beam while aligning it). When the red light stays on, rotate the sender towards the ceiling and stop when the red light on the receiver begins to flicker. Rotate the sender back towards a horizontal position with the floor and stop as soon as the red light on the receiver lights solid. The beam is now properly aligned.



SAFETY BEAM INDICATOR TABLE	
GREEN ON	POWER ON
GREEN OFF	POWER OFF
RED ON	BEAM OK - NO BLOCKAGE
RED OFF	BEAM BLOCKED OR MIS-ALIGNED
RED FLASHING	BEAM ALIGNED POORLY

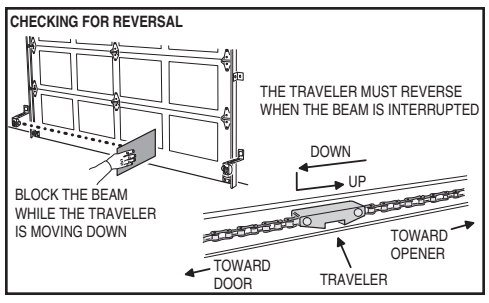


➤ ***NOTE:*** *If the receiver's red light remains off, check for: 1) Dirt on the receiver's lens, 2) Sunlight shining into the receiver's lens, 3) A short in the safety beam wiring (from staples or at the opener terminals).*

3 **With the door closed and the opener disengaged from the door,** press the wall station's UP/DOWN ARROW button to move the traveler (the part on the belt or chain that the trolley engages with) to the up position (away from the door). **NOTE: Do not cycle the opener to full travel without the door connected.**

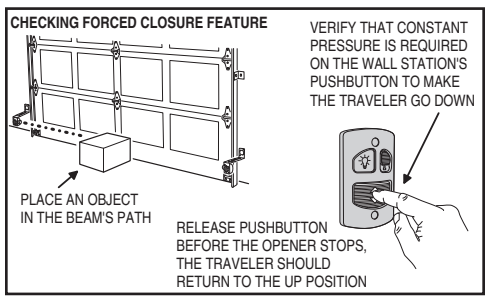
4 Push the wall station's UP/DOWN ARROW button again. While the traveler is moving to the down position (toward the door), block the safety beam. **THE TRAVELER MUST STOP, THEN REVERSE TO THE UP POSITION.** The opener's light and red light should flash three times.

5 Place an object in the path of the safety beam. Check that constant pressure is required on the wall station's UP/DOWN ARROW button to cause the traveler to move toward the down position. Release the pushbutton *before* the opener stops; check that the traveler returns to the up position.



➤ ***NOTE:*** *The garage door opener will not respond to a CLOSE command from a remote control if the safety beam is blocked.*

6 To reconnect the opener, flip the release lever up. Raise the door manually until the opener reconnects.



➤ ***NOTE:*** *If the door remains idle for 5 minutes, the beam light will turn off to save power. The beam power turns on for 5 minutes when door moves down to the fully closed position. The beam power can be restored for 5 minutes by pressing the light button.*

5 Adjusting the Open and Close Limits

The limit settings control how far the door will open or close. The limits should be set so the door opens just short of any door stops, and closes at the floor level.

If required, use the following steps to adjust the limits. After beginning to adjust the limits, if no buttons are pressed for one minute, the opener will return to normal operation.

Adjusting the Open Limit

1 Use the wall station or a remote control to move the door to the open limit position.

2 On the back of the opener, press both the UP and LEARN buttons for three seconds. The green indicator and opener's light will flash twice then stay on.

3 Use the UP and DOWN buttons to jog the door at slow speed to fine-tune the open limit position.

4 When the door is at the proper open limit position, press the LEARN button to store the setting and exit setup. The green indicator and the opener's light will flash two times.

Adjusting the Close Limit

1 Use the wall station or a remote control to move the door to the close limit position.

2 On the back of the opener, press both the DOWN and LEARN buttons for three seconds. The red indicator and opener's light will flash twice then stay on

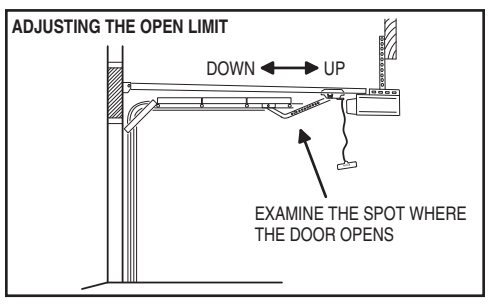
3 Use the UP and DOWN buttons to jog the door at slow speed to fine-tune the close limit position.

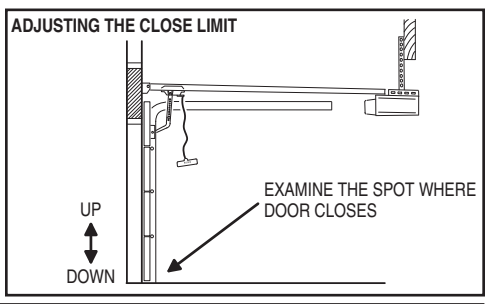
4 When the door is at the proper close limit position, press the LEARN button to store the setting and exit setup. The red indicator and the opener's light will flash two times.

➤ ***NOTE:*** *If the opener is field reset per Section 10, both the open and close limits must be adjusted and the automatic door force setup must be completed for proper operation.*

⚠ CAUTION ⚠

Set the open and close limits carefully. Setting the limits beyond the distance that the door can travel could cause damage to the door, the door hardware, or opener.





6 Replacing the Opener's Lamp

If the opener's safety lamp fails to light manually or when the opener is cycled, the light bulb needs replacing. Use the following steps to replace the light bulb.

1 Remove the light cover to expose the light bulb and lamp socket.

2 Replace the light bulb with a 100 watt maximum rough service bulb (sometimes called a garage door bulb).

3 Reattach the light cover.

4 Press the wall station's lamp button to test the lamp.

7 Automatic Door Force Setup

The opener automatically measures the door force throughout the entire travel of the door each time the opener cycles. The opener will automatically adjust to changing door hardware conditions over time due to weather and wear. Your installer has used these steps during setup of the opener. You can also perform these steps at any time.

⚠ WARNING ⚠

STAY CLEAR OF THE DOOR DURING THIS PROCEDURE!

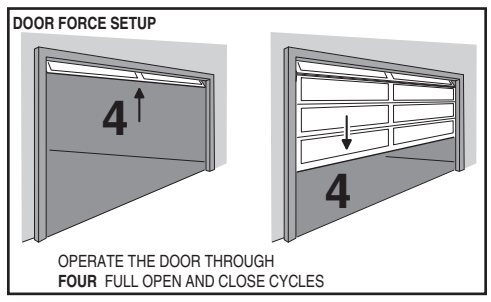
Automatic Door Force Setup

1 Be sure that the trolley latch is up and the door is connected to the opener.

2 Operate the door through four complete open and close cycles.

⚠ CAUTION ⚠

Do not cycle the opener full travel without the door connected. The automatic door force setting will adjust to the unloaded condition and may trip the safety system when the door is reconnected.



8 Safety Reversal System Test

The opener determines that there is an obstruction if a higher than expected amount of force is detected during a door cycle. If an obstruction is encountered during a closing cycle, the opener and door will stop then fully open. If an obstruction is encountered during an opening cycle, the opener and door will stop.

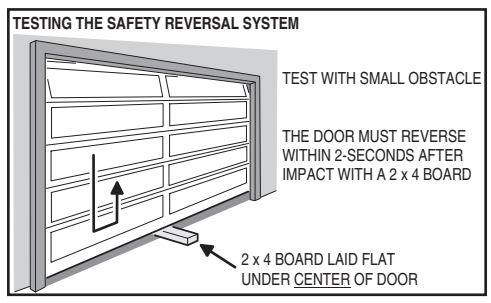
Safety Reversal System Test

1 Lay a 2 x 4 board flat on the floor where it will be struck by the **center** of the door as it closes.

2 Verify that the door reverses when it strikes the board. The door **must** reverse within two seconds after striking the board.

⚠ WARNING ⚠

Always perform the Safety Reversal System Test after making any adjustments to the opener. PERFORM THE SAFETY REVERSAL SYSTEM TEST MONTHLY!



9 Adjusting the Force Factor (Installation Option, Normally Not Used)

The opener uses the peak force measured during each of the last four complete cycles plus a "force factor" to calculate the maximum allowed force setting for the current door cycle. If the calculated maximum force setting is exceeded during the current door cycle, the opener reacts to the obstruction. As door hardware conditions change over time with weather and wear, the calculation of the maximum door force setting using the four cycle running average will compensate for the current conditions of the installation.

Changing the Force Factor Setting

As an installation option, the opener's "force factor" can be adjusted to change the amount of pressure exerted on an obstacle before the opener reacts to the obstruction.

1 Press both the UP and DOWN buttons for three seconds. The red and green indicators and opener's light will flash twice.

2 Use the UP or DOWN buttons to set the force factor. Pressing the UP button ***increases*** the force factor, pressing the DOWN button ***decreases*** the force factor.

FORCE FACTOR INDICATOR TABLE	
GREEN ON	LOW FORCE FACTOR
RED & GREEN ON	MEDIUM FORCE FACTOR
RED ON	HIGH FORCE FACTOR

3 After selecting the force factor, press the LEARN button to store the setting and exit setup. The red and green indicators and the opener's light will flash two times. *(If the force factor is not set within one minute, the opener will return to normal operation at its previous force factor setting.)*

4 After changing the force factor setting, perform the Safety System Reversal Test.

10 Field Reset

In installations where the door spring, door, or hardware is being replaced, and the opener was already programmed for the old door, reset the opener using the following steps.

1 Press and hold down the UP, DOWN, and LEARN buttons at the same time for ten seconds. The red and green indicators and the opener's light will flash twice.

2 Release the buttons. The opener will reset force setting and erase all set limits, **but will still retain all programmed remote controls in memory.**

3 **AFTER PERFORMING A FIELD RESET, BOTH THE OPEN AND CLOSE LIMITS MUST BE ADJUSTED AND THE AUTOMATIC DOOR FORCE SETUP COMPLETED BEFORE THE OPENER WILL FUNCTION.**

11 Troubleshooting

LAMP FLASHES TROUBLE CODE	PROBLEM	CAUSE	REMEDY
1 FLASH	No problem	Remote control entered into memory	Add any additional remote controls (MegaCode™ type only)
2 FLASHES	Door won't close	Shorted wall station wires	Check wall station wires. Be sure both are connected to the terminal screws. Check for a staple in the wall station wires. Remove any staples compressing the wire.
3 FLASHES	Door won't close	Safety beam obstacle	Check for obstacles. Align the safety beam (Section 4)
4 FLASHES	Door reverses or won't open or close	Open or Close force exceeded	Check for obstruction or binding of garage door. Perform field reset (Section 8) if necessary.
5 FLASHES	Door won't open from remote control	Remote was activated while vacation switch was locked	Unlock vacation switch on wall station
6 FLASHES	Motor ran longer than 30 seconds	Mechanical or electronic failure	Call your local garage door professional
7 FLASHES	Limit error	Encoder has detected error or down limit set above up limit.	Re-set the open and close limits. If error occurs again, call your local garage door professional.

FCC NOTICE

Changes or modifications not expressly described in this manual or approved by the manufacturer could void the user's authority to operate the equipment. This device complies with Industry Canada and FCC Part 15. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

LIMITED WARRANTY

This Linear product is warranted to the original consumer against defects in material and workmanship for:

MODEL	ELECTRONICS	MECHANICAL	MOTOR	BELT	CHAIN
LDC0800	1 year	5 years	Lifetime	Lifetime	5 years

This product is warranted to the original consumer against defects in material and workmanship for the periods mentioned above. Linear will repair, or at its option, replace, any device that it finds requires service under this warranty, and will return the repaired or replaced device to the consumer at Linear's cost. Devices must be sent to Linear for service at owner's expense. This warranty does not apply to damage to the product from negligence, abuse, abnormal usage, misuse, accidents, normal wear or tear or due to failure to follow Seller's instructions, or arising from improper installation, storage or maintenance. In no event will Linear be responsible for incidental, compensatory, punitive, consequential, indirect, special or other damages. The remedies provided by this warranty are exclusive. Some states do not allow the exclusion or limitation of incidental and consequential damages, so the above limitation or exclusion may not apply to you. Any warranties implied by law are limited to the time periods set forth above. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

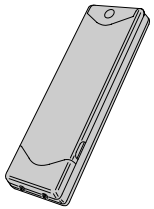
For warranty service and shipping instructions contact Linear at the phone number shown below. In order to be protected by this warranty, save your proof of purchase and send a copy with equipment should repair be required. All products returned for warranty service require a Return Product Authorization Number (RPA#). Contact Linear Technical Services at 1-800-421-1587 for an RPA# and other important details.

MDTK

MEGACODE®

DIGITAL KEYPAD TRANSMITTER

Installation Instructions



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DESCRIPTION

The MDTK Digital Keypad is one of Linear's MegaCode series of wireless radio controls designed for use with automatic garage door and gate operators. The MegaCode radio format provides unparalleled security with more than a million different codes.

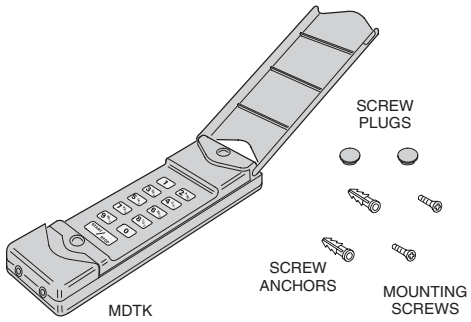
In operation, the user enters their unique code on the unit's keypad (1 to 6 digits long) and presses the START/STOP button to activate the door operator. For up to 30 seconds after the last activation, the MDTK can be re-triggered by simply pressing the START/STOP button again. This allows the user to stop or reverse the opener quickly, without having to re-enter their code.

The MDTK has built-in keypad lighting for use at night or in dark areas. The clear silicone keys are backlit with a pleasing green glow. By pressing the START/STOP button first, before entering their code, the user can light up the keypad. Pressing the START/STOP button twice at any time will light up the keypad.

The keypad lockout timer will disable the keypad after 10 activations. The keypad must remain idle for 30 seconds before new attempts.

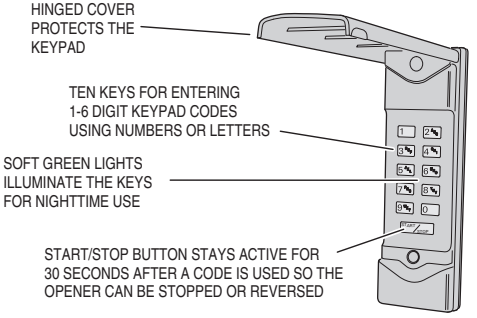
MegaCode receivers are programmed by sending a signal from the user's transmitters. This stores the transmitter's code into the receiver's memory. The receiver will retain its memory even without power and will only activate from these "memorized" transmitters. Each MDTK keypad code can be considered a different transmitter. Each MegaCode receiver can remember a maximum of 10 transmitters (40 for gate receivers). Any combination of portable transmitters and keypad codes up to the maximum number can be entered.

MDTK COMPONENTS



THE MDTK CAN BE PROGRAMMED INTO LINEAR'S MEGACODE GARAGE DOOR OPERATORS AND RECEIVERS ONLY

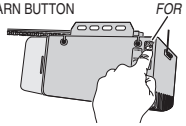
KEYPAD FEATURES



NOTE: FOR SECURITY, THE KEYPAD WILL SHUTDOWN AFTER 10 CODE ENTRIES UNTIL IT IS IDLE FOR 30 SECONDS

PROGRAMMING OPERATORS

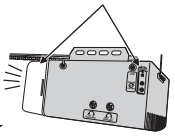
① PRESS THE OPERATOR'S LEARN BUTTON — *LEARN LIGHT GLOWS FOR 15 SECONDS*



NOTE: PRESSING THE LEARN BUTTON FOR MORE THAN 10 SECONDS WILL ERASE ALL KEYPAD CODES AND REMOTE CONTROLS

② WHILE THE LEARN LIGHT IS ON, ENTER A 1-6 DIGIT KEYPAD CODE AND PRESS THE KEYPAD'S START/STOP KEY

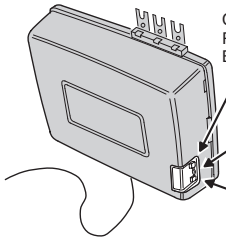
OPERATOR LIGHTS FLASH WHEN THE KEYPAD CODE IS ACCEPTED



③ REPEAT STEPS 1 & 2 FOR ANY ADDITIONAL KEYPAD CODES

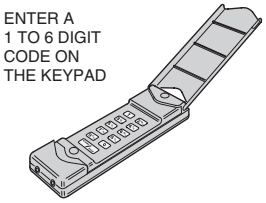
PROGRAMMING RECEIVERS

THE MDTK CAN BE PROGRAMMED INTO MDR, MDR-2, MDRG AND SMDRG RECEIVERS. LOCATE THE PROGRAM BUTTON(S) AND LED ON THE SIDE OF THE RECEIVER CASE.

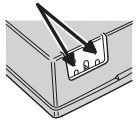


CONNECT AND POWER THE RECEIVER AS DESCRIBED IN IT'S INSTALLATION INSTRUCTIONS.

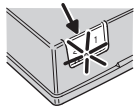
① ENTER A 1 TO 6 DIGIT CODE ON THE KEYPAD



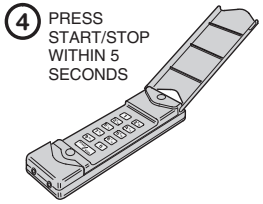
② PRESS RECEIVER PROGRAMMING BUTTON 1 OR 2 WITHIN 20 SECONDS



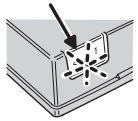
③ THE RECEIVER LED WILL LIGHT FOR 5 SECONDS IF THERE IS ROOM IN THE RECEIVER MEMORY



④ PRESS START/STOP WITHIN 5 SECONDS



⑤ RECEIVER LED WILL FLASH AS TRANSMITTER IS ENTERED



➥ ***NOTE: Be sure to press the receiver program button for less than 2 seconds.***

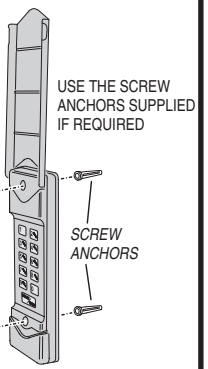
➥ ***WARNING: Door operator will not activate when the receiver is being programmed from the transmitter, but the door operator will activate the next time the transmitter is activated after programming.***

➥ ***NOTE: The programming LED also monitors radio signals entering the receiver. It is common to see an occasional blink from the LED. The LED will also light when any transmitter tuned to the receivers frequency (programmed into the receiver or not) is activated.***

WALL MOUNTING

MOUNT THE KEYPAD IN CLEAR VIEW OF THE DOOR WITH THE TWO SCREWS SUPPLIED

USE THE SCREW ANCHORS SUPPLIED IF REQUIRED



SCREW ANCHORS

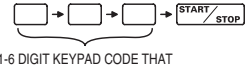
PUSH IN THE TWO SCREW COVERS TO HIDE THE SCREWS

KEYPAD OPERATION

DAYTIME OPERATION

① ENTER THE KEYPAD CODE

② PRESS START/STOP



1-6 DIGIT KEYPAD CODE THAT WAS ENTERED INTO OPENER

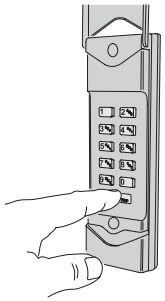
NIGHTTIME OPERATION

① PRESS START/STOP (LIGHTS KEYPAD)

② ENTER THE KEYPAD CODE

③ PRESS START/STOP

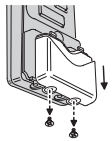
1-6 DIGIT KEYPAD CODE THAT WAS ENTERED INTO OPENER



NOTE: TO STOP OR REVERSE THE OPERATOR , THE START/STOP BUTTON CAN BE PRESSED AGAIN FOR UP TO 30 SECONDS WITHOUT RE-ENTERING THE CODE

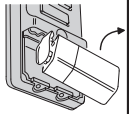
CHANGING BATTERIES

① REMOVE THE TWO SCREWS AND SLIDE THE BATTERY COVER OFF

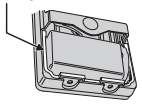


② REMOVE THE LOW BATTERY AND DISPOSE OF IT PROPERLY

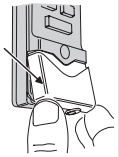
INSTALL A FRESH 9-VOLT **ALKALINE** OR **LITHIUM** BATTERY



③ BE SURE THE SILICONE GASKET IS IN PLACE



④ REPLACE THE BATTERY COVER AND INSTALL THE TWO SCREWS



LINEAR LIMITED WARRANTY

This Linear product is warranted against defects in material and workmanship for twelve (12) months. The Warranty Expiration Date is labeled on the product. This warranty extends only to wholesale customers who buy direct from Linear or through Linear's normal distribution channels. Linear does not warrant this product to consumers. Consumers should inquire from their selling dealer as to the nature of the dealer's warranty, if any. There are no obligations or liabilities on the part of Linear LLC for consequential damages arising out of or in connection with use or performance of this product or other indirect damages with respect to loss of property, revenue, or profit, or cost of removal, installation, or reinstallation. All implied warranties, including implied warranties for merchantability and implied warranties for fitness, are valid only until Warranty Expiration Date as labeled on the product. This Linear LLC Warranty is in lieu of all other warranties express or implied.

All products returned for warranty service require a Return Product Authorization Number (RPA#). Contact Linear Technical Service at 1-800-421-1587 for an RPA# and other important details.

IMPORTANT !!!

Linear radio controls provide a reliable communications link and fill an important need in portable wireless signaling. However, there are some limitations which must be observed.

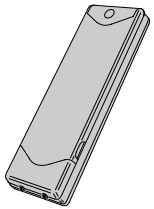
- For U.S. installations only: The radios are required to comply with FCC Rules and Regulations as Part 15 devices. As such, they have limited transmitter power and therefore limited range.
- A receiver cannot respond to more than one transmitted signal at a time and may be blocked by radio signals that occur on or near their operating frequencies, regardless of code settings.
- Changes or modifications to the device may void FCC compliance.
- Infrequently used radio links should be tested regularly to protect against undetected interference or fault.
- A general knowledge of radio and its vagaries should be gained prior to acting as a wholesale distributor or dealer, and these facts should be communicated to the ultimate users.

MDTK

MEGACODE®

ÉMETTEUR À CLAVIER NUMÉRIQUE

Instructions pour l'installation



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DESCRIPTION

Le clavier numérique MDTK est l'une des télécommandes radio sans fil de la série MegaCode conçue pour commander les portes de garage et les actionneurs de portail motorisés. La technologie MegaCode par radio assure une sécurité sans égal avec plus d'un million de codes différents.

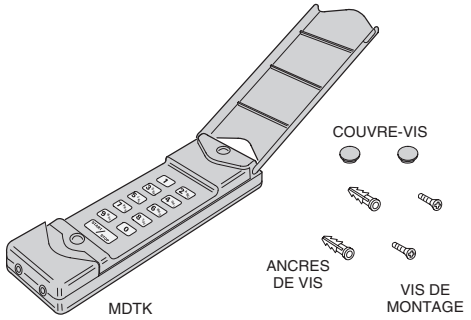
Pendant le fonctionnement, l'utilisateur saisit son code unique sur le clavier de l'unité (1 à 6 caractères) et appuie sur le bouton START/STOP (MARCHE/ARRÊT) pour activer l'actionneur de porte. Pendant un délai maximum de 30 secondes suivant la dernière activation, le MDTK peut être déclenché de nouveau par une pression sur le bouton START/STOP (MARCHE/ARRÊT). Ceci permet à l'utilisateur d'arrêter ou d'inverser la direction du système de motorisation rapidement sans avoir besoin de saisir de nouveau le code.

Le clavier du MDTK comporte un éclairage incorporé permettant de l'utiliser la nuit ou en lieu sombre. Les touches au silicone transparentes sont rétroéclairées par une lueur verte agréable. En appuyant d'abord sur le bouton START/STOP (MARCHE/ARRÊT), avant de saisir le code, l'utilisateur illumine le clavier. On peut illuminer le clavier à tout moment en appuyant deux fois de suite sur le bouton START/STOP (MARCHE/ARRÊT).

Le minuteur de verrouillage du clavier désactive ce dernier après 10 activations. Le clavier doit rester inactif pendant 30 secondes avant toute nouvelle tentative.

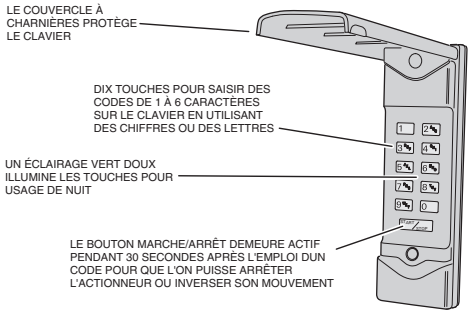
Les récepteurs MegaCode sont programmés par l'envoi d'un signal à partir des émetteurs de l'utilisateur. Ce signal enregistre le code de l'émetteur dans la mémoire du récepteur. Le récepteur conserve sa mémoire sans alimentation électrique et active exclusivement à partir de ces émetteurs « mémorisés ». Chaque code saisi par un clavier MDTK peut être considéré comme un émetteur différent. Chaque récepteur MegaCode peut mémoriser 10 émetteurs au maximum (40 pour les récepteurs de portail). On peut saisir toute combinaison d'émetteurs portables et de codes de clavier jusqu'au nombre maximum.

COMPOSANTS DU MDTK



ON NE PEUT PROGRAMMER LE MDTK QUE DANS LES ACTIONNEURS DE PORTE DE GARAGE ET LES RÉCEPTEURS MEGACODE DE LINEAR

FONCTIONS DU CLAVIER

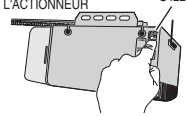


REMARQUE : POUR LA SÉCURITÉ, LE CLAVIER RESTE BLOQUÉ APRÈS SAISIE DE 10 CODES, JUSQUÀ CE QUIL SOIT RESTÉ INACTIF PENDANT 30 SECONDES

PROGRAMMATION DES ACTIONNEURS

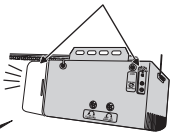
① APPUYER SUR LE BOUTON MÉMORISATION DE L'ACTIONNEUR

LE VOYANT MÉMORISATION S'ILLUMINE PENDANT 15 SECONDES



REMARQUE : UNE PRESSION SUR LE BOUTON MÉMORISATION PENDANT PLUS DE 10 SECONDES EFFACE TOUS LES CODES DE CLAVIER ET DE TÉLÉCOMMANDES

LE VOYANT DE L'ACTIONNEUR CLIGNOTE LORSQUE LE CODE DU CLAVIER EST ACCEPTÉ

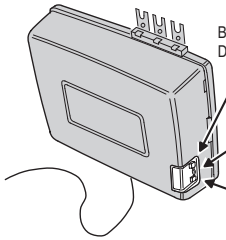


② PENDANT QUE LE VOYANT MÉMORISATION EST ALLUMÉ, SAISIR LE CODE DE CLAVIER DE 1 À 6 CARACTÈRES ET APPUYER SUR LE BOUTON MARCHE/ARRÊT DU CLAVIER

③ RECOMMENCER LES OPÉRATIONS DES ÉTAPES 1 & 2 POUR TOUT CODE DE CLAVIER SUPPLÉMENTAIRE

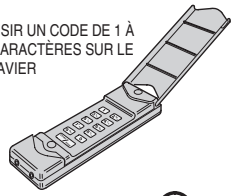
PROGRAMMATION DES RÉCEPTEURS

ON PEUT PROGRAMMER LE MDTK DANS LES RÉCEPTEURS MDR, MDR-2, MDRG ET SMDRG. REPÉRER LE OU LES BOUTONS DE PROGRAMMATION ET LA DEL SUR LE CÔTÉ DU BOÎTIER DU RÉCEPTEUR

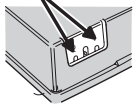


CONNECTER LE RÉCEPTEUR ET LE METTRE SOUS TENSION SELON LA DESCRIPTION FOURNIE DANS LES INSTRUCTIONS RELATIVES À SON INSTALLATION.

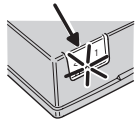
① SAISIR UN CODE DE 1 À 6 CARACTÈRES SUR LE CLAVIER



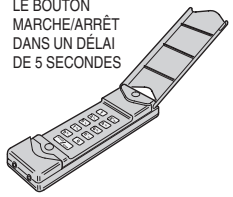
② APPUYER SUR LE BOUTON 1 OU 2 DE PROGRAMMATION DU RÉCEPTEUR DANS UN DÉLAI DE 20 SECONDES



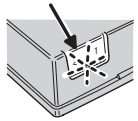
③ LA DEL DU RÉCEPTEUR S'ALLUME PENDANT 5 SECONDES S'IL Y A DE L'ESPACE DANS LA MÉMOIRE DU RÉCEPTEUR



④ APPUYER SUR LE BOUTON MARCHE/ARRÊT DANS UN DÉLAI DE 5 SECONDES



⑤ LA DEL DU RÉCEPTEUR CLIGNOTE QUAND L'ÉMETTEUR EST PROGRAMMÉ DANS LE RÉCEPTEUR

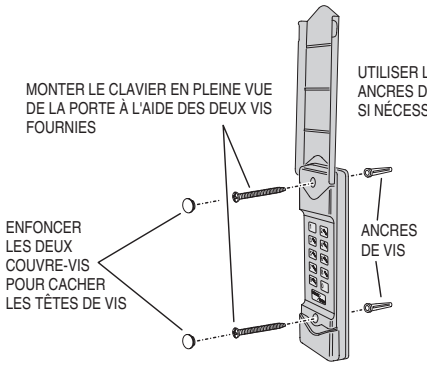


➥ ***REMARQUE : Veiller à ce que la pression sur le bouton de programmation du récepteur dure moins de 2 secondes.***

➥ ***AVERTISSEMENT : L'actionneur de porte ne s'active pas lorsqu'on est en train de programmer le récepteur à partir de l'émetteur, mais il s'active à la première occasion après que l'on ait activé l'émetteur à la suite de la programmation.***

➥ ***REMARQUE : La DEL de programmation surveille aussi les signaux radio entrant dans le récepteur. Il est courant d'observer un clignotement occasionnel de la DEL. La DEL s'allume également lorsqu'un émetteur quelconque syntonisé sur la fréquence des récepteurs (qu'il soit ou non programmé dans le récepteur) est activé.***

INSTALLATION MURALE

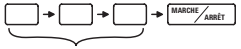


FONCTIONNEMENT DU CLAVIER

FONCTIONNEMENT DE JOUR

① SAISIR LE CODE DU CLAVIER

② APPUYER SUR LE BOUTON MARCHE/ARRÊT



CODE DU CLAVIER DE 1 À 6 CARACTÈRES QUI A ÉTÉ SAISI DANS L'ACTIONNEUR

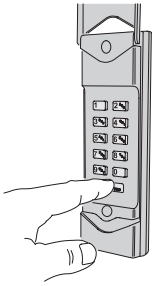
FONCTIONNEMENT DE NUIT

① APPUYER SUR LE BOUTON MARCHE/ARRÊT (POUR ILLUMINER LE CLAVIER)

② SAISIR LE CODE DU CLAVIER

③ APPUYER SUR LE BOUTON MARCHE/ARRÊT

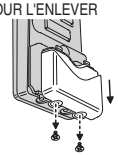
CODE DU CLAVIER DE 1 À 6 CARACTÈRES QUI A ÉTÉ SAISI DANS L'ACTIONNEUR



REMARQUE : POUR ARRÊTER L'ACTIONNEUR OU INVERSER SON MOUVEMENT, ON PEUT APPUYER DE NOUVEAU SUR LE BOUTON MARCHE/ARRÊT PENDANT UN DÉLAI DE 30 SECONDES MAXIMUM SANS DEVOIR SAISIR À NOUVEAU LE CODE

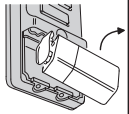
REMPLACEMENT DES PILES

① RETIRER LES DEUX VIS ET FAIRE GLISSER LE COUVERCLE DE LA PILE POUR L'ENLEVER

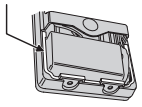


② RETIRER LA PILE USÉE ET LA JETER DE FAÇON RÉGLEMENTAIRE

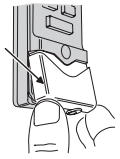
INSTALLER UNE PILE DE 9 VOLTS, **ALCALINE** OU AU **LITHIUM**



③ S'ASSURER QUE LE JOINT AU SILICONE EST EN PLACE



④ REMETTRE LE COUVERCLE DE LA PILE ET L'INSTALLER AVEC LES DEUX VIS



GARANTIE LIMITÉE DE LINEAR

Ce produit Linear est garanti contre les vices de fabrication et de main d'œuvre pendant douze (12) mois. La date d'expiration de la garantie est imprimée sur le produit. Cette garantie s'étend uniquement aux clients revendeurs en gros qui achètent directement à Linear ou par les canaux du réseau de distribution normal de Linear. Linear ne garantit pas ce produit aux consommateurs. Les consommateurs doivent s'informer sur la nature de la garantie du revendeur qui leur est accordée, le cas échéant, auprès de leur propre revendeur. La société Linear LLC n'a aucune obligation et sa responsabilité ne peut être mise en jeu à raison de dommages indirects survenant du fait de l'usage ou des performances de ce produit ou en liaison avec cet usage ou ces performances, lesdits dommages indirects incluant, notamment, la perte de biens, le manque à gagner, la perte de profits et les coûts de dépose, d'installation ou de réinstallation. Toutes les garanties implicites, y compris les garanties de valeur marchande et les garanties implicites d'adéquation au but ou à l'usage sont valides exclusivement jusqu'à la date d'expiration imprimée sur le produit. La présente garantie de Linear LLC tient lieu de toute autre garantie expresse ou implicite.

Tous les produits retournés pour mise en jeu de la garantie nécessitent un Numéro d'autorisation de retour de produit (n° RPA). Veuillez contacter le service technique de Linear au 1-800-421-1587 pour obtenir un numéro RPA et d'autres détails importants.

IMPORTANT !!!

Les commandes radio Linear assurent une liaison de communication fiable et jouent un rôle important pour la signalisation sans fil par instrument portable. Toutefois, certaines limitations existent et doivent être respectées.

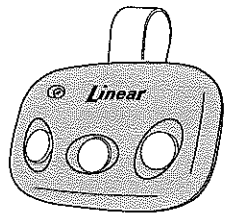
- Uniquement pour les installations aux États-Unis : les radios doivent être conformes aux règles et à la réglementation de l'agence fédérale de contrôle des communications (FCC) applicables aux dispositifs relevant de la Partie 15 du Code. Comme tels, ils ont une puissance de transmission limitée et par conséquent, une portée limitée.
- Un récepteur ne peut pas répondre à plus d'un signal d'émetteur à la fois et peut être bloqué par des signaux radio émis sur sa fréquence ou à des fréquences proches, quelle que soit la configuration du code.
- Tout changement ou modification du dispositif peut annuler la conformité réglementaire FCC.
- Les liaisons radio qui ne sont pas fréquemment utilisées doivent être testées régulièrement pour vérifier tout bruit ou défaut non détecté.
- Il est recommandé d'acquérir des connaissances générales sur la radio et ses incertitudes avant de s'établir comme revendeur ou distributeur, et ces connaissances doivent être communiquées aux utilisateurs finals.

MEGACODE®

MCT-3

3-BUTTON DIGITAL TRANSMITTER

Operation Instructions



Linear

(760) 438-7000
USA & Canada (800) 421-1587 & (800) 392-0123
Toll Free FAX (800) 468-1340
www.linearcorp.com

DESCRIPTION

The MCT-3 MegaCode® digital transmitter is a wireless radio control designed for use with automatic garage and gate operators.

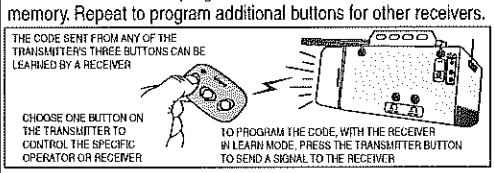
Each of the three transmitter buttons will send a unique code when pressed. One button can be used to activate the individual's garage door opener, a second button can operate an access gate, a third button can activate an additional garage door operator or most Linear 318 MHz MegaCode® wireless receivers.

MegaCode® transmitters and receivers do not contain a typical "coding switch". Each transmitter is permanently coded at the factory. The receiver is programmed by "learning" a transmitter's unique digital code. The receiver will activate only from the "memorized" transmitters.

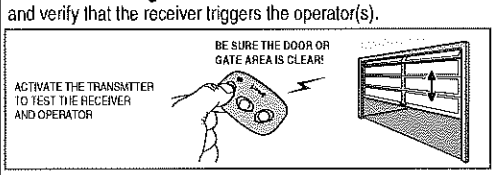
The transmitter is powered by two Type 2032 "coin-cell" batteries. They should last 3 years with normal use. The red indicator on the face of the transmitter will glow when the unit is activated. If the indicator lights dimly, or not at all when transmitting, the batteries need to be replaced. To conserve battery life, an internal timer limits the transmission duration to 10 seconds if a transmitter button is held down.

PROGRAM RECEIVER & TEST TRANSMITTER

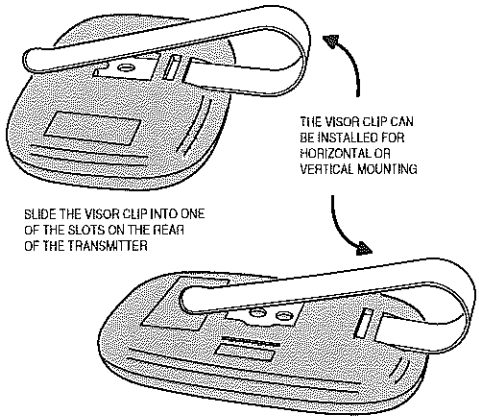
Refer to the instructions provided with the receiver to set it into "learn" mode. With the receiver ready to learn, press the desired transmitter button to program that button into the receiver's memory. Repeat to program additional buttons for other receivers.



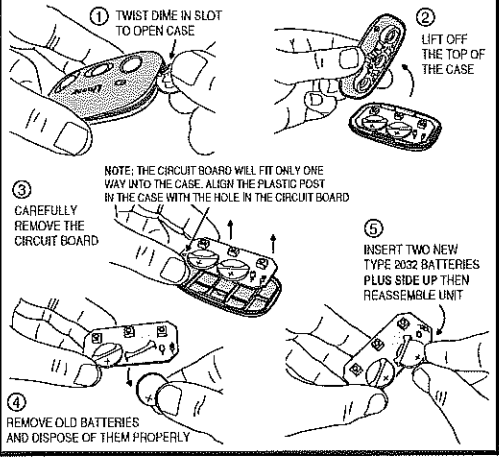
After programming, test the transmitter from various locations. **Be sure the door or gate areas are clear.** Activate the transmitter and verify that the receiver triggers the operator(s).



VISOR CLIP INSTALLATION



REPLACING THE BATTERY



LINEAR LIMITED WARRANTY

This product is warranted to the consumer against defects in material and workmanship for one year from the date of purchase. This warranty applies to first retail buyers of new devices. Warrantor will repair, or at its option, replace, any device it finds that requires service under this warranty, and will return the repaired or replaced device to the consumer at the warrantor's cost. For warranty service and shipping instructions contact warrantor at the address shown below. Devices must be sent to warrantor for service at owner's expense. The remedies provided by this warranty are exclusive. Implied warranties under state law are to the one year period of this written warranty. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. In order to be protected by this warranty, save your proof of purchase and send copy with equipment should repair be required. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

All products returned for warranty service require a Return Product Authorization Number (RPA#). Contact Linear Technical Services at 1-800-421-1587 for an RPA# and other important details.

IMPORTANT !!!

Linear radio controls provide a reliable communications link and fill an important need in portable wireless signaling. However, there are some limitations which must be observed.

- For U.S. installations only: The radios are required to comply with FCC Rules and Regulations as Part 15 devices. As such, they have limited transmitter power and therefore limited range.
- A receiver cannot respond to more than one transmitted signal at a time and may be blocked by radio signals that occur on or near their operating frequencies, regardless of code settings.
- Changes or modifications to the device may void FCC compliance.
- Infrequently used radio links should be tested regularly to protect against undetected interference or fault.
- A general knowledge of radio and its vagaries should be gained prior to acting as a wholesale distributor or dealer, and these facts should be communicated to the ultimate users.
- This device complies with FCC Part 15 and Industry Canada Rules and Regulations. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

222267 A

Built Green® WASHINGTON

Please indicate:
☐ **Preliminary checklist** (for enrollment)
☒ **Final checklist** (for certification review)

Single-Family/Townhome New Construction Checklist

Builder	Ichijo
Project Address	Sun Ridge
# of Bedrooms	
Unit size in square feet	
House Size Multiplier	#N/A
Comments	#N/A

3RD PARTY VERIFICATION

#N/A

Total points

0	SECTION 1: BUILT GREEN TEAM
197	SECTION 2: SITE & WATER
167	SECTION 3: ENERGY EFFICIENCY
127	SECTION 4: HEATH & INDOOR AIR QUALITY
104	SECTION 5: MATERIALS EFFICIENCY
13	SECTION 6: OPERATION, MAINTENANCE
10	SECTION 7: BUILT GREEN MARKETING

REQUIRED CREDITS

Category	Possible Points	Credit	Point Totals	Comments		NOTES
THREE-STAR REQUIREMENTS (300 points minimum)						
	required	3rd party verification required (See reference)	★		TB field verified	
	required	All ★items	★			
	required	Conform to the House Size Matrix (Table 0-1)	★		TB field verified	
	required	Meet all applicable codes and regulations	★		OK BUILDER STANDARD PRACTICE	
	required	Program Orientation (one time only)	★		Builder has attended, project manager veteran of Z home, very expert on Built Green	
Site & Water	required	Prohibit burying of construction waste	★		OK BUILDER STANDARD PRACTICE	
Site & Water	required	Stabilize all construction entrances with quarry spall or crushed rock	★		TB field verified	
IAQ	required	Ensure proper drainage of crawl space	★	NA		
IAQ	required	All spot fans under 110 CFM are 1.5 sones or less	★		TB field verified	
Materials	required	Post and implement a jobsite recycling plan	★		TB field verified	
	required	Provide a building owners manual in accordance with credit 6-1	★	Owners manual to be provided	ok nick sending copy of manual	
Energy	required	15% energy use improvement over State Energy Code (2012)	★		TB field verified	
	required	Achieve a minimum of 40 points in each of sections 2-5	★		TB field verified	
FOUR-STAR REQUIREMENTS (400 points minimum)						
	required	Meet 3-Star requirements	★			
	required	Achieve a minimum of 60 points in each of sections 2-5	★		TB field verified	
Site & Water	required	No zinc galvanized ridge caps, copper flashing or copper wires for moss prevention	★	Composition roof on north slope, membrane on deck	TB field verified	
Site & Water	required	Landscape with plants appropriate for site topography and soil types, emphasizing use of plants with low watering requirements [drought tolerant]	★	Yes all natives..	TB field verified	
Site & Water	required	Use the most efficient aerator available for kitchen faucets, lavatory faucets and showerheads	★	Kohler Dual flush toilets in all baths	TB field verified	
Energy	required	Achieve 20% improvement over Washington State Energy code (2012)) (See Table 0-2 in Appendix)	★	See 5-1 REM model 43%+ over WEC 2012	TB field verified	
IAQ	required	Use low toxic/low VOC paint on all major surfaces	★	Paints meet low VOC limits 50/150 g/L	TB field verified	
IAQ	required	Ventilate with box fans in windows blowing out during drywall sanding and new wet finish applications	★	Builder standard practice	TB field verified	Ichijo STANDARD PRACTICE
IAQ	required	Use no products that contain added urea formaldehyde for any interior applications	★	Ichijo cabinetss, doors and closets meet JIS standards F*** standards, which are lower	TB field verified	
Materials	required	Practice waste prevention and recycling and buy recycled products (Section 5)	★	see list in section 5 right margin	TB field verified	
Materials	required	Achieve a minimum recycling rate of 50% of waste by weight	★	77% rate with CDL recycle	TB field verified	
FIVE-STAR REQUIREMENTS (600 points minimum)						
	required	Meet 4-Star requirements plus point minimum	★	yes	TB field verified	
	required	Achieve a minimum of 100 points in each of sections 2-5	★	yes - see totals below	TB field verified	
Site & Water	required	Amend disturbed soil with compost to a depth of 10 to 12 inches to restore soil environmental functions (2-34)	★		TB field verified	re spreacing topsoil , plus hog fuel dduring grading, plus 6" compost cedar grove on top
Site & Water	required	Use pervious materials for at least one-third of total area for driveways, walkways, and patios (See action item 2-44)	★	small driveway areas are imperv, but entire site drains to in street bioswales, designed for 95% infiltration. Overflow in wet periods goes to DOT pond below, which is re used for irrigating public and street areas every year.	TB field verified	
Site & Water	required	Limit use of turf grass to 25% of landscaped area (2-61)	★	Small lawn areas well under 25%	TB field verified	
Site & Water	required	Avoid soil compaction by limiting heavy equipment use to building footprint and construction entrance (2-19)	★	Site was graded, but all soils where equimpent was used were extensivly supplemented and tilled - see credit below in section 2	TB field verified	
Site & Water	required	Preserve existing native vegetation as landscaping (2-21)	★	Forest buffer along east and south side of development is all native vegetation, also see mitigation and development agreement created larger permanent greenspace	TB field verified	also mitigating development with public tract A and also stormwater runoff infiltrates into LED raingardnes with perferatoed curbs
Site & Water	required	Retain 30% of the trees located on site at the start of construction or, alternatively, achieve a Green Factor score or .6 or higher (2-23)	★	less than 30% of original trees on this site, but spirit of credit exceeded by mitigation and greenspace development exchange with city of Issaqah, see note at right	TB field verified	City of Issaquaah a llowed 20 acres here per development agreement of parce A1 , 2, and C saved 90 acres of permanent green space on tiger mountain
Energy	required	Pre-wire for future PV installation (3-93)	★	All homes have 3.5 KW PV systems Standard!	TB field verified	
Energy	required	Achieve 30% improvement over Washington State Energy code (2012)) (See Table 0-2 in Appendix)	★	Yes see credit 3-1	TB field verified	
IAQ	required	Detached or no garage OR garage air sealed from house with automatic exhaust fan (4-27)	★	50 cfm garage fan installed with automatic control	TB field verified	
Materials	required	Achieve a minimum recycling rate of 70% of waste by weight	★	77% rate with CDL recycle	TB reviewed recycling reports - refer to standard facilty rate 2015 approoved by Program	
Materials	required	Use a minimum of 10 materials with recycled content	★	Yes - see list at 5-1 below	TB field verified	

Check items you will be including in this project to qualify for a BUILT GREEN star rating. **Version 2012**

QUALIFYING CREDITS

Item #	Possible Points	Credit		Comments	
SECTION 1: BUILT GREEN TEAM					
1-1	1-10	Use Built Green® member subcontractors, vendors, service providers, and real estate agents			
1-2	5	A. Incorporate Built Green® early in the design by conducting an eco-charrette with the homeowner & team to determine Built Green® features to be included in the home. B. Identify team member roles and how they relate to various phases of green lot design, prep and development C. Create a mission statement that includes the projects goals and objectives			
1-3	1	Provide all documentation/copies to third party verifier electronically			TB field verified
		SECTION 1 TOTAL	0		
SECTION 2: SITE & WATER					
SITE PROTECTION					
Proximity					
2-1	5	Locate site within one of the Urban Growth Area (UGA) designated areas			
		Subtotal	0		
Overall					
2-2	5	Build on infill lot to take advantage of existing infrastructure, reduce development of virgin sites			TB field verified
2-3	5	Build on a greyfield lot			
2-4	5	Build on an EPA-recognized brownfield lot			
2-5	5	An adaptive reuse lot is selected			
2-6	10	Build in a Built Green® development	10	Issaquah highlands is an entirely BuiltGreen Development	TB field verified
2-7	5	Use an alternative foundation system that minimizes volume of foundation material and disturbance to soil and/or to water flow, for at least 50% of the foundation			

City of Issaquaah a llowed 20 acres here per development agreement of parce A1 , 2, and C saved 90 acres of permanent green space on tiger mountain

also mitigating development with public tract A and also stormwater runoff infiltrates into LED raingardnes with perferatoed curbs

Washdot pnd is used for irrigation - fed by stormwater

2-8	5	Build in a low impact development	5	IH is leading LID demonstration development	TB field verified	
2-9	4	Build in a rural cluster development (RCD)				
		Subtotal	15			
Lot Design						
2-10	6	Self-conduct a site inventory and assessment	6	Consultants did fulll site assessment and worked with City, County, and IH development on openspace and tree preservation plan, grading plan, species assessment, etc		
2-11	5	Complete a natural resources inventory under the direction of qualified professional.	5	All consultants were certified in their field of study		
2-12	5	Conduct a third party review of the site development plan for critical areas and habitat protection (e.g. botanist, arborist, landscape architect)		regular review from state stormwater officials and habitat consultants during site development		
2-13	6	Implement a plan to conserve the elements identified by the resource inventory as high priority resources. Create a protection and maintenance plan for priority natural resources/areas during construction		Site development plan		
2-14	2	All tree pruning on site is conducted by or supervised by a Certified Arborist				
2-15	3	Basic training in tree or other natural resource protection is provided for the on-site supervisor.				
		Subtotal	11			
Slope Disturbance						
2-16	6	Long-term erosion effects are reduced through the design and implementation of terracing, retaining walls, landscaping, and restabilization techniques.	6	West and South sides are designed with stabilized slope leading to natural bioswale that borders forest buffer	TB field verified	all drainage from Lots 8-20 all tie into dispersion tee sends all water into greenbelt
Defensible Space Precautions						
2-17	1-3	Landscape fire buffer around house using native species that are fire resistant	2	Buffered areas around homes , forest vegetation is very healthy	TB field verified	
2-18	3	Reduce fire danger by removing underbrush and unhealthy vegetation on site (perform all measures listed in handbook)	3	Buffered areas around homes , forest vegetation is very healthy	TB field verified	
		Subtotal	11			
Protect Site's Natural Features						
2-19	3	Avoid soil compaction by limiting heavy equipment use to building footprint and construction entrances	3	Lots are less that 15ft from footprint of homes, Also see note at right	TB field verified	re spreacing topsoil , plus hog fuel dduring grading, plus 6" compost cedar qrove on top
2-20	4	Trenching, significant changes in grade, and compaction of soil and critical root zones in "tree save" areas are avoided	4	Forest buffer and root zone at edge was marked off and fenced from all equipment	TB field verified	
2-21	3	Preserve existing native vegetation as landscaping	3	forest buffer is healthy 2nd growth, Deer and Bear freqrnt the site	TB field verified	
2-22	3	Take extra precautions to protect trees during construction	3	Forest buffer and root zone at edge was marked off and fenced from all equipment	TB field verified	
2-23	1-5	Retain trees on site (1 pt per 20% preserved)	1	approx 20% is forest buffer	TB field verified	
2-24	3	If building near wetlands, shorelines, bluffs, and other critical areas, preserve & protect beyond code or local requirements				
2-25	1-5	Set aside percentage of buildable site to be left undisturbed	1	approx 20% is forest buffer	TB field verified	
2-26	4	Measures are planned and implemented that will support wildlife habitat	2	forest buffer is healthy 2nd growth, Deer and Bear freqrnt the site	TB field verified	partial credit
2-27	5	Previously compromised environmentally sensitive areas are mitigated or restored	5	City of Issaquaah a llowed 20 acres here per development agreement of parce A1 , 2, and C saved 90 acres of permanent green space on tiger mountain	TB field verified	also mitigating development with public tract A and also stormwater runoff infiltrates into LED raingardnes with perferatoed curbs
		Subtotal	22			
Protect Natural Processes On-Site						
2-28	6	Natural water and drainage features are preserved and used	6	West and South sides are designed with stabilized slope leading to natural bioswale that borders forest buffer	TB field verified	
2-29	2	Install and maintain temporary erosion control devices that significantly reduces sediment discharge from the site beyond code requirements	2	Yes silt fences, 6" hog fuel spread during grading and street construction	TB field verified	
2-30	1	Use compost to stabilize disturbed slopes	1	slight sloped areas in lots 8-20 stabilized w hog fuel and straw	TB field verified	
2-31	3	Stabilize disturbed areas within 14 days that are complete or will be left unworked for greater than 21 days using methods as recommended by the EPA or in the approved storm water pollution prevention plan (SWPPP), where required	3	Hydroseeding and jute mat on back slopes - spread hog fuel on all sloped areas	TB field verified	
2-32	3	Balance cut and fill, while maintaining original topography	3	very limited - relatively flat site - fill used to form swales and buffer edge	TB field verified	
2-33	4	Limit grading to 15 feet around structures, septic, ground-source heat pump fields, except for driveway access		entire site was graded to put in streets and lots		
2-34	4	Amend disturbed soil with compost or suitable soil amendments to a minimum depth of 10" to restore soil environmental functions	4	re spreaing topsoi 6"l , plus 4-6^ hog fuel during grading, plus 6" compost cedar grove on top	TB field verified	
2-35	2	Replant or donate removed vegetation for immediate reuse	2	plants re used for z home and public dig parties with King County		
2-36	2	Use plants donated from another site				
2-37	3	Grind land clearing wood and stumps for reuse	3	Stumps ground for hog fuel	TB field verified	
2-38	5-10	Use a water management system that allows groundwater to recharge on site (5 pts for 50%, 10 pts for 100%)	10	system drains to community treatment and infiltration/constructed wetland system	TB field verified	
		Subtotal	34			
Landscape Plan						
2-39	5	Species and locations for tree planting are identified that will provide summer shading of the dwelling and parking areas to moderate temperatures				
2-40	4	Vegetative wind breaks or channels are designed as appropriate to local conditions	4	Forest buffer and trees preserved to the west and south serve as a natural wind break		
2-41	1-5	Achieve a Green Factor Score for urban or infill under 1 acre http://www.seattle.gov/dpd/Permits/GreenFactor/				
2-42	3	Plant only trees that when full grown still allow for future solar install on south-side of property	3	homes layed out to allow solar access clearance from forest buffer		
		Subtotal	7			
Impervious Surfaces						
2-43	1-10	Install vegetated roof system (e.g. green roof) to reduce impervious surface (1 pt per 10% of roof)				
2-44	2-6	Use pervious materials for driveways, parking areas, walkways, and patios (2 pts per 33% pervious achieved)	6	small driveway areas are imperv, but entire site drains to in street bioswales, designed for 95% infiltration. Overflow in wet periods goes to DOT pond below, which is re used for irrigating public and street areas every year.	TB field verified	
		Subtotal	6			
Eliminate Water Pollutants during Construction						
2-45	2	When construction is complete, leave no disturbed areas uncovered or unstabilized	2		TB field verified	
2-46	1	Do not bury construction waste	1			
2-47	1	Establish and maintain a single stabilized construction entrance (quarry spall, crushed rock or concrete)				
2-48	3	Preserve and cover topsoil on site for reuse	3	Topsoil was preserved and re spread	TB field verified	
2-49	1	Wash out concrete trucks into storage containers, slab, or sub base areas.	1	yes		
2-50	1	Establish and post clean up procedures for spills to prevent illegal discharges	1	spill kit maintained on site	TB field verified	
2-51	1	Reduce hazardous waste through good jobsite housekeeping	1	yes	TB field verified	
2-52	3	Produce no hazardous waste	3	yes		
2-53	3	Construct tire wash, establish and post clean up protocol for tire wash				
2-54	2	Use slow-release organic fertilizers to establish vegetation	2	yes - Cedar Grove compost	TB field verified	
2-55	2	Use less toxic form releasers	2	bio degradable peanut oil product	Confrimed by builder interview	
2-56	1	Use non-toxic outdoor materials for landscaping (plastic, non-treated wood)	1	yes - no PT wood	TB field verified	
2-57	5	Do not clear or grade during wet weather periods	5	Grading during winter months was constantly monitored and inspected daily to maintain runoff below state turbidity standards.	OK per buider interview	
2-58	2	Do not use zinc galvanized ridge caps, copper flashing, or copper wires for moss prevention	2	Composition roof IKKO with no copper or Galv	TB field verified	
		Subtotal	24			
Heat Island Mitigation						
2-59	2	Use light colored hardscaping: Horizontal hardscaping materials are installed with a Solar Reflectance Index of 29 or greater for min 50% surface area	2	light colored concrete paving for driveway and walkway. Llight concrete meets SRI 29 in cement assoc studies	TB field verified	
		Subtotal	2			
WATER PROTECTION						
Outdoor Conservation						
2-60	1	Mulch landscape beds with 2 inches of organic mulch	1		TB field verified	
2-61	3-12	Limit use of turf grass, or use no turf grass (3 pts per 25%)	9	grass < 25% of landscaped area	TB field verified	
2-62	2	Use drought-tolerant grass type	2	Grass is " perfect green" mix of perennial rye, hard fescue, and kentucky bluegrass. Drought tolerance is Excellent, goo, and good, respectively.	TB verified on www.countrygreen.net/sod/php	
2-63	2	Landscape with plants appropriate for site topography and soil types, emphasizing use of native plants with low watering requirements (drought-tolerant)	2	yes natives include strawberries, vine maple, ferns, salal	TB field verified	
2-64	5	Plants with similar watering needs are grouped (hydrozoning).				
2-65	4	Pre-plumb for greywater reuse for irrigation				
2-66	5	Install greywater system for irrigation				
2-67	10	Install landscaping that requires no potable water for irrigation whatsoever after initial establishment period (approx. 1 yr), excluding food production	10		TB field verified	
2-68	1-10	Install rainwater collection system (cistern) for reuse	1	site overflow fills WA DOT pond below for re use in community		
2-69	3	Irrigation system is designed by a professional in accordance with EPA WaterSense requirements (or equivalent) and installed in accordance with EPA WaterSense Program or equivalent	3	Landscaped area < 100 sf qualifies for waiver in WATER seense		

EPA WATER SENSE REQUIREMENTS - Outdoor
4.1 Only applies to front yard
Lots with < 1000 sf of total landscaped area are exempt
IF OVER 1000 SF
Slopes req to be planted 2-3 " mulch reqiured
4.2 Irrigation system must be designed and installed by
WaterSense certified professional
apply for waiver if there arent any available!

2-70	4	Evapotranspiration- (ET-) based irrigation controller with a rain sensor			
2-71	4	Soil moisture sensor based irrigation controller			
2-72	2	Install a leak detection system with excess water flow shutoff			
2-73	4	An integrated pest management plan to minimize chemical use of pesticides and fertilizers is established			
		Subtotal	28		
Indoor Conservation					
2-74	8	Plumbing system with all plumbing fixture fittings (faucets & showerheads) located such that the volume of the water contained in each pipe run between the water heater and fixture fitting is a maximum of 6 cups (1.42 liters) (86.63 cubic inches) (.38 gallons)	8	WATERSENSE if PEX run to master bath is less than 41 ft	TB field ve
2-75	2	For bathroom faucets, select fixtures with less than 1.5 GPM	2	lav faucets measured at 1.43 gpm or less	TB field verified
2-76	1-3	Self-closing valve, motion sensor, metering, or pedal-activated faucet is installed to enable intermittent on/off operation			
2-77	1	For showers, install showerheads with less than 2.0 GPM		average shower is 1.9 gpm, master shower to be reduced	TB field verified
2-78	1	Install at least 1 kitchen faucet with less than 2.0 GPM		Kitchen tested at 2.2 gpm - ok for water sense, not Bult green	TB field verified
2-79	1-4	Select high-performance low-flush or dual-flush toilets (1.28 gpm) from list in resources. (1 pt per toilet)	3		TB field verified
2-80	10	Install composting toilets			
2-81	1-2	Install system to refill toilet with hand-wash water (1 pt per toilet)			
2-82	4	Stub-in plumbing to use greywater or rainwater for indoor reuse			
2-83	8	Install greywater or rainwater system for indoor reuse			
2-84	2	Install a recirculating pump for domestic hot water w/ timer or motion sensor			
2-85	2	Urinal is installed with a flush volume of 0.5 gallons or less			
		Subtotal	13		
Indoor Water Quality					
2-86	3	Provide compost or worm bins instead of a food garbage disposal			
2-87	2	Install a whole house water filter system			
2-88	2	Install water filtration system for consumptive use			
2-89	2	Install a chemical and salt free water softener system			
2-90	1	Separate outdoor water supply prior to filtration			
2-91	1-3	Provide spot water filtration using reverse osmosis or biodegradable carbon filter in kitchen and bathrooms. (1 pt per fixture)			
		Subtotal	0		
ENVIRONMENTAL DESIGN CONCEPTS					
2-92	10	Provide accessory dwelling unit or accessory living quarters			
2-93	2	Maintain clear area to south of house for passive and active solar access	2	South facing front area next to street - all homes designed for PV access on roof	TB field verified
2-94	3	Provide a covered front porch	3	front porch inculed in desing	TB field verified
2-95	3	Position garage so it is not in front of house, while minimizing impervious driveway area			
2-96	2-5	Minimize garage size	2		TB field verified
2-97	3	Build within ¼ mile of a transit stop	1	Issaquah higlands major transit center is .6 mile	TB field verified
2-98	1-5	Design to promote and encourage pedestrian-friendly and safe neighborhoods	5	Issaquah highlands design includes trails, bike lanes, playgrounds, and extensive shopping within 1/2 miole of site	
2-99	2	Bury utility lines in common trenches	2		TB field verified
2-100	5	Utilities are installed using one or more alternative means such as tunneling instead of trenching, use of smaller (low ground pressure) equipment, or geomats to spread the weight of construction equipment, shared utility trenches or easements, and placement of utilities under streets instead of yards.			
2-101	1	Use dark sky compliant fixtures to minimize night glare. (no point allowed if required by local codes)	1	all exterior fixtures are down lights only... Issaqyah Highlands community standard required.	TB field verified
2-102	3	Build on a lot that is within 1/2 mile of at least six essential services, (e.g., grocery store, post office, place of worship, community center, daycare center, bank, school, restaurant, medical/dental office, laundromat/dry cleaner, etc)	3	Issaquah highlands village is less than 1/4 mi and has many many services, movie theater, market, mall, banks, sporting goods, restaurants, drycleaners, etc etc.	TB field verified
2-103	4	Driveways or parking are shared between multiple units	4	lots 8-20 share private drive way/ alley, shared parking area next to lot 1	
2-104	3	Proximity to bike amenities within 1 mile	1		TB field verified
		Subtotal	24		
Extra Credit for Site and Water					
2-105	1-10	Extra credit for innovation in Site and Water			
		SECTION 2 TOTAL	197		

Post install inspection by certified Professional

No leaks, runoff, overspray.
rain sensor shutoff required

Detailed irrigation controllers

for water sense certif

EPA WATER SENSE REQUIREMENTS - Indoor

3.1 Check/ test all systems for leaks

3.2 Pressure test maximum of 60 PSI

3.3 Hot water lines short and efficient - maximum of 0.6 gallon

can come out before hot water arrives

3.4 Water Sense toilet 1.28 gal / flush

3.5 Lav faucets Water sense labeled - 1.5 gpm max

Kitchen faucet 2.2 gal/min

3.6 Water Sense label showerhead 2.0 gpm max

3.7 ENERGYSTAR Dishwasher
ENERGYSTAR Clothes washer w/ WF< 6.0

5.1 Owner operation manual includes

manuals for controls or timers,
schematic of sprinkler system
general info about ENERGY STAR appliances if they are not included in the home

3 point added for lots 8-20

SECTION 3: ENERGY EFFICIENCY

OVERALL					
3-1	1-50	Document a reduction in overall home energy use using approved energy modeling software (1 pt per % improvement over code)	43	43 % improvement is shown in attached REM RATE report energy modeling in process by TB	TB field verified
3-2	50	Build a zero net energy home that draws zero outside power or fuel on a net annual basis (based on modeling)			
ENVELOPE					
Thermal Performance					
3-3	1-40	Document envelope improvements beyond code (component performance approach) (1 pt per % improvement over code)			
3-4	1-40	Document envelope improvements beyond code (prescriptive approach)			
3-5	10	Home is ENERGY STAR® Homes Northwest certified			
3-6	1-2	Install no more than 1% of conditioned floor space of skylights (1 pt), or NO skylights (2 pts)	2	No skylights	TB field verified
3-7	5	Skylights minimum of U-0.1			
3-8	10	All windows w/ minimum of U-0.20			
3-9	3	Design with low window to floor ratio (<12%)			
3-10	5	Install full continuous rigid insulation beyond code beneath any slabs on grade			
3-11	5	Install dense packed cellulose (over 2.5 lbs/inch), or wet-blown cellulose, or blown-in foam or fiberglass BIBS or blown in fiberglass as insulation	5	BIBS wall insulation	TB field verified
3-12	5	Install frost-protected shallow foundation, minimum R-10 insulation			
3-13	2	Skylight shafts insulated to R-38, covered with GWB, OSB or other rigid sheathing to prevent air movement through the insulation from degrading the insulation value			
3-14	2	Specify and use raised-heel trusses (>= 8in.) or SIPs roof, to allow full insulation over conditioned space	2	flat and sloped shed roofs have full insulation depth at eaves	TB field verified
		Subtotal	52		
Air Sealing					
3-15	3	Airtight drywall approach for framed structures using thermal enclosure checklist	3	TBC checked off in walkthrough with Green Verifier	TB field verified
3-16	5-10	Blower door test results better than 3.5 ACH50 (5 points), 2.5 ACH50 (10 points)	5	tested 3.5 ACH 50	TB field verified
3-17	3	Use an air barrier on the exterior wall assembly installed per manufacturers guidelines			
		Subtotal	8		
Reduce Thermal Bridging					
3-18	1	Use insulated headers	1		TB field verified
3-19	1	Where applicable, use 2-stud instead of 3-stud corners, and fully insulate corners	1		TB field verified
3-20	1	Fully insulate at interior/exterior wall intersection by open cavity framing	1		TB field verified
3-21	10	Use structural insulated panels (SIPs), insulated concrete forms (ICFs) or straw bale for exterior walls around conditioned space			
3-22	2	Use exterior rigid insulation beyond code			
3-23	3	Use advanced wall framing, 24-inch on-center, w/ double top plate			
3-24	4	Use advanced wall framing—24-in on-center framing, w/ single top plate			
3-25	1	Use drywall stops or clips for backing			
3-26	3	Innovative stick framing to reduce thermal bridging, by methods such as double wall framing and horizontal wall furring			
3-27	10	Free air movement in attic or on site framed roof systems exceeding code by 15%	10	Hybrid flash and batt spray foam roof system eliminates need for roof ventilation	TB field verified
3-28	3	Install storm door system with magnetic seal			
		Subtotal	13		
Solar Design Features					
3-29	5	Orient home on site to optimize passive solar strategies			
3-30	5	Passive solar design, basic features installed			
3-31	1-12	Passive solar design, advanced features installed			
3-32	3	Model solar design features using approved modeling software			
3-33	5	Design and implement passive cooling system (no A/C; radiant cooling or passive cooling system)			
		Subtotal	0		
HEATING/COOLING SYSTEM					
Equipment & Distribution					
3-34	1	Centrally locate heating/cooling system to reduce the size of the distribution system	1	Radiant floor system	TB field verified
3-35	1	Provide two properly supported ceiling fan pre-wires			
3-36	1-2	Install properly supported ENERGY STAR® ceiling fans, 1 pt per fan			
3-37	1	Use foil-covered external insulation on metal ducting			
3-38	1	Use advanced sealing of all duct joints using low-toxic mastic			
3-39	2	Third-party duct test results less than 4% loss of conditioned floor area (50 pascals)			

ENEVELOPE INSULATION

FLOOR	over Crawl R38
Wall	R23 BIBS wall insulation
ceiling	R42 flash and batt
Windows	Ichiio double pane u=.35

tyveck all seams must be taped

3-40	3	Place all ducts in conditioned space				
3-41	1	Insulate any ducts located in unconditioned space to at least R-11				
3-42	5	Locate heating/cooling equipment inside the conditioned space	5	In closet below stairs	TB field verified	For lots 8-22
3-43	3	Air handling equipment or return ducts are not located in the garage, unless placed in isolated/air sealed mechanical rooms with an outside air source	3	Radiant floor system eliminates Air handler	TB field verified	furnace in garage - builder may look at reduced area duct system r later building
3-44	2	Design the distribution system using ACCA Manual D	2	Radian t floor and floor voard design is per room by room heat load analysis and Ichijo slotted underlayment board is custom manufactured to fit rooms	per buider interview	
3-45	10	Use ductless distribution system (e.g. hydronic, radiant, ductless minisplits)	10	Navien 95% boiler/hw heater	TB field verified	by MM confort. Tested 125 cfm50
3-46	3	Where appropriate, install furnace fan or pumps with an electrically commutated motor (ECM)				
3-47	1	Locate registars towards center of home rather than at outside walls minimizing ducting and loads on unit				tested by MM comfort - not 3rd party
		Subtotal	21			
						is system tested and balanced?
Controls						
3-48	3	Select high efficiency heat pumps instead of electric heat[1] (add, or heat pump with efficiency that exceeds code requirements				
3-49	5	Install a heating system with zonal controls	5	.Manifolds and thermostates control separate floor zones	TB field verified	
		Subtotal	5			
Heat Recovery						
3-50	5	Install a heat recovery ventilator or energy recovery ventilator[1]				
		Subtotal	0			
Heating / Cooling						
3-51	5	Select ENERGY STAR® heating/cooling equipment (not available if claiming under WSEC Table 406.2)	5	Navien 240 boiler is ENERGY STAR	TB field verified	
3-52	2	Install high-efficiency auxiliary heating units, e.g. EPA-approved pellet stove, Russian fireplace, masonry radiant heater	2			Lot 1 only
3-53	2	Properly size HVAC system using ACCA Manual J (do not oversize)	2		?? For installer of radiant system	
3-54	2	Use direct vent gas or propane hearth products (AFUE rating)				
3-55	10	Install geothermal heat pumps[1]				
		Subtotal	9			
WATER HEATING						
Distribution						
3-56	1	Locate water heater within 20 pipe feet of highest use				
3-57	1	Insulate all hot water pipes				
3-58	3	Design home with single plumbing wall				
3-59	2	Use 3/8" pipe (PEX) tubing				
3-60	1	Install an on demand hot water recirculation system				
		Subtotal	0			
Drain water Heat Recovery						
3-61	3	Install drain water heat recovery system (DHR)				
		Subtotal	0			
Water Heating						
3-62	2	Install tankless water heater[1]	2		TB field verified	
3-63	3	Install electric water heater efficiency to EF of .93 or higher (not available if claiming under WSEC Table 406.2)				
3-64	1-5	Upgrade gas or propane water heater efficiency to EF 0.62, 0.83, or 0.90[1]	5	96% efficient Navien CH24 hW heater and boiler	TB field verified	
3-65	2	Install water heater inside the heated space (electric, direct vent, or sealed venting only)	2	in main floor closet	TB field verified	
3-66	6	Upgrade electric water heater to exhaust air heat pump water heater or de-superheater: EF 2.0[1]				
3-67	2	Use indirect water heater for domestic hot water (DHW)				
		Subtotal	9			
LIGHTING						
Natural Light						
3-68	1	Light-colored interior finishes	1		TB field verified	
3-69	2	Use clerestory for natural lighting				
3-70	2	Use light tubes for natural lighting and to reduce electric lighting				
3-71	1	Create more shared light with glass interior doors and windows				
		Subtotal	1			
Efficient Lighting						
3-72	1	Solar-powered walkway or outdoor area lighting	1		TB field verified	
3-73	2	Use compact fluorescent bulbs, ballast, or fixtures in three high-use locations (kitchen, porch/outdoors, and one other location)	2		TB field verified	
3-74	1-5	Install fluorescent- or LED-lighting (1 pt for each 5% of lighting beyond the code required 75%)	9	95% LED and CFL - all LED recessed lighting in most rooms	TB field verified	
3-75	1-3	Install fluorescents or LED lights on dimmer (1 pt per installed dimmer)				
3-76	1-3	Use interior occupancy sensors, e.g. timers, motions detectors (1 pt per item)				
3-77	1	Install photo cells, timers, motion detectors (exterior)(beyond Energy Code requirements)	1		TB field verified	
3-78	1	Install LED lighting in high-use location	1	kitchen, baths and main room all LED cans	TB field verified	
3-79	2	Install switches for wall outlets (phantom load switches)				
3-80	5	Install no recessed can lights that penetrate the building's thermal envelope	5	hybrid flasn and batt insulation creates a building pressure boundary above the recessed cans and seals rim joist area.	TB field verified	
		Subtotal	19			
Appliances						
3-81	1	Provide an outdoor clothesline				
3-82	1	Install gas clothes dryer				
3-83	2	Install front loading or ENERGY STAR® washing machine		Buyer option - in lot 1		
3-84	1	Install an ENERGY STAR dishwasher	1		TB field verified	
3-85	1	Install ENERGY STAR refrigerator		Buyer option - in lot 1		
3-86	1	Install ENERGY STAR exhaust fan vented to outside	1	Yes Pannasonci Whisper ceiling fans all	TB field verified	
3-87	2	Install induction range				
3-88	3	Install energy monitoring device in home	3	NEST thermaostats	TB field verified	
		Subtotal	5			
ALTERNATIVE ENERGY						
3-89	2-3	Enroll the residence in the local utility's electricity program for renewable electricity sources	3		TB field verified	
3-90	2	Pre-pipe for solar water heater				
3-91	10	Solar water heating system sized to provide a minimum of 40% hot water designed energy use[1]				
3-92	1-25	Percentage or all of home powered by renewable energy source (5 pts per kW)	18	3.5 Kw PV system standard	TB field verified	
3-93	4	Provide designated location on south roof area and rough-in conduit for wiring and controls for future solar thermal and photovoltaics	4	Conduit sized for easy expansion of PV arrah	TB field verified	
		Subtotal	25			
Extra Credit for Energy Efficiency						
3-94	1-10	Extra credit for innovation in Energy Efficiency				
		SECTION 3 TOTAL	167			

1 Not applicable if claiming under WSEC Table 406.2

SECTION 4: HEALTH & INDOOR AIR QUALITY

OVERALL					
4-1	4	Interact w/ homeowner early in design/construction process to identify chemical sensitivities and preferred IAQ measures and finishes			
4-2	5	Project team member to have taken American Lung Association (ALA) of Washington "Healthy House Professional Training" course or other IAQ class with 8 hours of curriculum minimum	5	Nick attened ALA professional trainng in 2010	
4-3	15	Certify the home to a third-party verified program emphasizing indoor air quality (e.g., EPA Indoor airPLUS®, American Lung Association Health House®)			
4-4	3	Design for soundproof area in home			
		Subtotal	5		
JOBSITE OPERATIONS					
4-5	1	Use less-toxic cleaners	1		TB field verified
4-6	1	Require workers to use VOC-safe masks when applying VOC containing wet products, and N-95 dust masks when generating dust	1	required as part of standard contract - ichjo pictures avail on req2	verified by biulder statement/interview
4-7	1-3	Take measures during construction operations to avoid moisture problems later, 1 pt per 4 measures	3	yes standard practice incluides moisture meter req 15% or less on framing before covertesting, tarp deliveries , materials in dry garages	verified by biulder statement/interview
4-8	2	Take measures to avoid problems due to construction dust (perform all measures listed in handbook)	2	vaccum post drywall framing cavities/ standare paractice to do the actions listed in the handbook	verified by biulder statement/interview
4-9	3	Implement comprehensive dust control plan as described in handbook			

4-10	2	Use moisture meter to ensure moisture levels are 19% or less in walls, 12% or less in floors before closing up, installing drywall, and finish floors	2	yes standard practice incluides moisture meter req 15% or less on framing before cover, testing, tarp deliveries , materials in dry garages	verified by biulder statement/interview
4-11	3	Ventilate with box fans in windows blowing out during drywall sanding and new wet finish applications	3	Standard company practice included in contracts	verified by biulder statement/interview
4-12	2	No use of unvented combustion-type heaters during construction	2	Ichijo uses no propane heaters using duct system for temp heat	**TB field verified**
4-13	2	Block all duct ports upon installation and no use of ducted HVAC	1	DHP air conditioners kept sealed and clean until final finish	verified by biulder statement/interview
4-14	3	Clean duct and furnace thoroughly just before owners/tenants move in		na no furnace on this home	
4-15	2	No smoking inside of any building or within 25 ft. (or more) radius of exterior of any building	2		
4-16	4-8	Train subs in implementing a healthy building jobsite plan for the project (4 pts) and contractually require compliance (8 pts)	8	standard practice for all items listed in handbook	verified by biulder statement/interview
4-17	2	Implement a "no-idle zone policy" for equipment and vehicles not in active use			
		Subtotal	25		
LAYOUT & MATERIAL SELECTION					
4-18	1	Use pre-finished flooring	1		**TB field verified**
4-19	10	No carpet			
4-20	2	If using carpet, specify products certified by third-party for indoor air quality	2	Mowhawk carpets have Green label plus certificaton	**TB field verified**
4-21	2	Install low pile or less allergen-attracting carpet and pad	2		**TB field verified**
4-22	1	Install natural fiber carpet (e.g. jute, sisal, wool)			
4-23	3	Limit use of carpet to one-third of home's square footage			
4-24	1	If using carpet, install by dry method	1		**TB field verified**
4-25	3-5	Optimize air quality in family bedrooms to basic (3 pts) or advanced level (5 pts) (see handbook)	3	meet basic levels in handbook	
4-26	5	Garage air-sealed from house with automatic exhaust fan	5	50 cfm fan tied to switch	**TB field verified**
4-27	10	Detached or no garage			
4-28	2	Fully insulate attached garage to minimize condensation-based mold growth	2	Garage walls are insulated	**TB field verified**
4-29	3	Use urea formaldehyde-free insulation or GreenGuard Certified product	3	Ecobatt, Mowhawk carpets, Cabinets, Counters	
		Inside the house, use only low-VOC, low-toxic, water-based, solvent-free sealers, grouts, mortars, caulks, adhesives, stains, pigments, and additives for:			
4-30	2	Tile and grout	2	custom products	**TB field verified**
4-31	2	Framing	2	OSI adhesives	**TB field verified**
4-32	4	Flooring	4	no adhesives	**TB field verified**
4-33	2	Plumbing	2	All adhesives used by plumber are low VOC/VOC Compliant. Only adhesives used were for ABS Glue.	**TB field verified**
4-34	2	HVAC	2	low voc mastic	**TB field verified**
4-35	2	Insulation	2	green guard certif	**TB field verified**
4-36	2	Drywall	2	yes	**TB field verified**
4-37	2	Use materials without added urea-formaldehyde for finish work, including shelving, window and door trim, and base molding	2	Ichijo cabinets and shelving meet Japanese JIS F***** standards - less than CARB ULEF	**TB field verified**
4-38	3	Use plywood and composites of exterior grade or with no added urea formaldehyde (for interior use)	3	Ichijo cabinets and shelving meet Japanese JIS F***** standards - less than CARB ULEF	**TB field verified**
4-39	3	Install cabinets made w/ no-added urea formaldehyde board and low-toxic finish	3	Ichijo cabinets and shelving meet Japanese JIS F***** standards - less than CARB ULEF	**TB field verified**
4-40	2	Use ceramic tile for 5% or more of flooring	2	three baths total more than 120 sf of flooring area including showers	
4-41	3	Use polyethylene piping for plumbing and electrical conduit. No PVC piping	3	all pipin is PEX or ABS	**TB field verified**
4-42	3-5	Use low- or non-VOC and non-toxic interior paints and finishes on large surface areas (3 pts) or all interior surfaces (5 pts); 150 flat, < 50 for non-flat	5	All paints are low VOC, Sherwin Wiliams Pro Mar 200 and CoverGo trim paint	
		Subtotal	53		
MOISTURE CONTROL					
4-43	1	Slope crawlspace and foundation grade toward perimeter for drainage, supply drainage lines out to exterior footing drains, and install polyfilm vapor barrier sealed to stem walls	1		**TB field verified**
4-44	1	Verify seal at doors, windows, and plumbing and electrical penetrations against moisture and air leaks	1		**TB field verified**
4-45	3	Envelope inspection at pre-insulation by a qualified professional	3		**TB field verified**
4-46	2	Slab on grade, upgrade under-slab moisture barrier beyond code to 10 mil minimum; minimum of 10 mil poly in crawl spaces with sealed seams and sealed perimeter			
4-47	1	Install approved ice and water shield membrane for roofs pitched under 4-in-12			
4-48	3	Roof overhangs are at least 24" inches			
4-49	2	Protect windows and doors on tall walls with additional overhang protection			
4-50	2	Use a nontoxic foundation, dampproofing treatment and perimeter drain to protect walls against moisture			
4-51	1	Install a drainable house wrap under exterior siding to promote wall drainage.	1		**TB field verified**
4-52	5	Full exterior drainage plane integrated shingle-style with pan-flashed and face-flashed door and window openings, as designated in EEBA's "Water Management Guide", or equivalent			
4-53	5	Install a sloped sill pan with end dams and back dams for all windows, and back dams for all exterior doors exposed to the weather			
4-54	1	Install metal flashing at all windows and all door heads exposed to the weather	1		**TB field verified**
4-55	3	Hose-test installed windows, before siding, to verify resistance to wind driven rain			
4-56	2	Where not required by code, install working radon type vent system to eliminate potential moisture, methane, and radon problems in crawl space or under slabs on grade			
4-57	1	Install a rigid perforated footing drain at foundation perimeter, not connected to roof drain system	1		**TB field verified**
4-58	3	Show and build moisture management details for below grade walls beyond code, such as dimple drainage mat at exterior face and capillary breaks			
4-59	2	Perform calcium chloride moisture test on all slabs on grade prior to installing any finish flooring in conformance with product warranties			
4-60	3	Have crawl space, attic, and garage building performance tested for disconnection to the living space of house	3	TB testing garages on final.. In this case, garage is built out as a sales center	**TB field verified**
4-61	3	Use an unvented or mechanically-exhausted, conditioned crawl space (not appropriate where flood venting is required)			
4-62	4	No plumbing distribution lines in exterior walls			
4-63	4	Implement mold prevention measures such as antimicrobial treatment			
		Subtotal	11		
AIR DISTRIBUTION AND FILTRATION					
4-64	3	Verify performance of ventilation systems; measuring supply and exhaust airflow, checking control activation and damper operation	3	Fan flows tested by rater	**TB field verified**
4-65	3-5	Install return-air ducts (5 pts) or passive pressure (3 pts) relief strategy in all bedrooms	1	Releif grille in laundry/ Whole hosue fan room	**TB field verified**
4-66	1	Use medium-efficiency pleated filter, MERV 10			
4-67	5	Use high-efficiency pleated filter, MERV 12 or better, or HEPA			
4-68	2	Balance airflow system based on filter being used			

Notes from Nick and Jason:

4-7 Avoid Moisture Problems

- Tarped deliveries and storage of materials inside of dry garages
- PM has moisture meter, maximum allowable moisture content before GWB is 15%
- Install drains on flat roof before any R/I trades start, eliminating water intrusion into building
- Head flash all door and window openings.
- Use Panasonic whispergreen fans, timer controlled for all bathrooms

4-8 Avoid Dust Problems

- Perform the actions listed in the handbook, except we typically sweep in lieu of vacuum. We only vacuum, prior to millwork paint and final cleaning.
- We have found some difficulty in keeping heat registers clean, but keep standard practice to vacuum all ducts, and install new filters prior to closing.

4-9 Ventilate with Box Fans

- Standard practice and included in contract

4-12 Train Subs to Implement Healthy Building

- Standard practice for all items listed in handbook.

4-69	3	Install central vacuum, exhausted to outside			
4-70	2	Provide for cross ventilation using operable windows	2		TB field verified
4-71	2	Install an operable skylight, clerestory or roof monitor (manual or automated) high up in the structure to aid natural ventilation. Use U-factor of 0.45 or below and solar gain co-efficient of 0.35 or below for skylight			
4-72	2	Use ultraviolet light or equivalent new technologies for air purification			
4-73	3	A carbon monoxide (CO) alarm is installed in a central location outside of each separate sleeping area in the immediate vicinity of the bedrooms. the alarm is hardwired with a battery back-up.	3	smoke / CO monitors throughout home	TB field verified
		Subtotal	9		
HVAC EQUIPMENT					
4-74	1	Limit kitchen exhaust fan to 300 CFM maximum	1	Kitchen fan is under 300 cfm	TB field verified
4-75	2-4	Install timers, humidistat controls, or occupancy sensors for bath and laundry exhaust fans, 2 pts per device	4	all bath fans have 10/10/30/60 timers	
4-76	1-3	Install quiet (<1.5 sone) bath fan with smooth ducting, minimum 4 inch or employ other quiet ventilation strategy or install ENERGY STAR, or equivalent fan operating =< 1 sone (3 pts)	3	all bath fans and WWF in laundry are Panasonic whisper ceiling < 1.0 sone	TB field verified
4-77	1	Install exhaust fans in rooms where office equipment is used			
4-78	3	Do not install naturally aspirated heating and hot water equipment	3	Sealed combustion Navien tankless boiler only	TB field verified
4-79	1	No sound insulation or other fibrous materials installed inside ducting	1	ductless AC and heating system	
4-80	5	Provide balanced or slightly positive indoor pressure using controlled ventilation			
4-81	10	Install whole house radiant heating system (no ducted heating)	10	Navien CH 240 Boiler	TB field verified
4-82	3	If providing central heating and cooling, install whole house humidification and/or dehumidification			
		Subtotal	22		
INDOOR POLLUTANT CONTROL					
4-83	1	Build a lockable storage closet for hazardous cleaning and maintenance products, separate from occupied space			
4-84	1	Install showerhead filter			
4-85	1	Do not install gas-burning appliances inside house			
4-86	7	Fireplace, woodstoves, pellet stoves, or masonry heaters are not installed in the home			
4-87	2	Design a designated shoe-removal area and storage at primary entrance			
BUILDING ENTRANCE POLLUTANTS CONTROL					
4-88	1	Install exterior grilles or mats			
4-89	1	Install interior grilles or mats			
4-90	1-3	Install floor drain or catch basin with drain under washing machine and/or water heater			
4-91	1	Install moisture alarms under sinks and dishwasher			
		Subtotal	0		
ELECTROMAGNETIC FIELDS					
4-92	2	Wire bedrooms so circuitry can be conveniently shut off at night to eliminate electric fields			
4-93	2	Design sleeping and sitting areas to be at least 12 feet from major appliances	2	yes	TB field verified
4-94	1	Use no CFLs			
		Subtotal	2		
Extra Credit for Health and Indoor Air Quality					
4-95	1-10	Extra credit for innovation in health and indoor air quality			
		SECTION 4 TOTAL	127		

SECTION 5: MATERIALS EFFICIENCY

Overall Design					
5-1	5-9	Design and build for deconstruction concept			
5-2	2	Use stacked floor plan	2	Bathrooms are stacked above kitchen or bath in most plans	
5-3	1	Use standard dimensions in design of structure	1	yes	TB field verified
5-4	2	Avoid waste from structural over-design	2	efficient desing and simple structural systems	
		Subtotal	5		
Reduce					
5-5	2	Create detailed take-off and provide as cut list to framer	2	Ichijo utilizes an optimized framing package. All plates, trimmers, cripplers, headers, are pre-cut at an offsite facility to limit waste and maximize the organization and specific use for a piece of lumber. A panel book is provided with each delivery outlining all onsite framing requirements.	TB field verified
5-6	2	Use central cutting area or cut packs	2	• Due to the optimized package, the framer should only have to field cut joists and beams. Given the optimization no more than 3" waste should be left from these items. • Standard sized lumber are used in lieu of custom cuts.	TB field verified
5-7	2	Use suppliers who offer reusable or recyclable packaging	2	• Waste reduction efforts are written into specific contract language, identifying daily cleaning and source separation of materials. See sample contract. • Jobsite housekeeping and clean-up are constant topics for safety/jobsite meetings	TB field verified
		Subtotal	6		
Use Salvaged Materials					
5-8	2	Purchase used building materials for your job			
5-9	1-4	Use salvaged doors			
5-10	1-2	Use salvaged flooring			
5-11	1-2	Use salvaged windows			
5-12	1-2	Use salvaged appliances			
5-13	1-2	Use salvaged fixtures			
5-14	1-2	Use salvaged hardware			
5-15	2	Use salvaged cabinets			
5-16	2	Use salvaged siding			
5-17	2	Use salvaged decking			
5-18	2	Use salvaged trim			
5-19	2	Use salvaged framing lumber			
5-20	1	Reuse spent solvent for cleaning			
		Subtotal	0		
Recycling					
Source-Separated Recycling				*Use source sep or comingled credits, not both.	
5-21	5	Use deconstruction to dismantle and reuse existing building(s) on site			
5-22	1	Recycle cardboard by source separation, 85% minimum recycling rate			
5-23	3	Recycle metal scraps by source separation, 85% minimum recycling rate			
5-24	5	Recycle clean scrap wood and broken pallets by source separation, 85% minimum recycling rate			
5-25	2	Recycle package wrap and pallet wrap by source separation, 85% minimum recycling rate			
5-26	3	Recycle drywall by source separation, 85% minimum recycling rate			
5-27	2	Recycle concrete/asphalt rubble, masonry materials, or porcelain by source separation, 85% minimum recycling rate			
5-28	1	Recycle paint by source separation, 85% minimum recycling rate			
5-29	4	Recycle asphalt roofing by source separation, 85% minimum recycling rate			
5-30	2	Recycle carpet padding and upholstery foam by source separation, 85% minimum recycling rate			
5-31	1	Recycle glass by source separation, 85% minimum recycling rate			
5-32	3	Recycle land clearing and yard waste, soil, and sod by source separation, 85% minimum recycling rate			
5-33	4	Recycle fluorescent lights and ballasts			
5-34	1	Donate, give away, or sell reusable finish items			
5-35	1	Move leftover materials to next job or provide to owner			
		Subtotal	0		
Commingle Recycling					
5-36	10	Send at least 90% of jobsite waste (by weight, excluding concrete, brick and asphalt) to a commingle recycling facility with a 50% recycling rate			
5-37	18	Send at least 90% of jobsite waste (by weight, excluding concrete) to a commingle recycling facility with a 75% recycling rate	18	CDL recycle - builder provided monthly diversion reports for project as a whole - 7-8 homes built concurrently in each phase. 77% rate reported by CDL for project	TB interviewed builder and reviewed reports.
5-38	24	Send at least 90% of jobsite waste (by weight, excluding concrete) to a commingle recycling facility with a 90% recycling rate			
		Subtotal	18		
DESIGN AND MATERIAL SELECTION					
Overall					

Waste reducion strategies

1 Topsoil and stumps re used on site - mimal import/expeort
2 open floor plan on main level
3 5-7 use suppliers who use recyclable packaging
4 require subs toparticipate in waste reduction
5 Optimized pre cut framing packages
6 central cutting area - factory machine cutting very efficient

Recycled content materials

1 Recy conncrete aggregate and fill
2 Hardi backer tile base
3 drywall
4 MDF trim
5 MDF cabinets - Ichijo
6 MDF closet system - Ichijo
7 Recy content flat panel doors
8 metal stair railing
9 Composite IKKO roofing
0 Certainteed "Allura" siding product is 10-20% recyclied content

5-39	1-10	Install locally-produced materials (1 pt per item)	6	Drywall, wall framing /roof framing/steel railings/mdf trim/ Allura siding / recy concrete fill and aggreagate	TB field verified	
5-40	1-8	Use building salvaged lumber, minimum 200 board feet				
5-41	2-3	Use urban or forest salvaged lumber, minimum 250 board feet				
5-42	3	Use rapidly renewable building materials and products made from plants harvested within a ten-year cycle or shorter in at least 2 substantial applications				
5-43	2	Use environmentally preferable products with third-party certification, such as SCS, GreenGuard, and Floor Score (not applicable to carpet)	2	engineered oak hardwood flooring, fiber cement siding, , solid surface counter tops.	TB field verified	
5-44	2	Use recycled-content plastic lumber				
		Subtotal	8			
Framing						
5-45	7	Use dimensional lumber that is third-party certified sustainably harvested wood that meets the Tier 1 requirements outlined in the handbook, 50% minimum				
5-46	1	Use dimensional lumber that is third-party certified sustainably harvested wood that meets the Tier 2 requirements outlined in the handbook				
5-47	5	Use sheathing that is third-party certified sustainably harvested wood that meets the Tier 1 requirements outlined in the handbook, 50% minimum				
5-48	1	Use sheathing that is third-party certified sustainably harvested wood that meets the Tier 2 requirements outlined in the handbook				
5-49	5	Use beams that are third-party certified sustainably harvested wood that meets the Tier 1 requirements outlined in the handbook, 50% minimum				
5-50	1	Use beams that are third-party certified sustainably harvested wood that meets the Tier 2 requirements outlined in the handbook				
5-51	2	Use factory framed wall panels (panelized wall construction), including SIPs and ICFs				
5-52	3	Use truss roof system	2	partial truss roof plus I joist in vaulted areas	TB field verified	
5-53	3	Use engineered structural products and use no dimensional 2xs larger than 2x8, and no 4xs larger than 4x8	3	Yes all framing is pre cut and optimized with composiite joists and beams	TB field verified	
5-54	3	Use finger-jointed framing material (e.g. risers and studs) longitudinal compression loads only				
5-55	3	Use cementitious foam-formed walls with flyash concrete				
		Subtotal	5			
Foundation						
5-56	1	Use regionally produced block				
5-57	3-6	Use flyash or blast furnace slag for 25% by weight of cementitious materials for all concrete (20% for flat work)	6	30% slag cement mix in foundation walls	TB field verified	
5-58	2	Use recycled concrete, asphalt, or glass cullet for base or fill	2	Recycled aggregate on all driveway slabs	TB field verified	
		Subtotal	8			
Doors						
5-59	1	Use doors that are recycled-content or certified as sustainably produced (FSC, CSA Intl., or American Tree Farms System)	1	MDF fiber core doors by Ichiho	TB field verified	
5-60	2	Use domestically-grown and manufactured wood interior doors				
		Subtotal	1			
Finish Floor						
5-61	4	Hardwood flooring from third-party certified, sustainably harvested sources, locally harvested or re-used lumber				
5-62	2	Use recycled-content underlayment products	2			
5-63	1	Use recycled-content vinyl flooring.				
5-64	4	No vinyl flooring	4	No vinyl flooring		
5-65	3	On more than 250 square feet, use rapidly renewable flooring products with a ten-year harvest cycle or shorter (excluding carpet)				
5-66	1	Use recycled-content carpet pad	1	pad and carpet are integral	TB field verified	
5-67	3	If installing carpet, use recycled-content or renewed carpet	2	mowhawk 44% post indust recycle content	TB field verified	
5-68	1	Use replaceable carpet tile	1	Mowhawk carpet tile in laundry		
5-69	3	Use 40% recycled-content hard surface tile, 100 square feet minimum				
5-70	3	Use natural linoleum				
5-71	3	Use recycled-content glass, ceramic, or porcelain tile for 10% of total floor area				
5-72	5	Use flooring that is third-party certified sustainably harvested wood that meets the Tier 1 requirements outlined in the handbook, 50% minimum				
5-73	1	Use flooring that is third-party certified sustainably harvested wood that meets the Tier 2 requirements outlined in the handbook				
5-74	1	Use durable/spot repairable floor finish	1	engineeered oak flooring is spot repairable		
5-75	2	Use concrete slab or sub-floor as a finished floor in living space				
5-76	6	A minimum of 85 percent of installed hard-surface flooring is in accordance with the emission concentration limits of CDPH 01350 as certified by a third-party program, such as the Resilient Floor Covering Institute, or GREENGUARD				
		Subtotal	11			
Interior Walls						
5-77	1	Use drywall with at least 30% recycled-content gypsum				
5-78	2	Use recycled or "reworked" paint and finishes				
5-79	1	Use recycled newspaper or cork expansion joint filler				
5-80	2	Use natural wall finishes, e.g. lime paint, clay				
5-81	2	Reduce interior walls through open plan for kitchen, dining, and living areas	2	Open plan main floor	TB field verified	
		Subtotal	2			
Exterior Walls						
5-82	1	Use recycled-content sheathing				
5-83	1	Use siding with reclaimed or at least 15% recycled material on at least 75% of solid wall surface	1	Allura siding product has 30% recyclied content (Flyash) and has less silica dust in cutting	TB field verified	
5-84	2	No vinyl siding or exterior trim	2			
5-85	6	Wood siding is 100% FSC-certified or locally harvested or milled				
5-86	2	Use 50-year warranted siding product	2	Allura and Hardie have 50 yr warranty		
5-87	5	Use wood siding that is third-party certified sustainably harvested wood that meets the Tier 1 requirements outlined in the handbook, on at least 20% of solid wall surface				
5-88	1	Use wood siding that is third-party certified sustainably harvested wood that meets the Tier 2 requirements outlined in the handbook, on at least 20% of solid wall surface				
5-89	2	Use salvaged masonry brick or block, 50% minimum				
5-90	2	Use regionally-produced stone or brick				
		Subtotal	5			
Windows						
5-91	5	Use wood / fiberglass / finger jointed / composite wood windows				
5-92	1	Use locally-produced windows				
5-93	5	Use wood windows that are third-party certified sustainably harvested wood that meets the Tier 1 requirements outlined in the handbook				
5-94	1	Use wood windows that are third-party certified sustainably harvested wood that meets the Tier 2 requirements outlined in the handbook				
		Subtotal	0			
Cabinetry and Trim						
		Trim:				
5-95	1	Use regional trim products, 50% minimum	1	interior trim is from METRIE, based in sumner, WA		
5-96	3	Use trim that is third-party certified sustainably harvested wood that meets the Tier 1 requirements outlined in the handbook, 50% minimum				
5-97	1	Use trim that is third-party certified sustainably harvested wood that meets the Tier 2 requirements outlined in the handbook, 50% minimum				
5-98	3	Use finger-jointed or MDF trim with no added urea formaldehyde, 90% minimum	3	Trim is 90% recycled content and NAUF (SPEERO)	TB field verified	http://metrie.com/green-building/
5-99	1	Use wood veneers that are third-party certified sustainably harvested wood that meets the Tier 1 requirements outlined in the handbook, 50% minimum				
		Cabinets:				
5-100	2	Use cabinetry made of a rapidly renewable product				
5-101	2	Use regional products, 90% minimum				
5-102	3	Use wood that is third-party certified sustainably harvested wood that meets the Tier 1 requirements outlined in the handbook, 50% minimum				2
5-103	1	Use wood that is third-party certified sustainably harvested wood that meets the Tier 2 requirements outlined in the handbook, 50% minimum				
5-104	3-7	Alternative materials used for cabinetry with low or no VOCs - recycled content stainless steel, solid wood, glass, etc (4 pts) or construction methods - pantry use, open shelves, etc.(3 pts)			TB field verified	
5-105	2-5	Use cabinet casework and shelving constructed of agricultural fiber with no-added urea formaldehyde	5	Ichijo cabinets meet JIS ultra low FH standards (F****)	TB field verified	
		Countertops:				
5-106	2	Use countertops that are third-party certified sustainably harvested wood that meets the Tier 1 requirements outlined in the handbook				
5-107	4	Counter tops of concrete, domestic stone, tile with recycled content, recycled paper products and cabinets and countertop underlayment of wheatboard or non-formaldehyde particle board				
		Subtotal	9			

pad is integral to carpet tile

Roof					
5-108	2	Use recycled-content roofing material	2	IKO composite shingles have recycled content	TB field verified
5-109	2	Use 40-year warranted roofing material	2	IKO composite	
5-110	3	Use 50-year warranted roofing material			
5-111	5	Use solar shingles			
5-112	8	Install a metal, concrete, slate, tile, or clay roof			
5-113	3	Install self-adhering underlayment on eves, valleys & penetrations			
5-114	3	Install self-adhering underlayment on entire roof	3	Ice and water shield on whole roof under comp shingle	TB field verified
		Subtotal	7		
Insulation					
5-115	2	All insulation to have a minimum of 40% recycled-content	2	Knauf Ecobatt	TB field verified
5-116	3	Use environmentally friendly foam building products (formaldehyde-free, CFC-free, HCFC-free)	3	Closed cell water based polyurethane	TB field verified
		Subtotal	5		
Other Exterior					
5-117	2	Use reclaimed or salvaged material for landscaping walls			
5-118	3	Use lumber that is third-party certified sustainably harvested wood that meets the Tier 1 requirements outlined in the handbook for decking and porches			
5-119	3	Use 100% recycled-content plastic or wood polymer lumber for decks and porches, or third party certified wood products			
5-120	4	Use no-pressure treated lumber	4	No PT lumber in landscaping	TB field verified
5-121	1	Use low-toxic pressure-treated wood			
5-122	5-8	B20 biodiesel or better equipment (5 pts for 100% excavation equipment on biodiesel, 1 pt for any additional vehicle frequently on-site)			
		Subtotal	4		
Recycling					
5-123	3	Provide built-in kitchen or utility room recycling center	3	Standard on Ichijo kitchens	TB field verified
5-124	1	Provide garage sorting bins for recyclable materials			
		Subtotal	3		
Universal Design					
5-125	2	Stepless front entry	2	Yes no step from garage or front portch	TB field verified
5-126	1	Stepless other entry (rear or side door, door from garage)	1		TB field verified
5-127	1	Hard-surface stepless grade changes at exterior to allow access to essential maintenance locations, like garbage cans, etc.	1		TB field verified
5-128	1	Install exterior accessible hard-surface gathering area. (requires item 5-127)			
5-129	2	Provide accessible guest bathroom on main floor of home (requires stepless access to house, either 5-127 or 5-128)		powder room only on main floor	
5-130	3	Accessible bathroom with curbless shower, (grab-bar blocking required in all bathrooms)		upstairs bath shower is curbless	
5-131	3-5	Locate closets or other spaces directly above each other on all floors that can be used for future elevator installation.			
5-132	3	Minimum door width 2'-10" for all rooms requiring entry (small closets excepted)			
5-133	1-3	Install smart technology (e.g. electronic blinds, programmed environmental controls, etc.) 1 pt per installed item	3	Electronic blinds installed in model	TB field verified
5-134	1-3	Install cabinets with removable or slide-away lower doors for roll-up access to kitchen sink, upper cabinets that lower to counter top height for access, etc. 1 pt per feature			
5-135	1-3	Special work and forethought, innovative universal design features, see Homebuilder Guide for more information.			
		Subtotal	7		
Extra Credit for Materials Efficiency					
5-136	1-10	Extra credit for innovation in Materials Efficiency			
		SECTION 5 TOTAL	104		

SECTION 6: OPERATION, MAINTENANCE & HOMEOWNER EDUCATION					
6-1	3-5	A building owners manual is provided that includes at least 4 of the following: (all 8 items = 5 pts)	5		Manual inprocess at time of certification.. Verifier has workd with manual and seen it is adequate on previous projects.
		Information on local recycling programs			
		Information about available local utility programs that purchase a portion of energy from renewable energy providers			
		Explanation of the benefits of using energy efficient lighting systems (e.g., compact fluorescent light bulbs, light emitting diode (LED) in high usage areas			
		A list of practices to conserve water and energy			
		Local public transportation options			
		List of common hazardous materials often used around the building and instructions for proper handling and disposal of these materials			
		Information about organic pest control, fertilizers, de-icers, and cleaning products			
		Information about native landscape materials and/or those that have low-water requirements			
6-2	6	Building owners/occupants are familiarized with the green building goals and strategies implemented and the impacts of the occupants' practices on the costs of operating the building. Training is provided on the equipment operation and control systems	6		Manual inprocess at time of certification.. Verifier has workd with manual and seen it is adequate on previous projects.
6-3	0.5	A diagram showing the location of safety valves and controls for major building systems			
6-4	0.5	Where frost protected shallow foundations are used, notify owner of precautions, including instructions not to remove or damage insulation when modifying landscaping, to provide heat to the home as required by the irc/ibc, and to keep base materials beneath and around the home free from moisture due to broken water pipes or other water sources			
6-5	0.5	A list of local service providers that offer regularly scheduled service and maintenance contracts to assure proper performance of equipment and the structure (e.g., HVAC, water heating equipment, sealants, caulks, gutter and downspout system, shower/tub surrounds, irrigation system.)			
6-6	0.5	a photo record of framing with utilities installed. photos taken prior to installing insulation, clearly labeled, and included as part of the homeowner's binder			
6-7	0.5	Maintenance checklist	0.5		Manual inprocess at time of certification.. Verifier has workd with manual and seen it is adequate on previous projects.
6-8	0.5	Information about methods of maintaining the building's relative humidity in the rate of 30-60%			
6-9	0.5	Instructions for maintaining gutters, downspouts, rain gardens and other infiltration devices and importance of diverting water at least five feet away from foundation			
6-10	0.5	Instructions for inspecting the building for termite infestation			
6-11	0.5	A narrative detailing the importance of maintenance and operation retaining the attributes of a Built Green® home	0.5		
6-12	1	Educate owners/tenants about fish-friendly moss control	1		
		SECTION 6 TOTAL	13		

SECTION 7 BUILT GREEN BRAND PROMOTION					
7-1	1-10	Extra credit for innovation in marketing for Built Green brand	10	Marleting - this the first project in the region where a production home was marketed competetive with low energy and solar as standard equipment. There is strong solar education display in the sales center, and home buyers are responding enthusiastically to the concept - a very important step for marketing net zero homes in WA!	TB field verified
		SECTION 7 TOTAL	10		

	SECTION 1: BUILT GREEN TEAM	0
	SECTION 2: SITE & WATER	197
	SECTION 3: ENERGY EFFICIENCY	167
	SECTION 4: HEATH & INDOOR AIR QUALITY	127
	SECTION 5: MATERIALS EFFICIENCY	104
	SECTION 6: OPERATION, MAINTENANCE & HOMEOWNER EDUCATIC	13
	SECTION 7: BUILT GREEN BRAND PROMOTION	10
	SUBTOTAL	618
	House Size Multiplier	#N/A
	GRAND TOTAL	#N/A

Total Points for Project

Program Level Obtained

☐ 1-Star ★ ☐ 2-Star ★★ ☐ 3-Star ★★★
☐ 4-Star ★★★★ ☐ 5-Star ★★★★★

By my signature, I certify that I have

X

(Home Builder Signature and Date)

Built Green House Size Matrix

Smaller houses use a multiplier for their overall points based on SF size.

Larger houses are required to earn a minimum of points in the energy and materials section. (Points listed are for each section)

Project size to include all conditioned space of house except for an Additional Dwelling Unit (ADU)

Table 0*1 House Size Matrix

2005 avg. size
(in WA State)

	Bedrooms						Multiplier	min. points req in energy section**	min. points req in materials section**
	1	2	3	4	5	6			
	<500	<700	<900	<1300	<1900	<2400	1.20	N/A	N/A
	501-800	701-1000	901-1200	1301-1750	1901-2350	2401-2700	1.15	N/A	N/A
	801-1200	1001-1400	1201-1800	1751-2350	2351-2950	2701-3500	1.10	N/A	N/A
	1201-1600	1401-1800	1801-2400	2351-3000	2951-3600	3501-4300	1.05	N/A	N/A
	1600	**1800**	**2400**	**3000**	**3600**	**4300**	1.00	0	0
	1601-1800	1801-2000	2401-2700	3001-3400	3601-4000	4301-4700	1.00	25	25
	1801-2000	2001-2200	2701-3000	3401-3800	4001-4400	4701-5100	1.00	35*	35*
	2001-2200	2201-2400	3001-3300	3801-4200	4401-4800	5101-5500	1.00	45*	45*
	>2200	>2400	>3300	>4200	>4800	>5500	1.00	55**	55*

* Energy Star Certification can be substituted for the required point minimum

Sun Ridge
Emergency Contact List

SYSTEM	CONTRACTOR	CONTACT
Heating & Hot Water	Bob's Heating and Ventilation	800-840-3346
Ventilation	Bob's Heating and Ventilation	800-840-3346
Plumbing	Lakeside Plumbing	206-363-4513
Line Voltage - Service	Puget Sound Energy	888-225-5773
Line Voltage - Electrical	Provident Electric	253-631-7750
Low Voltage - Electrical	Provident Electric	253-631-7750
Fiber Optics	Highlands Fiber Optics	425-427-0999
Cable	Comcast	800-266-2278
Phone	CentryLink	877-348-9007
Warranty	Ichijo USA	206-629-4691
Roofing and PVC Roof	R & C Roofing/Chinook Roofing	253-922-6902
Solar	NW Wind and Solar	206-788-3804

Sun Ridge Utility Contacts

Once your closing date has been confirmed by our Project Manager during your walkthrough, please take a moment to contact the utility providers to give them your name, address and your closing date to ensure continued service. Thank you!

Electricity/Gas

Puget Sound Energy
1-888-225-5773, customercare@pse.com

Homeowner's Association

Issaquah Highlands
Phone: 425-427-9257
Email: beth.d@ihcommunity.org

Water/Sewer

City of Issaquah
Phone: 425-837-3070
Fax: 425-837-3029

King County (Sewer)
Phone: 206-296-1450
Fax: 206-263-6073

Garbage/Recycling/Food Waste Containers

CleanScapes Northwest
Phone: 425.837.1234
Email: issaquah@recology.com
www.cleanscapes.com

Cable/Internet

Comcast
Phone: 1-800-934-6489
www.xfinity.com

Highlands Fiber Network
Phone: (425) 427-0999
Email: support@hfnservices.com

CenturyLink
877-720-3428
www.centurylink.com