LED Lighthouses

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The Coast Guard is changing the light of a number of New England lighthouses. The Coast Guard intends to replace the current lantern with a more power efficient LED lantern. The emergency light of reduced intensity, when the main light is extinguished, will be removed. Since this is a continuing project, the following list is probably incomplete.

Light List Number	MAINE	Location	Type
2040	Baker Island Light	Southwest Harbor	VLB-44 1 Tier
155	Boon Island Light	York	VLB-44 8 Tier
4310	Curtis Island Light	Camden	VLB-44 1 Tier
60/7520	Cape Elizabeth Lights	Cape Elizabeth	VRB-25
5485	Cuckolds Light	Boothbay Harbor	VLB-44 4 Tier
2995	Deer Island Thorofare Light	Stonington	VLB-44 1 Tier
6145	Doubling Point Range Light	Bath	VLB-44 1 Tier
3530	Dyce Head Light	Castine	VLB-44X 1 Tier
10360	Eagle Island Light	Stonington	VLB-44 1 Tier
1865	Egg Rock Light	Bar Harbor	VRB-25
4830	Franklin Island Light	Friendship	VLB-44 1 Tier
105/8100	Goat Island Light	Kennebunkport	VLB-44 2 Tier
2295	Great Duck Island	Swans Island	VLB-44X 2 Tier
4405	Grindle Point Light	Islesboro	VLB-44 1 Tier
40/6675	Halfway Rock Light	Portland	VLB-44 8 Tier
6025	Kennebec River Light	Pond Island	VLB-44 1 Tier
1120	Libby Island Light	Machiasport	VLB-44 8 Tier
1075	Little River Light	Cutler	VRB-25
855	Lubec Channel Light	Lubec	VLB-44 1 Tier
10/3195	Matinicus Rock Light	Matinicus Island	VLB-44 8 Tier
20/4925	Monhegan Island Light	Monhegan	VRB-25
1390	Moose Peak Light	Machiasport	VLB-44 8 Tier
5/2290	Mount Desert Light	Southwest Harbor	VRB-25
1735	Petit Manan Light	Corea	VRB-25
7565	Portland Head Light	Cape Elizabeth	VRB-25
5420	Ram Island Light	Cape Elizabeth	VLB-44 1 Tier
4130	Rockland Harbor Breakwater	Rockland	VRB-25
3325	Saddleback Ledge Light	Vinalhaven	VLB-44 1 Tier
2670	Swans Island Light	Burnt Coat Harbor	VRB-44 1 Tier
4540	Two Bush Island Light	Muscle Ridge Island	VRB-25
200	Whaleback Light	Kittery	VRB-25
4380	Whitehead Island Light	St George	VLB-44 1 Tier
945	Whitlocks Mill Light	Calais	VLB-44 1 Tier
95	Wood Island Light	Biddeford	VLB-44 16 Tier
	New Hampshire		
235	Isle of Shoals Light	Rye	VLB-44 8 Tier
	MASSACHUSETTS		
225	Cape Ann Light	Rockport	VRB-25
350/9975	Bakers Island	Manchester	VRB-25
390/10679	Graves Light	Boston	VRB-25
545/13650	Great Point/Nantucket Light	Nantucket	VRB-25
800	Highland Light	North Truro	VLB-44 8 Tier
4856	Race Point Light	Provincetown	VRB-25
13270	Wood End Light	Provincetown	VRB-25
	RHODE ISLAND		

17780	Beavertail Light	Jamestown	VRB-25
18145	Hog Island Shoal Light	Portsmouth	VLB-44 3 Tier
18555	Pomham Rocks Light	East Providence	VLB-44 1 Tier
19790	Watch Hill Light	Westerly	VRB-25
	LONG ISLAND SOUND		
21210/24060	Southwest Ledge Light	New Haven	VRB-25
21250	Stratford Shoal Light	Port Jefferson/Bridgeport	VRB-25
	New York		
21150	Horton Point Light	Southard	VRB-25
Not Active	Princes Bay Light	Staten Island	VRB-25

Here are links to lists of lighthouses, by state, on Wikipedia.

https://en.wikipedia.org/wiki/List_of_lighthouses_in_Maine

https://en.wikipedia.org/wiki/List_of_lighthouses_in_the_United_States#New_Hampshire

https://en.wikipedia.org/wiki/List_of_lighthouses_in_Massachusetts

https://en.wikipedia.org/wiki/List_of_lighthouses_in_Rhode_Island

https://en.wikipedia.org/wiki/List_of_lighthouses_in_Connecticut

https://en.wikipedia.org/wiki/List_of_lighthouses_in_the_United_States#Vermont

https://en.wikipedia.org/wiki/List_of_lighthouses_in_New_York

The following link has extensive Maine lighthouse information.

https://downlighthouseroad.substack.com/p/maine-lighthouse-optics

The use of highly efficient optics and electronics has resulted in energy efficiency as high as 175 Candela per Watt (depending on vertical divergence). The low energy needs reduce the solar panel and battery requirements in a standalone application.

The VRB-25 is a lighthouse optical system designed and built by Vega Industries Ltd. in New Zealand (was sold to Carmanah Technologies / Sabik Marine in 2017). It was originally designed in 1993–95 with the assistance of the United States Coast Guard to meet USCG requirements for a robust mechanism requiring minimum maintenance. It has become the Coast Guard's standard 12 volt rotating beacon.

The VLB-44 beacon, also by Sabik, consists of one, two, four or eight tiers. The installation of LEDs is also substantially reducing the solar footprint at light stations, and in doing so, enhancing the historic integrity of a site and the natural environment that embraces it. The VLB-44 beacon is completely self-contained, requires nearly no maintenance, and has an amazing life span of ten years.

The VLB-44 beacon comes in 3 models with different vertical divergence to cover applications from buoy to fixed installations.

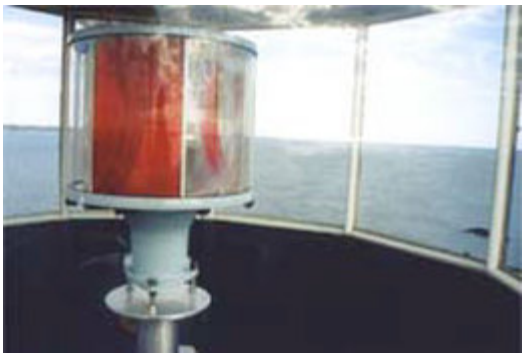
- VLB-44 10 degree for buoys
- VLB-44 5 degree for land/pole use
- VLB-44 2.5 degree for lighthouse

The VLB-44X also offers optional GPS synchronized flashing, via the VSU-29 GPS Sync Unit.

Multiple units can be used to extend the range to up to 16NM. Each tier uses approximately 10 Watts of energy. The available colors are: red, green, white, yellow and blue. All colors meet the IALA chromaticity recommendation. The unique optical system utilizes an acrylic lens to maximize the light capture from the LEDs. The LEDs are precisely graded and placed to produce a light beam with minimum variation in intensity. A switch mode regulator maintains the light output of the LEDs independent of input voltage.

Hopefully, the Fresnel lenses removed for the LED installations have been saved as they are works of art.

VRB-25-LED High-Intensity Rotating Beacon



VRB-25 Baker's Island, Flashing white/red

VLB-44 1 Tier

Flashing VLB-44 16 Tier

Reference: https://downlighthouseroad.substack.com/p/maine-lighthouse-optics

LED insert into Fresnel lenses.

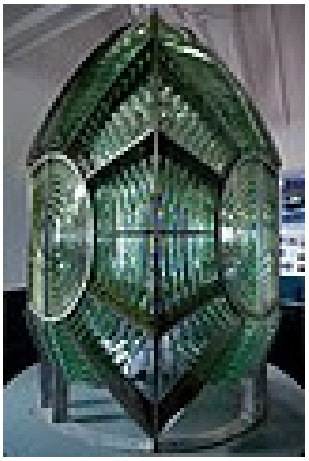
A Fresnel lens is a type of composite compact lens which reduces the amount of material required compared to a conventional lens by dividing the lens into a set of concentric annular sections. The higher the order, the small the lens.

The Coast Guard is also adding an LED insert into the existing Fresnel beacons as a replacement for the incandescent lamps. There are two versions with the SL-LED-216 with variable output up to 135 watts, and the SL-LED-324 with variable output up to 200 watts.

Light List Number	Name		Fresnel Order	LED Replacement

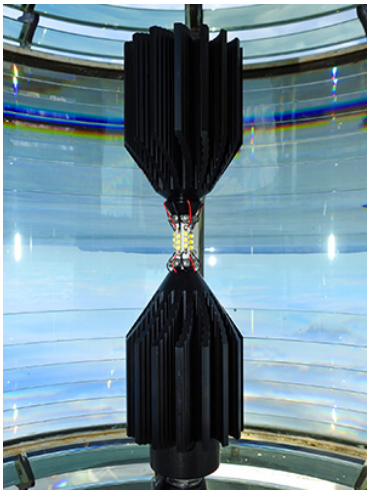
34	Sequin Light	Popham Beach, ME	First	SL-LED-324
125	Cape Neddick Light	York, ME	Fourth	SL-LED-216
1040	West Quoddy Head Light	Lubec, ME	Third	SL-LED-216
2335	Bass Harbor Head Light	Bass Harbor, ME	Fourth	SL-LED-216
5145	Pemaquid Point Light	Bristol, ME	Fourth	SL-LED-216
8330	Portsmouth Harbor Light	New Castle, NH	Fourth	SL-LED-216
21325	Eatons Neck	Northport, NY	Third	SL-LED-324
34795	Staten Island Rear Range Light	Staten Island, NY	Second	SL-LED-324
660	Montauk Point	Montauk, NY	3.5	SL-LED-216

Fresnel lenses are much less bulky than an equivalent conventional lens.



First Order Lens

Fourth Order Lens



LED-216 in a Fresnel Lens