

SECTION 24: Sunlight

The project proposes to construct an enclosed recirculating aquaculture system (RAS) facility in several key buildings, with adjunct facilities and equipment on the property. The site, encompassing 93 acres, has wetlands and a variety of land cover. In addition, the project will construct a seawater intake and outfall in the adjacent waterbody, Chandler Bay.

The performance standard for assessing providing solar access is contained in Chapter 375, Section 13. The standard requires:

In determining whether a proposed development will have an adverse effect on access to direct sunlight, the Department shall consider all relevant evidence to that effect, such as evidence that:

- (1) Structures within the proposed development will not block access to direct sunlight to structures utilizing solar energy through active or passive systems.

The proposed construction will encompass a 93 acre parcel, with adequate setbacks from all proposed structures to prevent shading of any part of adjacent properties, exceeding the standard. The structure most proximate to the northern boundary (Building 1) is 43 feet above original grade, and 450 feet from the property line. Similarly, along the northern side, the tallest structure (Building 2) has a maximum height of 55 feet above adjacent original grade, and is 685 feet from the property line. A study of the shading potential of these structures was performed for the shortest day condition of winter solstice. December 21, 2021 was utilized in the study. Data for the study was sourced from the National Ocean and Atmospheric Administration's Earth System Research Laboratories online sources.

This data is available at: <https://www.esrl.noaa.gov/gmd/grad/solcalc/sunrise.html>

Shadow length was normalized for the building height's projection over existing grade, and corrected for the adjacent slope where applicable.

Appended to this section is a study summary and sketch of shading based on the winter solstice, shortest day condition on December 21, 2021.

APPENDIX 24
Shading Study

Assessment Date 12/21/2021 Winter Solstice

Location Lat Dec Deg: 44.5562 DMS: 44d33m22s

Location Long Dec Deg: -67.5716 DNS: -67d34'18"

Solar Declination: -23.44 deg

Meteorological and Study Data

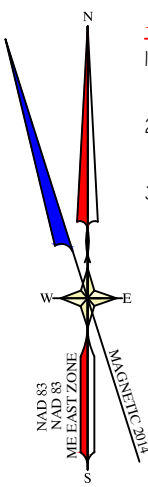
Data Point	Time	Azimuth, degrees	Az. Elevation, feet
Sunrise	07:04 EST	122.96	-
Study Time 1	09:00 EST	145.19	14.08
Solar Noon	11:29 EST	180	22.05
Study Time 2	15:00 EST	227.4	6.78
Sunset	15:53 EST	237.01	-

Data Point	Time	Location	EX Grade	FFE	Height	Total Height	Shadow Length	Azimuth
A-1	09:00 EST	Building 1 NW Corner	45.8	55	28	37.2	251.92	145.19
A-2	09:00 EST	Building 1 NE Corner	40.3	55	28	42.7	289.17	145.19
A-3	09:00 EST	Building 2 NW Corner	52.9	55	45	47.1	318.97	145.19
A-4	09:00 EST	Building 2 NE Corner	45	55	45	55	372.47	145.19
B-1	11:29 EST	Building 1 NW Corner	45.8	55	28	37.2	79.75	180
B-2	11:29 EST	Building 1 NE Corner	40.3	55	28	42.7	91.54	180
B-3	11:29 EST	Building 2 NW Corner	52.9	55	45	47.1	100.97	180
B-4	11:29 EST	Building 2 NE Corner	45	55	45	55	117.91	180
C-1	15:00 EST	Building 1 NW Corner	45.8	55	28	37.2	103.24	227.4
C-2	15:00 EST	Building 1 NE Corner	40.3	55	28	42.7	118.5	227.4
C-3	15:00 EST	Building 2 NW Corner	52.9	55	45	47.1	130.71	227.4
C-4	15:00 EST	Building 2 NE Corner	45	55	45	55	152.63	227.4

DATA: <https://www.esrl.noaa.gov/gmd/grad/solcalc/sunrise.html>

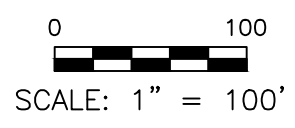
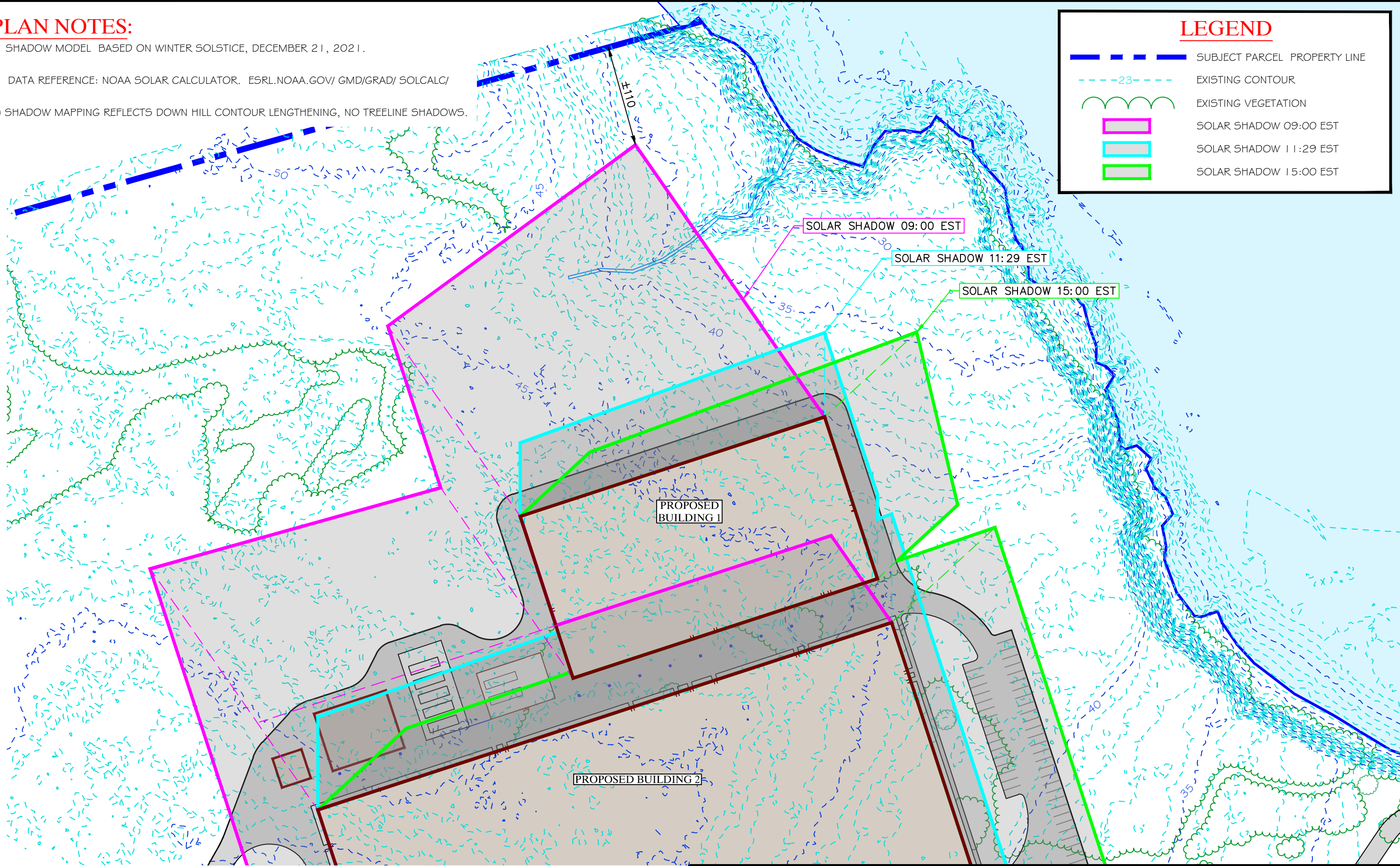
PLAN NOTES:

- 1) SHADOW MODEL BASED ON WINTER SOLSTICE, DECEMBER 21, 2021.
- 2) DATA REFERENCE: NOAA SOLAR CALCULATOR. ESRL.NOAA.GOV/ GMD/GRAD/ SOLCALC/
- 3) SHADOW MAPPING REFLECTS DOWN HILL CONTOUR LENGTHENING, NO TREELINE SHADOWS.



LEGEND

- SUBJECT PARCEL PROPERTY LINE
- EXISTING CONTOUR
- EXISTING VEGETATION
- SOLAR SHADOW 09:00 EST
- SOLAR SHADOW 11:29 EST
- SOLAR SHADOW 15:00 EST



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KINGFISH MAINE - SHADING STUDY
 ROUTE 187 - JONESPORT, MAINE
 DECEMBER 30, 2020
 PROJ. NO. 2019-412
 SK1

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