CASE STUDY REPORT

Manhattan Districts 1/2/5 Garage & Spring Street Salt Shed

\\ NYC, New York, United States

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ARCH 633

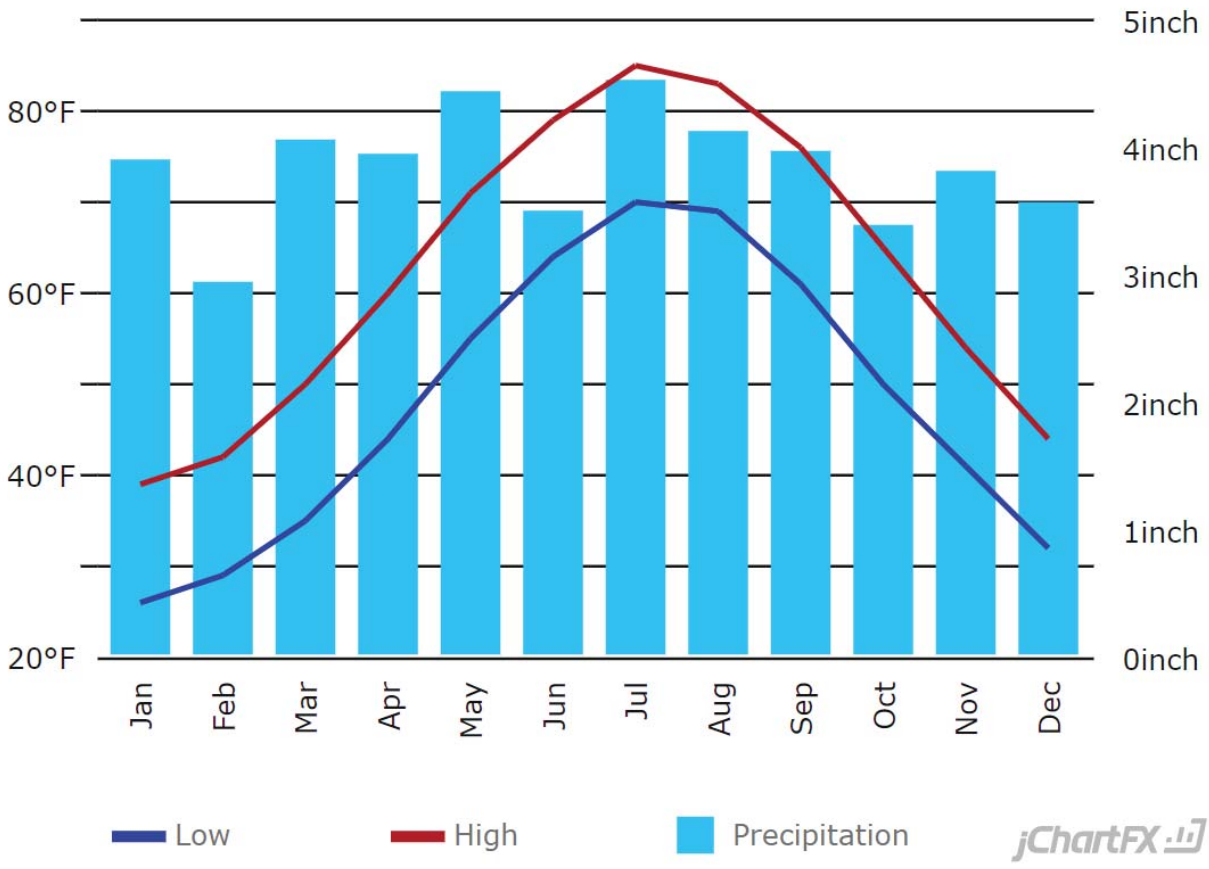
Manhattan Districts 1/2/5 Garage & Spring Street Salt Shed

PROJECT

FIRM	Dattner Architects
TYPE	Industrial › Warehouse
STATUS	Built
YEAR	2015
SIZE	425 000 sqft
RATING	LEED Gold
STORIES	5

CLIMATE (NYC)

Project Climate Zone:	4 (ASHRAE)
Annual high temp:	62.3°F
Annual low temp:	48°F
Avg temp:	55.15°F
Avg annual precip:	46.23 inch
Days per year w/ precip:	121 days
Annual hours of sunshine:	2677 hours



https://www.usclimatedata.com/climate/new-york/united-states/3202

DESIGN INTENT

The Manhattan Districts 1/2/5 Garage and Salt Shed houses 3 garages for the NYC Dept. of Sanitation. The design aimed to mitigate sun exposure, enhance storm water retention, protect the roof membrane, improve the view for neighboring buildings, and increase thermal performance.

ENVIRONMENTAL DESIGN STRATEGIES

+ DOUBLE SKIN FACADE

The building is wrapped in a perforated double-skin facade that reduces solar gain while allowing daylight and views. The skin is comprised of a glazed curtain wall and 2,600 custom perforated-aluminum solar shading devices, or "fins". The fins reduce direct sunlight on the glazing by 67 percent. This affects the heat flow equation through conduction and solar gain reduction.

+GREEN ROOF

The 1.5 acre green roof protects the roof membrane, reduces heat-island effect, enhances storm water retention and thermal performance, and promotes biodiversity of native species. The green roof is comprised of 13,250 pre-planted trays with 25 distinct drought-resistant species. The roof requires no permanent irrigation. This affects the heat flow equation through solar gain reduction, radiationn, and evaporation.

+RECYCLED WATER

Harvested non-potable water supply from the roof's storm water and waste steam condensate from heating and cooling the building are used as a source for flushing restroom fixtures and for truck washing. This affects the heat flow equation through evaporation and internal gains.

+ENERGY CONSUMPTION REDUCTION

The M125 Garage achieved an energy cost savings of 35.8 percent as calculated using the ASHRAE 90.1-2004 methodology. The strategies used to achieve this are 1. use of municipal steam for heating and cooling, 2. a condensate heat recovery system, 3. reduction of solar heat gain by shading the curtain wall, 4. daylight harvesting and multi-level lighting fixtures, 5. use of air monitoring, and 6. BMS control of ventilation rates. This affects the heat flow equation through internal gains, solar gain reduction, and ventilation.

CHANGES?

If I were in charge of the project, I would also consider allowing direct air flow into the personnell spaces via operable windows and minimize the surface area of the building facing the summer sun.

https://www.aia.org/showcases/76671-manhattan-districts-125-garage--spring-stree