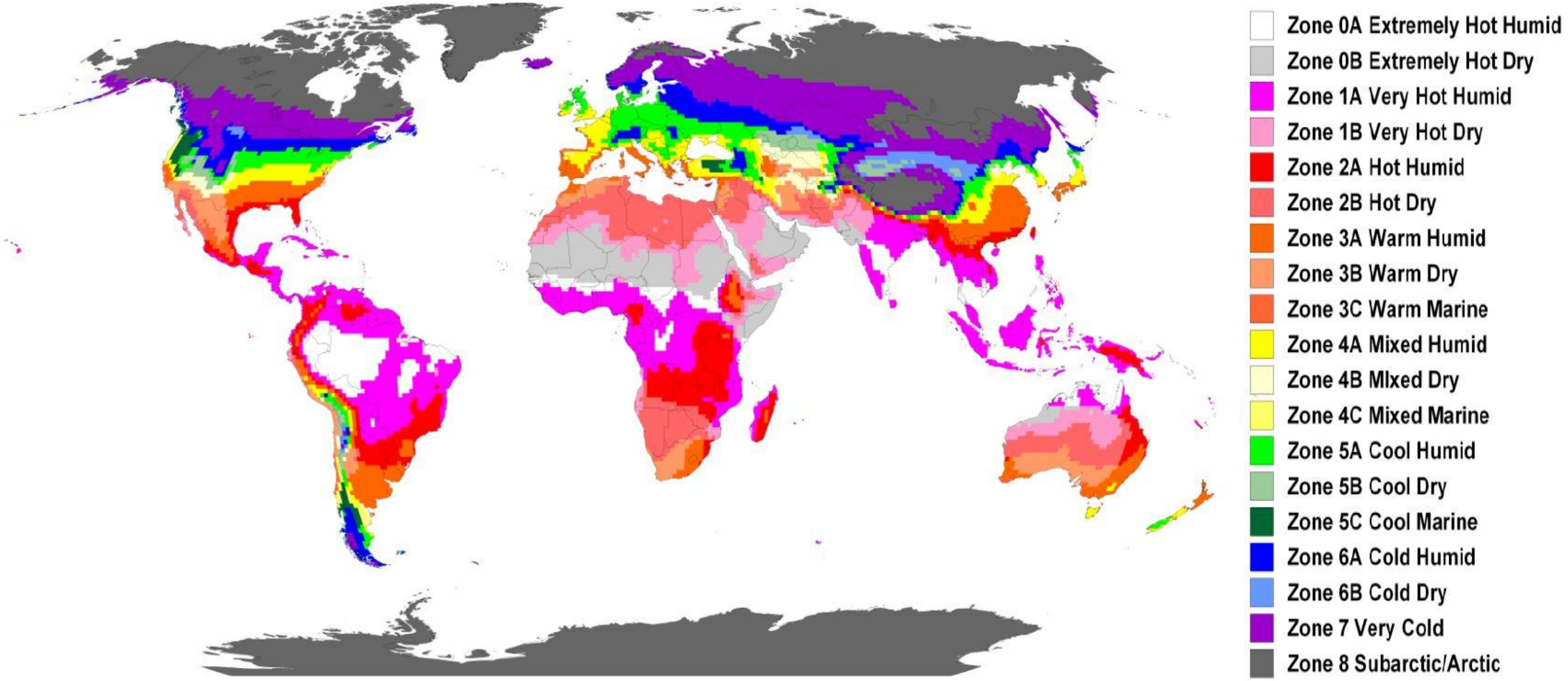
VISUALIZING CLIMATES AND HUMIDIFICATION TO FIGHT PANDEMICS

RELATIVE HUMIDITY PROFILES FOR MAJOR SOUTHERN HEMISPHERE CITIES

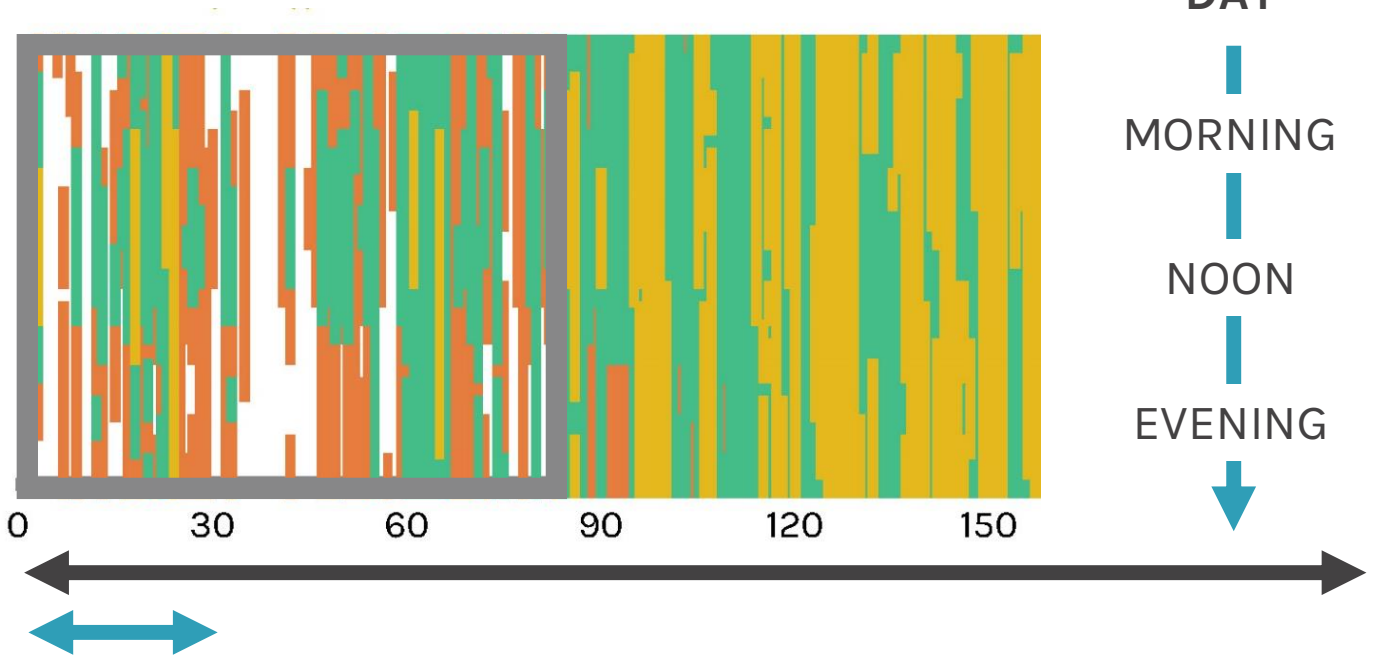
ASHRAE CLIMATE ZONES AND ASHRAE STANDARD 169-2013

CLIMATE ZONE VARIATION BY LOCATION IN THE WORLD



VISUALIZING RELATIVE HUMIDITY OPERATION BY LOCATION

RELATIVE HUMIDITY NEEDS VARY GREATLY BY LOCATION AND ELEVATION



OUTSIDE AIR (OA) < 32°F (0°C)
BASE LEVEL OF HUMIDIFICATION PER BUILDING ENVELOPE CONSTRAINTS

OUTSIDE AIR 32 - 40 °F (0 – 4.4 °C)
OPTIONAL HIGHER HUMIDIFICATION PER BUILDING ENVELOPE CONSTRAINTS

OUTSIDE AIR > 40 °F (4.4 °C)
HUMIDIFICATION TO 40% MINIMUM

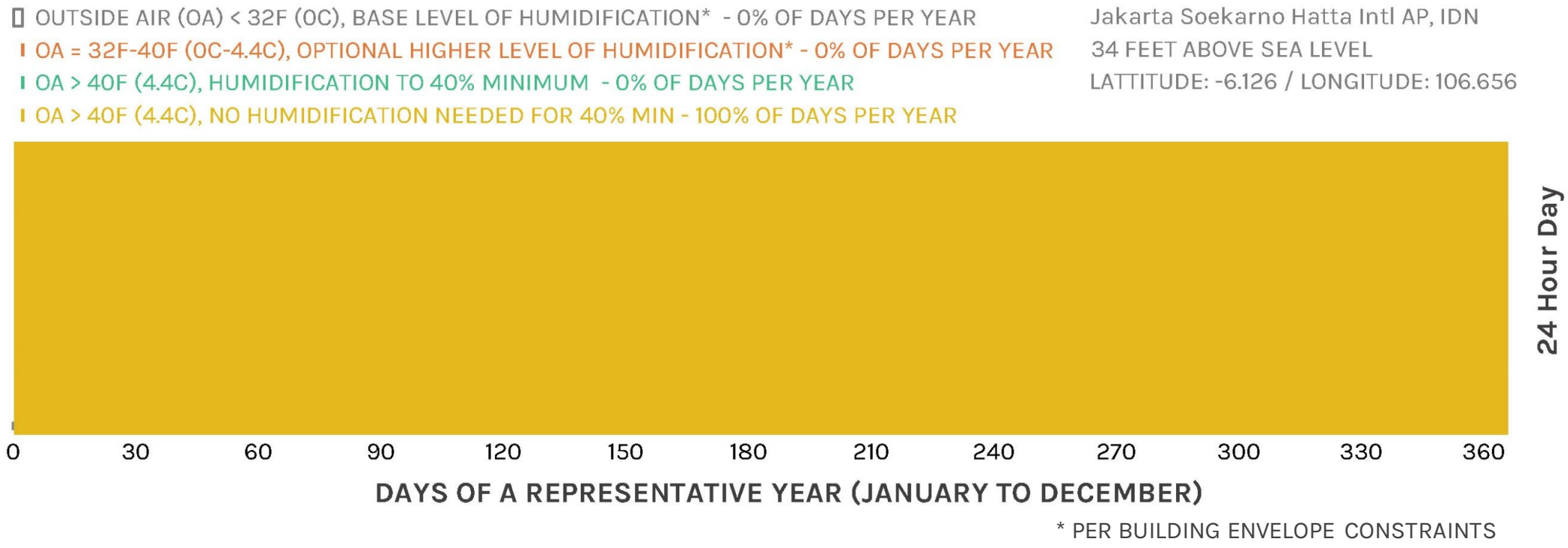
OUTSIDE AIR > 40 °F (4.4 °C)
NO HUMIDIFICATION NEEDED FOR 40%

DETERMINE APPROPRIATE CONTROL AT LOWER RH AND COLDER OA PER BUILDING ENVELOPE CONSTRAINTS

ASHRAE CLIMATE ZONE 1A

VERY HOT - HUMID

JAKARTA SOEKARNO HATTA INTL AP, IDN



* PER BUILDING ENVELOPE CONSTRAINTS

OBSERVATIONS

- CONSISTENTLY ELEVATED OUTDOOR HUMIDITY REQUIRES DEHUMIDIFICATION TO LOWER INDOOR RELATIVE HUMIDITY
- SUPPLEMENTAL HUMIDIFICATION TO MINIMUM 40% IS NOT REQUIRED
- NO POTENTIAL FOR FREEZING IN THIS CLIMATE

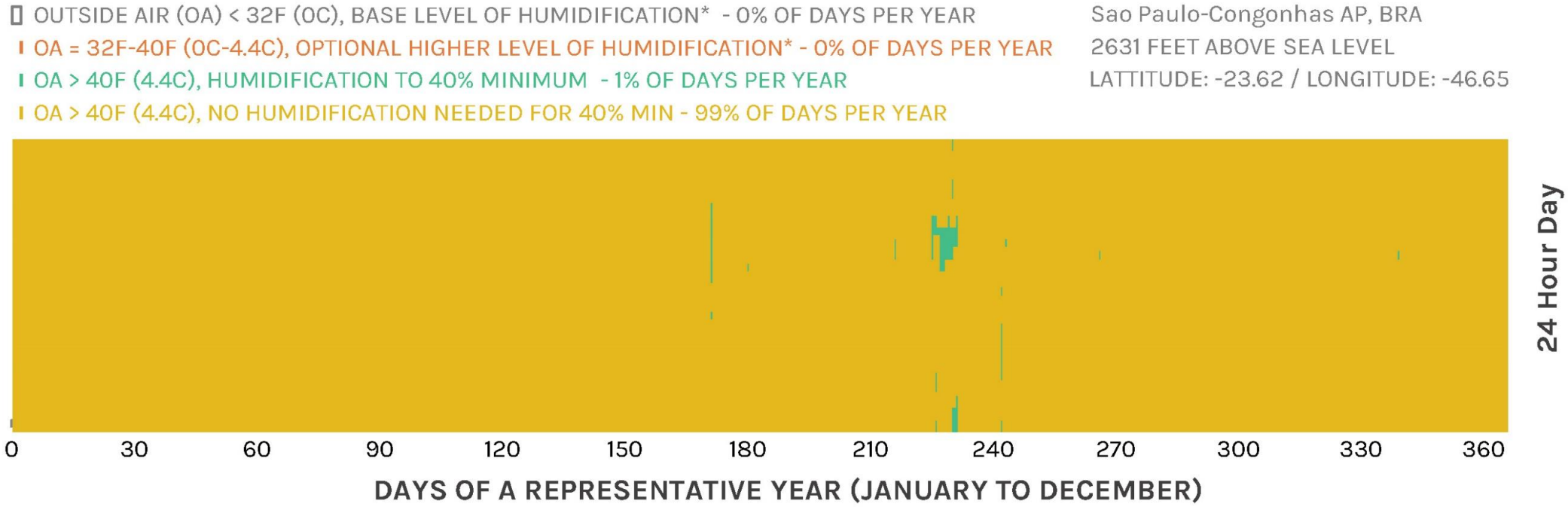
RECOMMENDATIONS

- PROVIDE HVAC SYSTEMS THAT MAINTAIN UPPER LIMIT RELATIVE HUMIDITY OF 60% OR LESS

ASHRAE CLIMATE ZONE 1A

VERY HOT - HUMID

SAO PAULO-CONGONHAS AP, BRA



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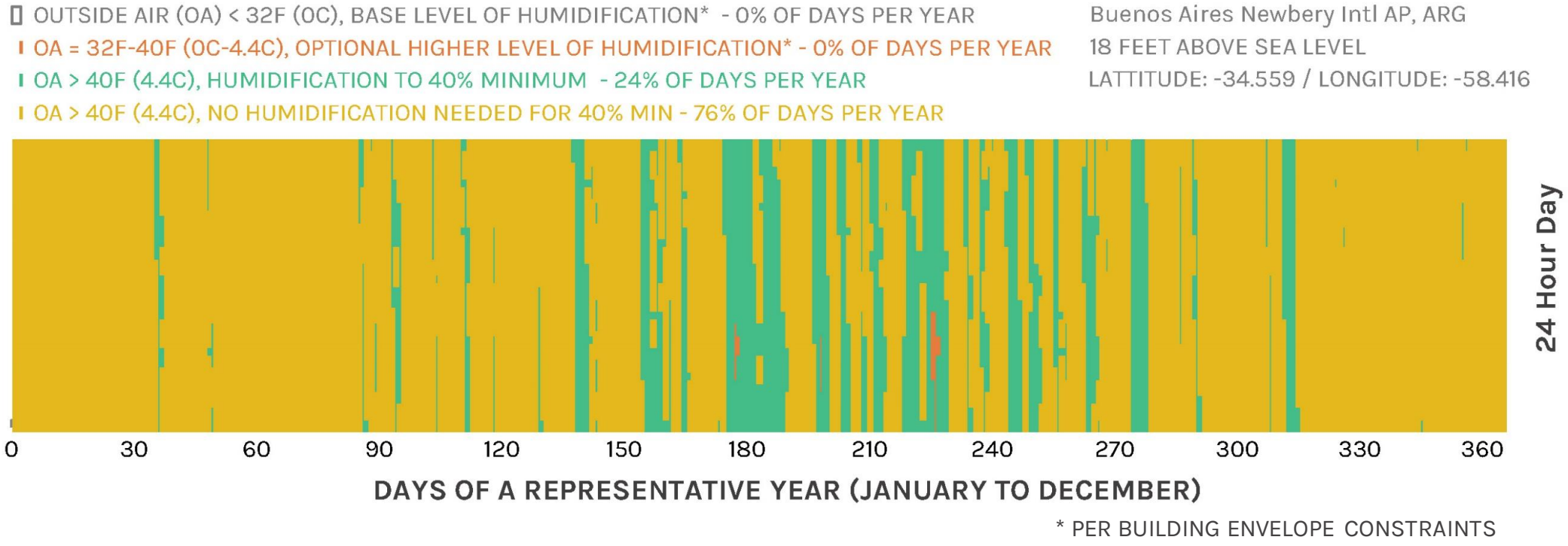
ASHRAE CLIMATE ZONE 3C

WARM - MARINE

BUENOS AIRES NEWBERY INTL AP, ARG



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OBSERVATIONS

- CONSISTENTLY ELEVATED OUTDOOR HUMIDITY REQUIRES DEHUMIDIFICATION TO LOWER INDOOR RELATIVE HUMIDITY
- NEED FOR SUPPLEMENTAL HUMIDIFICATION TO 40% RH MINIMUM IS LIMITED TO LATE FALL THROUGH EARLY SPRING
- MINIMAL POTENTIAL FOR FREEZING IN THIS CLIMATE

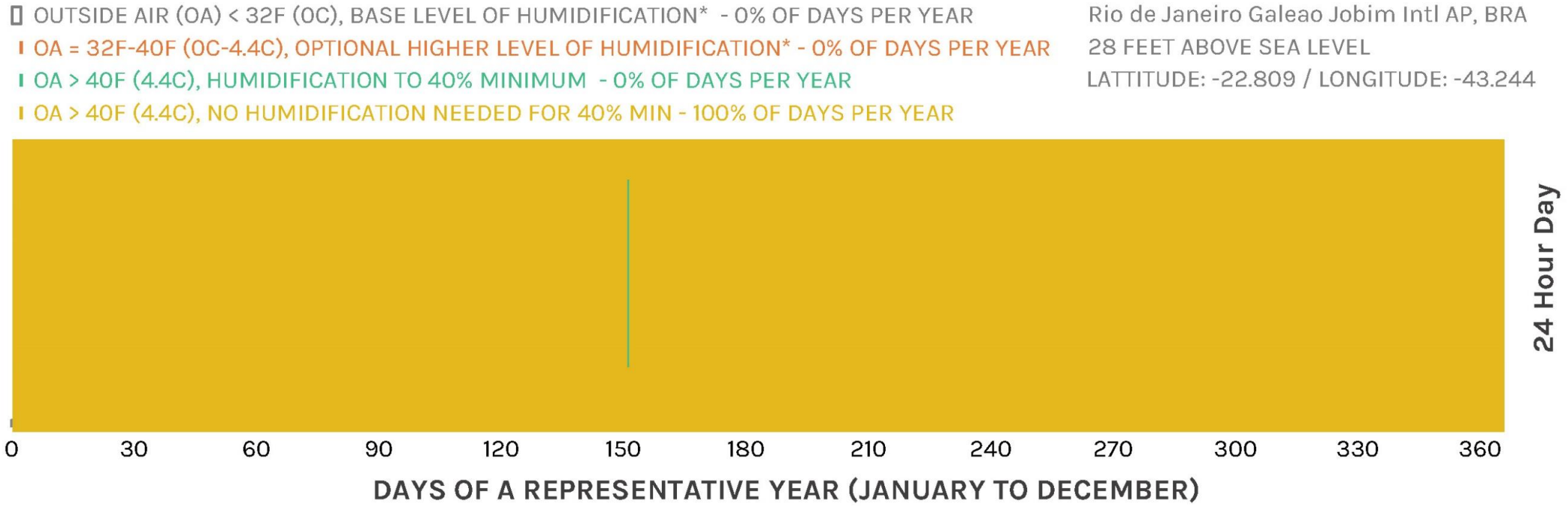
RECOMMENDATIONS

- PROVIDE HVAC SYSTEMS THAT MAINTAIN UPPER LIMIT RELATIVE HUMIDITY OF 60% OR LESS
- CONSIDER SUPPLEMENTAL HUMIDIFICATION TO 40% MINIMUM FOR LATE FALL TO EARLY SPRING

ASHRAE CLIMATE ZONE 1A

VERY HOT - HUMID

RIO DE JANEIRO GALEAO INTL AP, BRA



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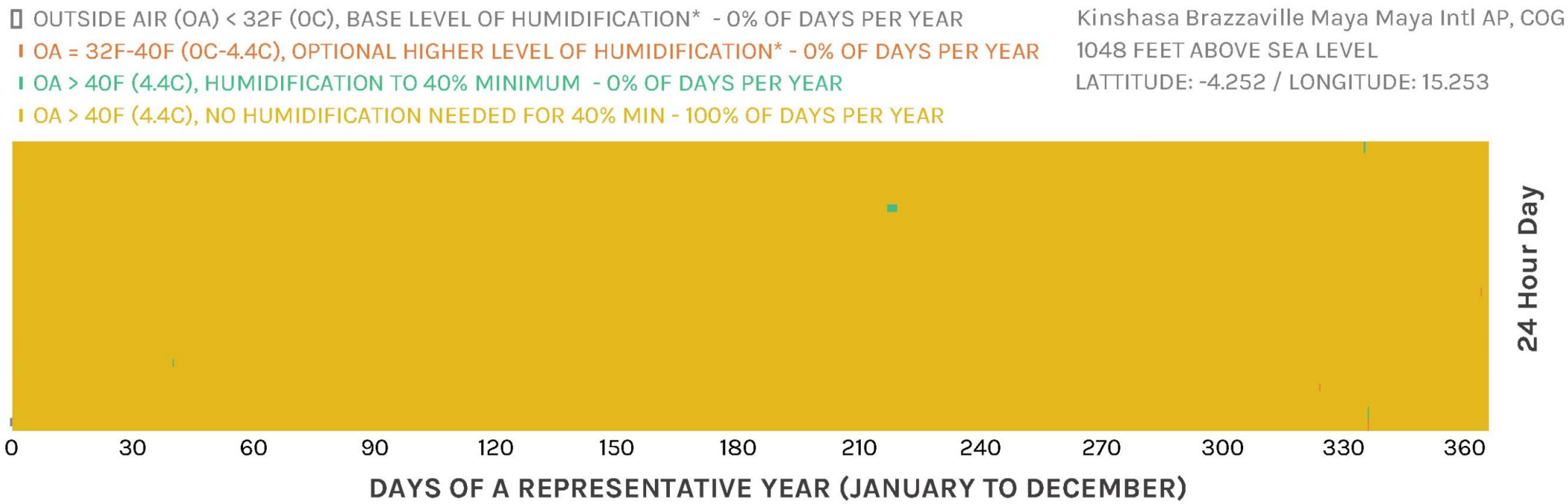
ASHRAE CLIMATE ZONE 1A

VERY HOT - HUMID

KINSHASA BRAZZAVILLE MAYA MAY INTL AP, COG



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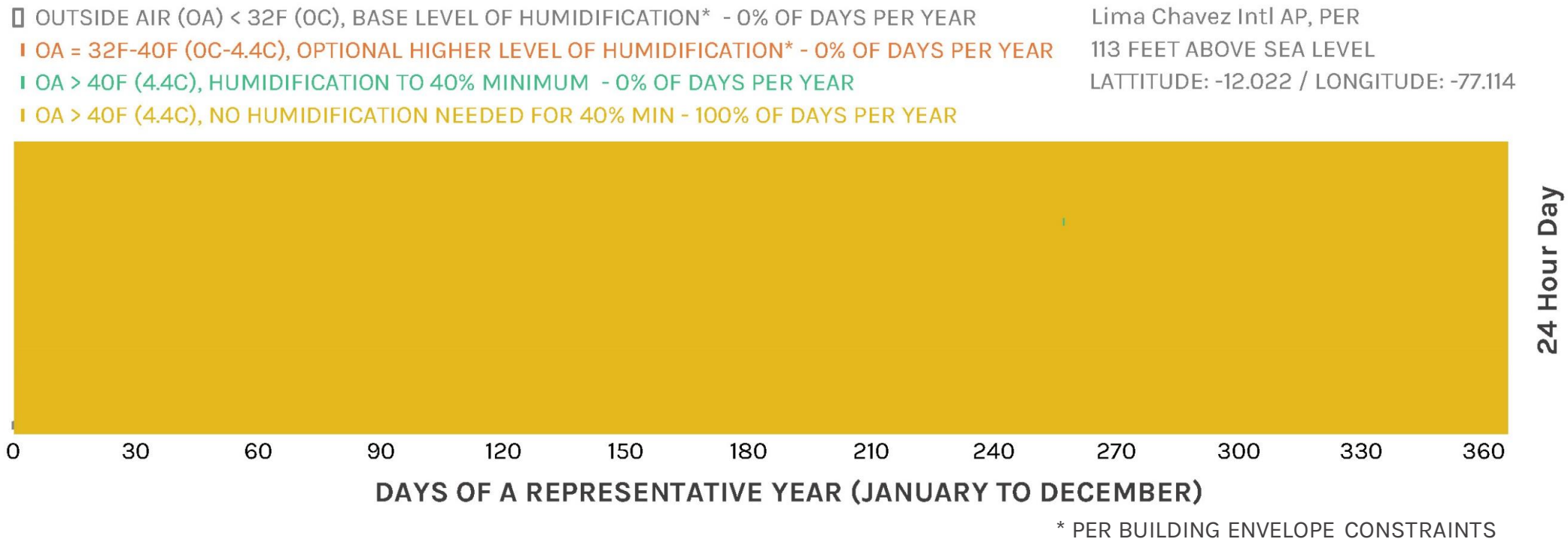
ASHRAE CLIMATE ZONE 1A

VERY HOT - HUMID

LIMA CHAVEZ INTL AP, PER



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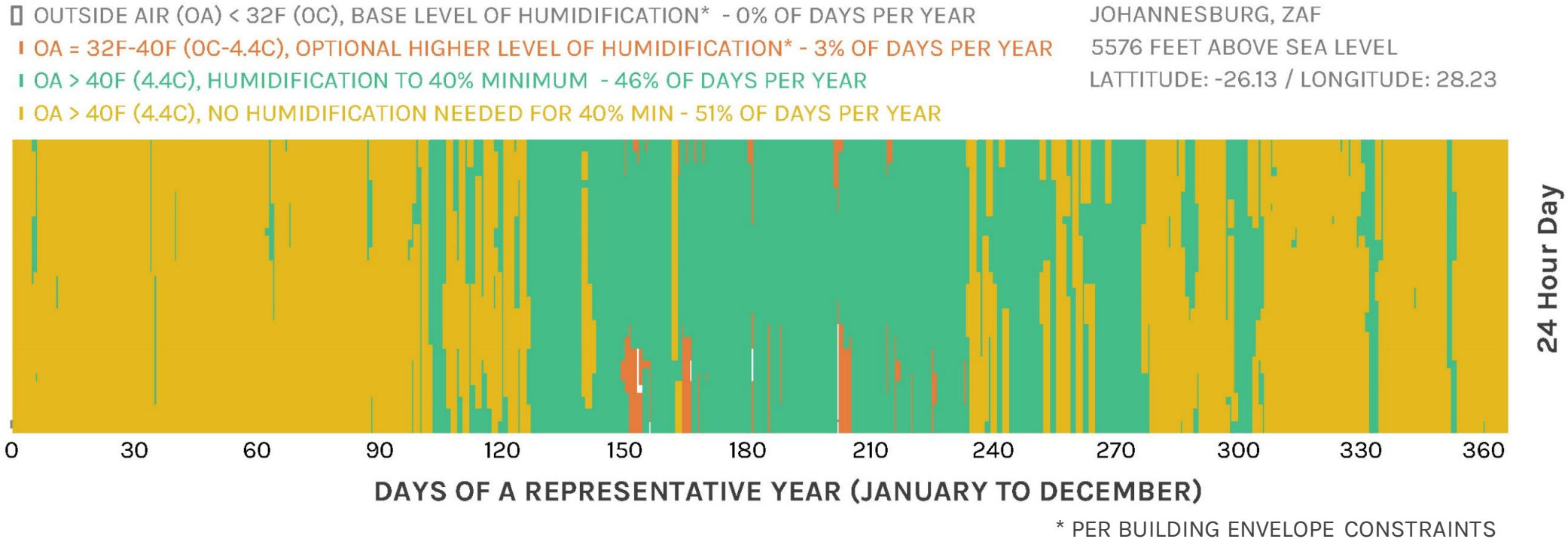
ASHRAE CLIMATE ZONE 4A

MIXED - HUMID

JOHANNESBURG, ZAF



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OBSERVATIONS

- ELEVATED OUTDOOR HUMIDITY IN SUMMER/FALL REQUIRES DEHUMIDIFICATION TO LOWER INDOOR RELATIVE HUMIDITY
- NEED FOR SUPPLEMENTAL HUMIDIFICATION TO 40% RH MINIMUM IS LIMITED TO FALL THROUGH SPRING
- LOW POTENTIAL FOR FREEZING IN THIS CLIMATE

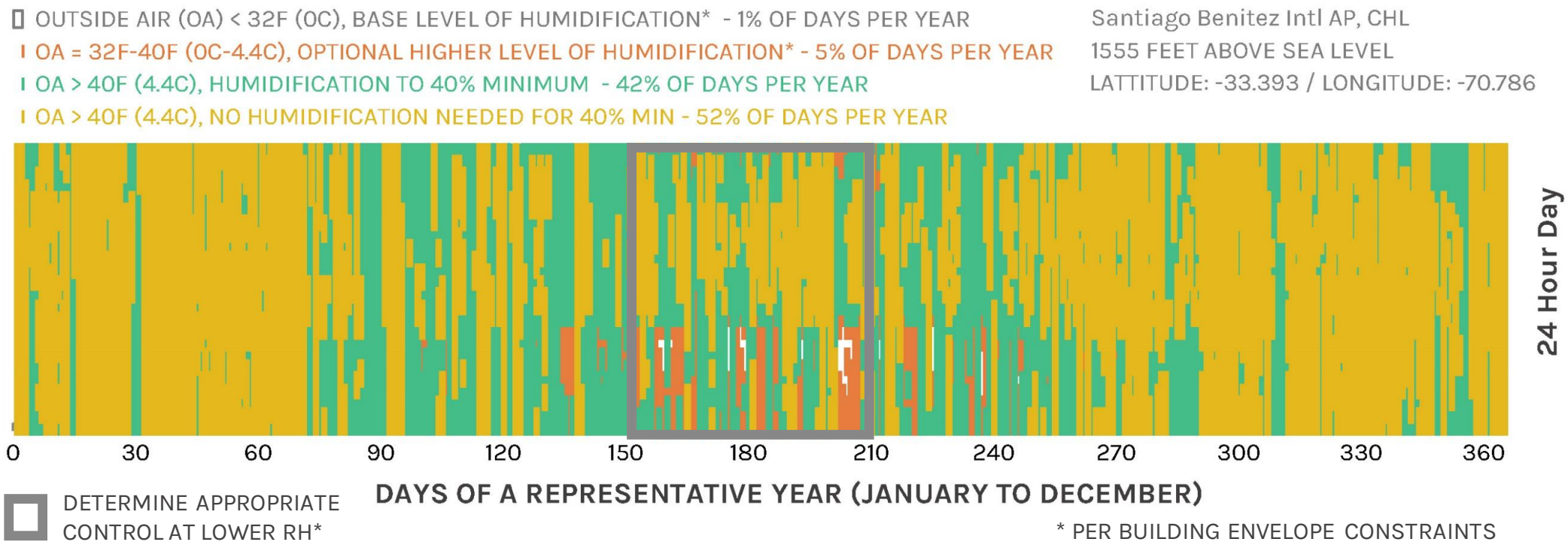
RECOMMENDATIONS

- PROVIDE HVAC SYSTEMS THAT MAINTAIN UPPER LIMIT RELATIVE HUMIDITY OF 60% OR LESS
- PROVIDE SUPPLEMENTAL HUMIDIFICATION TO 40% MINIMUM TOGETHER WITH ABILITY TO REDUCE WITH OA TEMPERATURES BELOW 40 °F (4.4 °C)

ASHRAE CLIMATE ZONE 4A

MIXED - HUMID

SANTIAGO BENITEZ INTL AP, CHL



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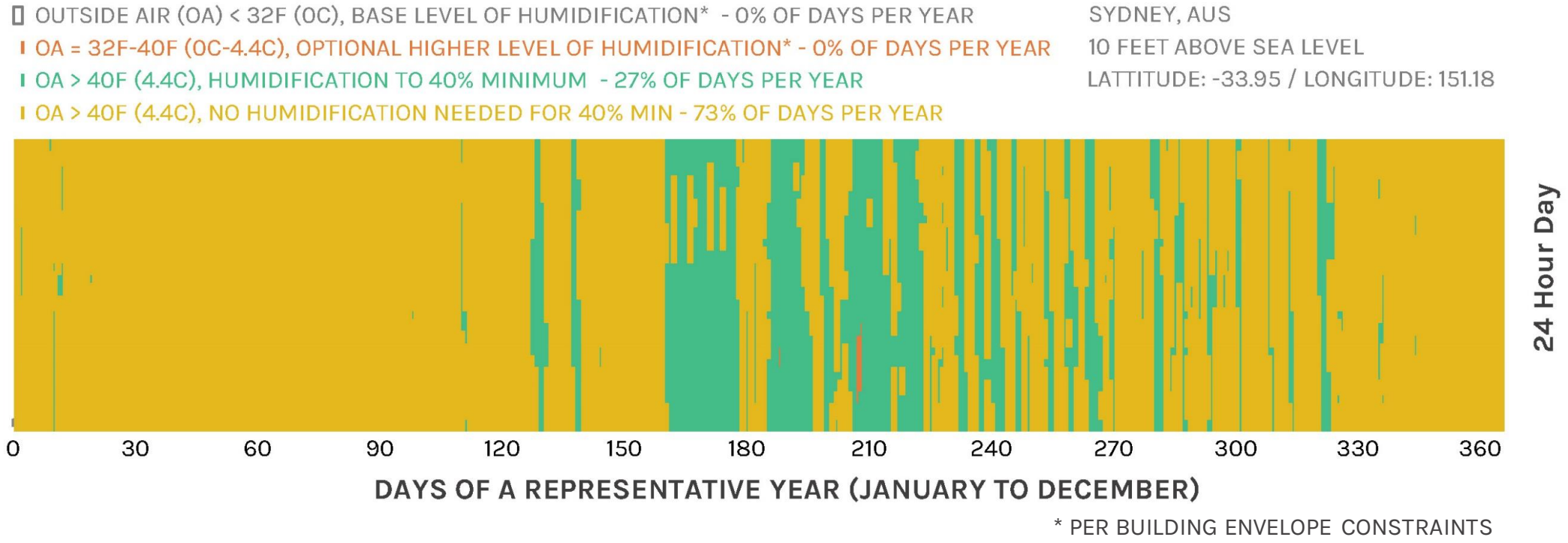
ASHRAE CLIMATE ZONE 3C

WARM - MARINE

SYDNEY, AUS



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Design a Better Future

SMITHGROUP