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PREVENTIVE CONSERVATION RISK ASSESSMENT
CHINA SHOP
January – May 2015

Risk identification and assessment contributes to a complete understanding of preventive conservation concerns. This report will discuss the findings gathered during a practical exercise in extended examination of a museum space. From January to May 2015, the China Shop room on the third floor of Winterthur Museum was evaluated through the framework of the Canadian Conservation Institute's Ten Agents of Deterioration (CCI 2013). Data collection, analysis, and interviews with museum staff supplemented monthly surveys of the space. Report includes the identification of specific agents as well as potential solutions for mitigation. Supporting documentation and discussion will be provided to contextualize these conclusions. To provide an indicator of risk priority level, three color-coded maps are included. These maps address overall risk level, pest risk, and temperature and humidity risk. The final component of the report is a self-assessment evaluating the decision process and techniques employed.

AGENTS OF DETERIORATION REPORT

Agent of deterioration	Risk	Action required to mitigate risk
Physical Forces	<ul style="list-style-type: none"> - Walkways between furniture and wall shelves are narrow. Chair and settee legs are trip hazards. - Ceramics are close to shelf edges. Visitors walk near shelves. 	<ul style="list-style-type: none"> - Keep guests in the main part of the room in front of furniture. - Shift central furniture to one side, creating one larger walkway. - Move objects away from shelf edges.
Thieves and Vandals	<ul style="list-style-type: none"> - Most objects in room are not tethered or cased. - Room contains small, portable objects. - Dishes are stacked, which makes recognizing a missing object difficult. - Visitors could sit in chair or settee. 	<ul style="list-style-type: none"> - Supervise visitors during tours. - Add deterrents or tie downs such as fishing wire. - Place brown paper strip or other visual marker under uppermost dishes so that missing items may be clearer. - Place thin ribbon across bamboo chair to protect fragile structure.
Dissociation	<ul style="list-style-type: none"> - Dishes within a service are similarly labeled. - Black book lists objects location by shelf. 	<ul style="list-style-type: none"> - Periodically check that all dishes in a service are stacked in location and in order. - Update black book with more descriptive locations.
Fire	<ul style="list-style-type: none"> - Fire extinguisher, alarm, and hose located by elevator through Tappahannock Hall. - Shelf lights produce heat. 	<ul style="list-style-type: none"> - Routinely inspect fire safety equipment and review emergency procedures. - Do not use study light settings for extended periods of time.
Water	<ul style="list-style-type: none"> - No specific risk. 	<ul style="list-style-type: none"> - CEP located through Tappahanock Hall in bathroom.
Pests	<ul style="list-style-type: none"> - House centipede carcass in north wall case is a food source. 	<ul style="list-style-type: none"> - Remove Plexiglas and clean carcass. - Continue monitoring for pest activity.

Pollutants	<ul style="list-style-type: none"> - Building envelope is not sealed in adjacent China Trade room. - Leaves and debris found in walkways. 	<ul style="list-style-type: none"> - China Trade window has been worked on October 2015-May 2015 to improve seal. - Housekeeping should check area after China Trade window has been opened.
Light/UV	<ul style="list-style-type: none"> - Brief periods of high light levels on textiles.¹ 	<ul style="list-style-type: none"> - Continue monitoring cumulative light exposure and compare to guidelines.
Incorrect Temperature	<ul style="list-style-type: none"> - Temperature in room reaches highpoints above the recommended limit. - Average temperatures near the upper end of the range, impacting relative humidity.¹ 	<ul style="list-style-type: none"> - Lower temperatures overall to help maintain RH in the space.
Incorrect RH	<ul style="list-style-type: none"> - RH is consistently low, with the majority of time spent below recommended range. - RH fluctuates daily.¹ 	<ul style="list-style-type: none"> - Moderately increase temperatures. - Replacement air handler with humidification capacity scheduled for fiscal year 2016. - Limit cycling to periods of stable weather if possible.

DISCUSSION OF RISKS AND DATA

Physical Forces

The China Shop space has a central arrangement of furniture including a bamboo chair (1951.0081.004) and a settee (1961.0431) placed in front of a counter (1966.0680). Narrow spaces on either side of the arrangement allow access to the south side of the room and the doorway to China Trade. Wall shelves with open displays of ceramics, sensitive to vibrations and impact, border the walkways. As observed on a tour of the space, visitors walk through this area to view the contents of the counter. Contractors and staff working in the China Trade room during the examination period also used these walkways frequently. Considering the protruding

¹ Light, temperature, and relative humidity were measured with a TR-74Ui logger unit. Temperature accuracy: ± 0.3°C at 10-40°C; RH accuracy: 5%; UV accuracy: ±5%; visible light accuracy: ±5%

furniture legs and the proximity of objects to shelf edges, these walkways pose risks for multiple objects as well as visitors.

Thieves and Vandals

While the majority of portable objects in the room are not tethered, missing or moved objects have not been a significant problem in the room (Smith 2015). Dish stacks have labels underneath the bottom dish on the shelf, but the uppermost plates do not have visual markers below if removed. Risk is decreased due to controlled access since tour groups are limited to five visitors supervised by a guide.

Dissociation

The black book in the room includes thumbnail images of the majority of objects in the China Shop. Within a service, many of the images appear identical, and objects could be switched easily. Detailed object labeling mitigates this issue.

Fire

Fire hose, alarm, and extinguisher are all located through Tappahannock Hall by the elevator, which is relatively close to the space. Fire hoses brought into the room could be problematic for objects in open shelving. Conservation records and discussion with Conservation Aide William Smith both indicate that a small, smoky fire was caused by electrical wiring in the shelf lighting in the late 1990s. Wiring and lighting in the space were updated as part of the museum-wide lighting project concluded in 2001, and risk appears to have decreased.

Water

While all spaces are potentially at risk for leaks from plumbing and HVAC systems, the China Shop does not have a history of water problems. A CEP spill kit is located in the bathroom by the elevator through Tappahannock Hall, which is accessible in case of emergency.

Pests

A Victor Glue Trap was placed in the northwest corner of the room under the black book holder. This location was selected due to the observation of a house centipede carcass in the northwest case and the presence of multiple pest traps in the China Trade room to the south. Pest trap was checked during surveys on January 15, February 26, March 18, April 21, and May 2. No pests were observed during this time period. While there have not been significant pest problems in the room in the past, lack of pests found may also be due to partial shielding of the trap (Smith 2015).

Pollutants

Dust and particulate pollutants are controlled by HVAC filtration and housekeeping procedures, which mandate dusting once a week and vacuuming every other week (Preventive Team 2013). The China Trade window was previously a weak point in the building envelope and a potential entry point for outdoor pollutants. During the survey period, China Trade improvements such as insulation and rotten board replacement have mitigated this risk.

Light/UV

During the survey period, the T and D TR-74Ui light meter was placed in direct lighting under the settee and secured with museum wax. This location was selected due to the presence of textile and lacquer objects in the center of the room, which are considerably more sensitive to light exposure than the room's ceramic contents (CC1 2013). Levels of UV light were consistently 0 microwatts/lumen. Results for visible light are summarized in Table 1 below. Highs of approximately 250 lux are brief peaks caused by the study light settings. While 250 lux exceeds the recommended light level of 50 lux for textiles, the low cumulative exposure indicates that overall risk is very low.

The data collection period of 4/9/15 – 4/30/15 shows significantly lower readings due to movement of the light meter.

Table 1. Summary of visible light data, T and D meter

Dates	High (lux)	Low (lux)	Cumulative (lux)
12/17/14 – 12/23/14	249.9	6.7	940.8
12/23/14 – 1/15/15	249.2	6.4	3574.3
1/15/15 – 2/6/15	251.6	6.2	3269.2
2/6/15 – 2/26/15	254.2	6.5	3128.0
2/26/15 – 3/18/15	265.9	7.9	3751.5
3/18/15 – 4/8/15	254.5	6.4	3367.6
4/9/15 – 4/30/15	51.0	2.6	37.7
			18069.1 ²

Incorrect Temperature and Relative Humidity

Temperature and relative humidity readings were gathered with a T and D TR-74Ui logger recording at 5 minute intervals. The logger was located under the settee against the counter in the center of the room. A summary of temperature and RH data is included below. Measurements above Winterthur Museum preventive guidelines are highlighted in red, while those below are in blue (Preventive Team 2015)³. The room also contains a Honeywell wireless data logger⁴ located in the northwest corner by the doorframe and a PEM2 data logger⁵ on top of the counter. Data from these additional loggers was accessed through eClimateNotebook.

Temperature is occasionally briefly high, but averages remain within the guidelines. RH frequently drops below 30%, with occasional brief highs that correspond to a temperature drop. RH fluctuated daily, likely as a result of cycling, and change was generally less than 15%. While the averages measured in the center of the room are acceptable, the data loggers by the doorways documented consistently low RH. During the winter months, the north and south ends of the room were below recommended RH 74.7% and 26.3% of the time, respectively. The RH maintained roughly the same

² Based on 180,000 maximum lux hours per year for sensitive materials, the five months studied should not exceed 75,000 lux hours (Preventive Team 2013).

³ Current guidelines are 65-72F° and 30-50% RH in the winter (Jan-March), and 68-75F° and 40-60% RH in the summer (April-May).

⁴ Model H7635A. Temperature accuracy: ±0.4°F at 77°F, RH accuracy: 3% from 20-95% RH.

⁵ Temperature accuracy: ±1°F from -40-150°F; RH accuracy: 2% from 10-90% and 3.5% outside range.

average as the guidelines shifted, and the room was below guidelines 66.9% and 80.1% of the time (Image Permanence Institute 2014). At the time of the report, recent months appear to have higher RH, which could potentially indicate a positive trend.

The China Shop and adjacent rooms have historically had problems with low RH due in part to the lack of humidification capacity in the HVAC system. The unit that services the China Shop room is due to be replaced with in fiscal year 2016, and humidification capacity is expected to reduce associated risks (Price 2015).

Table 2. Summary of temperature data, T and D logger

Dates	High (F°)	Low (F°)	Avg (F°)
12/17/14 – 12/23/14	71.6	69.8	70.6
12/23/14 – 1/15/15	74.5	66.4	70.2
1/15/15 – 2/6/15	70.7	67.1	69.2
2/6/15 – 2/26/15	71.2	65.8	68.6
2/26/15 – 3/18/15	72.1	64.8	69.3
3/18/15 – 4/8/15	74.5	66.2	71.5
4/9/15 – 4/30/15	74.3	71.8	73.2

Table 2. Summary of RH data, T and D logger

Dates	High (%)	Low (%)	Avg (%)
12/17/14 – 12/23/14	41	25	33
12/23/14 – 1/15/15	59	22	34
1/15/15 – 2/6/15	48	23	32
2/6/15 – 2/26/15	46	24	31
2/26/15 – 3/18/15	44	27	35
3/18/15 – 4/8/15	52	19	34
4/9/15 – 4/30/15	51	26	38

SELF-ASSESSMENT

My initial plan for the risk assessment audit was informed by my fall semester environmental report. I was aware that the room had a history of problems with incorrect temperature and relative humidity, and it was well equipped with loggers to monitor the issue. I also came back to the room with the knowledge that multiple objects, specifically a chair and miniature cabinet (1966.0628 and 1966.0635) had been removed for student projects, which gave me a sense of how these collection items are used. Research during the fall report prepared me for the range of materials in the room and the various levels of sensitivity, from stable ceramics to cracking lacquer. Shifting to the framework of the agents of deterioration, I began considering fire and water risks and emergency situations more in depth than I had in the fall. My strategy to incorporate all of the agents into a cohesive picture included continually updating a chart during each monthly visit. This process helped to guide each visit and maintain a consistent approach each time. I found that a thorough first visit was invaluable, and all of the pictures I took set a baseline for comparison. The January survey helped me to

reacquaint myself with the space and note the status of familiar issues while exploring new concerns.

The strategy of surveying the room in the middle of each month was effective for noting changes. I consistently relied on picture taking as a means of comparison. It also helped me to visit the space with a partner so that we could discuss issues and help with recording measurements. The process of learning to collect data and reset the loggers was surprisingly informative since it brought a group of classmates together to talk over each space as we worked. As I spent time surveying my room, I had several informative discussions with other people using the space, including art handlers and WPAMC students. These were not interviews that I would have thought to plan, but it helped me realize how many sources of information and perspectives on the room are available.

As the project progressed, I sought further information through interviews. Matt Mickletz and William Smith, who spends time in the room on a regular basis, were great sources. While surveying a room over several months provides a great deal of information, the historical trends of a space can be easier to grasp from first-hand accounts. I enjoyed getting to know details even if their significance was not immediately relevant since all information can contribute to subsequent synthesis.

In addition to working with a partner, communicating with classmates in connected spaces was very helpful throughout the process. Environmental issues and emergency response procedures had common themes throughout the floor. Exploring nearby closets and supply areas broadened my concept of what my space involves. Learning about other rooms also put risks and priorities in perspective within the institution. When I was making decisions about assigning risk levels, looking at group maps and sharing details helped hone in on appropriate color codes.

The strengths of my approach included thorough documentation and communication with people who were familiar with different aspects of the space. If I were to complete another audit, I think I could more efficiently analyze my photographic notes if I implemented an organization and filing system early in the process. These visual notes would help track subtle issues better, such as when my light meter shifted. I would also pursue more sources and interviews about facilities and maintenance since these areas were changing more than I realized initially.

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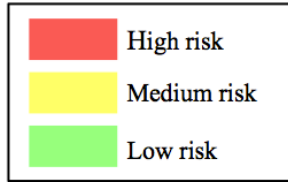
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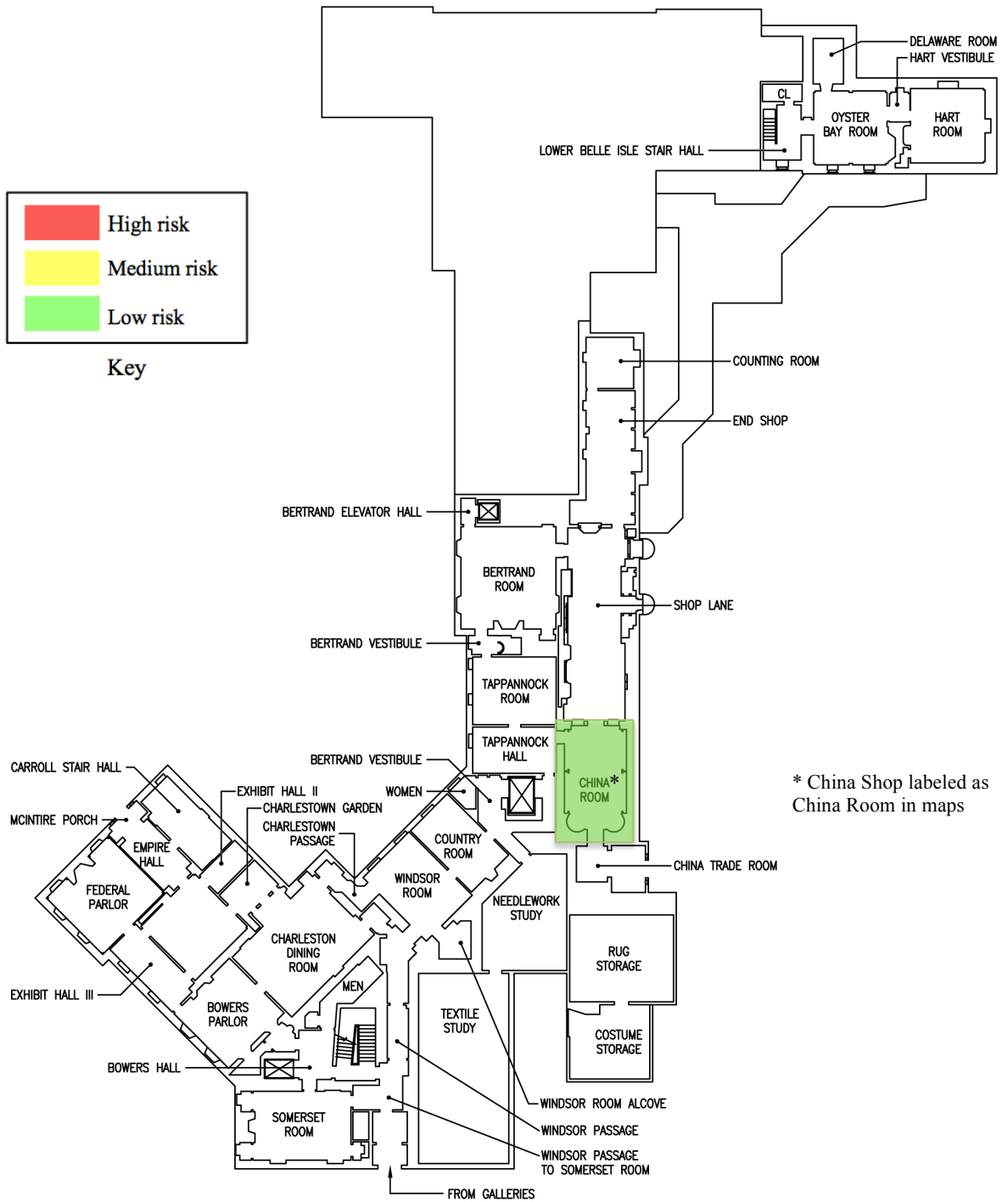
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OVERALL RISK

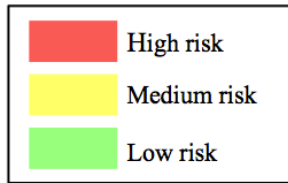


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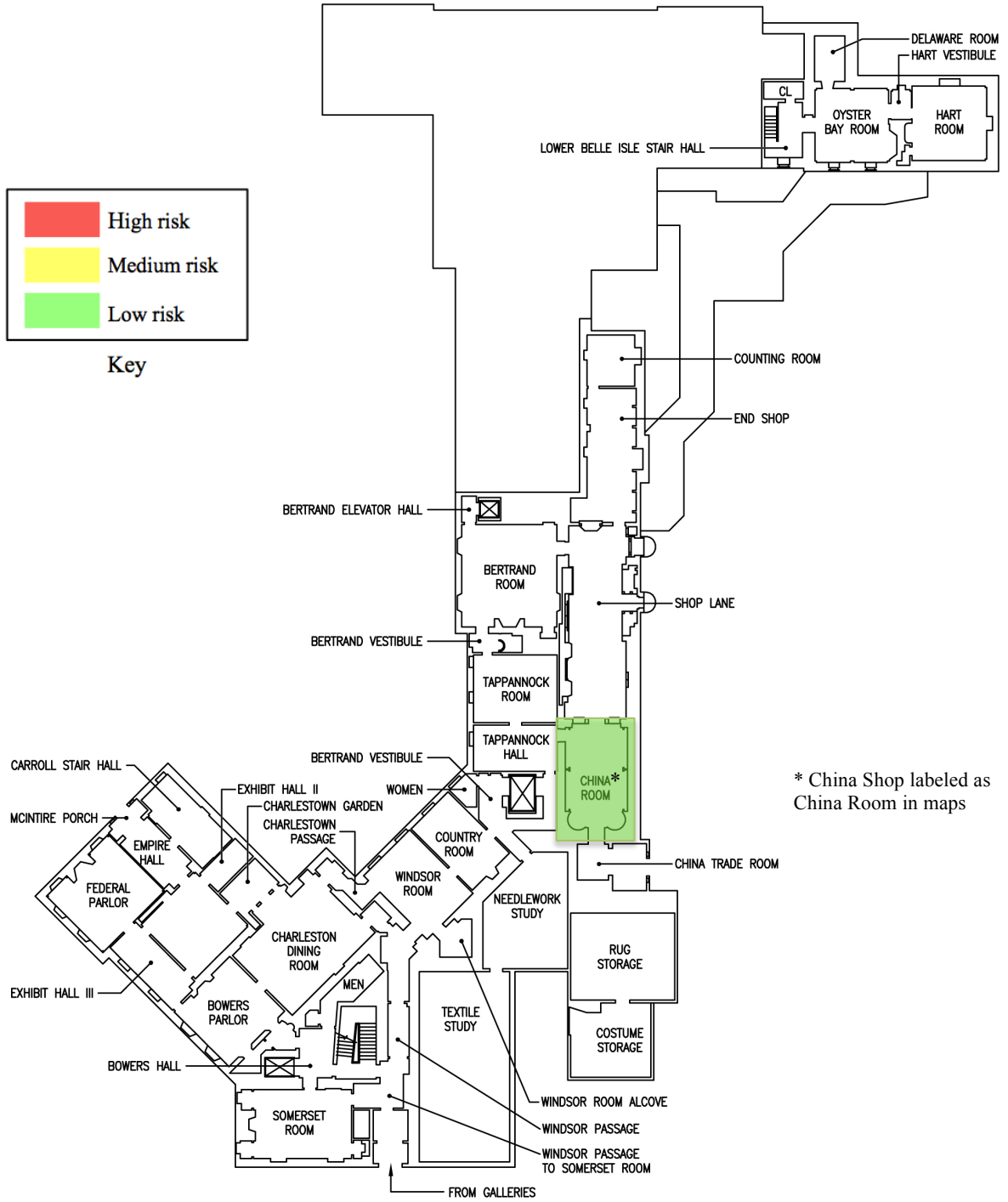


* China Shop labeled as China Room in maps

PEST RISK

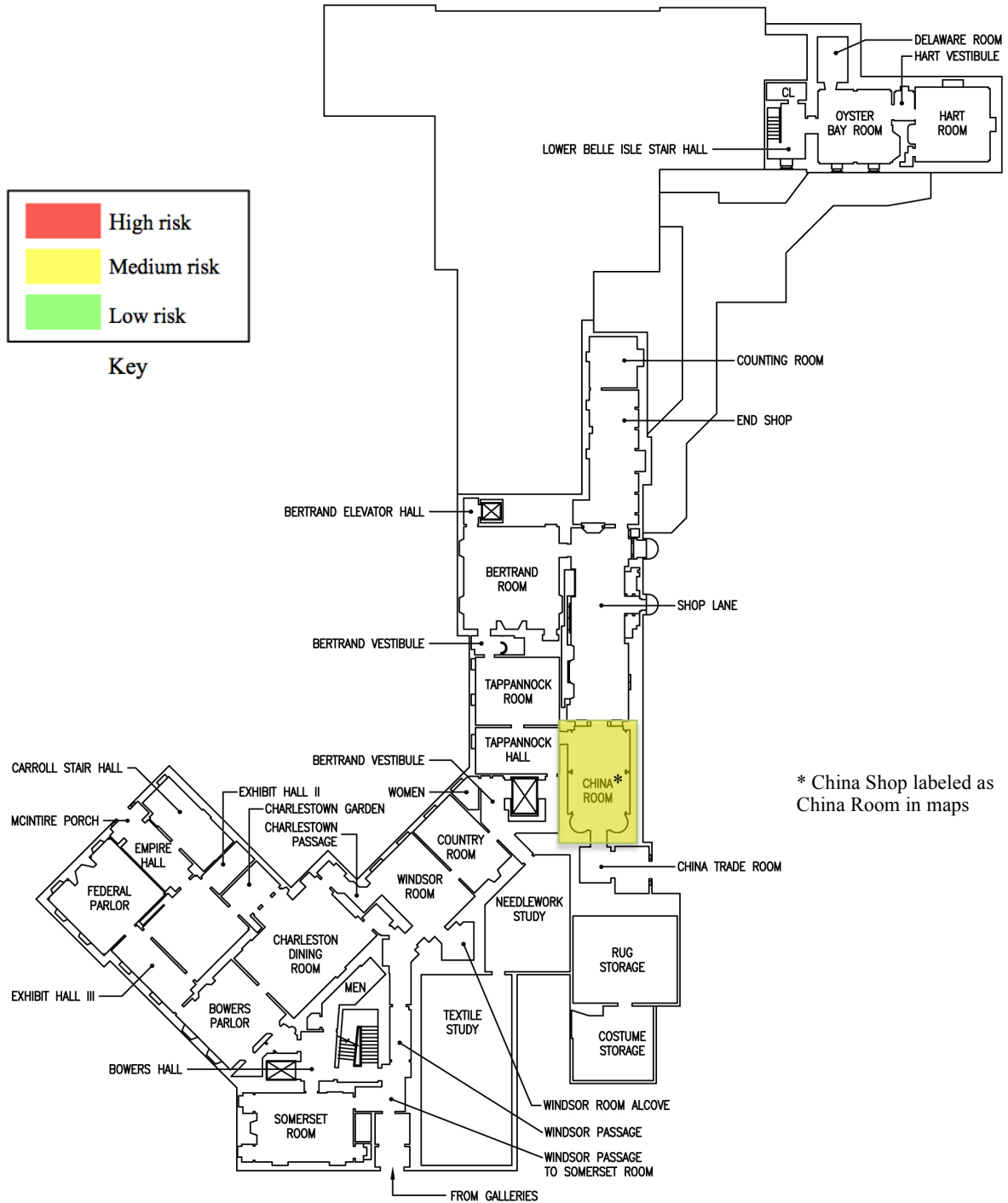


Key



* China Shop labeled as China Room in maps

RH AND TEMPERATURE RISK



* China Shop labeled as China Room in maps

WINTERTHUR
THIRD FLOOR